

S312A-4-L-4R / S312A-4-H-4R Line

Advanced Analog Indicators

4-Digits Display with 4 relay outputs

1. GENERAL SPECIFICATIONS

- Universal input voltage, current, thermocouples, thermoresistors (2, 3 or 4 wires measurements), potentiometer.
- Programmable retransmission of the measured instantaneous value by the isolated analog output (voltage or active/passive current).
- Filter programmable at 20 levels to stabilize reading.
- Temperature measurement displayable in Celsius or Fahrenheit degrees.
- Cold junction compensation in case of thermocouple input.
- 4 digits display.
- Four alarms are activable on the instantaneous input value (alarm type: maximum, minimum, automatically resettable or not).
- Alarms status visible through four leds on the frontal panel.
- Rs485 serial communication with MODBUS RTU protocol, maximum 32 nodes.
- Four relay outputs for alarms signalling.
- Easy navigation on the programming Menu by three buttons on the frontal panel.
- Quick configuration of the alarm thresholds by the Quick Alarms Menu.
- Disturbance rejection at 50 and 60 Hz.
- Display contrast settable.
- Four relay output: default state for out3 and out4 are settable by internal jumper

2. TECHNICAL SPECIFICATIONS

Power Supply:	Code S312A-4-L-4R: 10-40 Vdc, 19-28 Vac 50-60 Hz, max 3 W. Code S312A-4-H-4R: 85-265 Vac 50-60 Hz, max 3 W.
Voltage Input:	0..10 V, input impedance: 100 kΩ Resolution: 10000 points.
Current Input:	0..20 mA, input impedance ~20 Ω Resolution: 10000 points.
Thermoresistor Input (RTD) PT100	2, 3 or 4 wires measurement, excitation current: 1,1 mA, resolution: 0,1 °C. Temperature Range: -150 °C..650 °C. Resistance Range: 20..350 Ω.
Thermocouple Input:	Type: J, K, R, S, T, B, E, N; resolution: 10 μV . Refer to the TABLE: TC RANGE for the measurement range.
Potentiometer Input:	Excitation Current: 1 mA. Potentiometer value from 1 kΩ to 100 kΩ, to use always with a parallel resistor equal to 330 Ω.
Analog Output:	Generated Current: 0..20 mA, max load resistance: 500 Ω. Voltage: 0..10 V, min load resistance: 1 kΩ. Configurable Start and Full scale values. Resolution: 2 μA / 1 mV.



Table: TC Range

TC TYPE	Admitted Range	TC TYPE	Admitted Range
J ..-210..1200 °C	S ..-50..1768 °C		
K ..-200..1372 °C	R ..-50..1768 °C		
E ..-200..1000 °C	B ..250..1820 (0..) °C		
N ..-200..1300 °C	T ..-200..400 °C		

(2) EMI: electromagnetic interferences.

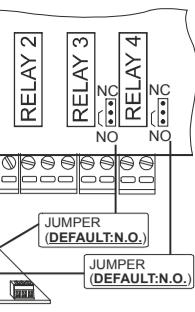
(3) Up to 250 °C, the output is considered equivalent to a null temperature.

3. RELAYS AND JUMPER POSITION

To extract the boards from S312Abox:
1) remove the screw terminals from rear panel;
2) turn inwards the box on the top panel (where there is the serigraphy) and, at the same time, press inwards the box on the bottom panel;
3) extract the display indicator;
4) extract the boards from box.

Boards are as in the following figure.

«NOTE: DEFAULT: N.O. means «NORMALLY OPEN»



4. FUNCTIONING DESCRIPTION

The measured or integrated input value is translated into an analog output signal.
The instantaneous measurement of the input is displayed. The values are also available via Modbus RTU protocol upon query by RS485 bus.

4.1 Setting Modalities

All the parameters of the instrument may be set by the programming Menu or RS485. The alarms thresholds may be quickly set by the Quick Alarm Menu. Besides the software has been developed for the programming and the configuration of the module (consult the web site www.seneca.it).

4.2 Retransmission Modalities

The instrument allows the following retransmission modalities:
Analog Output: the measured input value is translated into an analog output signal (voltage or current).

4.3 Alarms on the Analog Input

Four alarms may be activated on the instantaneous value of the input. Each alarm may be set on the following way:

1) Alarm on the minimum threshold. 2) Alarm on the maximum threshold.

3) Retained Alarm on the minimum threshold (the reset is automatic).

4) Retained Alarm on the maximum threshold (the reset is automatic).

For each alarm, it is possible to set Threshold and Hysteresis. If the alarm is set as high, the alarm will turn OFF when the input value is Threshold-Hysteresis; instead if the alarm is set as low, the alarm condition will end when the input value is Threshold+Hysteresis. The alarms status is displayed by four leds on the frontal panel and by the relays. The relays toggle at the alarm condition and return to the initial status at the end of the alarm condition or at the reset (if retained). The retained alarms are reset by pressing the buttons UP + OK/MENU for some seconds (on normal view functioning).

4.4 Password for access to the menu

It's possible to enable the protection of the Programming Menu by password. The Quick Alarm Menu is instead password free.

REAR SIDE: TERMINALS



5. BUTTONS AND TERMINALS POSITION

FRONTAL PANEL: BUTTONS AND LEDs



6. ELECTRICAL CONNECTIONS

PWR SUPPLY: Verify the code on the applied label.

Code S312A-4-L-4R

10 + 40 Vdc 3.0 W 1 1A 2A 85 + 265 Vac 3.0 W 1 2B

19 + 28 Vac 1 2A 8 9 10

CURRENT INPUT

mA input (2 wires)

7 8 9 10

10

The loop is powered by the sensor

PT100 INPUT

3 wires

7 8 9 10

4 wires

7 8 9 10

THERMOCOUPLE INPUT

7 8 9 10

POTENTIOMETER INPUT

7 8 9 10

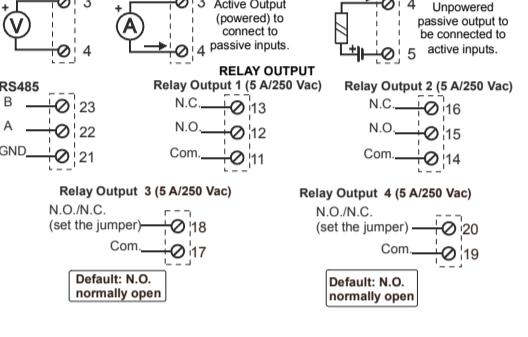
Resistance R=330 Ω (not provided), P=1 kΩ + 100 kΩ

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7. MENU'S PARAMETERS

Parameters settable from Menu: L.O.n.F.

Parameter Symbol	Parameter Name	Description and setting range	Default Value
PASS	Parameter Name	Setting a value different from 5477, the password (always 5477) will be required at the start of the menu.	5477: Password disabled

Parameters settable from Menu: I.n.P.t.

Parameter Symbol	Parameter Name	Description and setting range	Default Value
TYPE	Input Type	1 = Voltage 6 = TCR 11 = TCN 2 = Current 7 = TCS 12 = PT100 (2 wires) 3 = Potentiometer 8 = TCT 13 = PT100 (3 wires) 4 = TC J 9 = TC B 14 = PT100 (4 wires) 5 = TC K 10 = TCE	2: Current

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8. ERROR SIGNALINGS

The errors are directly viewed through display.

We are going to list all the possible signalings with the correspondent meaning:

rrrr: Instantaneous value to display > HI-d value of the 2.5% or if the instantaneous value > maximum displayable.

uuuu: Instantaneous value to display < LO-d value of the 2.5% or instantaneous value > maximum displayable.

bu-n: Burn-out of the temperature sensor.

EErr: communication error with the cold junction thermometer.

EErr: at the start may signal an error on the calibration memory. The functioning of the module is blocked while the Modbus communication is available.

9. ORDER CODES

Code	Description
S312A	Indicator with universal analog input, 4 relays.
-4	4 digits
Power Supply	-H 85..265 Vac -L 10..40 Vdc / 19..28 Vac
Output relay	-4R 4 output relay
Options	/T Calibration and configuration Service

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11 SETTABLE VALUES FOR MULTIPLE CHOICE PARAMETERS

The various options for the multiple choice parameters are listed below. Default values are indicated with the * symbol.

11.1 I.n.P.t. (ELECTRICAL INPUT)

1 = Voltage	5 = TCK	9 = TC B	13 = PT100 (3 wires)
2* = Current	6 = TCR	10 = TCE	14 = PT100 (4 wires)
3 = Potentiometer	7 = TCS	11 = TCN	
4 = TCJ	8 = TCT	12 = PT100 (2 wires)	

11.2 S.C.R.L. (SETTING DISPLAYED VALUE)

FRRr
Selects if the temperature will be displayed in:

- 0* = Celsius degrees
- 1 = Fahrenheit degrees.

FILt

Set the level filter. Admitted Value:

- 0* = no filter
- 1 ... 20.

11.3 R.L.1./R.L.2./R.L.3./R.L.4. (ALARM SETTING)

tYPE1/tYPE2/tYPE3/tYPE4

Sets the alarm type:
0* = Inactive Alarm
1 = Alarm on the minimum threshold
2 = Alarm on the maximum threshold
3 = Retained alarm on the minimum threshold (reset is not automatic)
4 = Retained alarm on the maximum threshold (reset is not automatic).

11.4 D.U.E.. (RETRANSMITTED OUTPUT SETTING)

tYPE
Sets the type of the retransmitted output:
1 = 0...10V output 2* = 4...20mA output
3 = 0...20mA output

11.5 b.U.S.. (RS485 SETTINGS)

Addr
Selects the slave Modbus address. Values from 1 to 255. Default: 1.

PRr
Selects the parity control of the serial communication:
0* = None 1 = Even 2 = Odd.

dEL

Sets the response delay time. Values: 0 .. 255. 0* = no delay, 1 = 1 pause, etc.

bRUD

Sets the Baudrate:

0 = 4800	3* = 38400	6 = 1200
1 = 9600	4 = 57600	7 = 2400
2 = 19200	5 = 115200	8 = 14400

11.6 S.Y.S.. (SYSTEM)

COntr

Sets the display contrast:

Values from 1 (minimum contrast) to 20 (maximum contrast). Default: 10.

bUrn

Behavior in case of Burn Out of PT100 or Thermocouple:
0* = Full scale indication
1 = Start scale indication.

11.7 d.F.L.t. (DEFAULT SETTING)

1 = Sets the default values for all the parameters.

8. SETTING EXAMPLES

8.1 Modification parameters examples

We are going to illustrate an example of HI-d parameter modification for a 6 digits model. In this example the digit to modify, that in the real case flashes, is bordered:
Once the parameter to modify has been selected, the set value is for example:

0 9 0 0

The pressure of the DOWN button entails:

0 9 0 9

DOW has brought the digit to the maximum value.

Now the pressure of OK/MENU buttons entails the position shift of the digit to modify:

0 9 0 9

The pressure of the UP button entails:

0 9 1 9

that is the digit has been increased of a unit.

To set a negative value, place on the most significant digit by subsequent pressures of OK/MENU button:

0 9 1 9

By pressing the DOWN button:

1 9 1 9

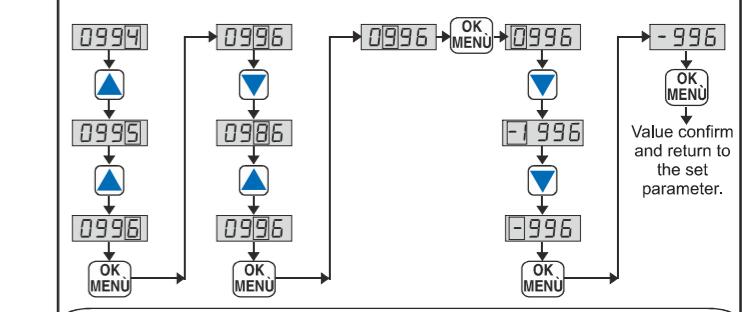
The last digit is brought to the most negative value: -1.

A further pressure of the OK/MENU button, entails the return to the voice correspondent to the just modified parameter:

H I - d

PARAMETERS MODIFICATION

The modification is performed digit by digit. The digit to modify **flashes**: on the figure this digit is bordered.



Notes on Values Setting
Negative Values: the last digit allows to insert also the '-' sign or "-1" value.
The Inserted Values are out of the parameter range: the value is carried within the range.

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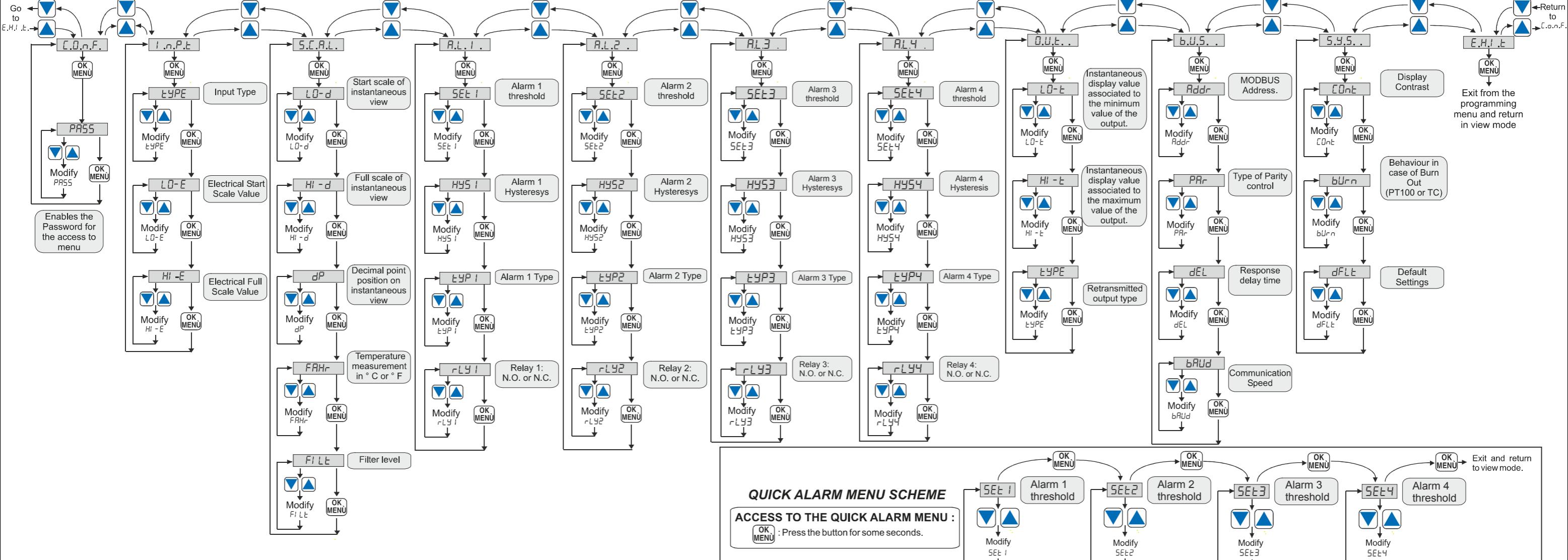
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ACCESS TO THE PROGRAMMING MENU :

: Press the two buttons simultaneously for some seconds.



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