MONIUNI – MONITOR UNIVERSAL

MANUAL

INDEX

INTRODUCTION

The MoniUni Universal Signal Monitor is a high-precision microprocessor instrument used for various signal and quantity digitization processes. It can be used to measure and indicate temperature, pressure, level, relative humidity, rotation, and other quantities through its signal inputs.

The MoniUni has 3 (three) signal inputs, configurable for RTD, 4 to 20 mA current or percentage level. It has three relays for alarm programming, with adjustable hysteresis and timing, three independent relay outputs for alarms, a dedicated relay for fault indication, an RS-485 communication output with Modbus RTU and DNP3 Level 1 protocols, as well as up to three configurable analog outputs in the ranges of 0 to 1 mA, 0 to 5 mA, 0 to 10 mA, 0 to 20 mA, or 4 to 20 mA.

Its enclosure is made of aluminum, compliant with DIN standards for panel mounting, and the electronic circuitry was developed in accordance with strict quality and design standards to withstand severe working conditions, and can be installed in power supply yards, maritime platforms and chemical industries. Meets the levels of demand, supportability and reliability according to IEC, DIN, IEEE and ABNT standards.

KEY FEATURES

- High-brightness 4-digit display, 20 mm digit height and 13 mm decimal point (red);
- Temperature measurement range from -99 to 850°C;
- 4 to 20 mA current signal input;
- Compensated input for PT100 / PT200 / PT500 / PT1000 3-wire RTD sensors and level;
- Universal power supply 48 to 265 Vdc/Vac;
- Configurable analog output, in the ranges of 0 to 1 mA, 0 to 5 mA, 0 to 10 mA, 0 to 20 mA, or 4 to 20 mA;
- Front USB 2.0 for parameterization via UseEasy™ software;
- Stores in memory the maximum and minimum values recorded for each measured variable;
- 1 Contact for Fault Indication (Watchdog);
- 3 NAF Alarm Contacts with programmable timing and hysteresis;
- Protection system against parameter changes by the Serial network;
- IP20 degree of protection **(NBR IEC 60529);**
- Automatically detects the speed of the Communication network;
- High mechanical strength housing, built entirely of aluminum, compliant with **DIN IEC 61554 standards;**
- Reduced size 48x96x140mm;
- Easy parameterization and use;
- 2 years warranty;

TECHNICAL DATA

UNIVERSAL SIGNAL MONITOR - MONIUNI	
Operating Voltage	48 to 265 Vdc/VAC 50/60 Hz
Operating Temperature	- 40 to +85°C
Consumption	< 15 W
Temperature Measurement Input	PT100 / PT200 / PT500 / PT1000 3 Wire
Temperature Measurement Range	-99 to +850°C
Current Measurement Input	4 to 20 mA
Level Measurement Range	Resistive from 0 to 5000 Ohms
3 analog output options and maximum load	0 ... 1 mA – 8000 Ohms
Analog Output and Maximum Load Options	0 ... 5 mA – 1600 Ohms
	0 ... 10 mA – 800 Ohms
	0 ... 20 mA – 400 Ohms
	4 ... 20 mA – 400 Ohms
	0.5% of end-of-scale
Maximum Error of Measurement Inputs	0.5% of end-of-scale
Maximum Analog Output Error	0.5% of end-of-scale
Outgoing Contacts	4 – Free of Potential
Maximum Switching Power	250 VA / 70 W
Maximum Switching Voltage	250 Vac / 125 Vdc
Maximum Driving Current	10 A
Serial Communication Port	RS485
Communication Protocol	Modbus RTU and DNP 3
Auto Baud Rate	1,200 to 57,600 bps
Front USB Port	USB Serial
Housing (DIN IEC 61554)	48 x 96 x 140mm - Aluminum
Equipment Attachment	Flush Panel Mounting

UPGRADED TYPE TEST

- Voltage Impulse (IEC 60255-5): 1.2/50 sec. / 5kV / 3 sec. and 3 sec. / 5 sec. Break;
- Electrostatic Discharge (IEC 60255-22-2): Air mode = 8 kV / Contact mode = 6 kV;
- Immunity to radiated electromagnetic disturbance (IEC61000-4-3): 80 to 1000 MHz / 10V/m;
- Immunity to fast electrical transients (IEC60255-22-4): Alim/Input/Outputs=4KV/common. 2kV;
- Surge Immunity (IEC60255-22-5): phase/neutral 1KV, 5 per polar. (±) - 2KV phase-to-ground/neutral-to-ground, 5 per polar (±);
- Immunity to conducted electromagnetic disturbances (IEC61000-4-6): 0.15 to 80 MHz / 10V/m;
- Climate Test (IEC60068-21-14): - 10ºC + 70ºC / 72 hours;
- Vibration Resistance (IEC60255-21-1): 3 axes / 10 to 150Hz / 2G / 160min/axis;
- Vibration Response (IEC60255-21-1): 3-axis / 0.075mm-10 at 58 Hz / 1G from 58 to 150 Hz / 8min/axis;

CONNECTION DIAGRAMS

Diagrama para conexões de entradas RTD.

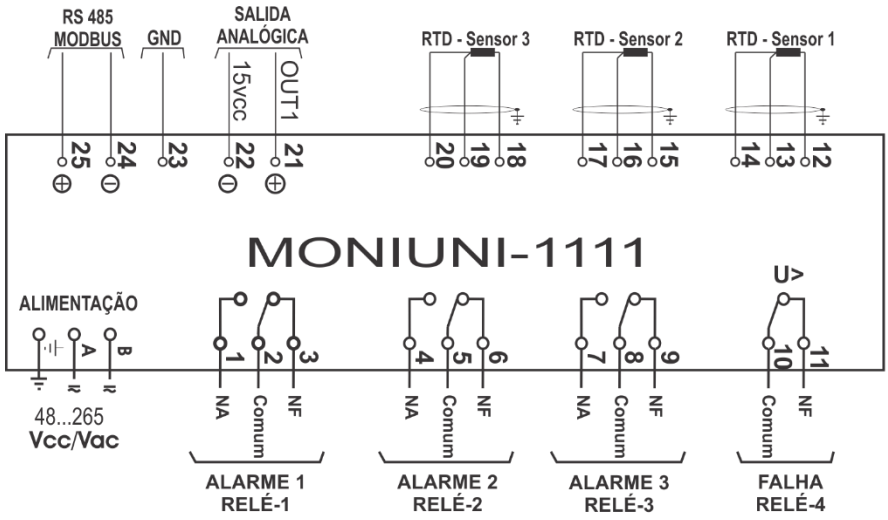


Diagrama para conexões de entrada 4 a 20 mA ativa.

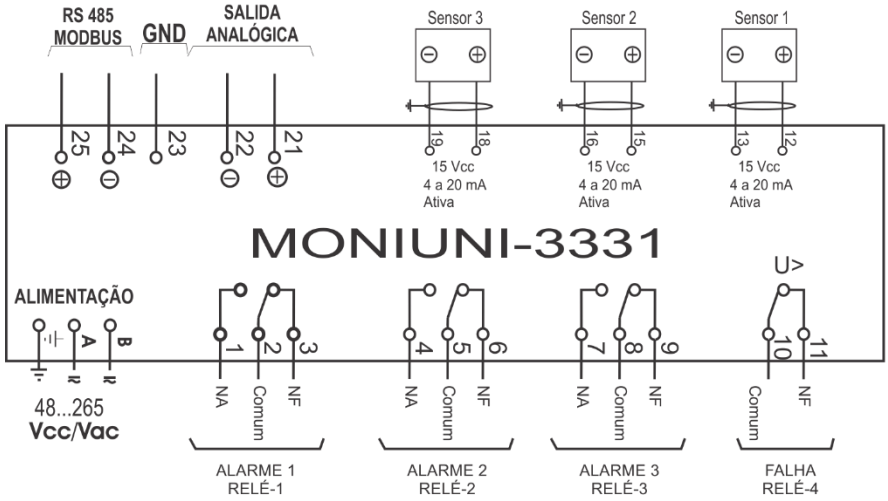
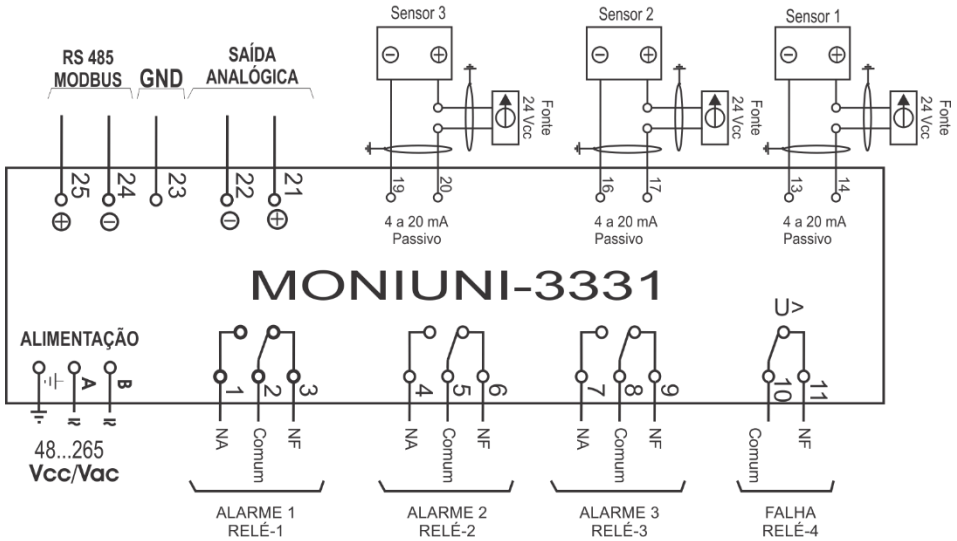
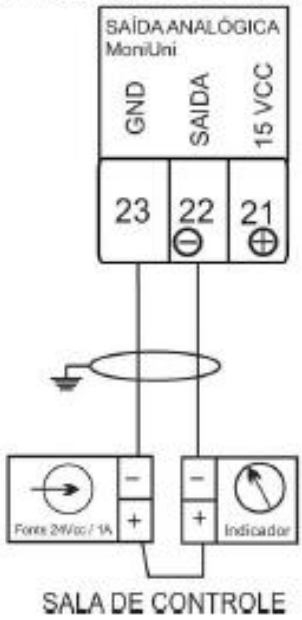


Diagrama para conexões de entrada 4 a 20 mA passiva.

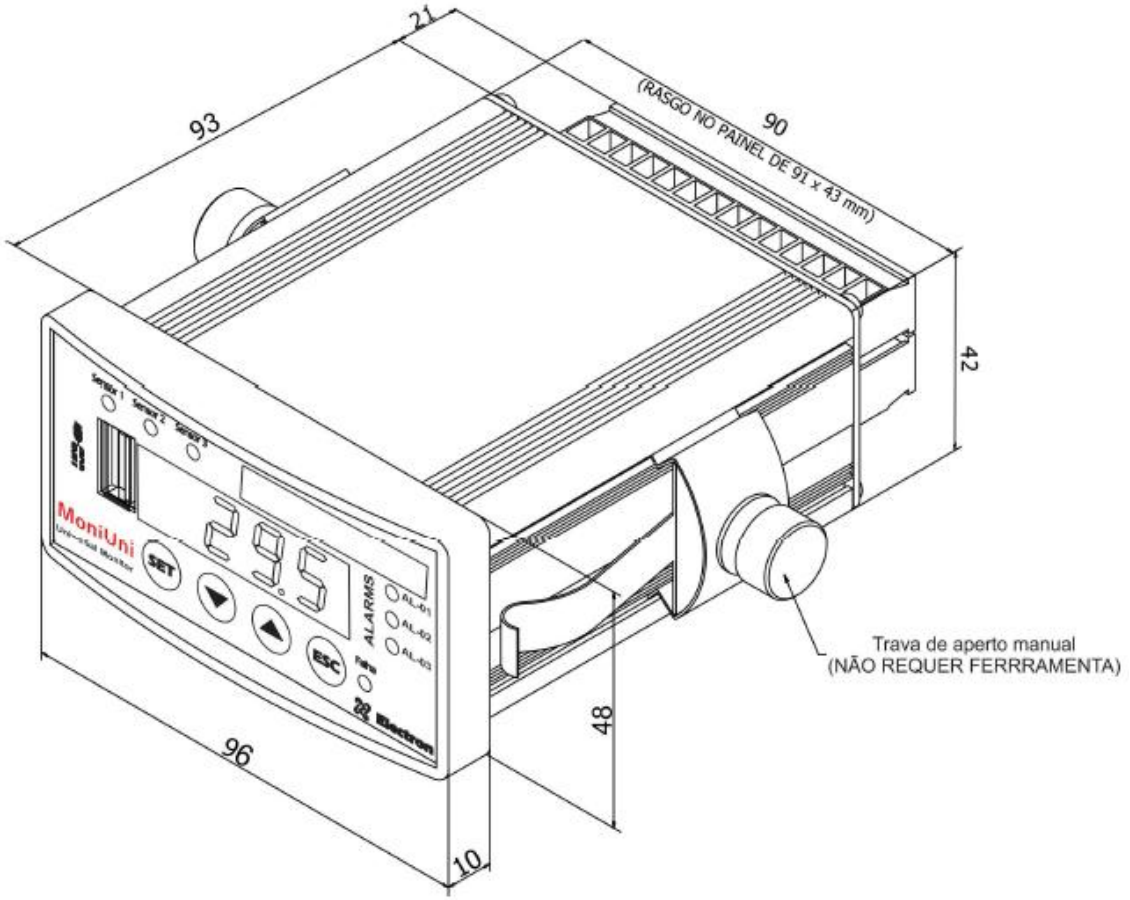


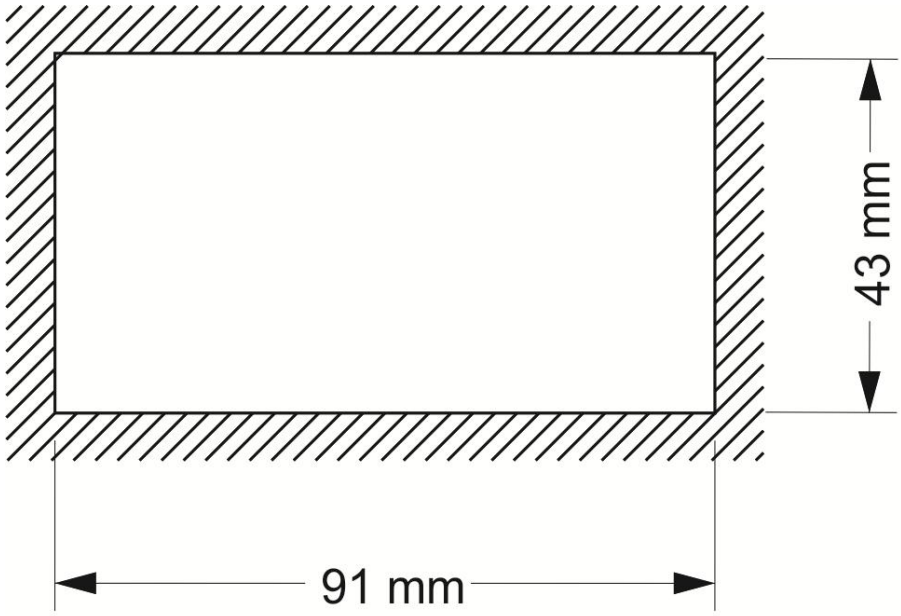
CONNECTION DIAGRAMS

Diagrama para conexões da saída de corrente em modo passivo quando o Indicador Analógico possuir fonte externa. caso contrario utilize os 15VCC do MoniUni



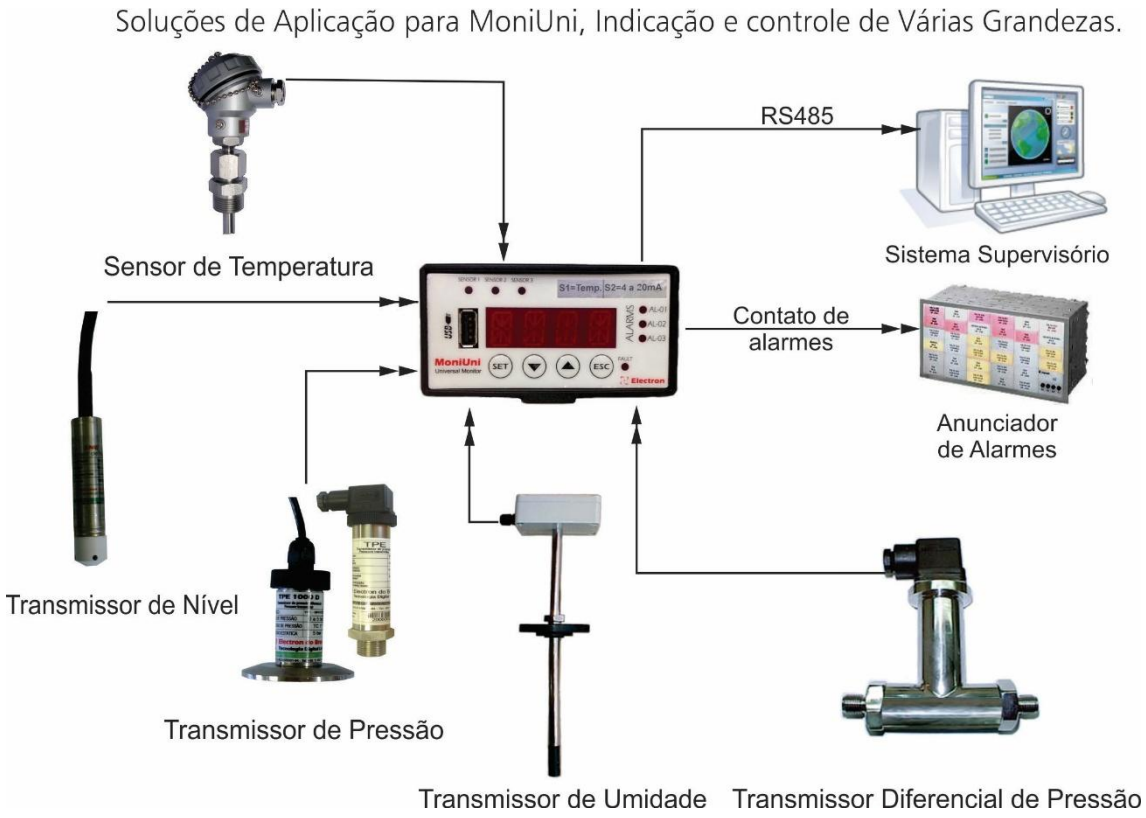
DIMENSIONS





Rasgo do Painel

APPLICATION EXAMPLE



INSTALLATION ACCESSORIES

Mascara de Adaptação

96x96 p/ 48x9

Caixa para uso Externo

SPECIFICATION FOR ORDER

MoniUni - [ ][ ][ ][ ]

Entrada do Sensor 1	
1	Resistiva / RTD
2	Cu10
3	4 a 20 mA

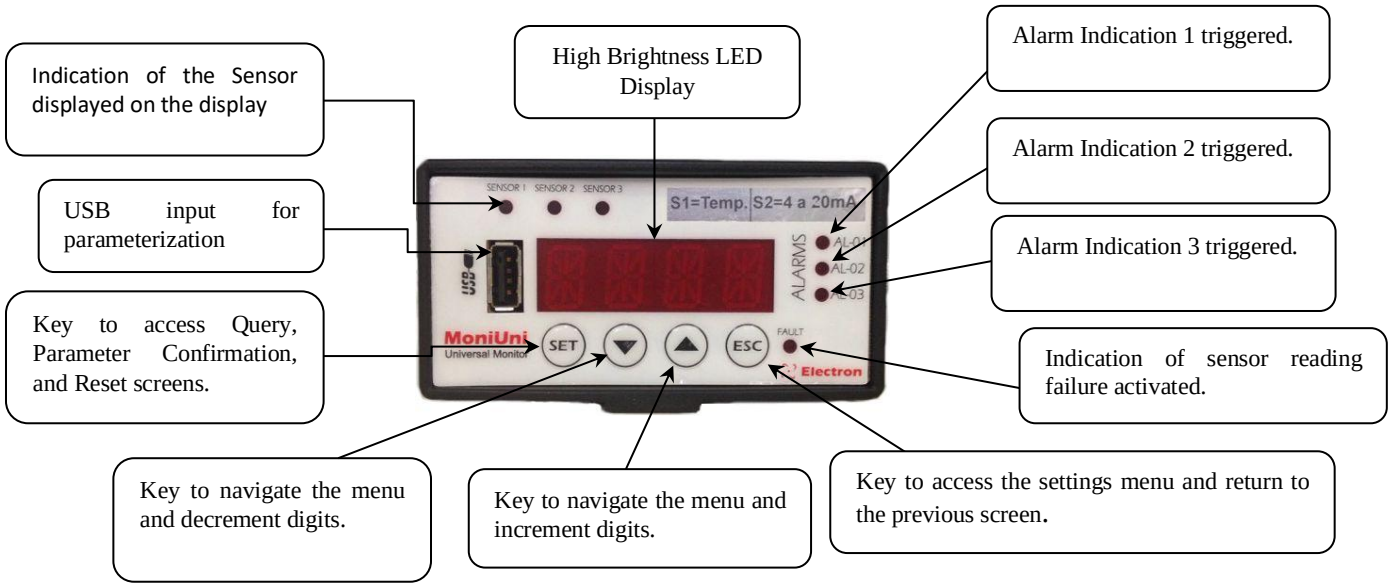
Entrada do Sensor 2	
0	S/ Entrada
1	Resistiva / RTD
2	Cu10
3	4 a 20 mA

Entrada do Sensor 3	
0	S/ Entrada
1	Resistiva / RTD
2	Cu10
3	4 a 20 mA

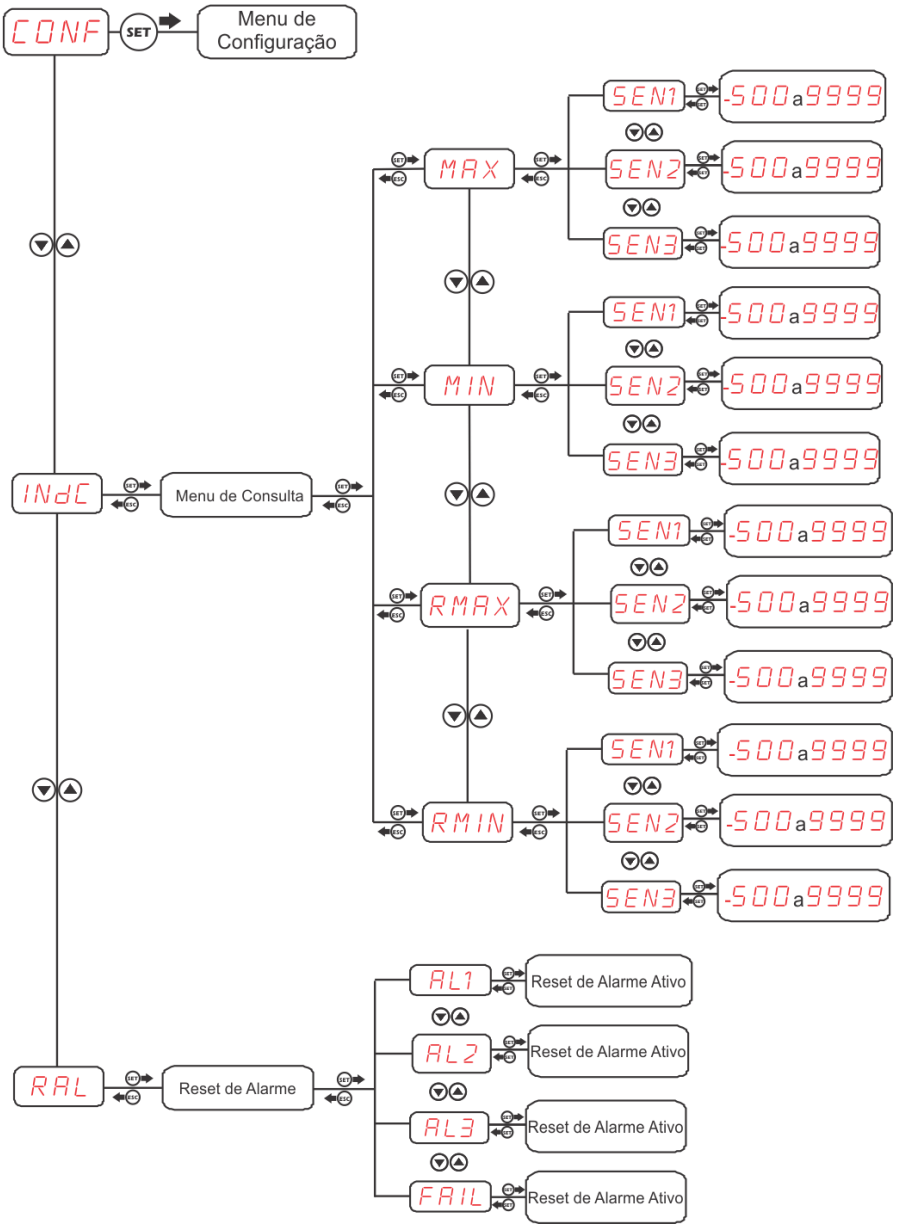
Saída Analógica	
0	S/ Saída
1	1 Saída
2	2 Saídas
3	3 Saídas

NOTE: It is only possible to model Moniuni with 3 current outputs when the input of sensor 3 is equal to 0, without input or equal to 3, input from 4 to 20 mA, in other cases it is only possible to have one current output.

GETTING TO KNOW MONIUNI



FLOWCHART OF QUERY SCREENS AND ACCESS TO THE CONFIGURATION MENU



CONSULTATION AND ACCESS TO THE CONFIGURATION MENU

Press the SET key and the display will display the acronym CONF, and use the increment and decrement keys to access the query menu or press the **SET** key to enter the password and access the settings and test menus.

***NOTE**: The manufacturing password is OOOO and the reminder number is 187O, if the user changes this password in the PaSS menu and forgets it, send the reminder number (187O) to Electron do Brasil for product password reset.

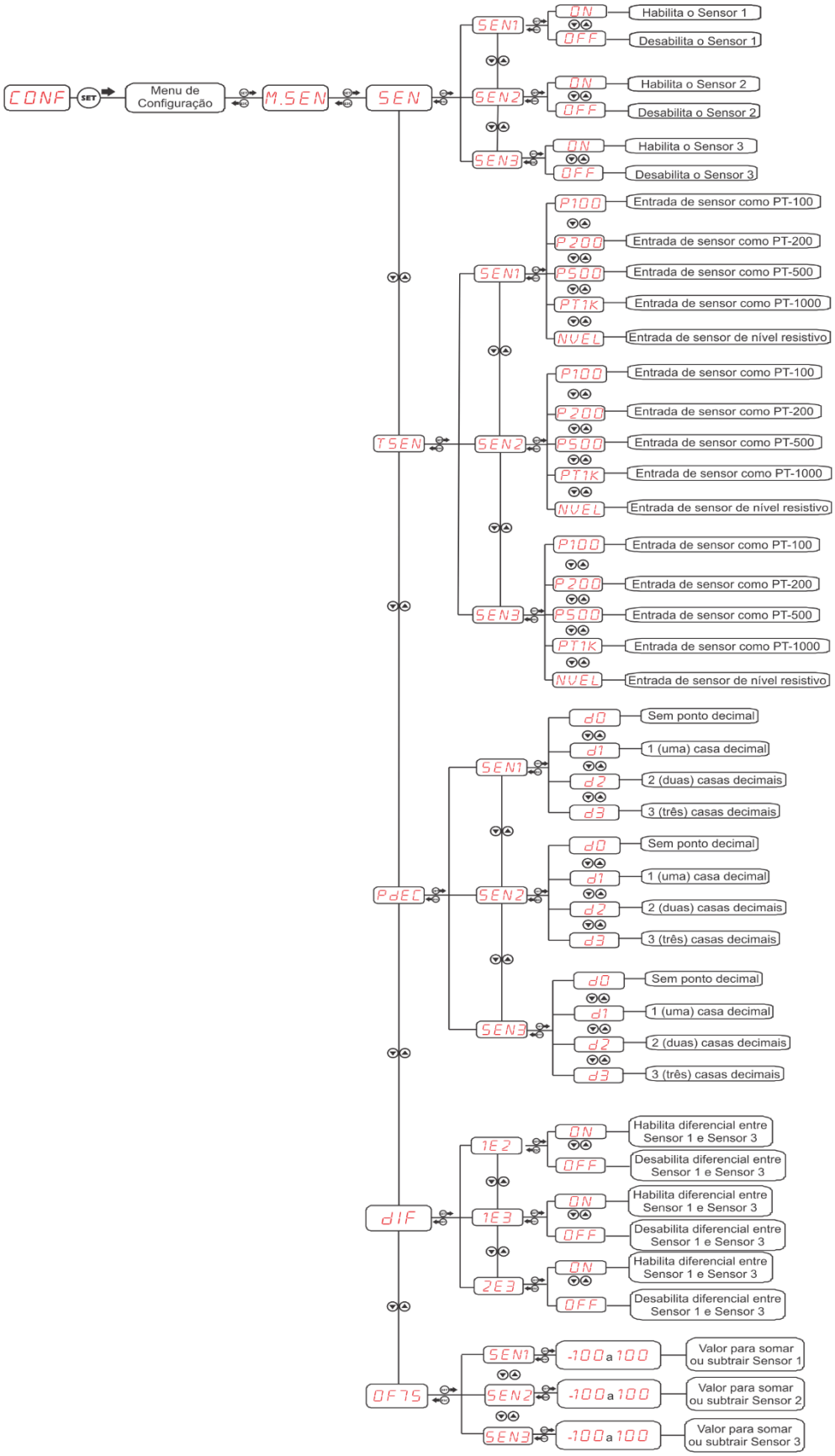
****NOTE**: This equipment has menus and parameters whose availability is subject to the model purchased.

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
INdC	→ Query menu for minimum and maximum values reached by the sensor.			
	MAX	→ Query menu for maximum values reached by each sensor;		
		SEN1	-500 to 9999	Submenu for consulting the maximum value recorded by Sensor 1;
		SEN2	-500 to 9999	Submenu to consult the maximum value registered by Sensor 2;
		SEN3	-500 to 9999	Submenu to consult the maximum value registered by Sensor 3;
	MIN	→ Query menu for minimum values reached by each sensor;		
		SEN1	-500 to 9999	Submenu to consult the minimum registration value by Sensor 1;
		SEN2	-500 to 9999	Submenu to consult the minimum registration value by Sensor 2;
		SEN3	-500 to 9999	Submenu to consult the minimum registration value by Sensor 3;
	RMAX	→ Reset menu of maximum values reached by each sensor;		
		SEN1	---	Submenu to Reset the maximum value recorded by Sensor 1;
		SEN2	---	Submenu to Reset the maximum value recorded by Sensor 2;
		SEN3	---	Submenu to Reset the maximum value recorded by Sensor 3;
	RMIN	→ Reset menu of minimum values reached by each sensor;		
		SEN1	---	Submenu to Reset the maximum value recorded by Sensor 1;
		SEN2	---	Submenu to Reset the maximum value recorded by Sensor 2;
		SEN3	---	Submenu to Reset the maximum value recorded by Sensor 3;

CONSULTATION MENU

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
RAL	→ Query menu for minimum and maximum values reached by the sensor. **NOTE:** It will only be necessary to perform the alarm reset if it is configured as manual return in the LRA menu alarm return logic			
	AL1	---	---	Alarm Reset 1;
	AL2	---	---	Alarm reset 2;
	AL3	---	---	Alarm reset 3;
	FAIL	---	---	Fault Reset;
FAIL	→ Sensor and Differential Fault Query Menu.			
	---	---	E01L	Signal on sensor 1 below minimum;
	---	---	E01H	Signal on sensor 1 above maximum;
	---	---	E02L	Signal on sensor 2 below minimum;
	---	---	E02H	Signal on sensor 2 above maximum;
	---	---	E03L	Signal on sensor 3 below minimum;
	---	---	E03H	Signal on sensor 3 above maximum;
	---	---	E04L	Signal at 1E2 differential below minimum;
	---	---	E04H	Signal in differential 1E2 above maximum;
	---	---	E04S	1E2 differential sensors signal failed;
	---	---	E05L	1E2 differential signal below minimum;
	---	---	E05H	1E3 differential signal above maximum;
	---	---	E05S	Signal from 1E3 differential sensors failed;
	---	---	E06L	Signal on differential 2E3 below the minimum;
	---	---	E06H	Signal on differential 2E3 below the minimum;
	---	---	E06S	2E3 differential signal up with failure;

SENSOR CONFIGURATION MENU FLOWCHART



SENSORS CONFIGURATION MENU

Press the **SET key,** the display will show the CONF menu, press the SET key again, a four-digit number will appear on the display, which is the reminder of the password that is configured on the equipment and soon after the acronym OOOO will appear. Use the increment and decrement keys to enter the password, to set the chosen number and move to the next square press the **SET** key, to return to the previous digit, press the **ESC key.** Confirming the four digits by pressing the **SET key**, if the password is correct, the acronym MSEN will enter the configuration menus displayed on the display

Displaying the MSEN menu on the display, press the **SET** key to set the input parameters of the sensors.

NOTE: The factory password OOOO and the reminder number 1807, if the user changes this password in the PASS menu and forgets the password he changed, contact Electron do Brasil and inform the password reminder (1807) and the product password will be reset.

Menu	Submenu	Parameter	Variable	Description
SEN	→ Menu to enable and/or disable input from sensors 1, 2, and 3.			
	SEN1	---	ON	Enable Sensor 1;
		---	OFF	Disables Sensor 1;
	SEN2	---	ON	Enable Sensor 2;
		---	OFF	Disables Sensor 2;
	SEN3	---	ON	Enable Sensor 3;
		---	OFF	Disables Sensor 3;
TSEN	→ Menu to configure the input type of each sensor **NOTE:** When the sensor input is set to 4 to 20 mA or Cu10, the sensor type selection is disabled.			
	SEN1	→ Select the input type of the sensor 1 confirm it by pressing the SET key**;**		
		---	P100	Configures the input of Sensor 1 as PT100;
		---	P200	Configures the input of Sensor 1 as PT200;
		---	P500	Configures the input of Sensor 1 as PT500;
		---	PT1K	Configures the input of Sensor 1 to PT1000;
		---	Level	Sensor input resistive level; **NOTE:** When configured as level input the indication will be from 0% to 100% with a configurable resistive input range of 0 to 5 KΩ
	SEN2	→ Select the input type of the sensor 2, confirm it by pressing the SET key **;**		
		---	P100	Configures the input of Sensor 1 as PT100;
		---	P200	Configures the input of Sensor 1 as PT200;
		---	P500	Configures the input of Sensor 1 as PT500;
		---	PT1K	Configures the input of Sensor 1 to PT1000;

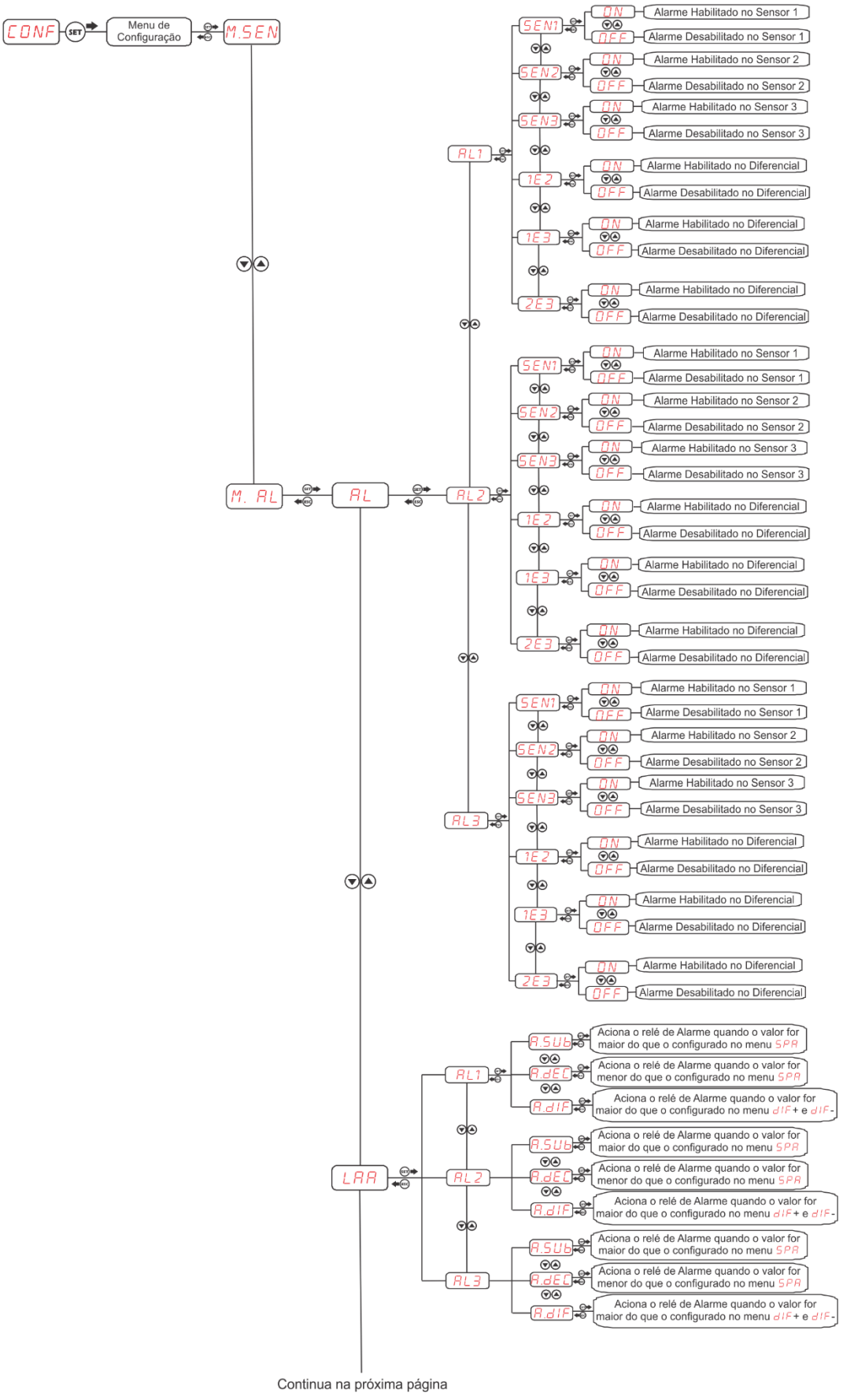
Menu	Submenu	Parameter	Variable	Description
	SEN2	---	Level	Sensor input resistive level; **NOTE:** When configured as level input the indication will be from 0% to 100% with a

TSEN				configurable resistive input range from 0 to 5 KΩ;
	SEN3	→ Select the sensor input type 3, confirm it by pressing the SET key ;		
		---	P100	Configures the input of Sensor 3 as PT100;
		---	P200	Configures the input of Sensor 3 to PT200;
		---	P500	Configures the Sensor 3 input to PT500;
		---	PT1K	Configures the input of Sensor 3 as PT1000;
		---	Ancient Man	Sensor input resistive level; **NOTE:** When configured as level input the indication will be from 0% to 100% with a configurable resistive input range from 0 to 5 KΩ;
PdEC	→ Menu to add a decimal point to the display, being possible to indicate a quantity of up to 3 decimal places, for each sensor read. **NOTE**: When the differential indication is set to 0N. The decimal point of the sensors will be the same. This setting is automatic, and the first sensor of the difference will be Master**.** For example: Differential between sensor 1 and sensor 2 (1E2), the decimal point configured on sensor 1 will be automatically implemented on sensor 2. Differential between sensor 1 and sensor 3 (1E3), the decimal point configured on sensor 1 will be automatically implemented on sensor 3. Differential between sensor 2 and sensor 3 (2E3), the decimal point configured on sensor 2 will be automatically implemented on sensor 3. When the sensor input is set as level input, there will be no option to choose a decimal place, as there will always be only 1 decimal place.			
	SEN1	---	d0	No decimal point;
			d1	1 decimal place;
			d2	2 decimal places;
			d3	3 decimal places;
	SEN2	---	d0	No decimal point;
			d1	1 decimal place;
			d2	2 decimal places;
			d3	3 decimal places;
	SEN3	---	d0	No decimal point;
			d1	1 decimal place;
			d2	2 decimal places;
			d3	3 decimal places;

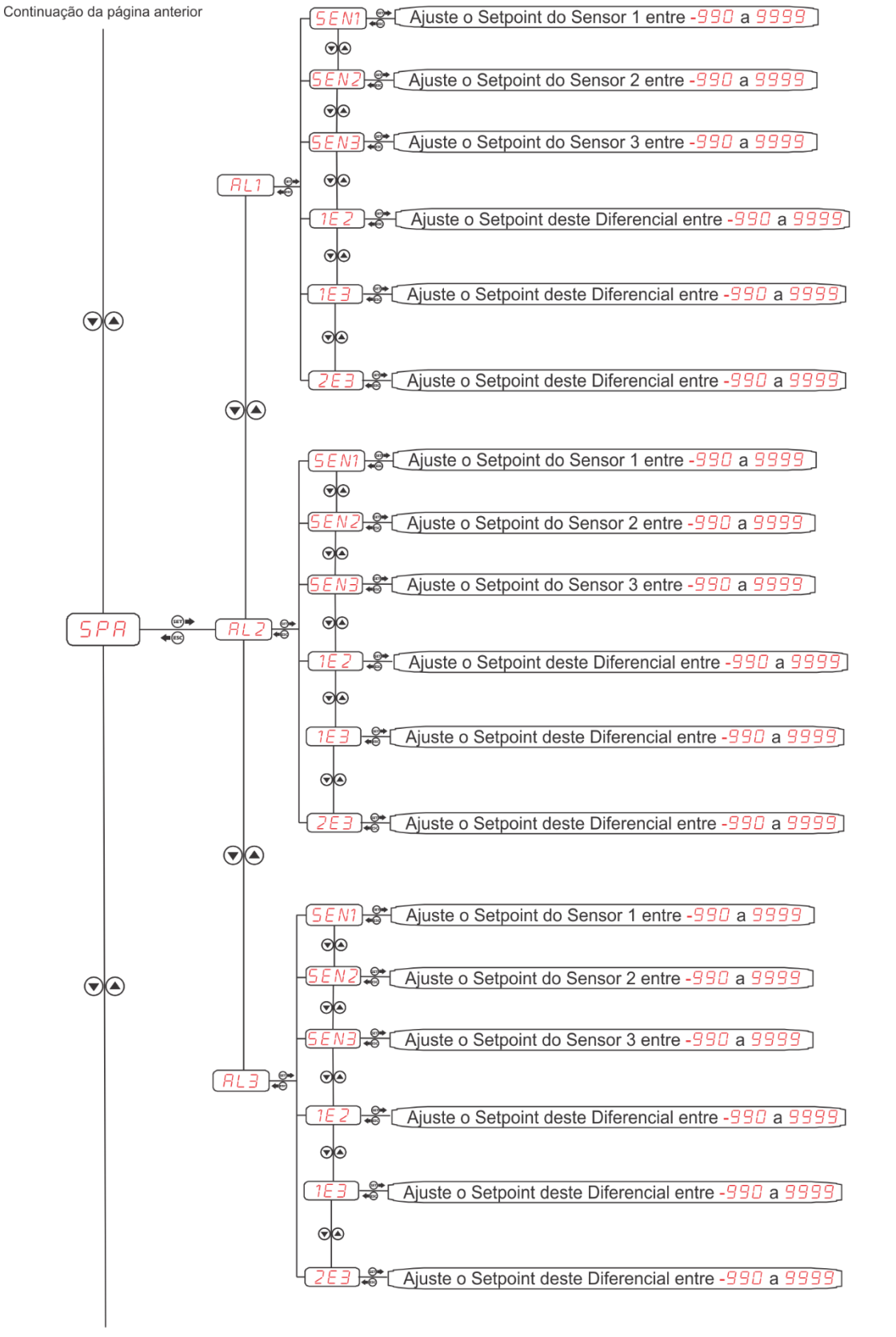
Menu	Submenu	Parameter	Variable	Description
dIF	→ Menu to enable or disable the indication of reading differential between the Sensors;			
	1E2	---	0N	Enables differential between Sensors 1 and 2;
		---	0FF	Disables differential between Sensors 1 and 2;

	1E3	---	ON	Enables differential between Sensors 1 and 3;
		---	OFF	Disables differential between Sensors 1 and 3;
	2E3	---	ON	Enables differential between Sensors 2 and 3;
		---	OFF	Disables differential between Sensors 2 and 3;
0F7S	→ Menu to adjust the Reading OffSet for each sensor. Allows you to make a correction in the quantity measured by the sensors, adding or subtracting the configurator value			
	SEN1	---	-100 to 100	Adjust Sensor Offset 1;
	SEN2	---	-100 to 100	Adjust Sensor Offset 2;
	SEN3	---	-100 to 100	Adjust Sensor Offset 3;

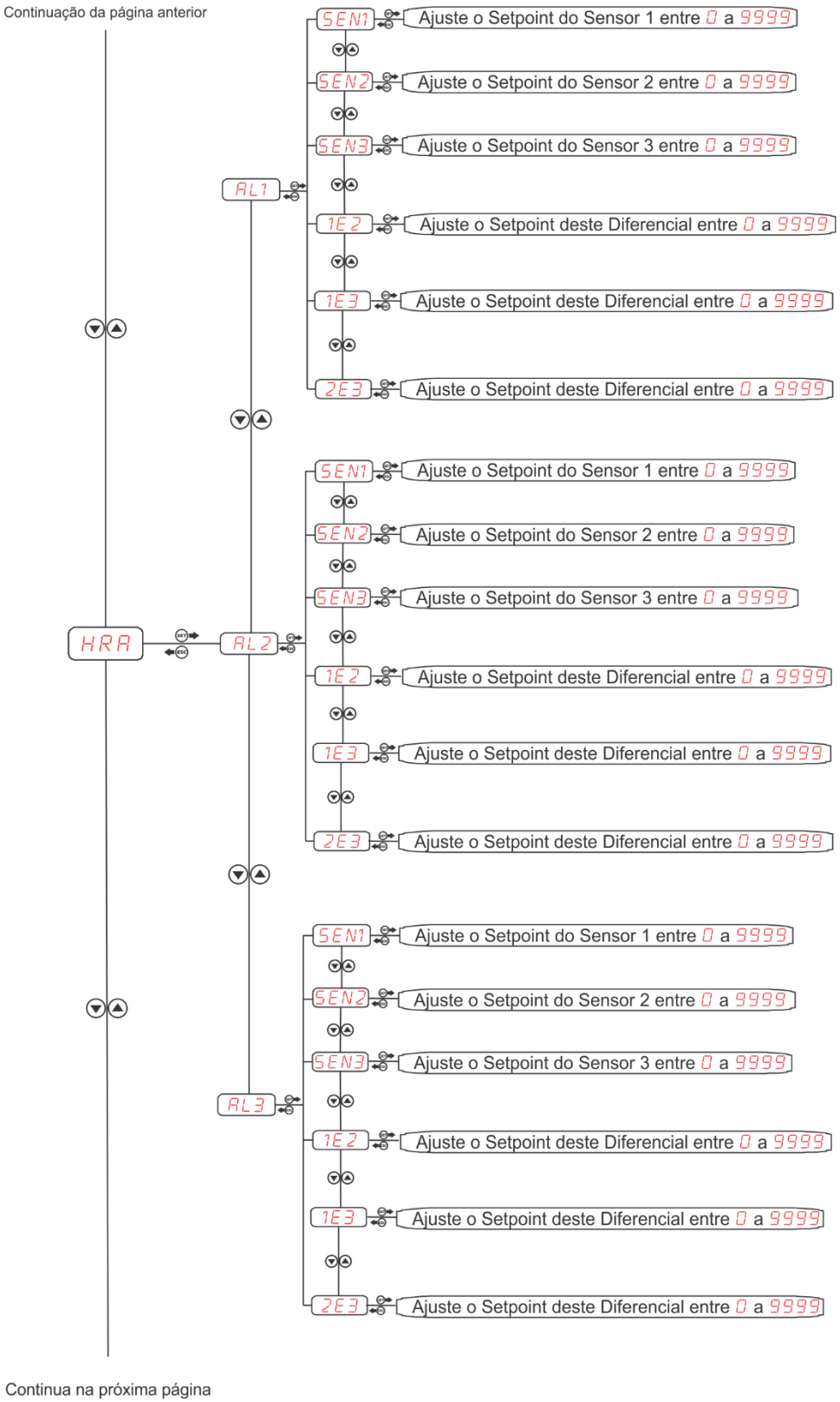
FLOW CHART OF THE ALARM CONFIGURATION MENU



FLOW CHART OF THE ALARM CONFIGURATION MENU



FLOW CHART OF THE ALARM CONFIGURATION MENU



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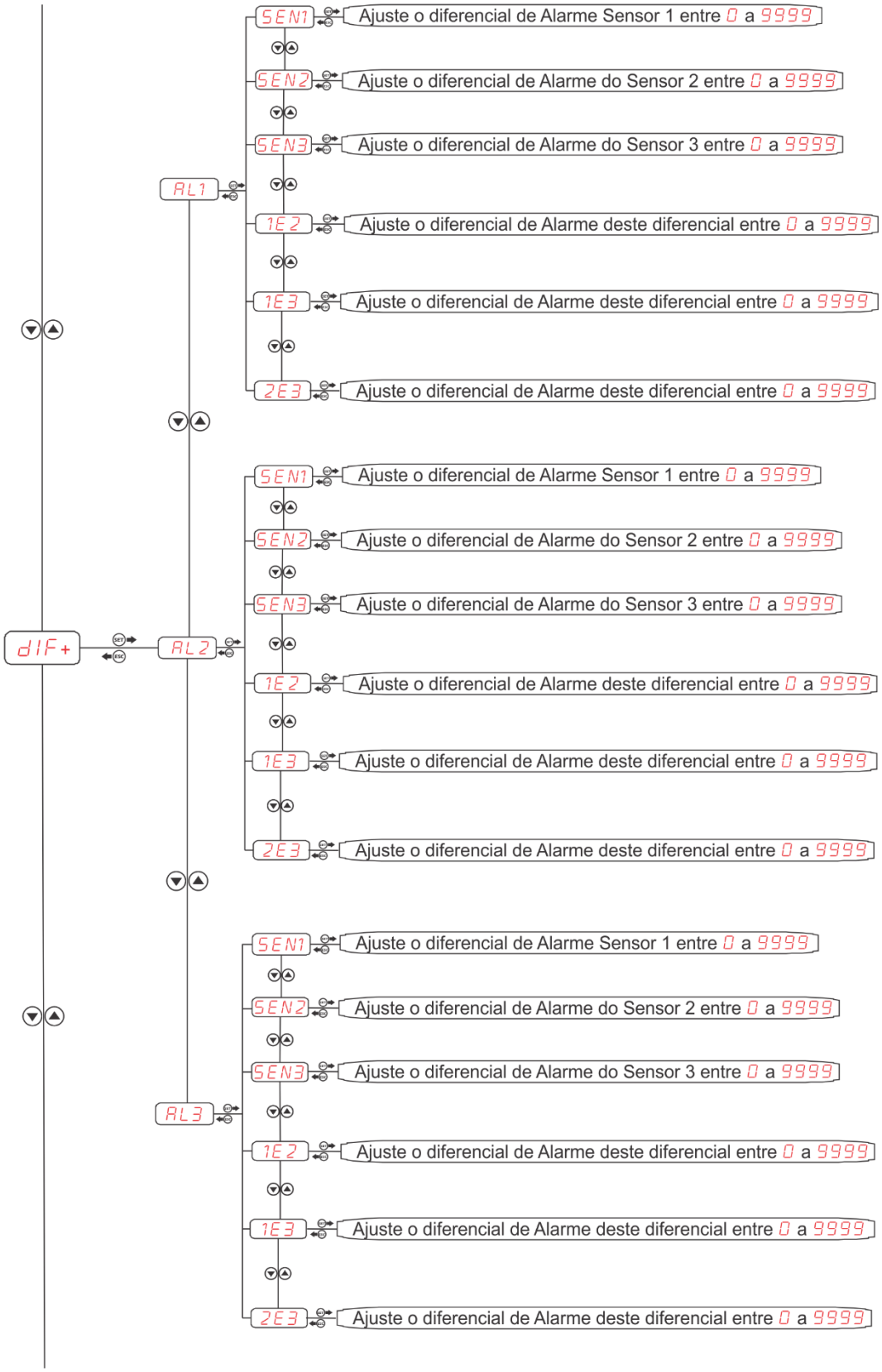

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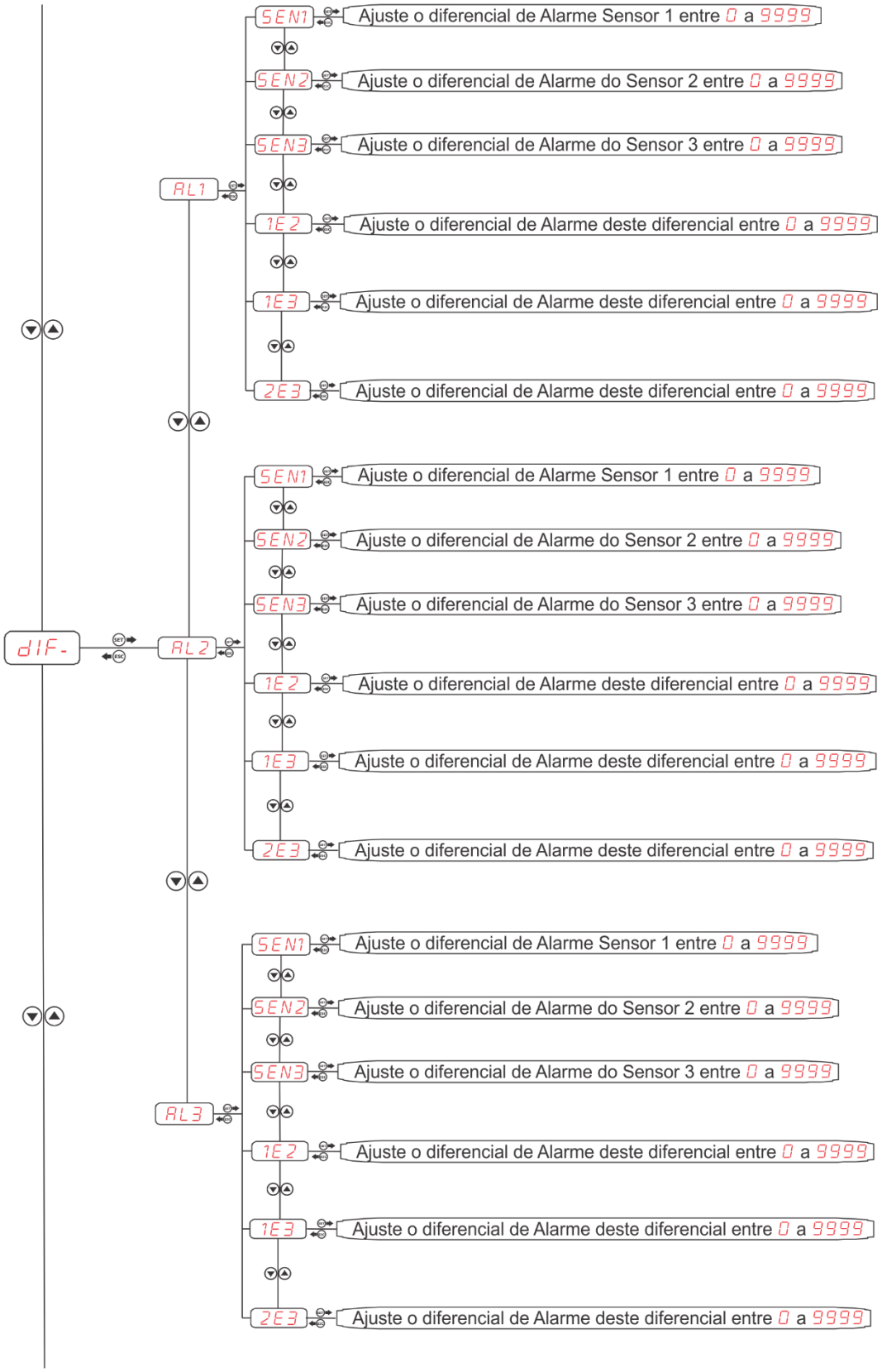

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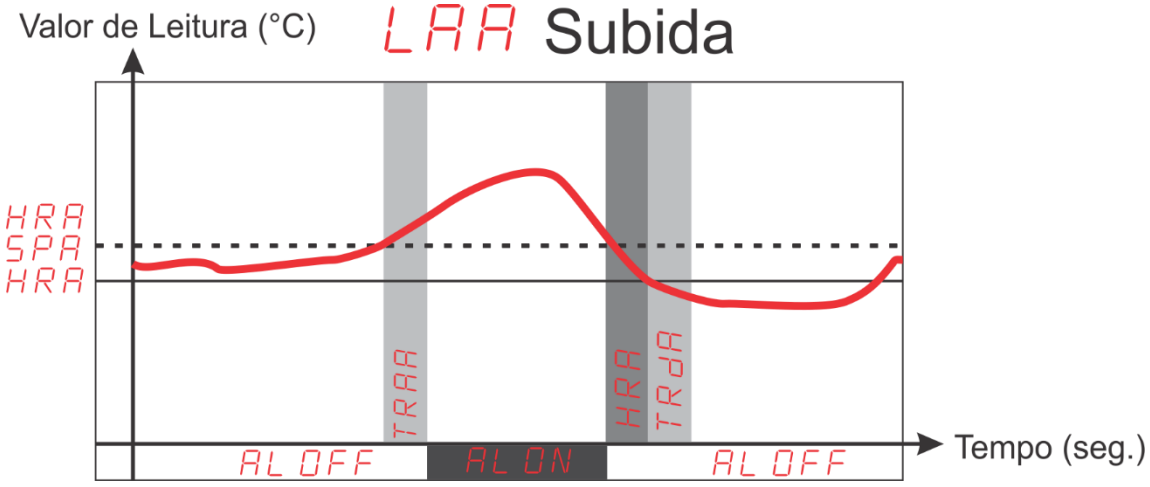
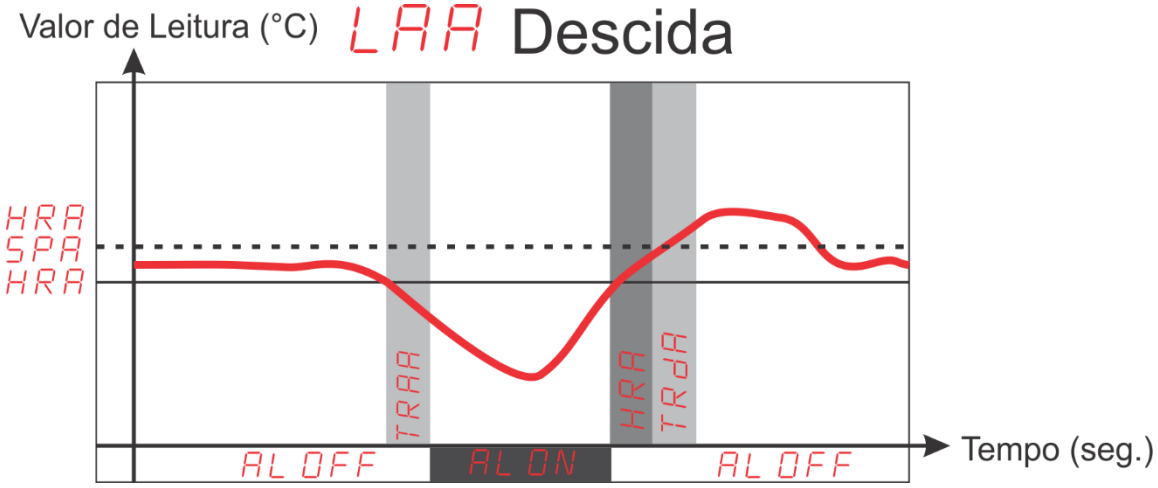
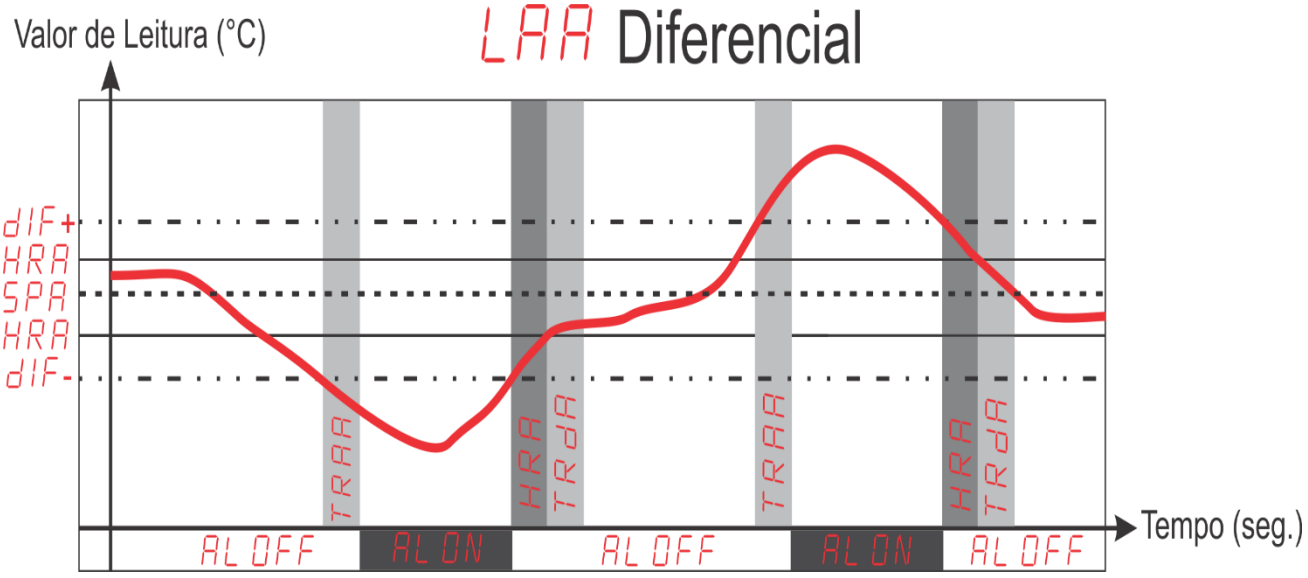
ALARM TRIGGERING LOGIC

Parameter	Description
SPA	Triggering logic of the Descent, Ascent and Differential Alarm;
LAA	Alarm shutdown hysteresis value;
HRA	Differential value above the SetPoint for triggering the Alarm;
dIF+	Differential value below the SetPoint for triggering the Alarm;
dIF-	Delay time for alarm activation;
TRAA	Delay time for alarm activation;
TRdA	Delay time for Alarm shutdown
AL	Alarm;

ALARM TRIGGERING LOGIC







ALARM CONFIGURATION MENU

Press the **SET key**, the display will show the CONF menu, press the SET key again, it will appear on the four-digit display, which is the reminder of the password that is set on the equipment and soon after 0000 will appear. Use the increment and decrement keys to enter the password and confirm the chosen number and move on to the next disc, press the **SET** key, to return to the previous number press the **ESC key**. Confirming the four digits by displaying the M menu on the display.SEN. Otherwise, it will come back to display 0000.

When the display displays M.SEN press the decrement key and the display will display the M key. AL press the **SET** key to set the alarm parameters.

NOTE: The factory password is 0000 and the reminder number is 1807, if the user changes this password in the PASS menu and forgets the password he changed, contact Electron do Brasil and inform the password reminder (1807) and the product password will be reset.

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
AL	→ Menu to Enable or Disable the Alarm on the corresponding sensors or differentials.			
	AL1	SEN1	ON	Alarm Enabled on Sensor 1;
			OFF	Alarm Disabled on Sensor 1;
		SEN2	ON	Alarm Enabled on Sensor 2;
			OFF	Alarm Disabled on Sensor 2;
		SEN3	ON	Alarm Enabled on Sensor 3;
			OFF	Alarm Disabled on Sensor 3;
		1E2	ON	Alarm Enabled in the differential between sensors 1 and 2;
			OFF	Alarm Enabled in the differential between sensors 1 and 2;
		1E3	ON	Alarm Enabled in the differential between sensors 1 and 3;
			OFF	Alarm Enabled in the differential between sensors 1 and 3;
		2E3	ON	Alarm Enabled in the differential between sensors 2 and 3;
		2E3	OFF	Alarm Enabled in the differential between sensors 2 and 3;

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
AL	→ Menu to Enable or Disable the Alarm on the corresponding sensors or differentials.			
	AL2	SEN1	ON	Alarm Enabled on Sensor 1;
			OFF	Alarm Disabled on Sensor 1;
		SEN2	ON	Alarm Enabled on Sensor 2;
			OFF	Alarm Disabled on Sensor 2;
		SEN3	ON	Alarm Enabled on Sensor 3;
			OFF	Alarm Disabled on Sensor 3;
		1E2	ON	Alarm Enabled in the differential between sensors 1 and 2;
			OFF	Alarm Enabled in the differential between sensors 1 and 2;
		1E3	ON	Alarm Enabled in the differential between sensors 1 and 3;
			OFF	Alarm Enabled in the differential between sensors 1 and 3;
		2E3	ON	Alarm Enabled in the differential between sensors 2 and 3;
		2E3	OFF	Alarm Enabled in the differential between sensors 2 and 3;
	AL3	SEN1	ON	Alarm Enabled on Sensor 1;
			OFF	Alarm Disabled on Sensor 1;
		SEN2	ON	Alarm Enabled on Sensor 2;
			OFF	Alarm Disabled on Sensor 2;
		SEN3	ON	Alarm Enabled on Sensor 3;
			OFF	Alarm Disabled on Sensor 3;
		1E2	ON	Alarm Enabled in the differential between sensors 1 and 2;
			OFF	Alarm Enabled in the differential between sensors 1 and 2;
		1E3	ON	Alarm Enabled in the differential between sensors 1 and 3;
			OFF	Alarm Enabled in the differential between sensors 1 and 3;

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
AL	AL3	2E3	ON	Alarm Enabled in the differential between sensors 2 and 3;
		2E3	OFF	Alarm Enabled in the differential between sensors 2 and 3;
LAA	→Menu to configure the Alarm activation mode; Example: SPA = 10, dIF+ = 3 and dIF = 2; The alarm will be triggered when the measured value is greater than 13 or less than 8. Configure the mode for triggering the alarms and confirm by pressing the **SET key**.			
	AL1	---	A.SUb	Triggers the Alarm relay when the read value is greater than the value configured in the SPA menu;
			A.dEC	Triggers the Alarm relay when the read value is lower than the value configured in the SPA menu;
			A.dIF	Activates the Alarm relay when the difference is greater than the value configured in the dIF+ and dIF- menus in relation to the SPA;
	AL2	---	A.SUb	Triggers the Alarm relay when the read value is greater than the value configured in the SPA menu;
			A.dEC	Triggers the Alarm relay when the read value is lower than the value configured in the SPA menu;
			A.dIF	Activates the Alarm relay when the difference is greater than the value configured in the dIF+ and dIF- menus in relation to the SPA;
	AL3	---	A.SUb	Triggers the Alarm relay when the read value is greater than the value configured in the SPA menu;
			A.dEC	Triggers the Alarm relay when the read value is lower than the value configured in the SPA menu;
			A.dIF	Activates the Alarm relay when the difference is greater than the value configured in the dIF+ and dIF- menus in relation to the SPA;

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
SPA	→ Menu to adjust the Alarm Setpoints; NOTE: the relay will only be activated if a sensor or differential is referenced in the AL menu. Set the desired value for each sensor and differential and confirm by pressing the **SET key**.			
	AL1	SEN1	-990 to 9999	Select the trigger value;
		SEN2	-990 to 9999	Select the trigger value;
		SEN3	-990 to 9999	Select the trigger value;
		1E2	-990 to 9999	Select the trigger value;
		1E3	-990 to 9999	Select the trigger value;
		2E3	-990 to 9999	Select the trigger value;
	AL2	SEN1	-990 to 9999	Select the trigger value;
		SEN2	-990 to 9999	Select the trigger value;
		SEN3	-990 to 9999	Select the trigger value;
		1E2	-990 to 9999	Select the trigger value;
		1E3	-990 to 9999	Select the trigger value;
		2E3	-990 to 9999	Select the trigger value;
	AL3	SEN1	-990 to 9999	Select the trigger value;
		SEN2	-990 to 9999	Select the trigger value;
		SEN3	-990 to 9999	Select the trigger value;
		1E2	-990 to 9999	Select the trigger value;
		1E3	-990 to 9999	Select the trigger value;
		2E3	-990 to 9999	Select the trigger value;
HRA	→ Menu to adjust Hysteresis, difference in values between triggering and triggering the Alarm; NOTE: the relay will only be activated if a sensor or differential is referenced in the AL menu. Set the desired value for each sensor and differential and confirm by pressing the **SET key**.			
	AL1	SEN1	0 to 9999	Select the trigger value;
		SEN2	0 to 9999	Select the trigger value;
		SEN3	0 to 9999	Select the trigger value;
		1E2	0 to 9999	Select the trigger value;
		1E3	0 to 9999	Select the trigger value;
		2E3	0 to 9999	Select the trigger value;
	AL2	SEN1	0 to 9999	Select the trigger value;
		SEN2	0 to 9999	Select the trigger value;
		SEN3	0 to 9999	Select the trigger value;
		1E2	0 to 9999	Select the trigger value;
		1E3	0 to 9999	Select the trigger value;
		2E3	0 to 9999	Select the trigger value;

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
HRA	AL3	SEN1	0 to 9999	Select the trigger value;
		SEN2	0 to 9999	Select the trigger value;
		SEN3	0 to 9999	Select the trigger value;
		1E2	0 to 9999	Select the trigger value;
		1E3	0 to 9999	Select the trigger value;
		2E3	0 to 9999	Select the trigger value;
LRA	→ Menu to choose how the alarm and fault relays will return after their activation (ANSI-86 function). If it is in MAN, it means that the **Reset is set to Manual**, i.e. the contacts of the respective relays will only return to the normal state after the operator's intervention. It will be necessary to reset the alarm according to the RAL menu. If the choice is AUTO, the alarms will automatically return after the alarm or failure normalizes.			
	AL1	---	MAN	Configures the return of Alarm 1 as manual;
			AUTO	Configures the return of Alarm 1 to automatic;
	AL2	---	MAN	Sets the Alarm 2 return to manual;
			AUTO	Sets the return of Alarm 2 to automatic;
	AL3	---	MAN	Configures the return of Alarm 3 as manual;
			AUTO	Sets the return of Alarm 3 to automatic;
	FAIL	---	MAN	Configures the return of Fault 1 to manual;
			AUTO	Configures the return of Failure 1 to automatic;

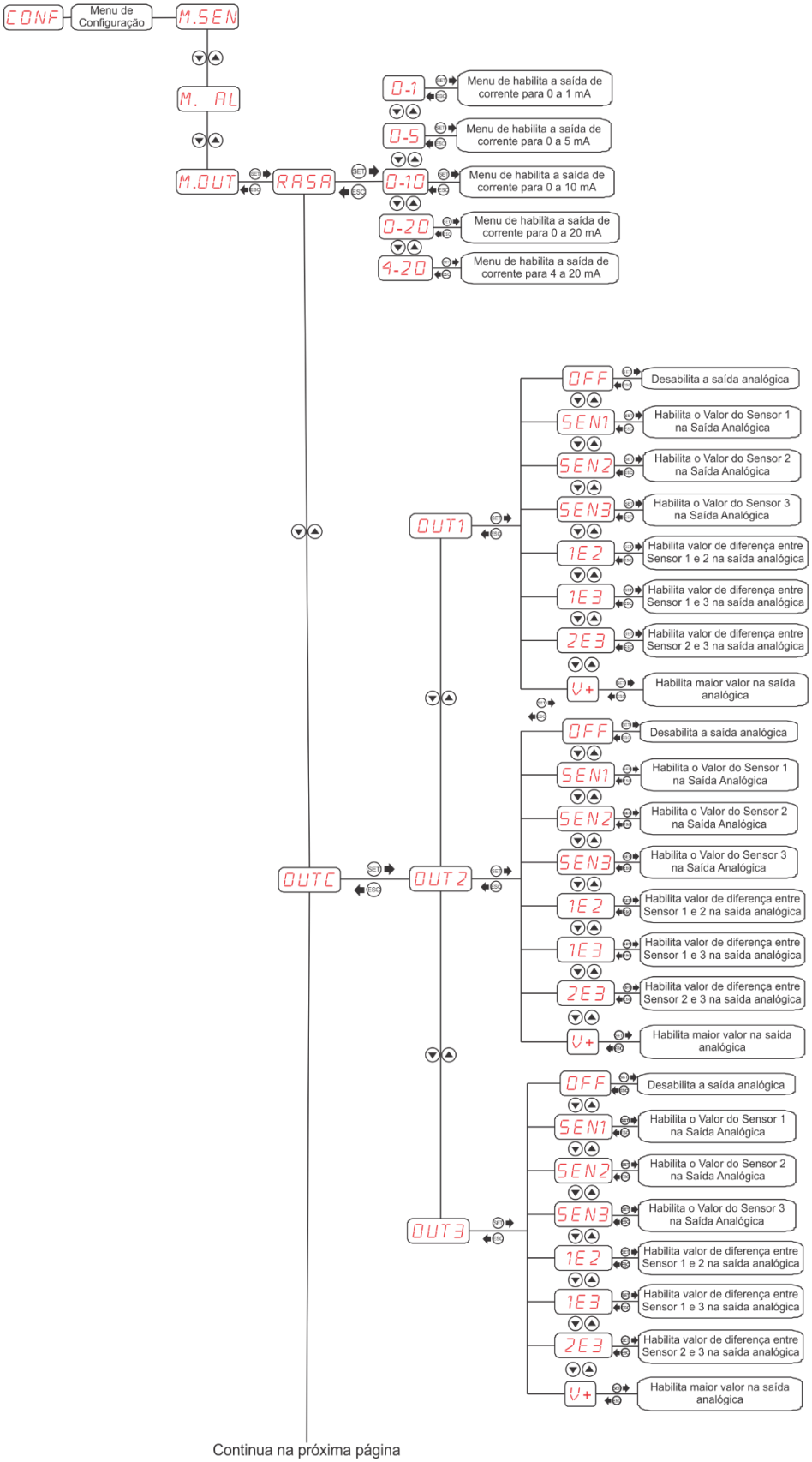
MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
dIF+	→ Menu for adjusting the alarm trigger difference when configured in the LAA menu as a differential. Example: If the SPA is set to 0.0 and the programmed dIF+ with 10.0, the alarm will only be triggered when the value reaches 10.1, that is, with 10.1 above the SPA parameter. **NOTE:** the Differential + cannot be set to a value lower than the HRA hysteresis return of the alarms. If the hysteresis is 5.0 dIF+ is limited to at least 5.1.			
	AL1	SEN1	0 to 9999	Select the drive difference value;
		SEN2	0 to 9999	Select the drive difference value;
		SEN3	0 to 9999	Select the drive difference value;
		1E2	0 to 9999	Select the drive difference value;
		1E3	0 to 9999	Select the drive difference value;
		2E3	0 to 9999	Select the drive difference value;
	AL2	SEN1	0 to 9999	Select the drive difference value;
		SEN2	0 to 9999	Select the drive difference value;
		SEN3	0 to 9999	Select the drive difference value;
		1E2	0 to 9999	Select the drive difference value;
		1E3	0 to 9999	Select the drive difference value;
		2E3	0 to 9999	Select the drive difference value;
	AL3	SEN1	0 to 9999	Select the drive difference value;
		SEN2	0 to 9999	Select the drive difference value;
		SEN3	0 to 9999	Select the drive difference value;
		1E2	0 to 9999	Select the drive difference value;
		1E3	0 to 9999	Select the drive difference value;
		2E3	0 to 9999	Select the drive difference value;

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
	→ Menu for adjusting the alarm trigger difference when configured in the LAA menu as a differential. Example: If the SPA is set to 0.0 and the dIF- programmed with 10.0, the alarm will only be triggered when the value reaches 10.1, that is, 10.1 units above the value configured in the SPA parameter. **NOTE:** the Differential + cannot be set to a value lower than the HRA hysteresis return of the alarms. If the hysteresis is -5.0 or dIF- is limited to at least 5.1.			
		SEN1	0 to 9999	Select the drive difference value;
		SEN2	0 to 9999	Select the drive difference value;
		SEN3	0 to 9999	Select the drive difference value;

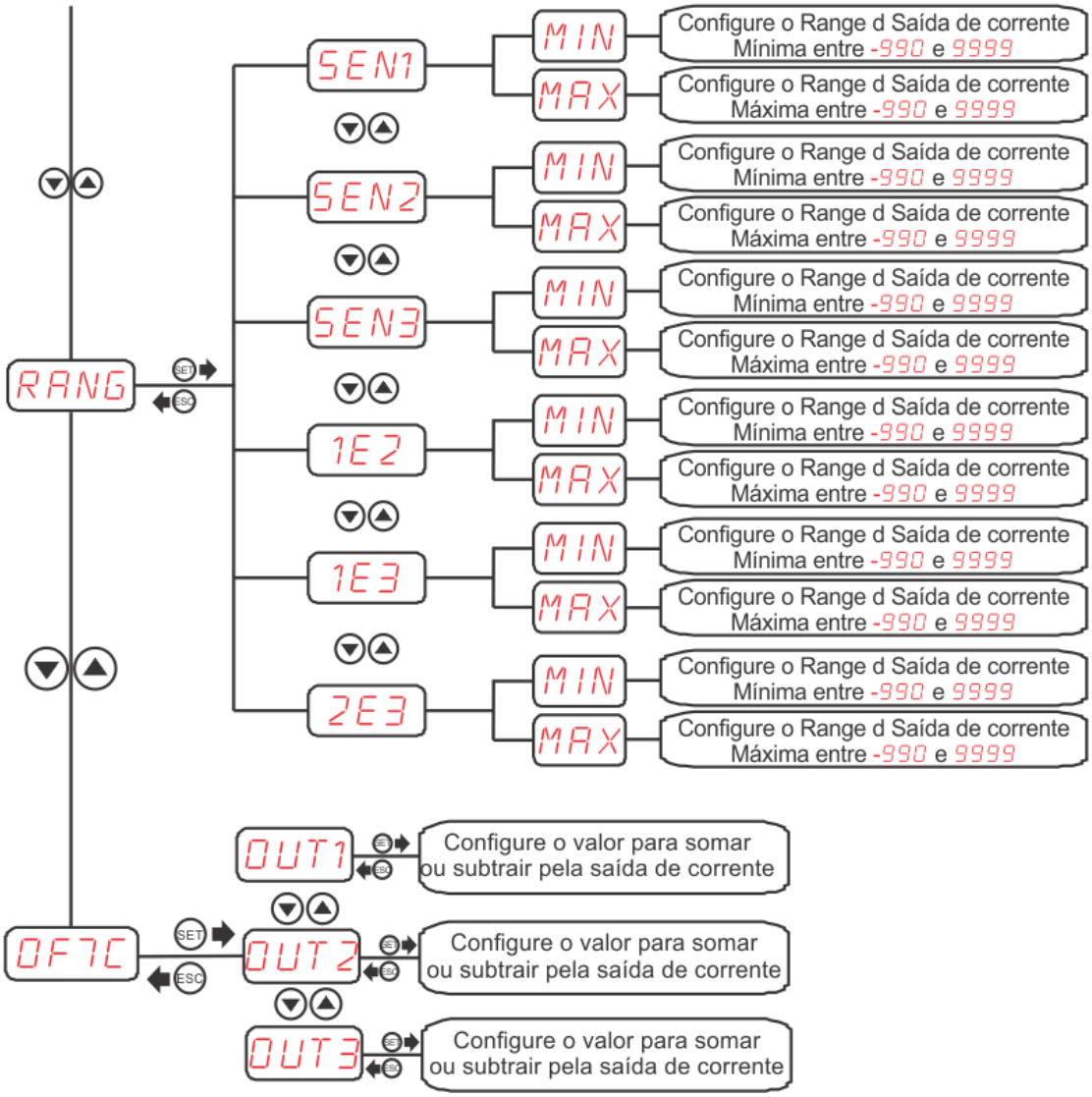
dIF-	AL1	1E2	0 to 9999	Select the drive difference value;
		1E3	0 to 9999	Select the drive difference value;
		2E3	0 to 9999	Select the drive difference value;
	AL2	SEN1	0 to 9999	Select the drive difference value;
		SEN2	0 to 9999	Select the drive difference value;
		SEN3	0 to 9999	Select the drive difference value;
		1E2	0 to 9999	Select the drive difference value;
		1E3	0 to 9999	Select the drive difference value;
		2E3	0 to 9999	Select the drive difference value;
	AL3	SEN1	0 to 9999	Select the drive difference value;
		SEN2	0 to 9999	Select the drive difference value;
		SEN3	0 to 9999	Select the drive difference value;
		1E2	0 to 9999	Select the drive difference value;
		1E3	0 to 9999	Select the drive difference value;
		2E3	0 to 9999	Select the drive difference value;

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
TRAA	→ Menu to adjust the delay in seconds for the triggering of alarms. When it reaches the programmed value for triggering the alarm, it starts counting the time to trigger it. If the time is set to 0 (zero). The matching Relay will trigger instantly. During the time count for triggering, the LED corresponding to the alarm will be flashing and will remain fixed when the alarm is triggered.			
	AL1	---	The 3000	Configure the alarm trigger delay time;
	AL2	---	The 3000	Configure the alarm trigger delay time;
	AL3	---	The 3000	Configure the alarm trigger delay time;
TRdA	→ Menu to adjust the delay in seconds for Alarms to turn off. When it reaches the programmed alarm shutdown value, it starts counting the time to turn it off. If the time is set to 0 (zero) the corresponding relay will turn off instantly.			
	AL1	---	The 3000	Configure the alarm shutdown delay time;
	AL2	---	The 3000	Configure the alarm shutdown delay time;
	AL3	---	The 3000	Configure the alarm shutdown delay time;
LORL	→ Menu for Relay Logic definition.			
	AL1	---	0N	Initial Conditions of the Normal "Off" Relay;
			OFF	Initial Conditions of the Inverted "Off" Relay;
	AL2	---	0N	Initial Conditions of the Normal "Off" Relay;
			OfF	Initial Conditions of the Inverted "Off" Relay;
	AL3	---	0N	Initial Conditions of the Normal "Off" Relay;
			OFF	Initial Conditions of the Inverted "Off" Relay;
	FAIL	---	0N	Initial Conditions of the Normal "Off" Relay;
			OFF	Initial Conditions of the Inverted "Off" Relay;

CURRENT OUTPUT CONFIGURATION MENU FLOW CHART



Continuação da página anterior



CURRENT OUTPUT CONFIGURATION MENU

Press the **SET key**, the display will show the CONF menu, press the SET key again, it will appear on the four-digit display, which is the reminder of the password that is set on the equipment and soon after 0000 will appear. Use the increment and decrement keys to enter the password and confirm the chosen number and move on to the next disc, press the **SET** key, to return to the previous number press the **ESC key**. Confirming the four digits by displaying the M menu on the display.SEN. Otherwise, it will come back to display 0000.

When the display displays M.SEN: Press the decrement key twice, and the display will display the M key. OUT press the **SET** key to set the alarm parameters.

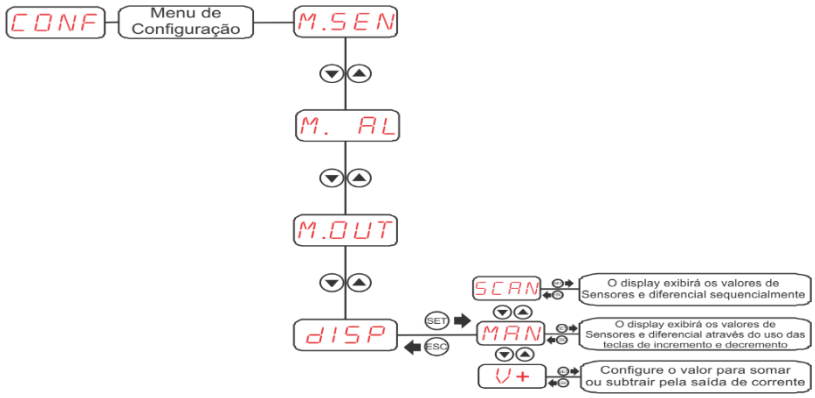
NOTE: The factory password is 0000 and the reminder number is 1807, if the user changes this password in the PASS menu and forgets the password he changed, contact Electron do Brasil and inform the password reminder (1807) and the product password will be reset.

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
SHALLOW	→ Menu to choose the value of the Current Output.			
	---	---	0 - 1	Enables 0 to 1 mA current output;
	---	---	0 - 5 years	Enables current output from 0 to 5 mA;
	---	---	0 - 10 months	Enables current output from 0 to 10 mA;
	---	---	0 - 20 months	Enables current output from 0 to 20 mA;
	---	---	4 - 20 months	Enables current output from 4 to 20 mA;
0UTC	→ Menu to adjust the channel you want to be transmitted in the current output;			
	0UT1	---	0FF	Disables analog output;
			SEN1	Enables Sensor value 1 on analog output;
			SEN2	Enables Sensor 2 value on analog output;
			SEN3	Enables Sensor 3 value on analog output;
			1E2	Enables value of the difference between Sensors 1 and 2 in the analog output;
			1E3	Enables value difference between Sensors 1 and 3 in analog output;
			2E3	Enables value difference between Sensors 2 and 3 in analog output;
			V+	Enables the highest value on the analog output;
	0UT2	---	0FF	Disables analog output;
			SEN1	Enables Sensor value 1 on analog output;
			SEN2	Enables Sensor 2 value on analog output;
			SEN3	Enables Sensor 3 value on analog output;
			1E2	Enables value of the difference between Sensors 1 and 2 in the analog output;
			1E3	Enables value difference between Sensors 1 and 3 in analog output;
			2E3	Enables value difference between Sensors 2 and 3 in analog output;
			V+	Enables the highest value on the analog output;

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
0UTC	0UT3	---	0FF	Disables analog output;
			SEN1	Enables Sensor value 1 on analog output;
			SEN2	Enables Sensor 2 value on analog output;
			SEN3	Enables Sensor 3 value on analog output;
			1E2	Enables value of the difference between Sensors 1 and 2 in the analog output;
			1E3	Enables value difference between Sensors 1 and 3 in analog output;
			2E3	Enables value difference between Sensors 2 and 3 in analog output;
			V+	Enables the highest value on the analog output;
RANG	→ Setting menu for the maximum and minimum current output range for mirroring. **Example: 4 to 20 mA** OUT1 Analog Output with a range of 0 to 150 mirroring Sensor1: - Set the RASA at 4-20 and the RANG SEN1 Minimum at (0) and Maximum at (150) and 0UT1 as SEN1. In this configuration, the analog output will mirror the value from 0 to 150 corresponding to sensor 1 (When it is 0 the signal will be 4 mA and when it is 150 the signal will be 20 mA). **NOTE:** Different ranges for sensor and differential can be configured. Use the Increment and Decrement keys to change the values. At the end of each set parameter, press the SET button again to save the chosen value.			
	SEN1	---	MIN	Configure the minimum current output range of Sensor 1 -990 to 9999;
			MAX	Configure the minimum current output range of Sensor 1 -990 to 9999;
	SEN2	---	MIN	Configure the minimum current output range of Sensor 2 -990 to 9999;
			MAX	Configure the minimum current output range of Sensor 2 -990 to 9999;
	SEN3	---	MIN	Configure the minimum current output range of Sensor 3 -990 to 9999;
			MAX	Configure the minimum current output range of Sensor 3 -990 to 9999;
	1E2	---	MIN	Configure the minimum differential current output range between sensor 1 and 2 -990 to 9999;

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
RANG	1E3	---	MIN	Configure the minimum differential current output range between Sensor 1 and 3 -990 to 9999;
			MAX	Configure the minimum maximum differential current output range between Sensor 1 and 3 -990 to 9999;
	2E3	---	MIN	Configure the minimum differential current output range between Sensor 2 and 3 -990 to 9999;
			MAX	Configure the minimum maximum differential current output range between Sensor 2 and 3 between -990 to 9999;
OF7C	→ Allows to adjust the OFFSET of the current output. It allows you to make a correction to the current outputs by adding or subtracting the configured value. **NOTE:** The added or subtracted value is not in milliAmpere but in the converted value of the measured quantity that will be mirrored in the current output. *Before making any changes to the current output offset, check:*  *If the RASA menu setting is correct 0-1, 0-5, 0-10, 0-20 or 4-20, if the RANG menu is set to the correct start and end of scale, and if the OUTC menu is set to mirror the correct sensor or differential.*  *In order for this correction parameterization to be made, the deviation has to be linear, that is, the same deviation from the beginning to the end of the scale.*			
	0UT1	---	-100 to 100	Set the value to add or subtract from the quantity mirrored by current output 1;
	0UT2	---	-100 to 100	Set the value to add or subtract from the quantity mirrored by current output 2;
	0UT3	---	-100 to 100	Set the value to add or subtract from the quantity mirrored by current output 3;

FLOWCHART DISPLAY PRESENTATION CONFIGURATION MENU



DISPLAY PRESENTATION CONFIGURATION MENU

Press the **SET key**, the display will show the CONF menu, press the SET key again, a four-digit number will appear on the display, which is the reminder of the password that is configured on the equipment and soon after 0000 will appear. Use the increment and/or decrement keys to enter the password, to confirm the chosen number and move to the next square press the **SET** key, to return to the previous number press the **ESC** key. Confirming the four digits by pressing the **SET key**, if the password is correct, you will enter the configuration menus with the M menu on the display.SEN. Otherwise, it will come back to display 0000.

Displaying the M menu on the display.SEN press the decrement key three times will present dSPT press the **SET** key to set the parameters of the current outputs.

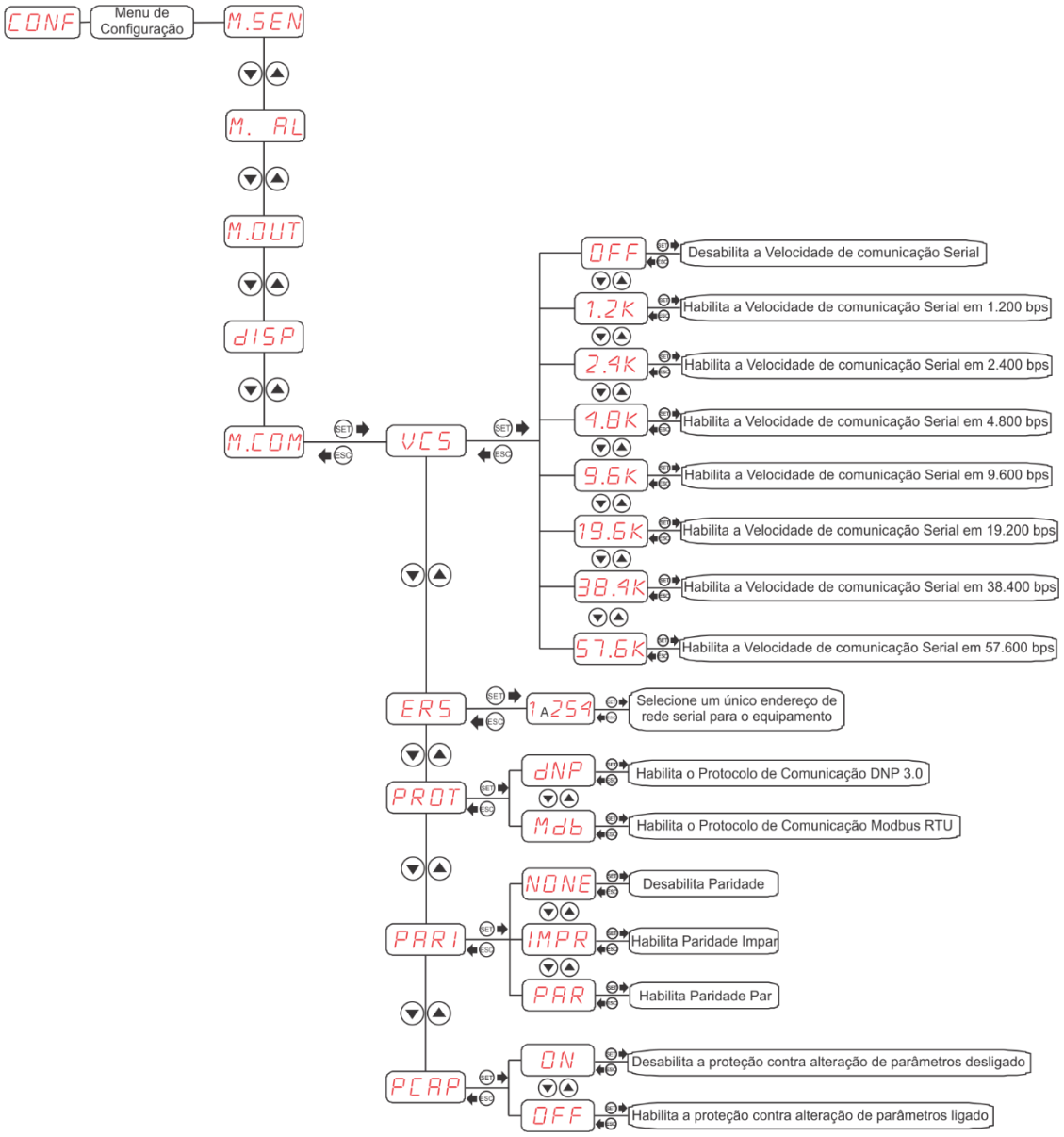
NOTE: The factory password is 0000 and the reminder number is 1807, if the user changes this password in the PASS menu and forgets just send the reminder number to ELECTRON and the product's password will be reset.

The equipment has menus and parameters whose availability is subject to the model purchased.

Attention! Whenever you change a parameter, confirm by pressing the **SET key**, if you exit the menu by pressing **ESC,** the changed parameter will not be saved and will return the previous value.

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
dSPT	→ Menu to select the display mode of the measured quantities on the display. It is also possible to navigate between the sensors using the increment and decrement keys. **NOTE:** When the display is indicating the differential between sensors, the LEDs of the two channels that the display is indicating the differential will be on. Only the sensor that is connected in the SEN menu and the differentials that are enabled in the dIF menu are available for indication;			
	---	---	SCAN	Display will display the values of Sensors and the differential sequentially;
	---	---	MAN	Display will display the values of Sensors and the differential sequentially from the use of the decrement increment keys;
	---	---	V+	Set the value to add or subtract by the current output;

RS-485 COMMUNICATION CONFIGURATION MENU FLOW CHART



RS-485 COMMUNICATION CONFIGURATION MENU

Press the **SET key**, the display will show the CONF menu, press the SET key again, a four-digit number will appear on the display, which is the reminder of the password that is configured on the equipment and soon after O000 will appear. Use the increment and/or decrement key to enter the password, to confirm the chosen number and move to the next square press the **SET** key, to return to the previous number press the **ESC** key. Confirming the four digits by pressing the **SET key**, if the password is correct, you will enter the configuration menus with the M menu on the display.SEN. Otherwise, it will come back on the O000 display.

Displaying the M menu on the display.SEN pressing the ▼ key four times will show M.COM press the **SET** key to set the parameters of the current outputs.

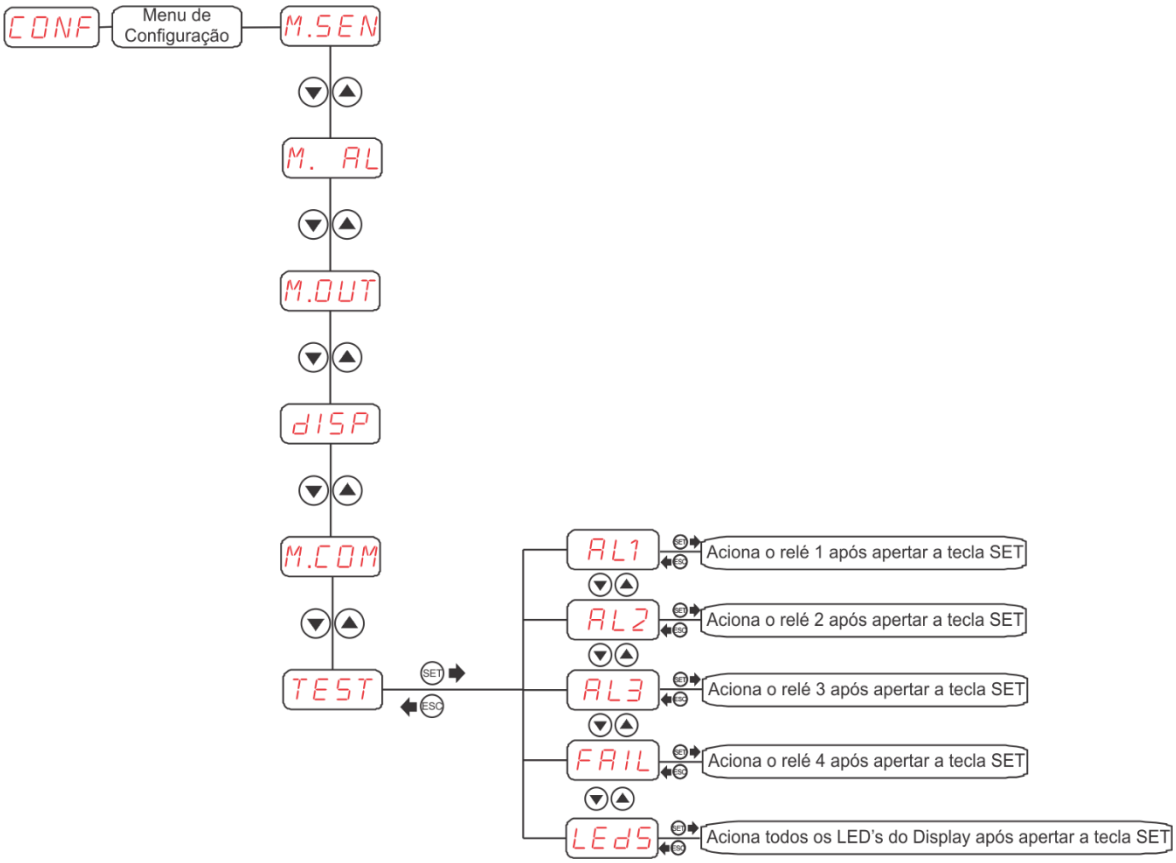
NOTE: The factory password is O000 and the reminder number is 1807, if the user changes this password in the PASS menu and forgets, just send the reminder number to ELECTRON and the product's password will be reset.

The equipment has menus and parameters whose availability is subject to the model purchased.

Attention! Whenever you change a parameter, confirm by pressing the SET key, if you exit the menu by pressing **ESC,** the changed parameter will not be saved and will return the previous value.

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
BAUD	→ Menu to test relay outputs and indicators.			
	---	---	AUTO	Automatically detects the communication speed;
	---	---	1.2K	Fixed Communication Speed at 1,200 bps;
	---	---	2.4K	Fixed Communication Speed at 2,400 bps;
	---	---	4.8K	Fixed Communication Speed at 4,800 bps;
	---	---	9.6K	Fixed Communication Speed at 9,600 bps;
	---	---	19.2K	Fixed Communication Speed at 19,200 bps;
	---	---	38.4K	Fixed Communication Speed at 38,400 bps;
	---	---	LIFE 57.6K	Fixed Communication Speed at 57,600 bps;
ERS	→ Menu to configure the Serial Network Address or to disable it.			
	---	---	OFF 1 to 254	When OFF disables this Menu. Each equipment connected to the RS 485 network (pins 24 and 25) must have a different address from the others, so that the supervisory system can identify it.

FLOW CHART TEST MENU



TEST MENU

Press the **SET key,** the display will show the CONF menu, press the SET key again, a four-digit number will appear on the display, which is the reminder of the password that is configured on the equipment and soon after 0000 will appear. Use the increment and/or decrement key to enter the password, to confirm the chosen number and move to the next square press the **SET** key, to return to the previous number press the **ESC** key. Confirming the four digits by pressing the **SET key**, if the password is correct, you will enter the configuration menus with the M menu on the display.SEN. Otherwise, it will come back on the 0000 display.

Displaying the M menu on the display. SEN pressing the increment key five times will display the acronym M.COM press the **SET** key to set the parameters of the current outputs.

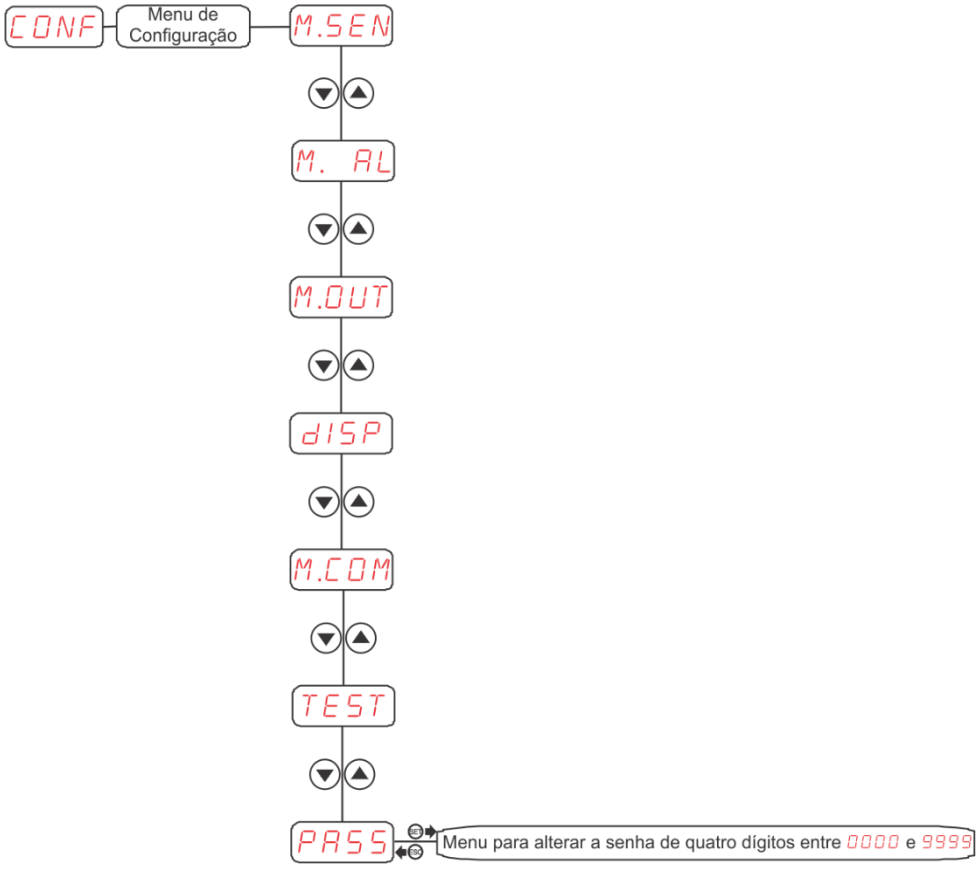
NOTE: The factory password is 0000 and the reminder number is 1807, if the user changes this password in the PASS menu and forgets, just send the reminder number to ELECTRON and the product's password will be reset.

The equipment has menus and parameters whose availability is subject to the model purchased.

Attention! When using this menu, it activates the relay outputs and lights up the monitor's LEDs so that the operator can make sure they work correctly. However, if the equipment is in operation and one of the relays is connected to the system protection, it will activate and the system protection will operate by turning off the machine it is protecting.

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
TEST	→ Menu to configure the Serial Communication speed.			
	---	AL1	---	Activates Relay 1 by pressing the **SET key**;
		AL2		Activates Relay 2 by pressing the **SET key**;
		AL3		Activates Relay 3 by pressing the **SET key**;
		FAIL		Activates Relay 4 by pressing the **SET key**;
		LEdS		Activates all the LEDs on the display by pressing the **SET key**;

PASSWORD MENU FLOWCHART



PASSWORD MENU

Press the **SET key**, the display will show the CONF menu, press the SET key again, a four-digit number will appear on the display, which is the reminder of the password that is configured on the equipment and soon after O000 will appear. Use the increment and/or decrement key to enter the password, to confirm the chosen number and move to the next square press the **SET** key, to return to the previous number press the **ESC** key. Confirming the four digits by pressing the **SET key**, if the password is correct, you will enter the configuration menus with the M menu on the display. SEN. Otherwise, it will come back on the O000 display.

Displaying the M menu on the display.SEN pressing the increment key six times will display the acronym M.COM press the **SET** key to set the parameters of the current outputs.

NOTE: The factory password is O000 and the reminder number is 1807, if the user changes this password in the PASS menu and forgets, just send the reminder number to ELECTRON and the product's password will be reset.

Attention! When using this menu, it activates the relay outputs and lights up the monitor's LEDs so that the operator can make sure they work correctly. However, if the equipment is in operation and one of the relays is connected to the system protection, it will activate and the system protection will operate by turning off the machine it is protecting.

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
TEST	→ Menu to change the password of the equipment configuration menu.			
	---	---	9999 to 0000	Menu to change the four-digit password. This password will be used to access the equipment configuration menu. To change the numbers, use the ▲ or ▼ key, to confirm the chosen digit and move on to the next one, press the **SET** key, to return to the previous digit press the **ESC key**. ***The factory password of MoniUni is 0000. In case of loss or forgetfulness of the password, contact Electron do Brasil and inform the password reminder number.***

EXCLUSIVE MENU

MENU	SUBMENU	PARAMETER	VARIABLE	DESCRIPTION
FAbR	→ Menu to change the password of the equipment configuration menu.			
	---	---	---	Exclusive menu from Electron do Brasil. To exit the Menu press the **SET key**

DEFECT SOLUTION

STEPS	FAILURE	CAUSE	SOLUTION
1	E01L E02L E03L	Sensor signal is below the minimum for reading	Check and eliminate possible bad contact or broken cables
			In the case of RTD, verify that the cables in the MoniUni sensor input are not connected in an inverted manner
			In the case of RTD, check the current input on the MoniUni with the multimeter, as explained below
			Check and replace if the sensor cable is not shielded
			Check for Sensor Cable Grounding
			Replacement of the failed sensor
2	E01H E02H E03H	Sensor signal is above the maximum for reading	Check and eliminate possible bad contact or broken cables
			In the case of RTD, verify that the cables in the MoniUni sensor input are not connected in an inverted manner
			In the case of RTD, check the current input on the MoniUni with the multimeter, as explained below
			Check and replace if the sensor cable is not shielded
			Check for Sensor Cable Grounding
			Replacement of the failed sensor
3	E04L E05L E06L	Differential value is below the indication range	Verify that the difference between the sensors is not outside the indication range -500 to 9999. **Example:** Differential between Sensor 1 and Sensor 2 1E2 fails E04L Sensor 1 with -200 reading and Sensor 2 with 400 reading. –200 – 400 = – 600 In this case, the differential of –600 is outside the minimum indication range, which is –500.
4	E04H E05H E06H	Differential value is above the indication range	Verify that the difference between sensors is not outside the -500 to 9999 indication range. **Example:** differential between sensor 1 and sensor 2 1E2 Sensor 1 with reading of 9900 and sensor 2 with -200 9900 – (-200) = 10100 In this case, the differential of 10100 is outside the maximum range, which is 9999
5	E04S E05S E06S	Without one of the differential sensors	Check that the two indicated sensors are connected to the correct ports to perform the differential
			Check in the SEN menu whether the sensors are enabled.
			Check that there are no sensor failures in the FAIL query menu. If it fails, perform steps 1 and/or 2 corresponding to the indicated fault.

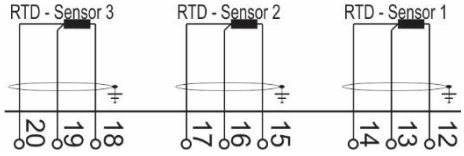
MONIUNI automatically returns to read mode when normalized. To reset the Monitor, press the **SET Key** for approximately 5 seconds, until the word REST appears on the display, then release and the equipment will restart. This operation does not erase the configured parameters and does not return the equipment to the factory setting.

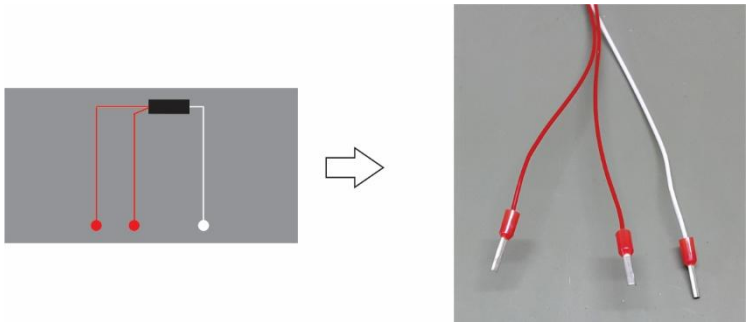
The MONIUNI has a fault contact (relay 4), it will act in case of indication or reading failures and if there is a power supply.

TESTING OF RTD SENSORS

MoniUni, depending on the model purchased, supports input of up to 3 RTDs.

The RTDs used in MoniUni are three-wire, two red wires, and one white wire.





On sensor 1, the pin of connector number 12 is connected to the white wire, and pins 13 and 14 are connected to the red wires.

On sensor 2, the pin of connector number 15 is connected to the white wire, and pins 16 and 17 are connected to the red wires.

On sensor 3, the pin of connector number 18 is connected to the white wire, and pins 19 and 20 are connected to the red wires.

To check the operation of the sensors, take the following measurements with a multimeter on the Ohmic scale. It is worth noting that the sensor must be disconnected from the MoniUni or the MoniUni must be turned off as otherwise there will be errors in the measurement of the sensor's resistance.

Between the red hairs, a very low resistance will be observed, close to 1 Ω. There may be upward variations depending on the length of the cable.

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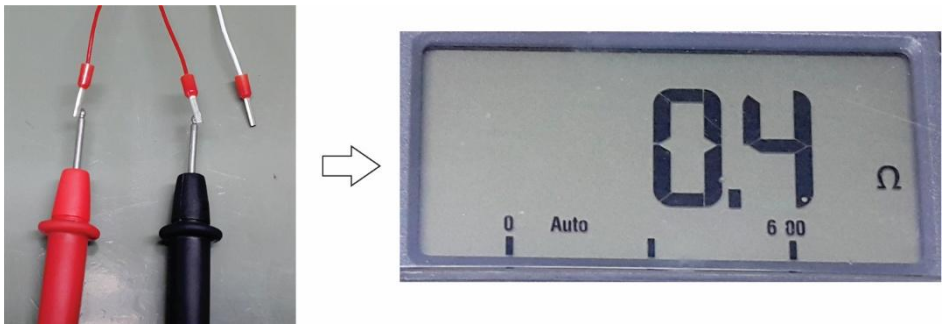
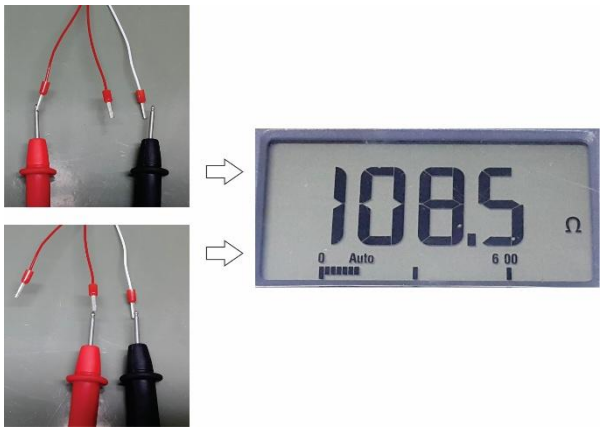


Between the red and white wires, a resistance equivalent to the temperature that the RTD sensor is measuring is measured. In the case below, it is a PT100 measuring a temperature of 22 °C, which is equivalent to a resistance of 108.5 Ω (according to the thermoresistance table available in http://www.electron.com.br/wp/pdfs/Tabela_PT100.pdf). For the other RTDs, PT200, PT500 and PT1000, the thermo-resistance table is different.



TEST ON SIGNAL INPUT FROM 4 TO 20 MILLI AMPERES

MoniUni, depending on the model purchased, supports input of up to 3 signals from 4 to 20 mA.

The connection can be made in active mode, using the internal MoniUni source of 15 VDC, or passive, using an external source of up to 24 VDC.

Diagrama para conexões de 4 a 20mA ativo.

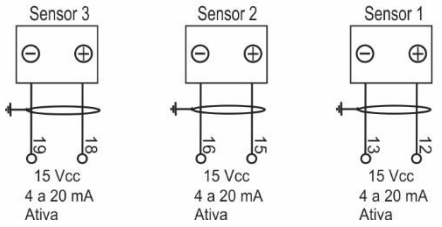
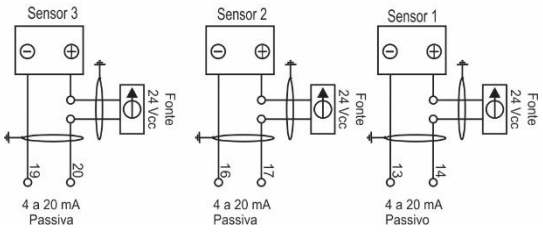


Diagrama para conexões de 4 a 20mA passiva.



TEST ON SIGNAL INPUT FROM 4 TO 20 MILLI AMPERES

This test has to be done with the MoniUni energized, so it is not allowed to remove any wires from the MoniUni power connector.

To verify that the current signal that is arriving at the MoniUni is correct, a multimeter is measured on the current scale in mA at the input of the sensor. The current input, whether passive or active, for the MoniUni are the pins: Sensor 1 - pin 13, sensor 2 - pin 16 and sensor 3 - pin 19.

In the example below, the current input to sensor 3 will be measured.

Removing the wire that is attached to pin 19 on the input of sensor 3, connect the probe of the black color multimeter to pin 19.

With the wire tip removed, connect the probe of the multimeter colored red to the wire terminal. The current measured under these conditions should be between 4 and 20 mA. In the case below, the measured current is 9.33 mA.

Sensor Reading Range 3 0 to 100% configured in the FLS menu:

Input current value on sensor 3 is 9.33 mA

To find out if the value indicated on the MoniUni display is correct, the following calculation is performed:

ΔmA = 20 mA – 4 mA = 16 mA, i.e., 16 mA is the variation of the input current.

ΔmA = 9.33 mA – 4 mA = 5.33 mA, i.e., 5.33 mA is the variation in input current at the instant of the reading.

Therefore, 16 mA / 100% = 0.16

5.33 / 0.16 = 33.31

When a current signal with 9.33 mA is at the input of the MoniUni, the MoniUni should indicate on the display the value of 33.31%.

TEST ON SIGNAL INPUT FROM 4 TO 20 MILLI AMPERES

MoniUni Configuration:

Range to mirror at current output 0 to 100% RANG menu

Current output configuration 4-20 mA menu SHALLOW

Sensor to mirror on analog output SEN1 OUTC menu

Sensor value 1 indicated on the display 57%

To find out if the value of the current output of MoniUni is correct, you can make the following calculation:

ΔmA = 20 mA – 4 mA = 16 mA, i.e. 16 mA is the variation of the current output signal.

So 16 mA ---- 100%

X ---------- 57%

X = (16 x 57)/100 = 9.12 mA

Since the input signal starts at 4 mA, you need to add 4 mA to the result,

X = 9.12 + 4 = 13.12 mA

13.12 mA is the current that has to be at the current output of the MoniUni when it is indicated 57% on sensor 1.

IMPORTANT RECOMMENDATIONS

Before putting the equipment into operation, check the following recommendations:

1. All sensors as well as the equipment must be grounded, not use the same grounding point for power supply and for the sensor so that there is no difference in potential.

Properly grounded sensors and power prevent malfunctions or damage in the event of disturbances, surges, and inductions in the equipment.

2. Use 120 Ω resistors in the communication network (RS485) at the 2 ends of the transmission line (start and end) in order to generate the potential difference necessary for the correct operation of the communication network.

3. Do not use MoniUni directly on SOL. Whenever it is installed in the field, it is important that it has a panel with smoked glass, so that the ultraviolet rays that attack the front polycarbonate are filtered. In this way, the life of the equipment will be prolonged.

WARRANTY TERM

The MoniUni Electron Monitor has a warranty period of two years from the date of sale stated on the invoice, with coverage for any manufacturing defects that make it unsuitable or unsuitable for the applications for which it is intended.

Disclaimer of Warranty

The warranty does not cover transportation expenses for technical assistance, freight or insurance for shipment of a product with evidence of defect or malfunction. The following events are also not covered: natural wear and tear of parts due to continuous and frequent use; damage to the outside caused by falls or improper packaging; attempt to repair / break a seal with damage caused by persons not authorized by Electron and in disagreement with the instructions that are part of the technical description.

Loss of Warranty

The product will automatically lose its warranty when:

The instructions for use and assembly contained in this manual and the installation procedures contained in the NBR 5410 Standard are not observed.

Subjected to conditions outside the limits specified in the respective technical descriptions.

Tampered with or repaired by a person other than Electron's technical staff;

The damage is caused by a drop or impact;

Infiltration of water or any other liquid occurs;

Overload occurs that causes degradation of the components and parts of the product.

Use of the Warranty

To enjoy this warranty, the customer must send the product to Electron along with a copy of the purchase invoice properly packaged so that there is no damage in transport. For emergency care, it is recommended to send as much information as possible regarding the defect detected. It will be analyzed and subjected to complete functional tests.

The analysis of the product and its eventual maintenance will only be carried out by the technical team of Electron do Brasil at its headquarters.

LETTER OF COMPLIANCE

Available for Downloads on the Website:

http://electron.com.br/wp/wp-content/uploads/2014/09/CARTA-DE-CONFORMIDADE-PORTUGUÊS.pdf

REVISION CONTROL

Revision No. 1.0 November 2015.
- Emission.

Revision No. 2.0 May 2016.
- Inclusion of the functions of the read differential, drive differential and read failures.

Revision No. 2.5 November 2019.
- Spelling review, layout update, flowchart update, electric diagram update and formatting.

Revision N4.0 – General Feb/2026