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PROCESS CONTROL DEVICE

USER MANUAL

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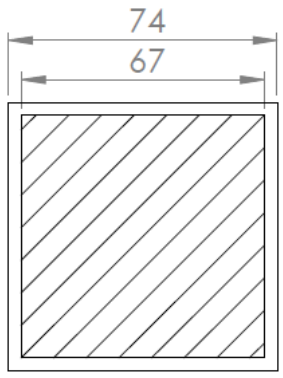
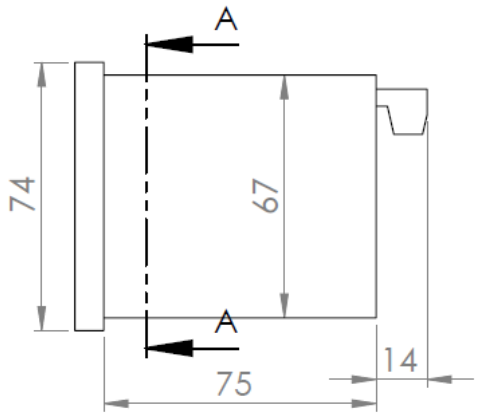
1.TECHNICAL SPECIFICATIONS

Supply Voltage	24 $V_{AC/DC}$ 50/60 Hz 85-265 V_{AC} 50/60 Hz	
Power Consumption	9 VA / 2,7 Watt Maximum	
Sensor Supply Voltage	Pot:	5 V_{DC}
	mV/V:	10 V_{DC}
	0-10V:	24 V_{DC}
	0-5V:	5 V_{DC}
	0,5-4,5V:	5 V_{DC}
	4-20 mA:	24 V_{DC}
	CANopen:	24 V_{DC}
Max Sensor Supply Current	100 mA	
Sampling Rate	3.5 kHz	
Input Resolution	16 bit	
Thermocouple Resolution	19 bit	
RTD Resolution	15 bit	
Analogue Inputs	Potentiometer, 0-10 V, 0.5-4.5 V, 0-5 V, 4-20 mA, 0-20 mA, 3,33 mV/V, 2mV/V, 2,5mV/V Ratiometric, Thermocouple (K, J, N, R, S, T, E and B type), RTD	
Relay Outputs	2 pcs 250 V_{AC} 3A (For Resistive Load) Relay (optional 3 pcs)	
Serial Communication (Optional)	RS-232, RS-485, USB, CANopen	
Analogue Outputs (Optional)	0-10 V, 0-5 V, 0.5- 4.5 V, 4-20 mA, 0-20 mA	
Analogue Output Resolution	12 bit	
Connection	Terminals with 2,5 mm^2 sockets	
Operating Temperature	0 °C … 50 °C	
Storage Temperature	-10 °C … 60 °C	
Protection Class	IP60 Front Panel, IP20 Back Panel	
Dimensions	67 x 67 x 74 mm	
Weight	~190 gr	
Mounting	It is fixed to the panel with the feet at the top and bottom.	

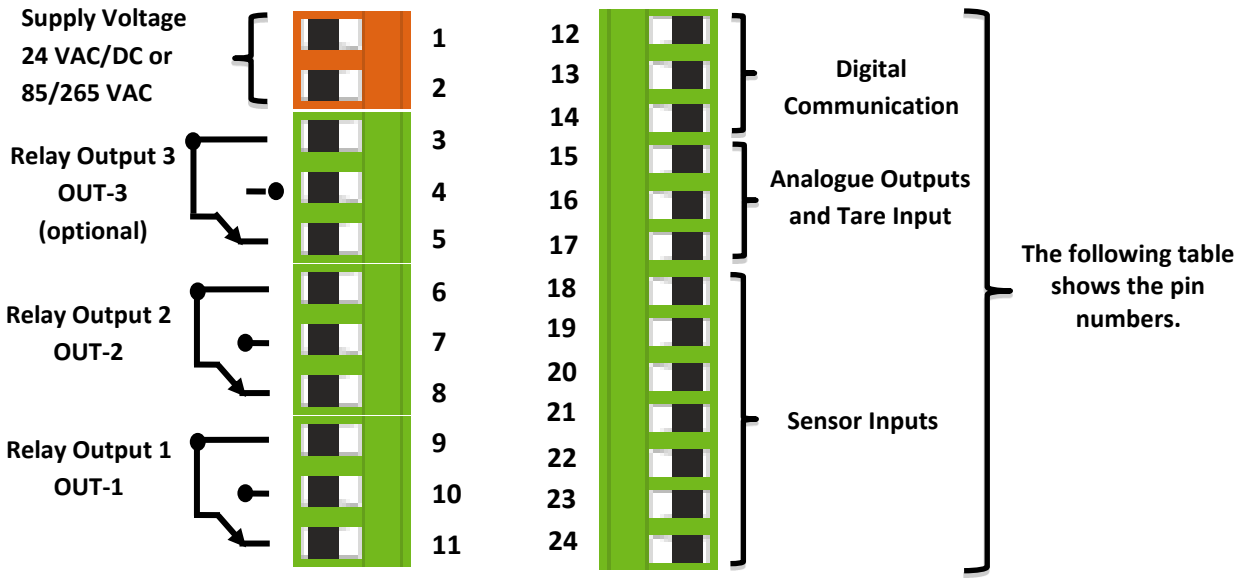
2. MECHANICAL DIMENSIONS



SECTION A-A



3. CONNECTIONS



Digital Conn.	12	13	14
RS485	A	B	GND
RS232	Rx	Tx	GND
USB HID	USB B TYPE CONNECTOR		
USB VIRTUAL	USB B TYPE CONNECTOR		
CANopen	CAN HIGH	CAN LOW	GND

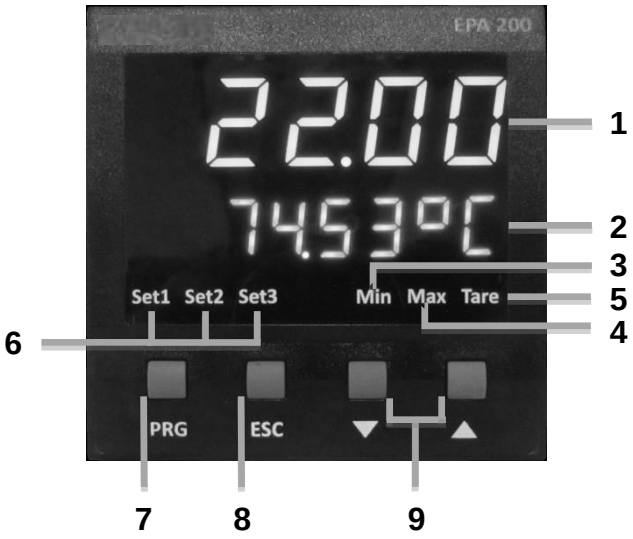
Analogue Outputs	15	16	17
4-20 mA Output 0-20 mA Output 0-10 V Output 0-5 V Output 0.5-4.5 V Output	X	GND	Signal Output
Tare Input	Tare Input	GND	X

SENSOR	24	23	22	21	20	19	18
Potentiometer	3. terminal	2. terminal	1. terminal	X	X	X	X
4-20 mA Input 0-20 mA Input 0-10 V Input 0-5 V Input 0.5-4.5 V Input	GND	Sensor Signal	Sensor Supply	X	X	X	X
3,33 mV/V Input 2 mV/V Input 2.5 mV/V Input	GND	X	Sensor Supply	Signal(-)	Signal(+)		
Thermocouple	X	X	X	X	X	T-	T+
RTD	X	X	X	X	X	R-	R+

SAFETY WARNINGS

1. Always follow the instructions and instructions in the operating instructions before making the connections and during use.
2. Please check the power supply type before you connect energy to your device.
3. During the operation, be sure to mount it firmly on the panel to be used against falling, sliding, shaking and shaking.
4. Make sure the sensor connections are not energized in your device, and do not disconnect or connect the devices while the device is running.
5. Make sure that the cables between the sensor and your device are shielded and free from high-current energy cables.
6. Do not expose your device directly to a heat source (solar, heater, etc.) in its operating environment.
7. The EPA200 is an industrial control device which is not suitable for outdoor use; please use only in room conditions.
8. Wipe with a damp cloth to clean your device, do not use water, alcohol, thinner and similiar chemicals.
9. Comply with the limit values specified in the technical specifications for relay outputs.
10. The device cannot be changed by the user in the event of a fault, Please contact our technical service in case of failure.

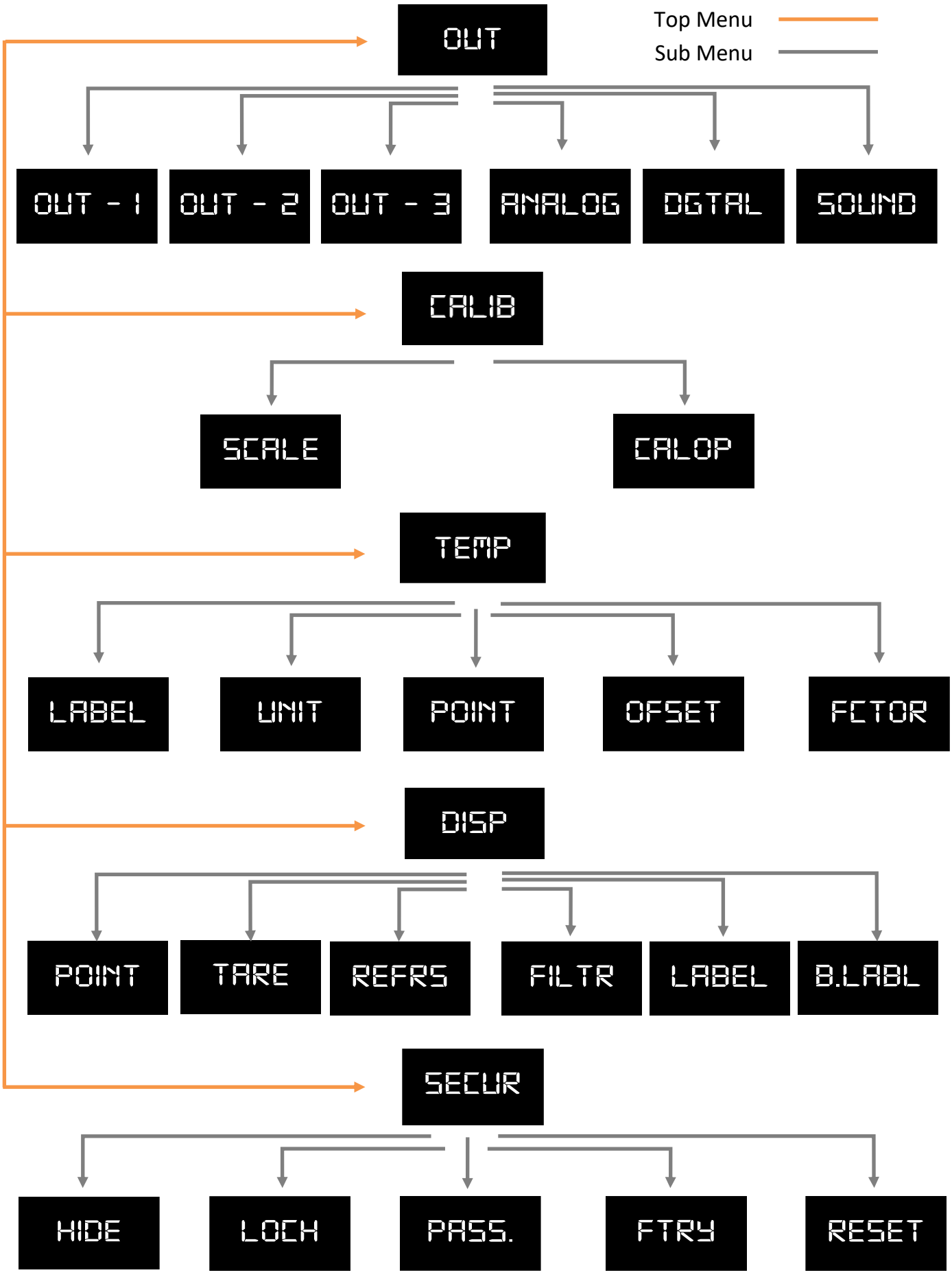
4. FRONT PANEL IDENTIFICATIONS



1) Top Display Line: It has 5 digits and shows the measured process value.
2) Bottom Display Line: It has 6 digits and shows the relay setpoint, the temperature measured by the thermocouple or the ambient temperature.
3) Min Status LED: It lights up when the lowest (minimum) value has been read since the moment the device is started.
4) Max Status LED: It lights up when the maximum value has been read since the moment the device is started.
5) Tare Status LED: It lights up when the Tare function is active.

6) Set Status LEDs: The LED associated with the active relay lights up.
7) PRG Button: Programming and Enter key. It is used to enter menus or to confirm entered values.
8) ESC Button: Escape, exit and back key. It is used to return to the upper menu or to exit the menu.
9) UP and DOWN Buttons: Navigating through the menus; is used to increase and decrease the value while entering values, or to move to a lower and higher digit.

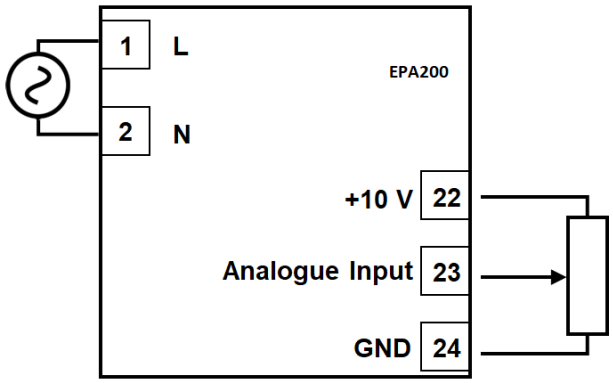
5. MENU TREE


Top Menu
Sub Menu
OUT
OUT - 1
OUT - 2
OUT - 3
ANALOG
DGTAL
SOUND
CALIB
SCALE
CALOP
TEMP
LABEL
UNIT
POINT
OFSET
FCTOR
DISP
POINT
TARE
REFRS
FILTR
LABEL
B.LABL
SECUR
HIDE
LOCH
PASS.
FTRY
RESET

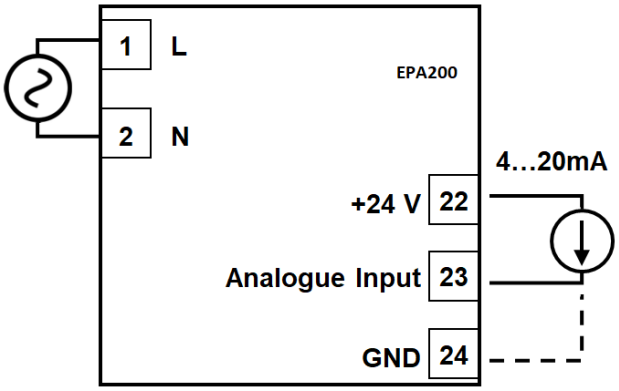
6. SETUP

6.1 Connecting the Sensor to the Device

Potentiometer Connection



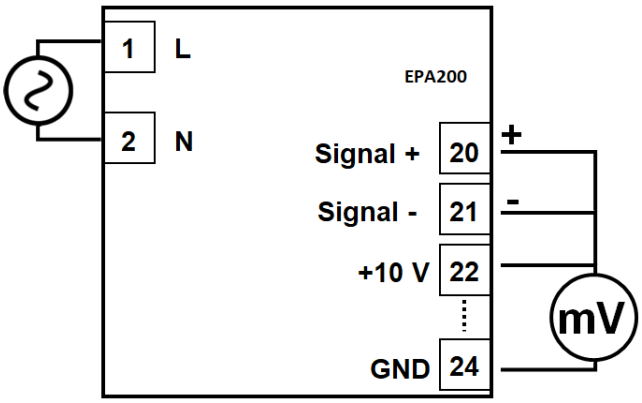
4...20mA / 0...20mA Connection



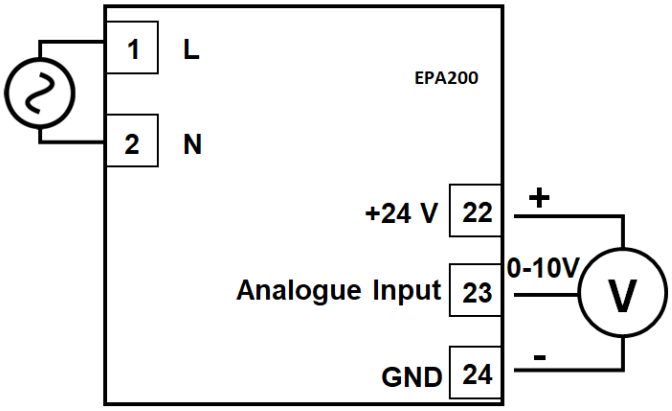
***2 wire connection:**

Sensor supply terminal must be connected to terminal 22
Sensor signal terminal must be connected to terminal 23

mV/Volt Connection

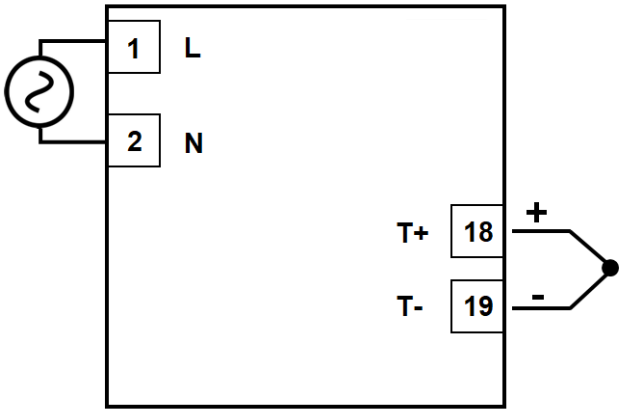


0...10V / 0...5V / 0.5-4.5V Conn.



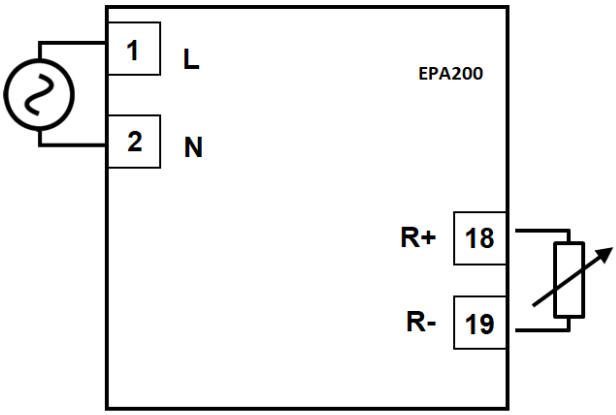
***0-5 V and 0.5-4.5 V connections are made as above.**

Thermocouple Connection



***K, J, N, R, S, T, E and B type thermocouples can be connected**

RTD Connection

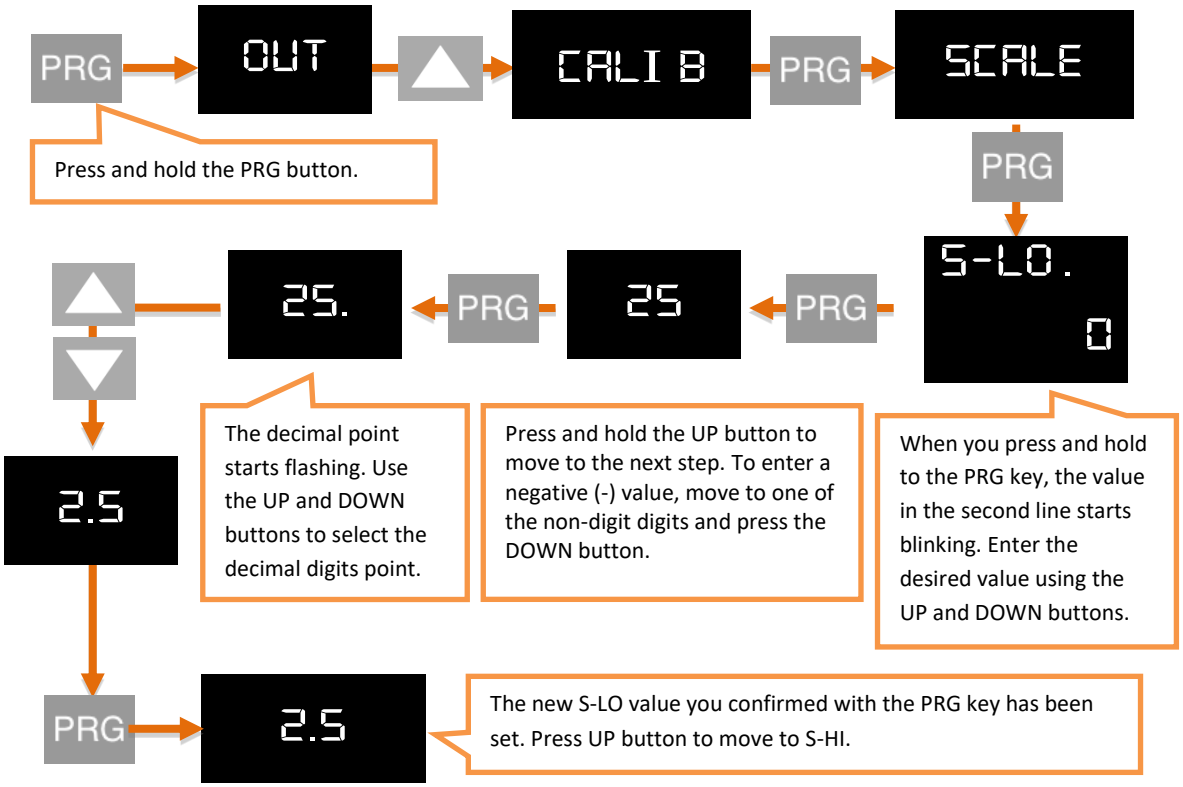


6.2 Device Calibration

Press and hold to the PRG key to switch to the programming menu.

6.2.1. Setting the Scale Value

Your device is automatically calibrated to the factory settings and operates in the 0-100 range. That is, the smallest value read on the sensor is 0, and the maximum value is 100 on the display. You can change this scale on calibration menu. Use the S-LO for the minimum value displayed on the screen and the S-HI option for the maximum value.



* After you have set the S-LO value, you can do the same for the S-HI value.

6.2.2 Setting Factor Value

You can use the **Fctor** menu to expand your scale by multiplying it with a fixed factor.The number of this factor, which is the default value of 1, is multiplied by the values of S-LO and S-HI to determine the scale value.

For example; When you set the S-LO value to 1, the S-HI value to 20 and make the factor 4, your device will operate in the range of 4-80 value range.

WARNING: Changing the scale and factor value does not change the calibration of your device, it only indicates the displayed value range on the screen.

6.2.3 Setting Calibration Method

Your device has been calibrated during production. If you want, you can do this calibration according to your sensor. To do that you should select the calibration method on this menu.

Factory calibration (Default)

2 pointed calibration

Multiple (Segmented) Calibration

6.2.3.1 Factory calibration (default)

The default calibration on your device. The multipoint calibration or the two pointed calibration that you have made to your device does not disturb the factory calibration.

6.2.3.2 Two-point calibration

By two-point calibration option, only the maximum and minimum points are selected. For example; While you are calibrating a 10 cm linear potentiometer, the minimum point is identified when the potentiometer is in the fully closed position and the maximum point is identified when the potentiometer is in the fully open position.

* After you set the CAL-L value, you can do the same for the CAL-H value.

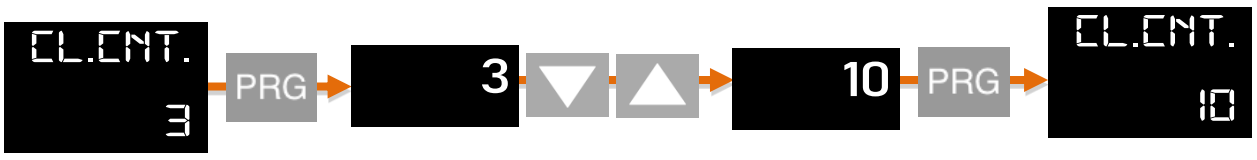
6.2.3.3 Multiple (segmented) Calibration

With the multiple calibration option, you can calibrate your device at up to 10 different points. This method increases the linearity of the sensor.

For example; If the length of the sensor is 40 cm and you want to calibrate at 5 different points, these points are; There may be 0. cm, 10. cm, 20 cm, 30 cm when sensor starts and 40 cm points where the sensor ends. These points can be set anywhere in the scale range. We recommend you to choose by equal intervals for a more suitable linearity.

6.2.3.4. Determining the Number of Calibrations (CL.CNT)

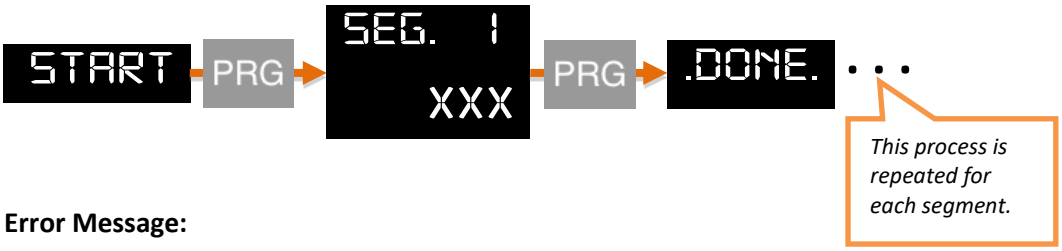
If you select the multi-segmented calibration option, in this menu that appears, you can specify the number of points you want to calibrate the device. It's a maximum of 10.



When the PRG button is pressed and entered into the menu, the second line starts blinking. Enter the desired value using the UP and DOWN buttons and confirm by pressing the PRG button again.

6.2.4 Start Calibration (START)

After selecting the number of calibration, press the button to access the start menu.



Error Message:

SN. ERR	This error message can only be seen on devices with 4-20mA and 0.5-4.5V inputs. Meaning; The sensor is not connected to the device or the sensor is defective.

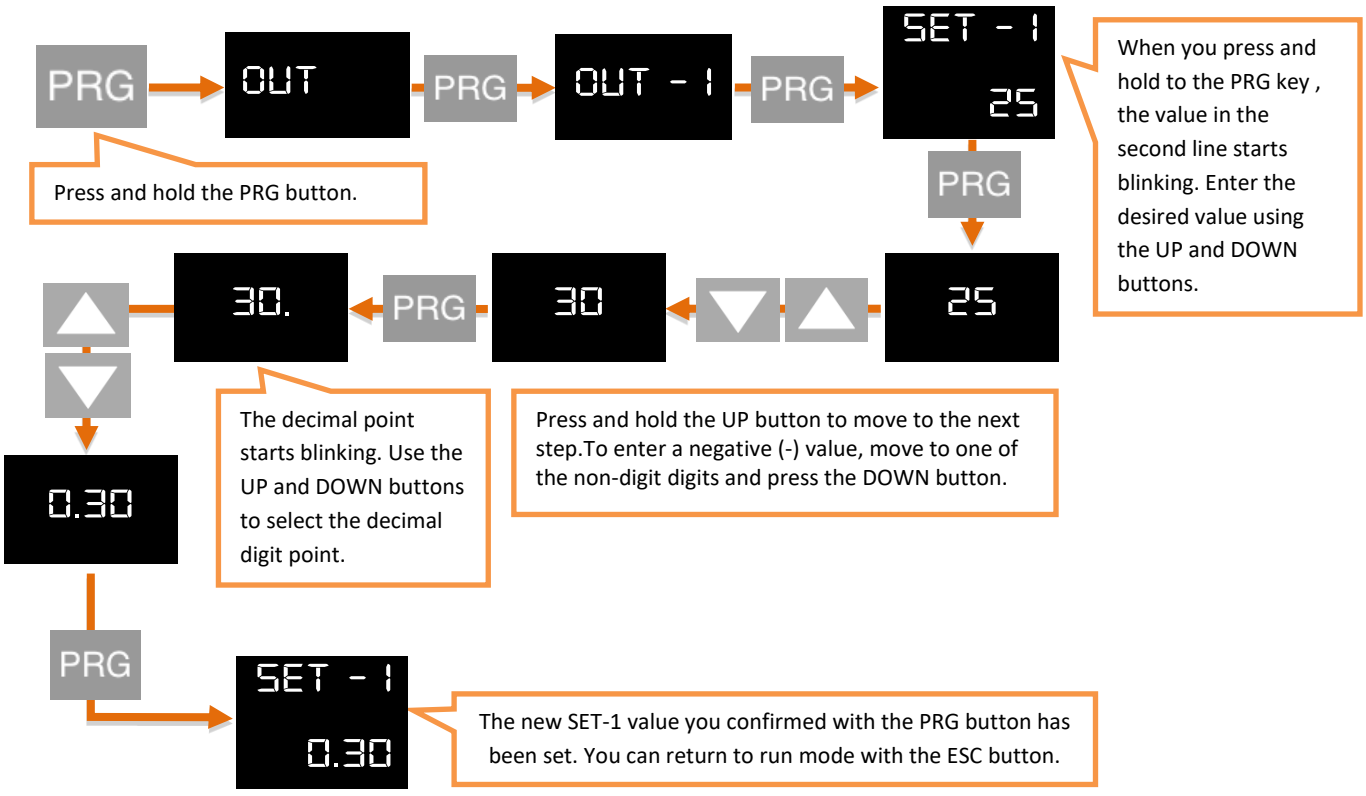
6.3. ADJUSTING THE RELAY SET VALUES

Your device has tree relays in total with two contacts, normally open and normally closed. You can use the relay contacts in five different functions according to your needs. These functions are described by 6.4.1

6.3.1. Relay Output Settings

Set the SET values in which the relay outputs of your device will be activated.

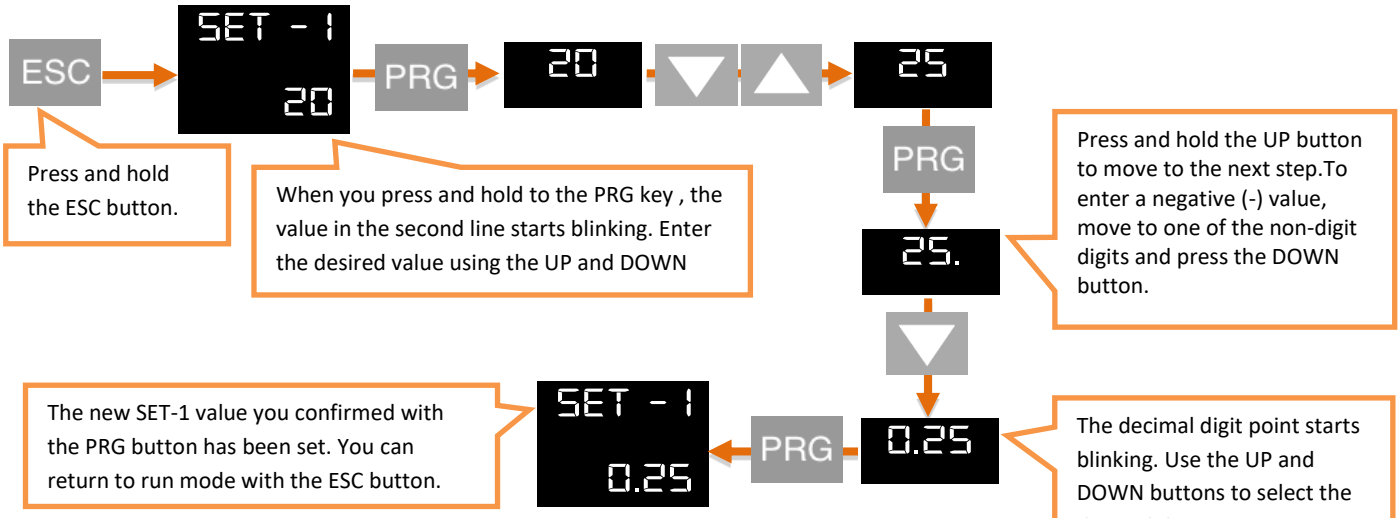
For SET 1 value;



* You can also set other relay outputs in the same way.

6.3.2 Changing Quick Set Values

You can quickly change the adjustable relay set values when the device is in operation mode.

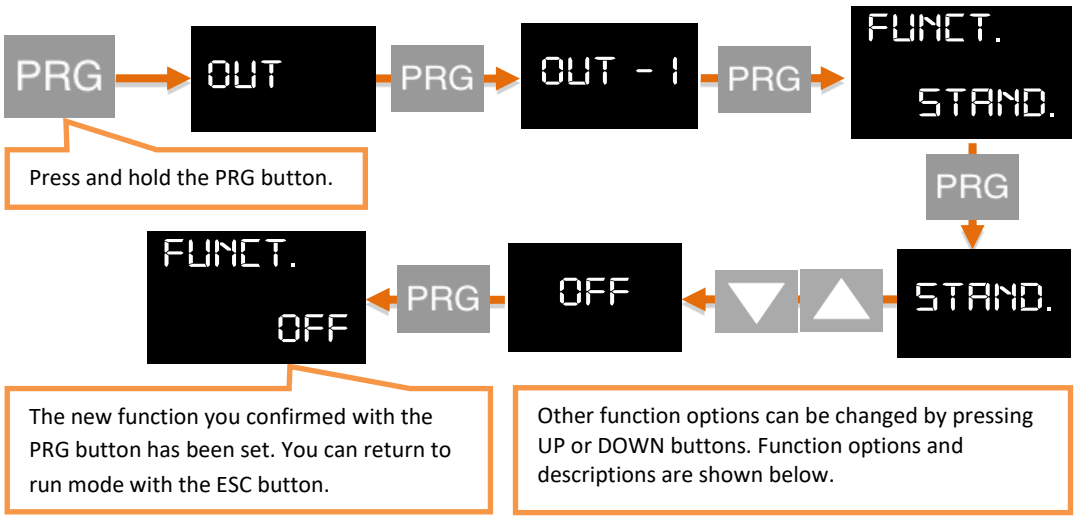


* You can set the quick set values for other relay outputs in the same way.

6.4. RELAY PROGRAMMING MODE

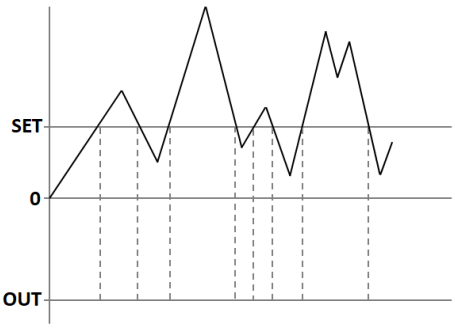
6.4.1. Relay Function Selection

This function selection determines when the relay output will switch on and switch off according to the set values.



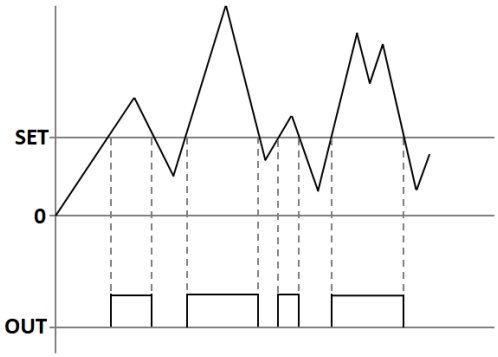
* You can set the functions for other relay outputs in the same way.

Relay Function Options:



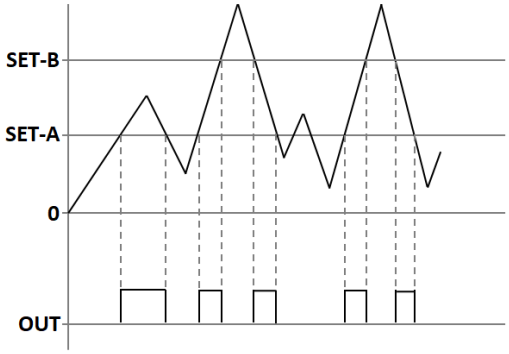
OFF

The relay does not switch off in any way.



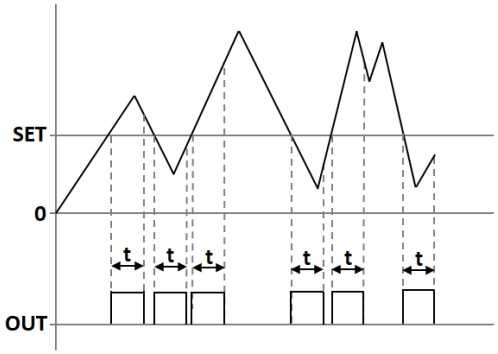
STAND.

When the value read in the device reaches or exceeds Set-1, the relay pulls.



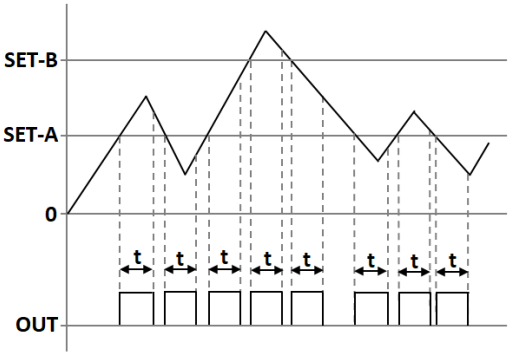
BAND

When the value read on the device is between Set-1A and Set-1B value, relay pulls.



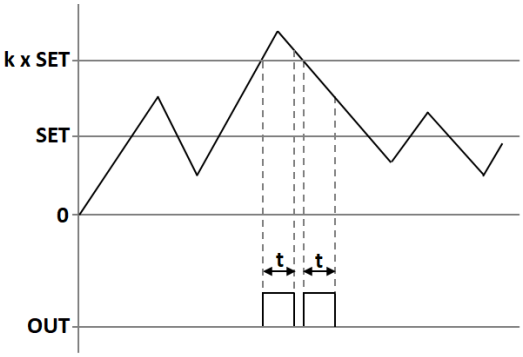
CATCH

The value read on the device remains set to the value of Set-1 by increasing or decreasing the value of the relay each time it is released for the time which is entered.



DUAL

When the value read in the instrument is increased or decreased with the value of Set-1A or Set-1B, the relay remains

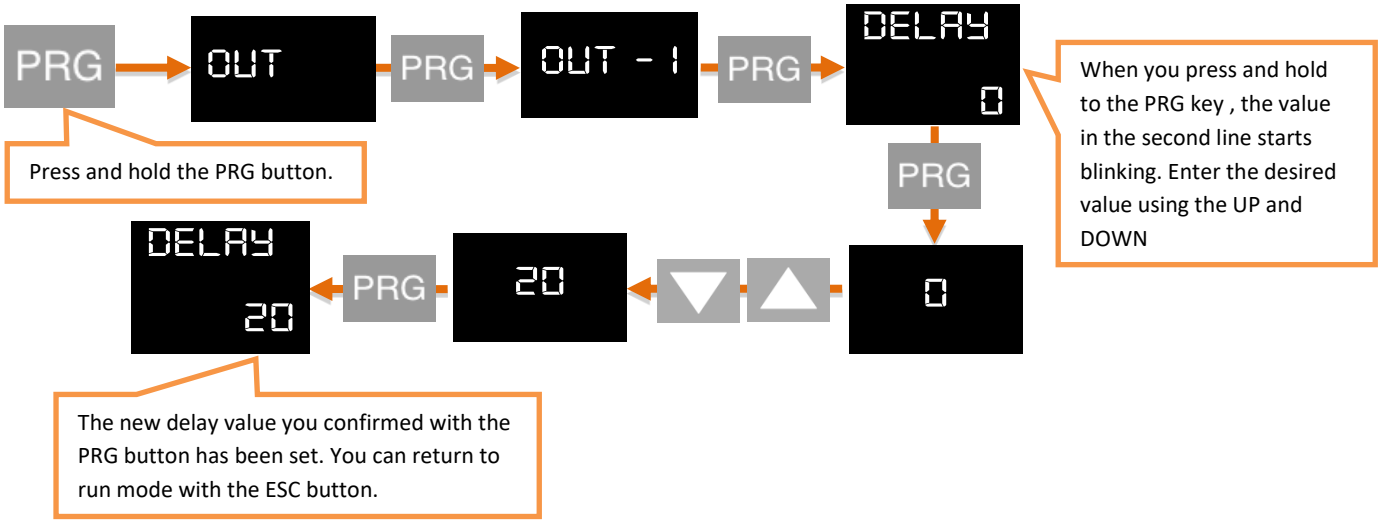


PER DC.

When the value read in the device is increased or decreases with the value of Set-1 or the value of Set-1 in every floor such as 2,3,4,5 ..., the relay remains drawn for the time entered.

6.4.2 Delay

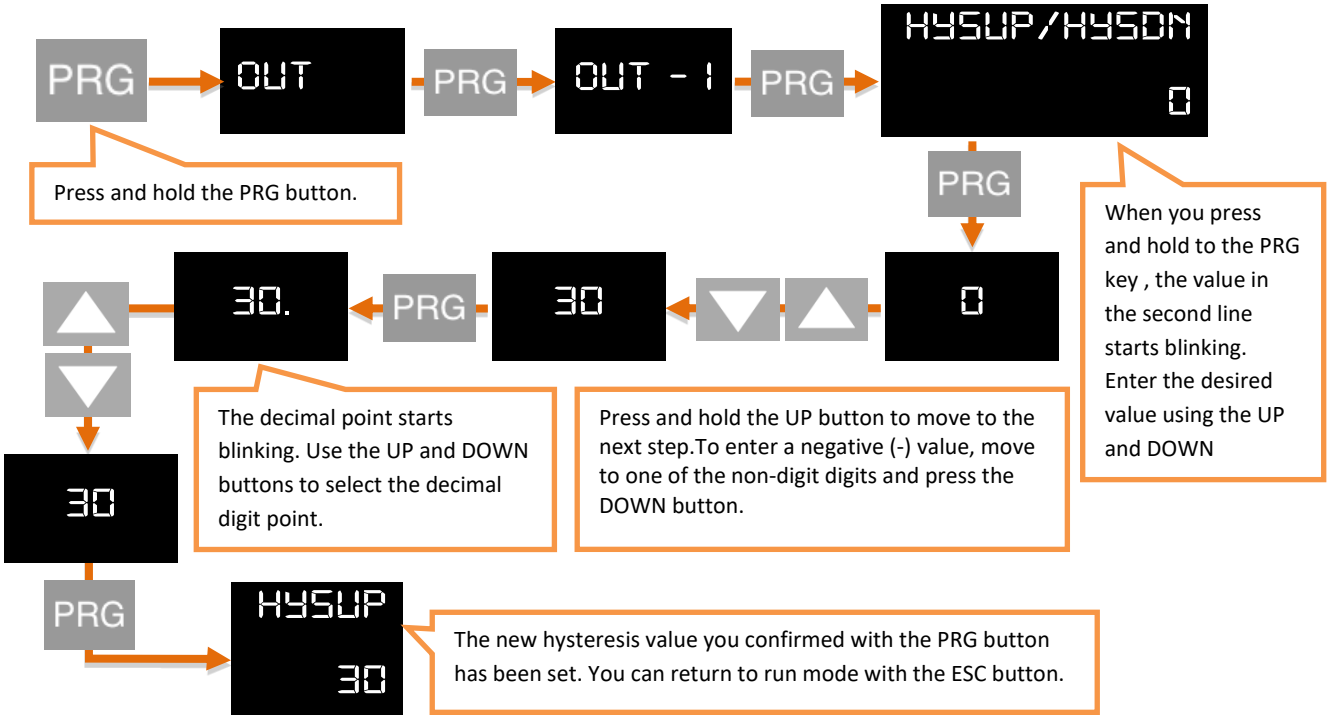
The relay specifies in seconds how long it will active and inactive after it is switched off. If '0' is entered as a zero value in the Stand function, the relay will remain drawn unless the relay output condition changes.



* You can also set other relay outputs in the same way.

6.4.3. Hysteresis

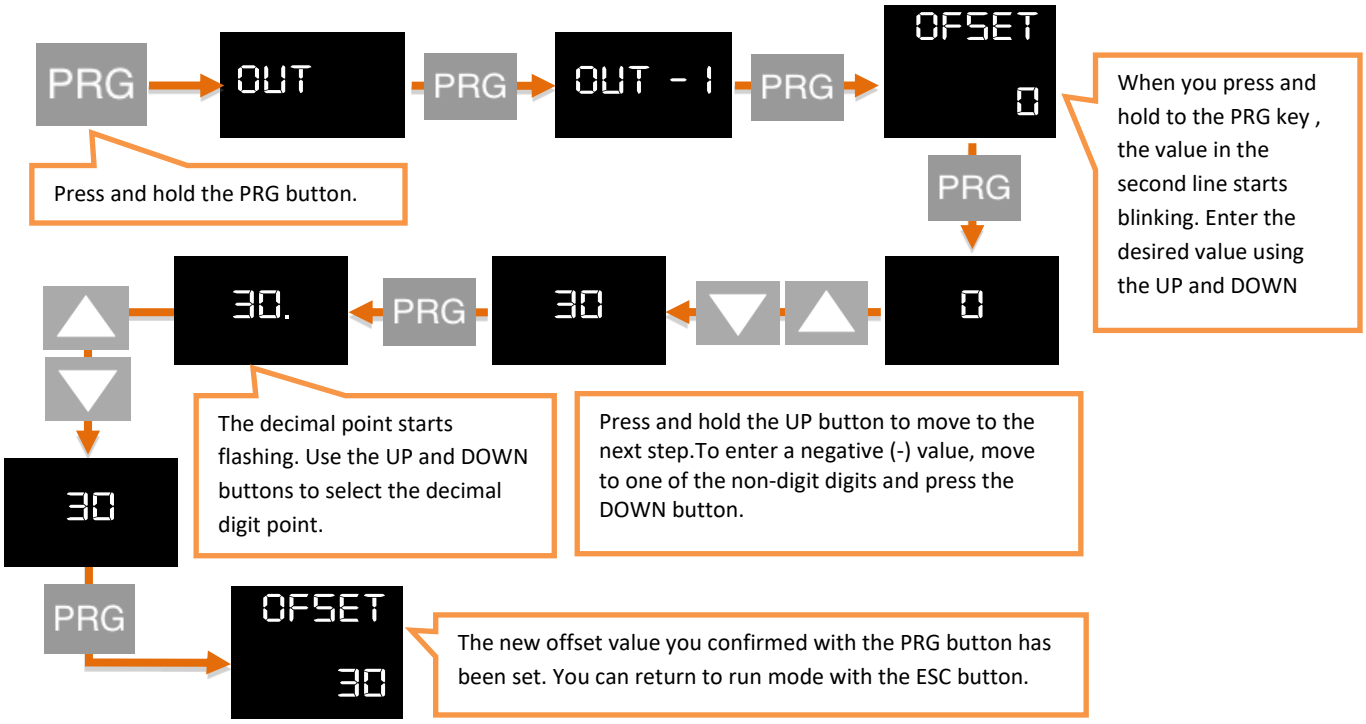
Due to the unstability in decimal value read on the connected sensor, you can enter the hysteresis value to prevent the relay from being turned on and off at any time, so that the set value you set for the relay will be activated and inactivated as low as Hysdn and above Hysup.



* You can also set other relay outputs in the same way.

6.4.4. Offset Value

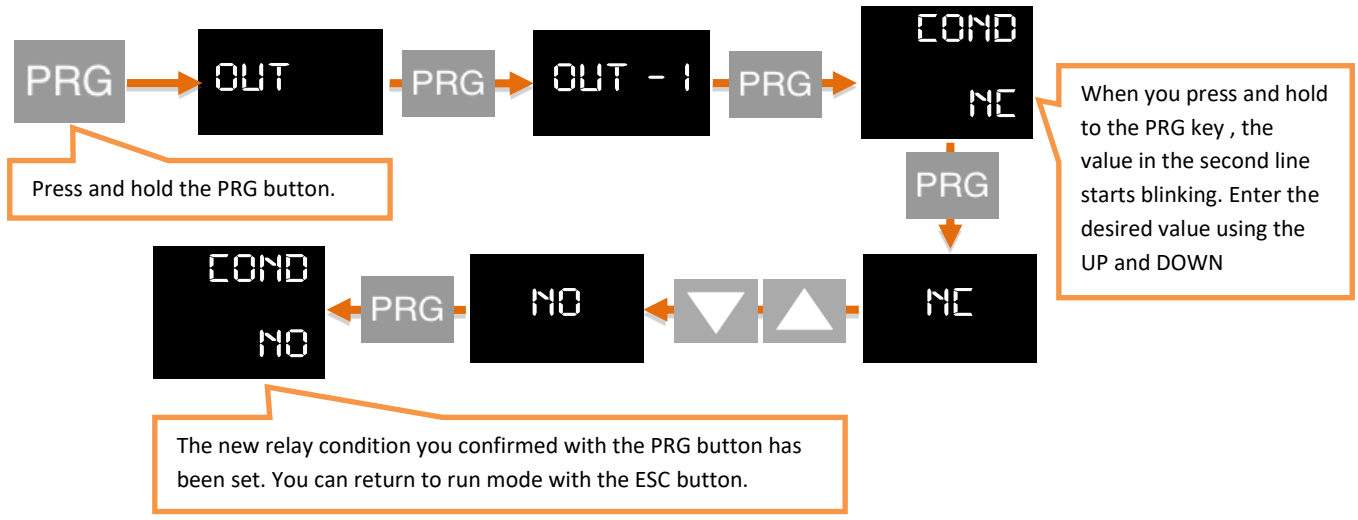
If you want to add offset to the entered set value, this menu is used. All set values are, as much as ofset value is shifted forward and if it is selected negative then it is shifted backwards .



* You can also set other relay outputs in the same way.

6.4.5. Default Status Of The Relay (Cond)

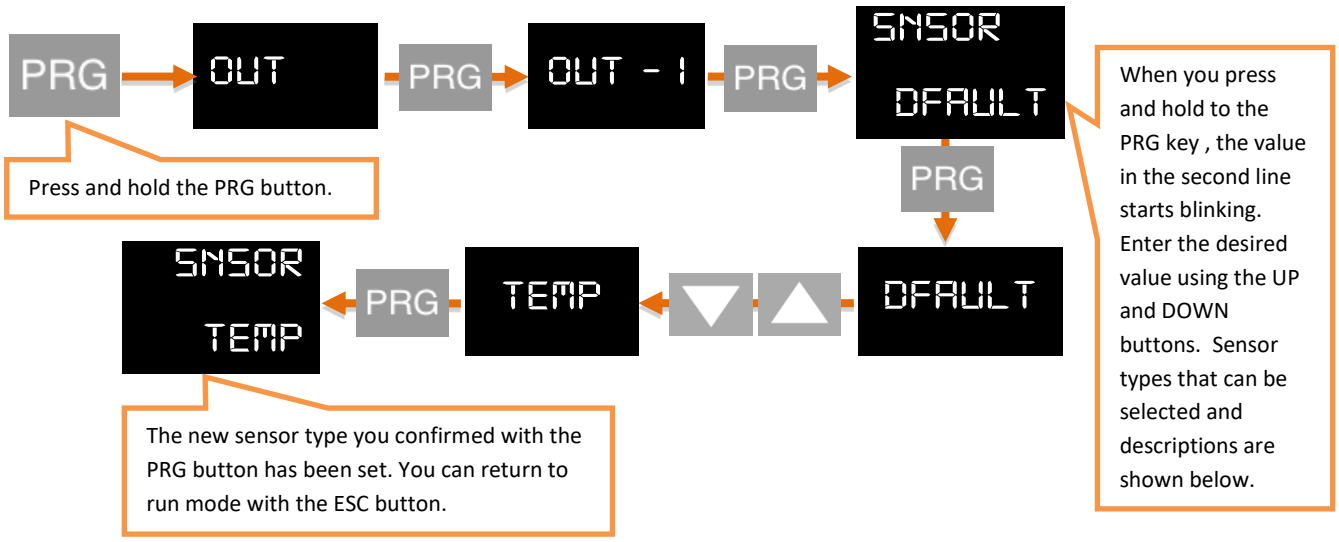
Depending on the factory settings of your device, the relay is normally off, so you can change it as normally open. Use the Cond option to do this. The factory setting NC (Normally Closed) indicates that the relay is normally closed, NO. (Normally Open) indicates that the relay is normally open.



* You can also set other relay outputs in the same way.

6.4.6. Sensor Selection (Snsor)

Assignment can be done to the selected relay for the sensor types shown below.



Sensor Type:

DEFAULT	When the relay output is wanted to be activated for sensor input, the "DEFAULT" should be selected.
TEMP.	When the relay output is wanted to be activated for Thermocouple or RTD input, the "TEMP" should be selected.
CAN.DT 1	When the relay output is wanted to be activated for CAN-Open communucation connection through data-1, the "CAN.dt1" should be
CAN.DT 2	When the relay output is wanted to be activated for CAN_Open communucation connection through data-2, the "CAN.dt2" should be

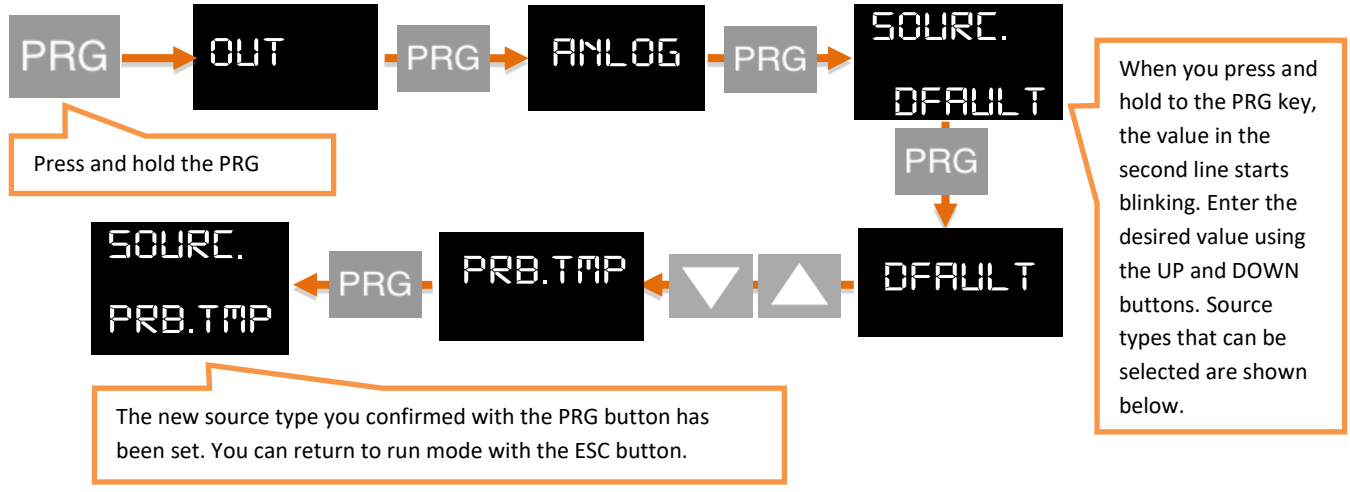
* You can also set other relay outputs in the same way.

6.5. ANALOGUE OUTPUT SETTINGS

If your EPA 200, which is specially manufactured according to your order, has analogue output module, you can make the necessary settings on this menu.

6.5.1. Source Type Selection for Analog Output (SOURC)

Under the Type menu, any of the following analogue SOURCE types can be selected.

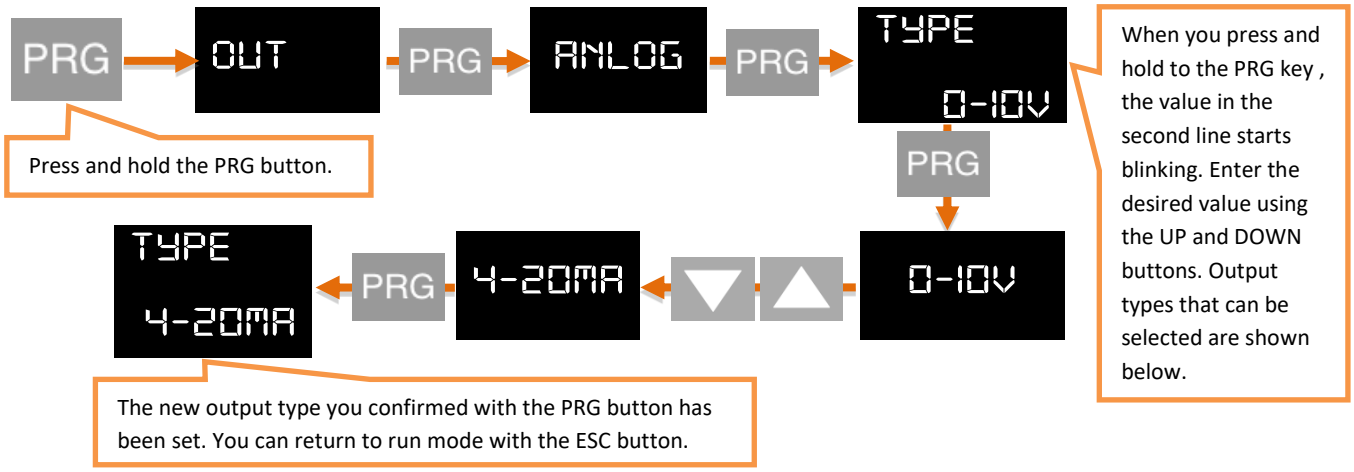


Source Types:

PRB.TMP	The sensor or thermocouple which is connected are selected as source.
AMB.TMP	Ambient temperature information is selected as source.
CAN.DT1	CAN line information from the 1st data is selected as the source.
CAN.DT2	CAN line information from the 2nd data is selected as the source.
SET-1	The specified Relay 1 setpoint is selected as the source.
SET-2	The specified Relay 2 setpoint is selected as the source.
SET-3	The specified Relay 3 setpoint is selected as the source.

6.5.2. Analogue Output Type Selection (TYPE)

Under the Type menu, any of the following analogue output types can be selected.

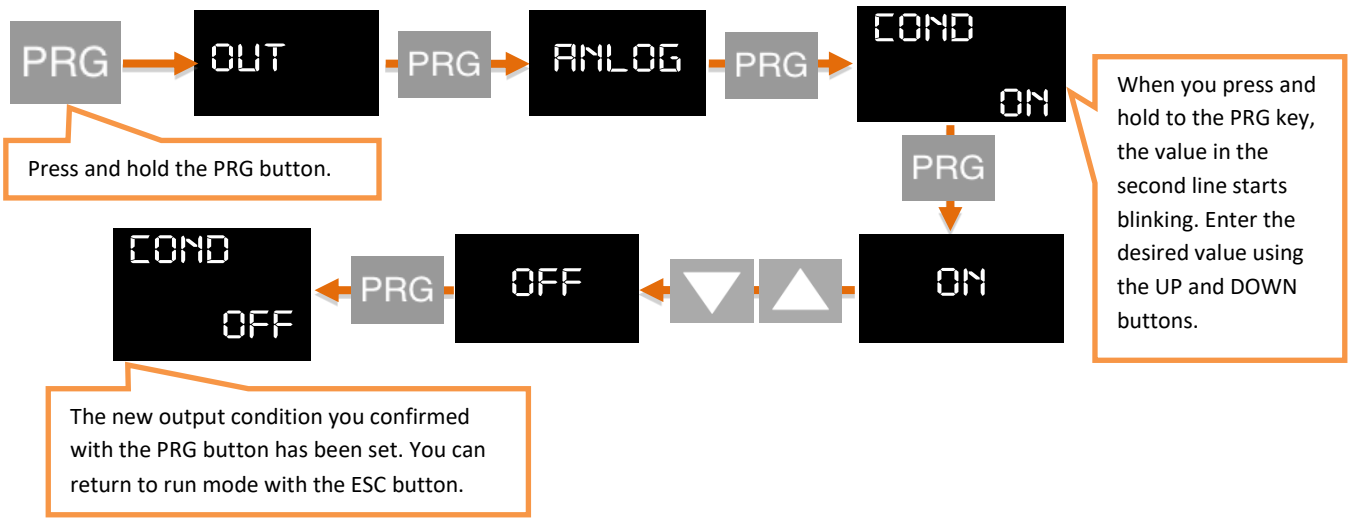


Analogue Output Types:

0-10V	0.5-4.5V
4-20MA	0-20MA
0-5V	

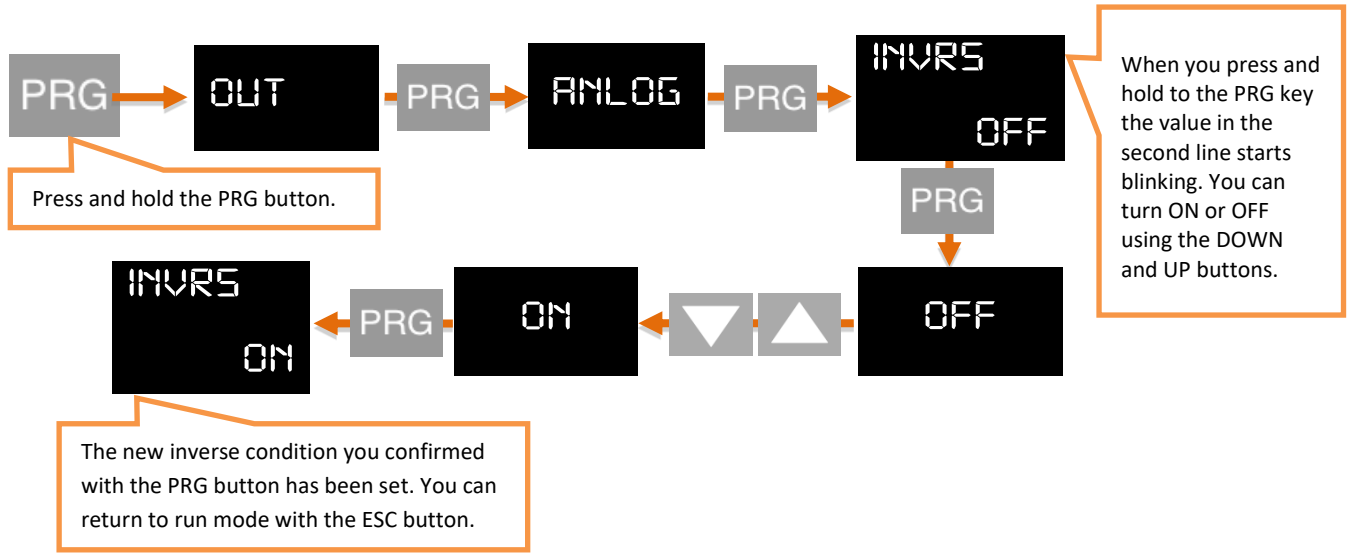
6.5.3. Analogue Output ON/OFF (COND)

"ON" is used to turn on the analogue output and "OFF" is used to turn it off.



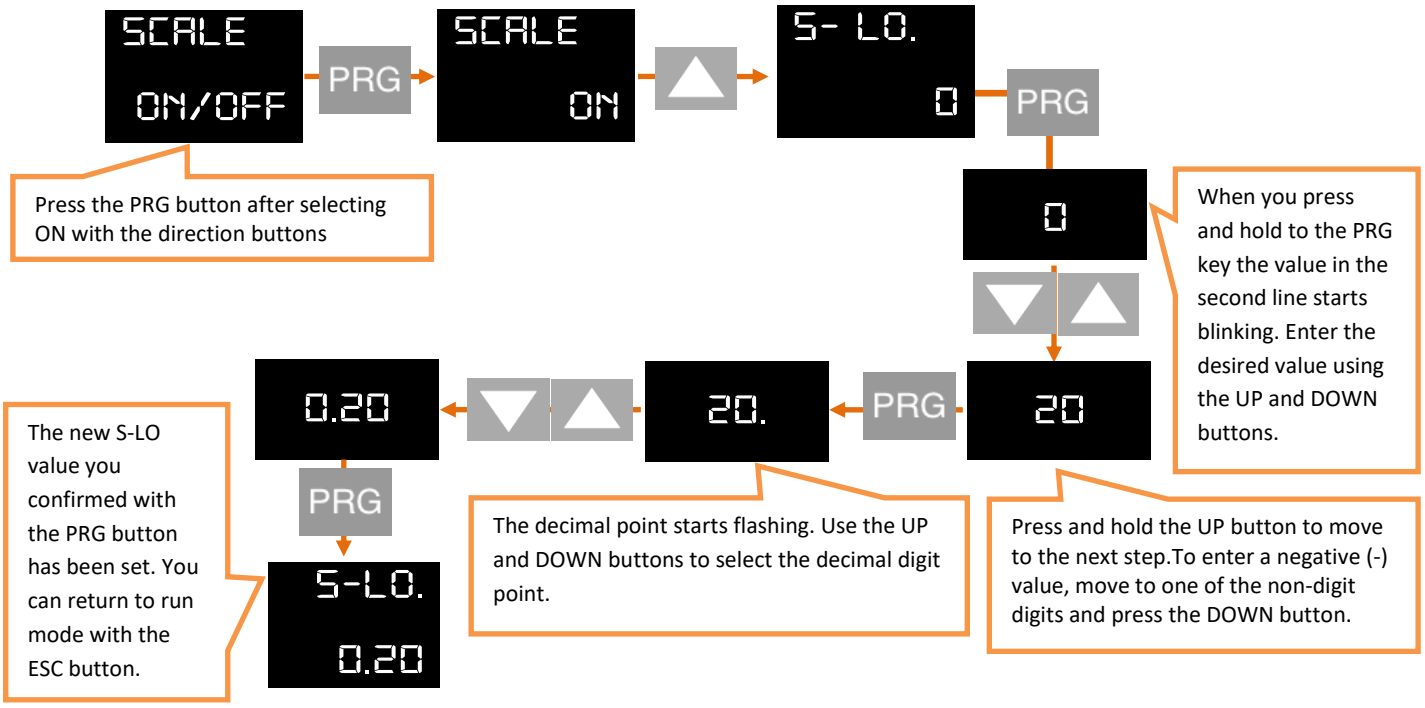
6.5.4. Inverse Setting (INVRS)

You can choose in which direction the value to be read on the analogue output increases or decreases according to the sensor. This option, which is OFF according to the factory default settings, provides an analogue output that increases or decreases in proportion to the value which is read at the sensor. If you turn this ON, while the value which is read out at the sensor is increasing, the value at the analogue output will decrease, ie an inversely proportional output will be provided.



6.5.5. Analogue Output Scale Setting

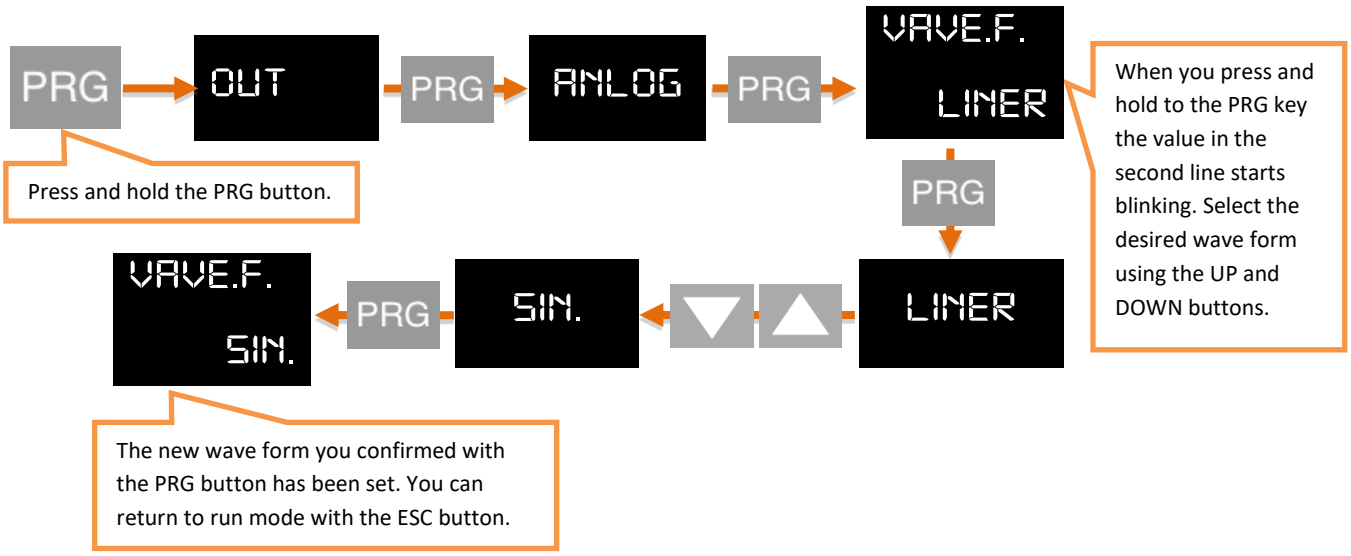
On the device with the analogue output feature, to set the output signal to the desired scale range, SCALE mode on this menu must be ON. Then S-LO. and S-HI. values can be entered.



* After you have set the S-LO value, you can do the same for the S-HI value.

6.5.6. Wave Function (WAVE.F)

On this menu, you can find the linear standard waveform which is in the factory setting ; you can set as the sine, cosine or triangular format.



6.6. DIGITAL OUTPUT SETTINGS

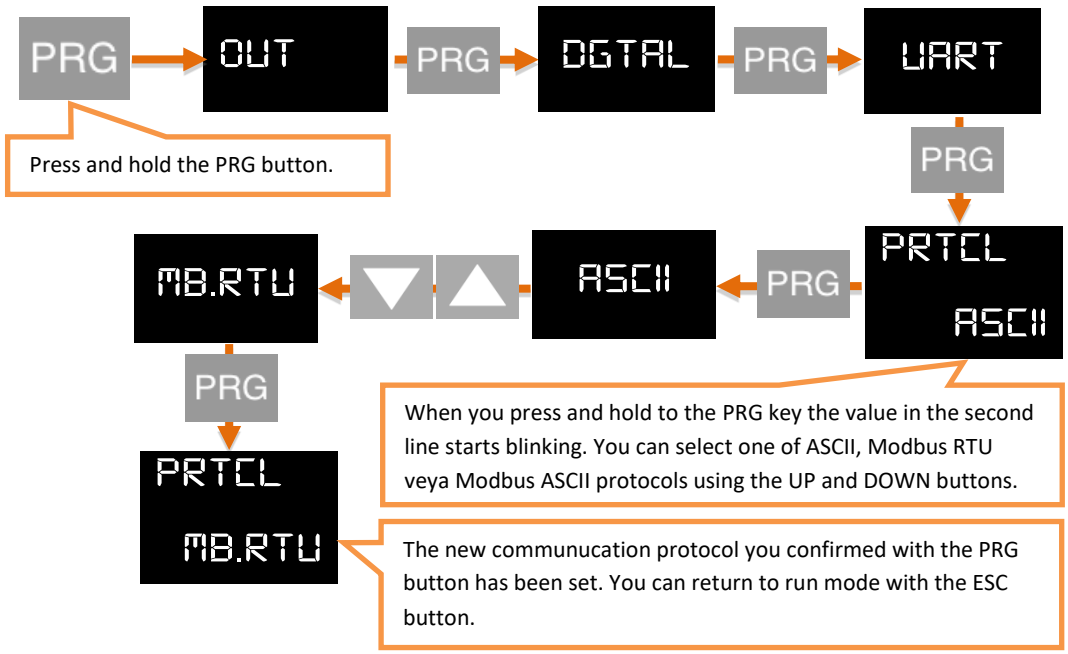
WARNING: After changing the UART or CANopen settings, you should restart the device to make the changes to take effect.

If your device has a USB port, use MyPanelMeter, which you can download from our website to check your device. Check the user manual of the program.

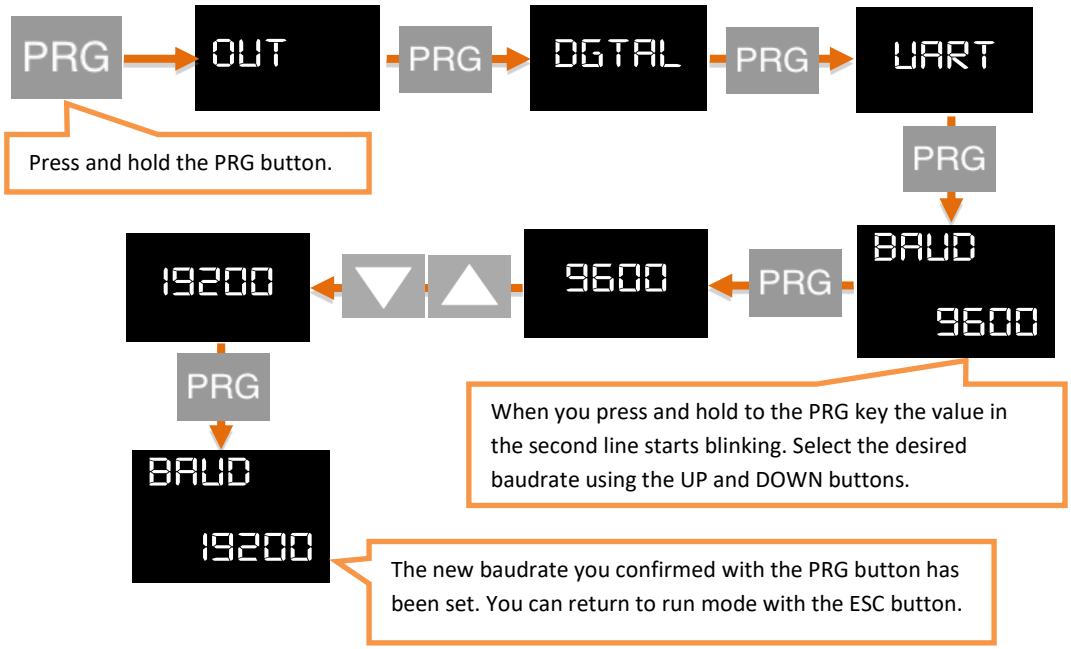
6.6.1. UART Settings

If you are communicating with your device via RS-485 or RS-232; You can make the necessary settings here. You can select the communication protocol, baudrate, parity, address and period information. For the MODBUS Protocol address information, see the relevant booklet.

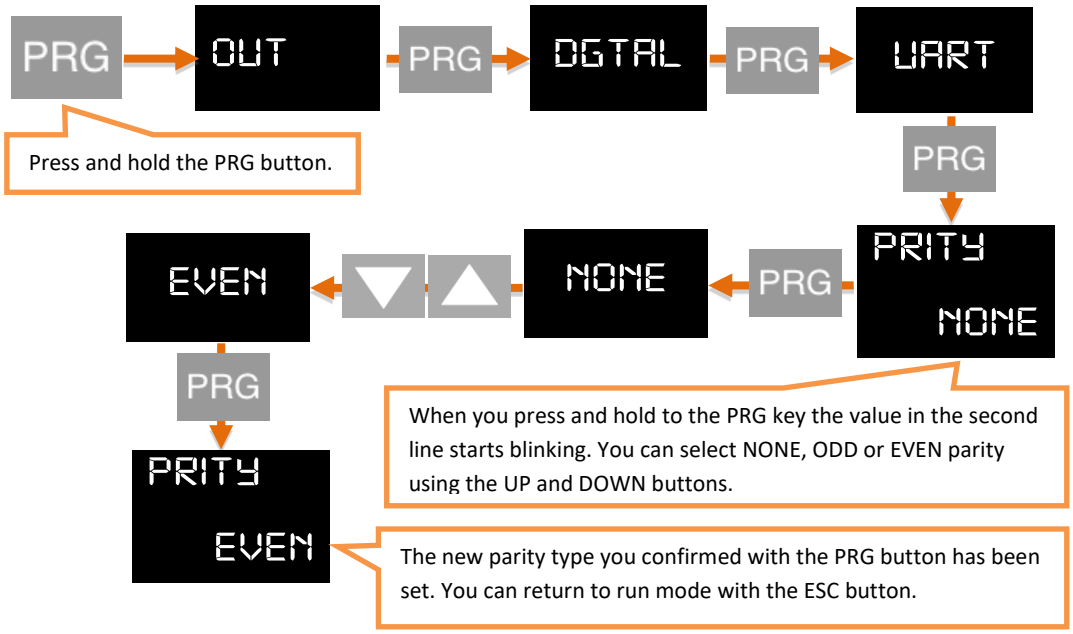
6.6.1.1. Protocol Settings



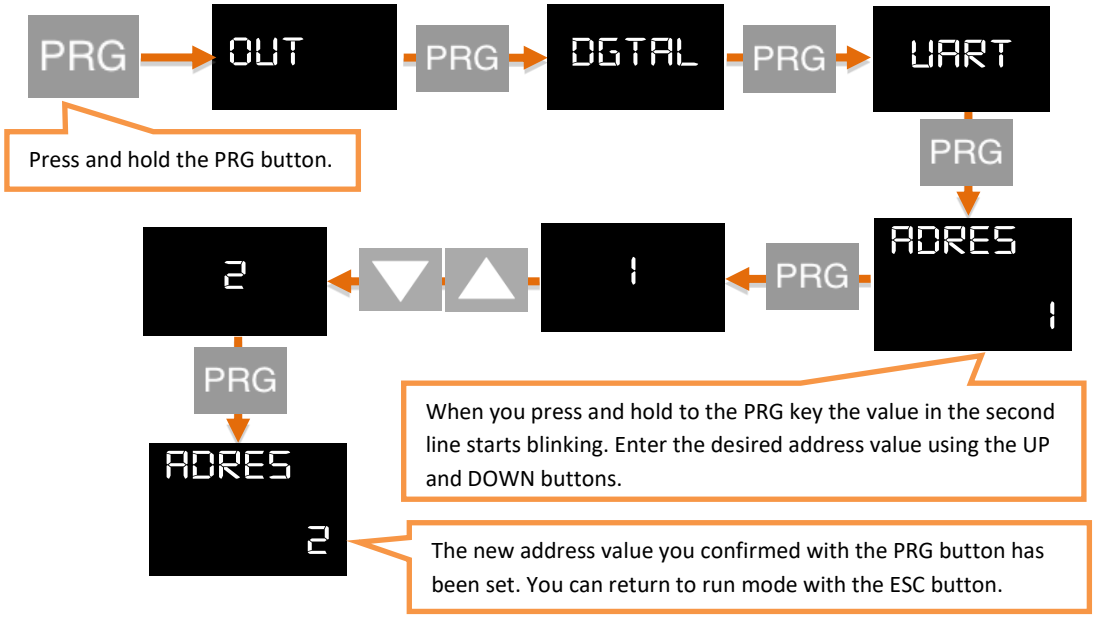
6.6.1.2. Baudrate Setting



6.6.1.3. Parity Setting



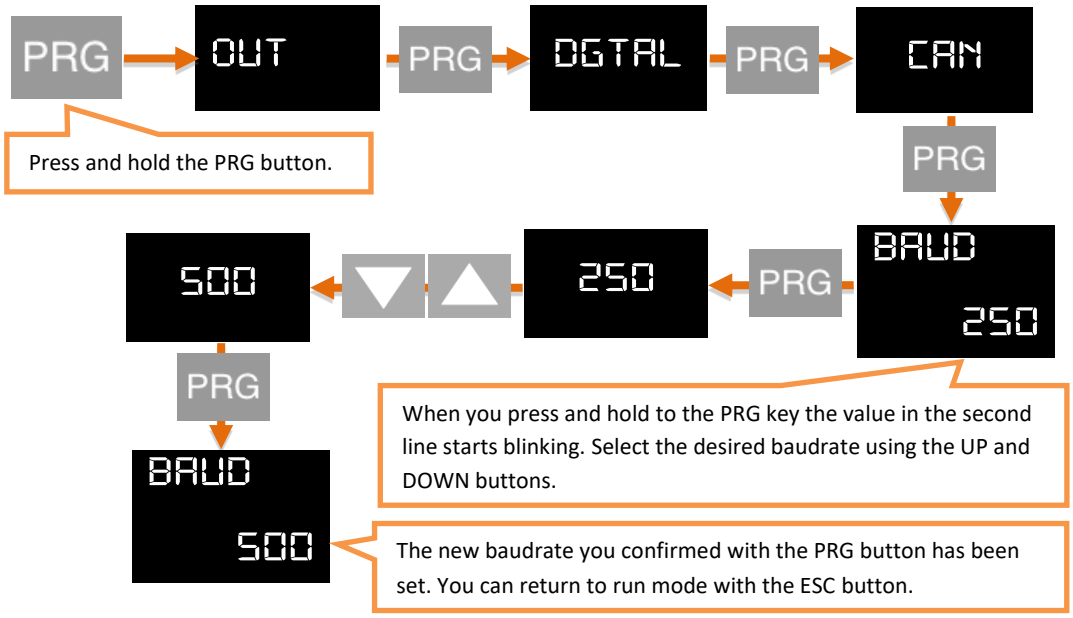
6.6.1.4. Address Setting



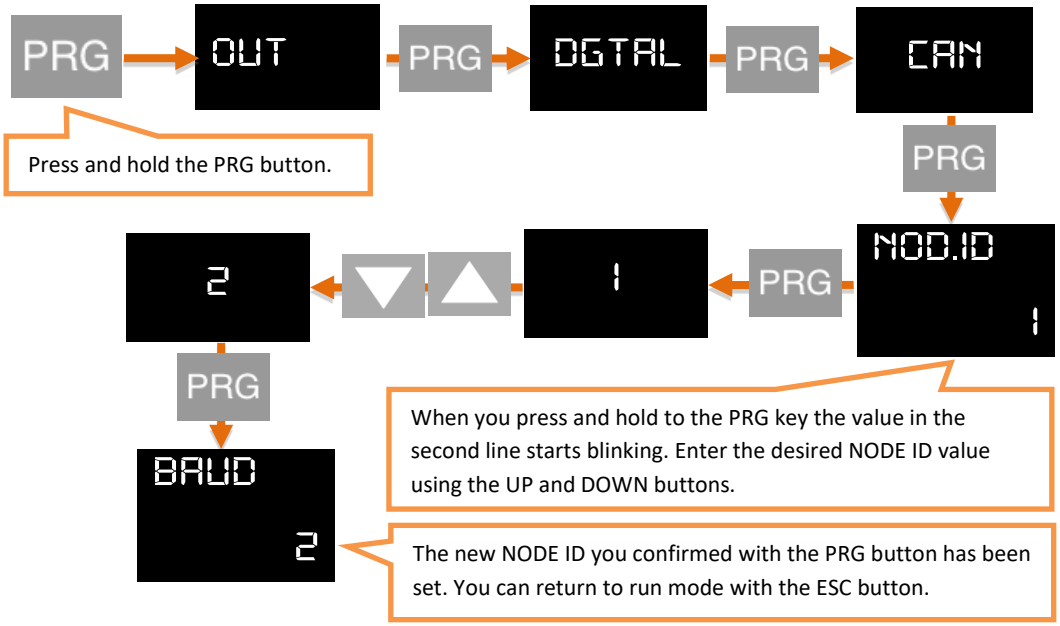
6.6.2. CAN-Open Settings

Here you can set the baudrate, Node ID, Heartbeat, PDO etc. of your device related to CANopen protocol. For more information on CANopen, see the EPA 200-CANopen booklet.

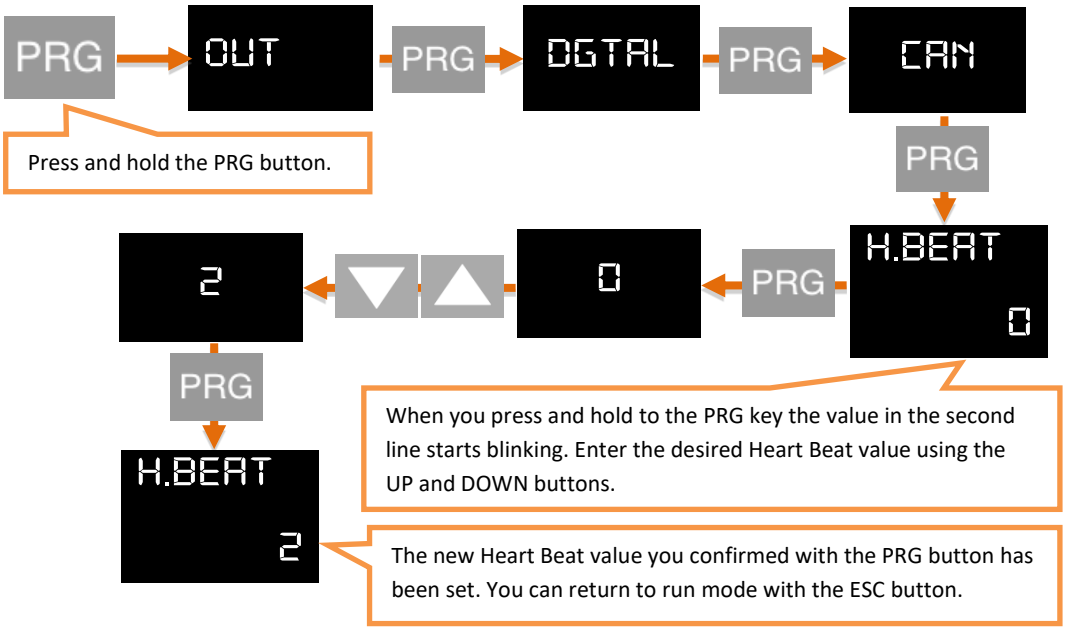
6.6.2.1. Baudrate Setting



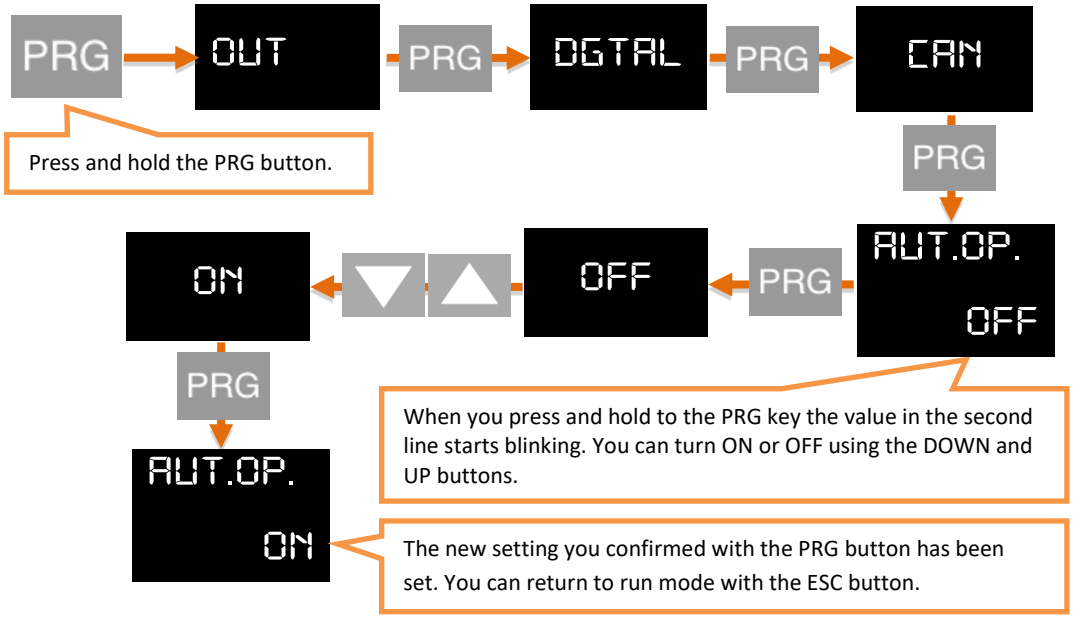
6.6.2.2. NOD ID Setting



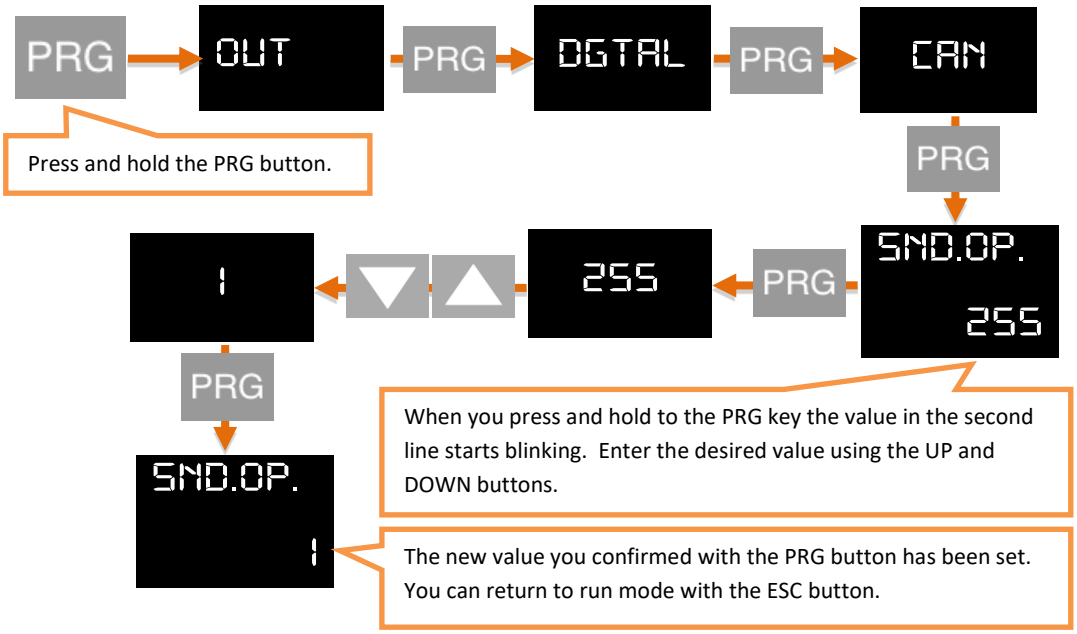
6.6.2.3. Heart Beat Setting



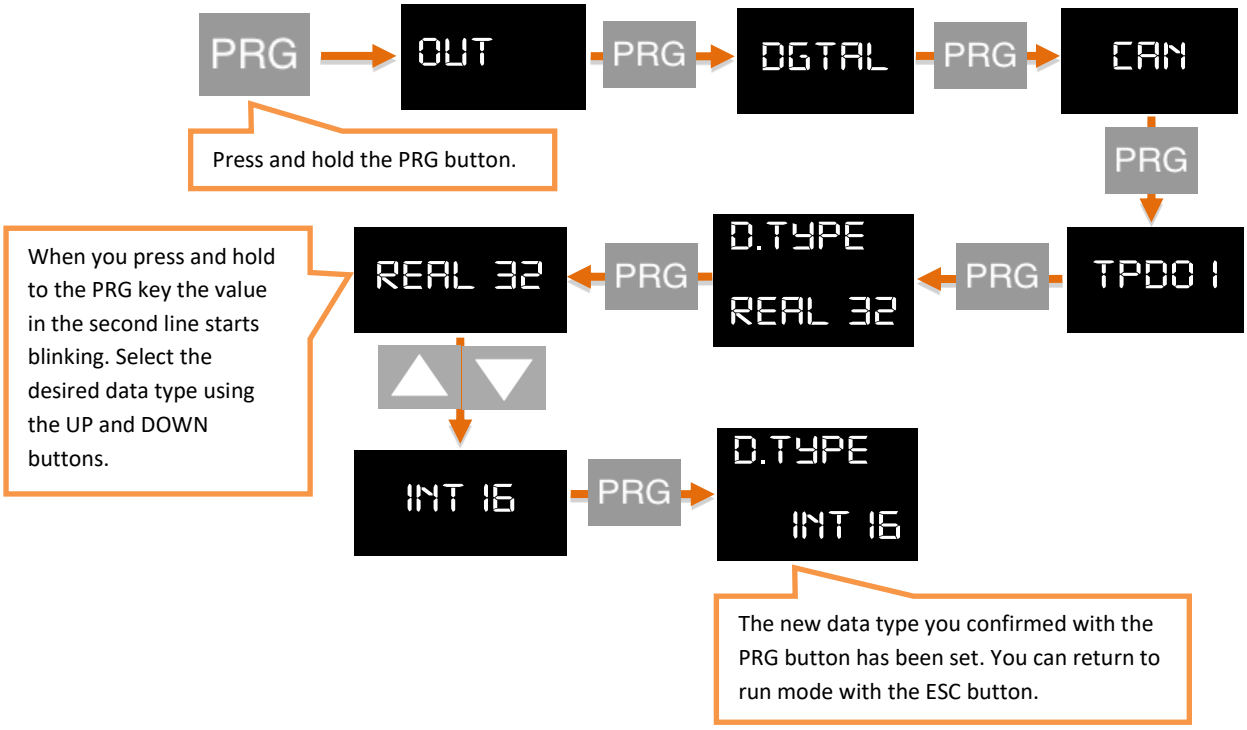
6.6.2.4. Auto Operation Setting



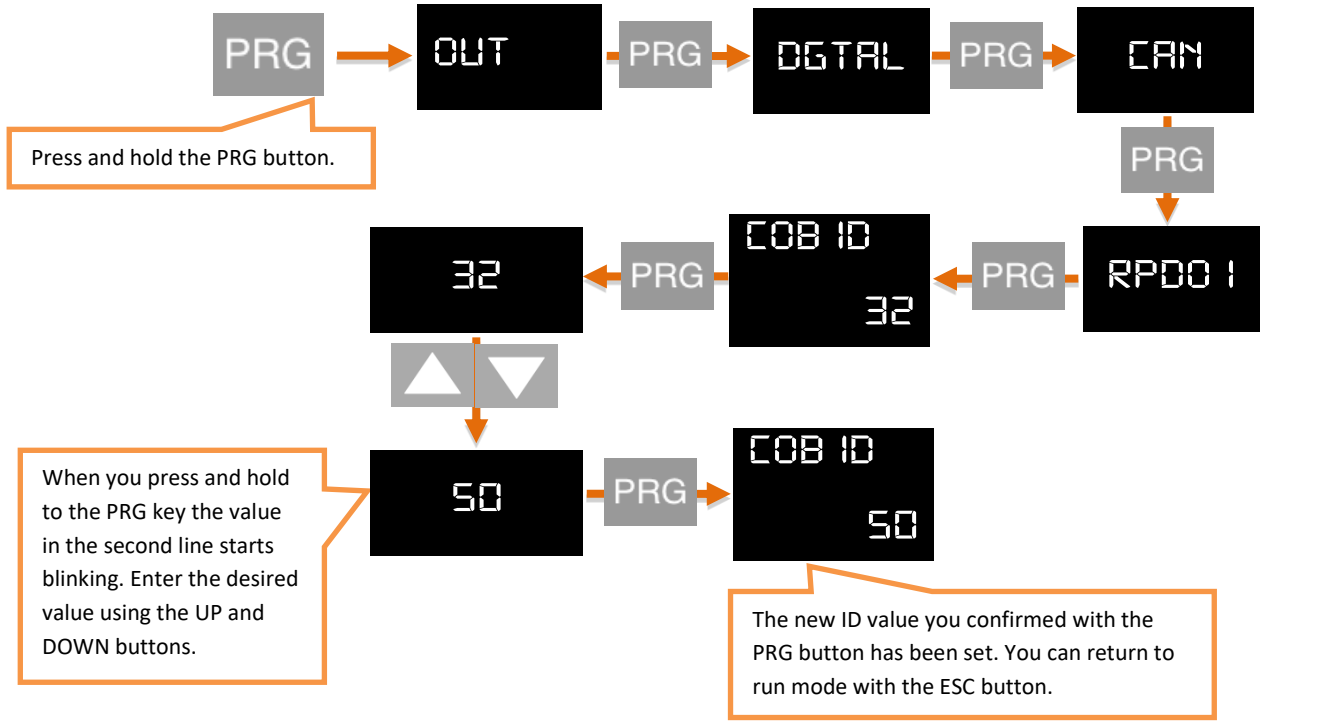
6.6.2.5. Send Operation Setting

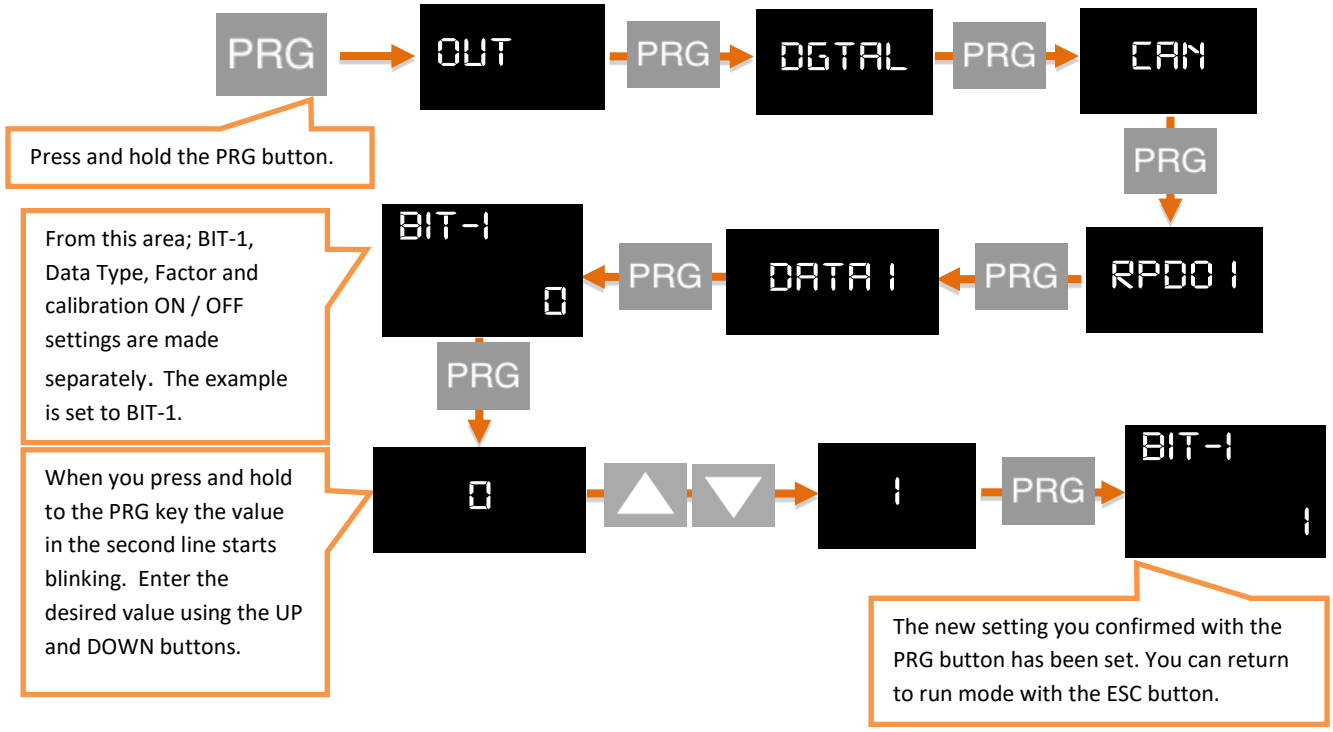


6.6.2.6. TPDO Setting



6.6.2.7. RPDO Setting

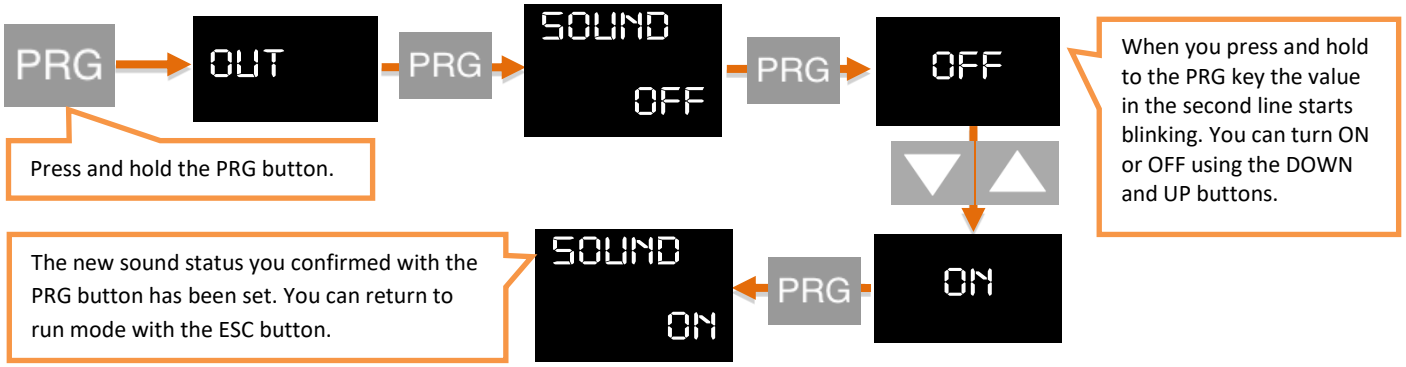




* You can also do data-2 settings in the same way.

6.7. KEY TONE (SOUND) SETTING

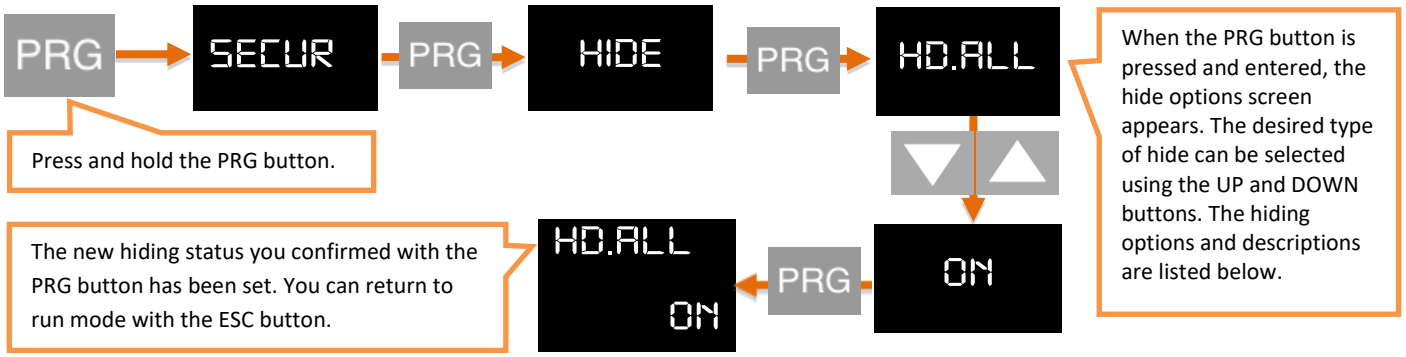
When you press any key on your device, you can turn the beep sound on and off on this menu. Use ON to turn on the sound, OFF to turn it off.



6.8. SECURITY (SECURE) MENU

6.8.1. Hide the Menu (HIDE)

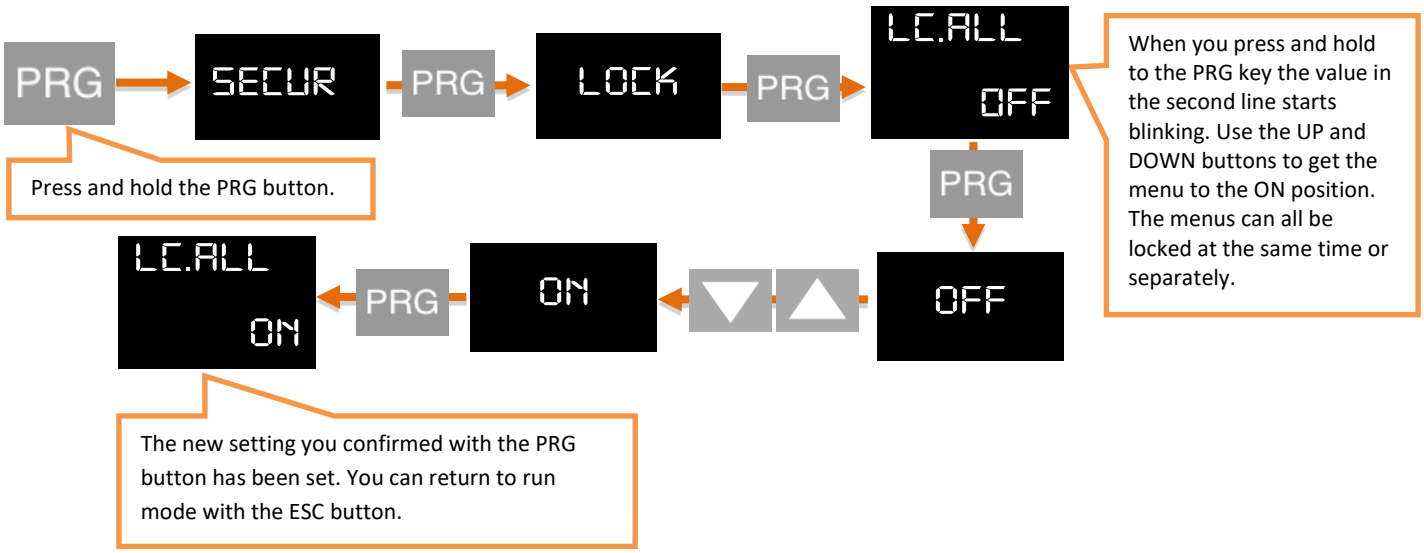
By this menu, you can hide the menus that you don't want the operators see.



HD.ALL	All menus are hidden except Secure.
HD.OUT	The Output menu is hidden.
HD.CLB	The Calib menu is hidden.
HD.TMP	The Temperature menu is hidden.
HD.DSP	The display menu is hidden.
HD.FOU.	The Quick Set change menu is hidden.

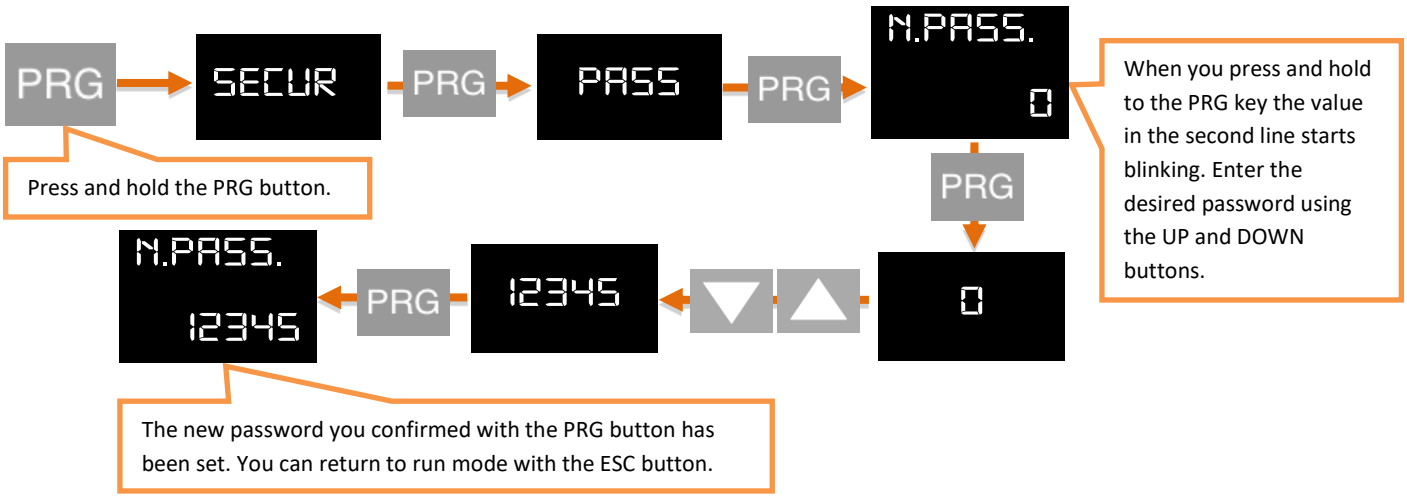
6.8.2. Lock the Menu (LOCK)

If you have not set a password before, you will see NPASS in the display when you enter this menu. Press the PRG key to set the desired password here. Then use the DOWN and UP keys to select ON the menus you want to lock.



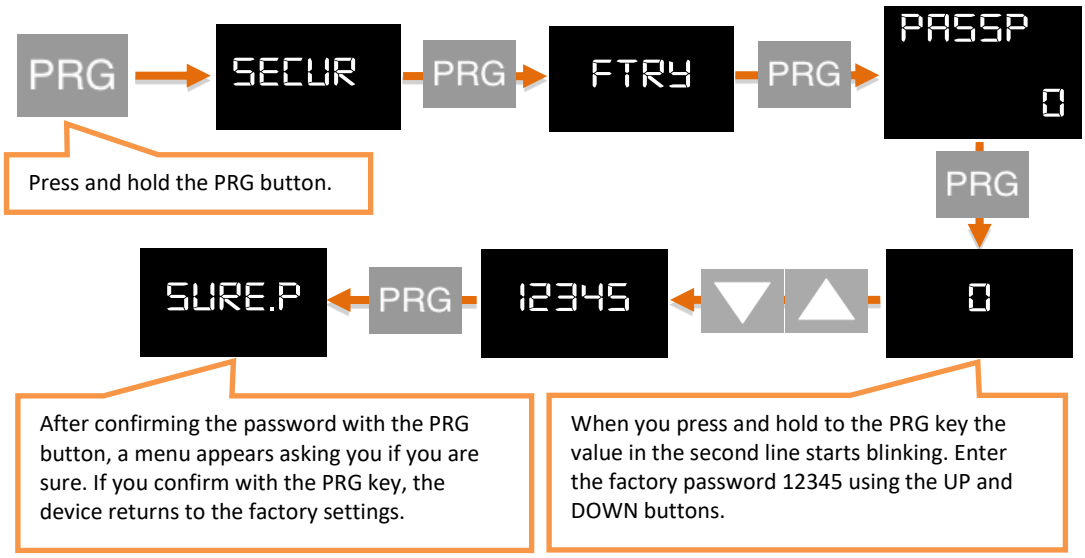
6.8.3. Password Determination (PASS)

Use this menu item to set a password or to change the password you have previously set. If no password was previously set; When you enter this menu, the display will show NPASS. Press the PRG key to set the desired password here. If the password has already been set; on the display PASS? will appear and you will be asked to enter this password. After inputting the password, the display will show NPASS. You can specify your new password here and confirm it by the PRG key.



6.8.4. Return to Factory Settings (FTRY)

You can return the EPA 200 to its factory settings at any time. Press PRG key to come to this menu to return to the factory settings. Here you are going to face the PASS? You need to enter 12345, which is the factory password, not the user password you specified on the password screen.



6.8.5. Restart the Device (RESET)

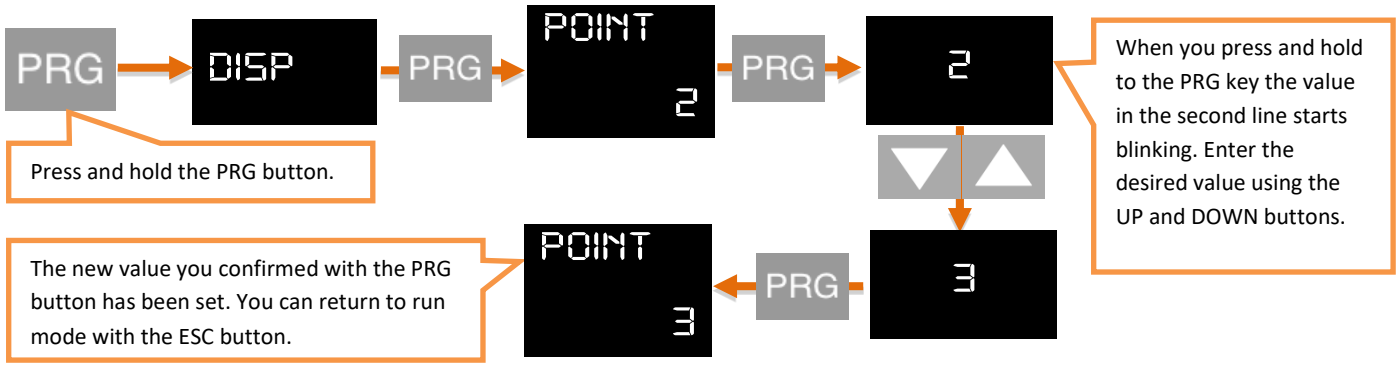
In any case, press the PRG key to come back to this menu to restart your device. The device will automatically power off and on and start working.

7. OTHER SETTINGS

7.1. Display Menu

7.1.1. Decimal Point (POINT)

In the value that appears on the display in run mode, you can set the position of the decimal point in this menu. This value, which is '2' in the factory settings, indicates how many digits are displayed after the currancy. If you select '0', only the integer appears on the screen.

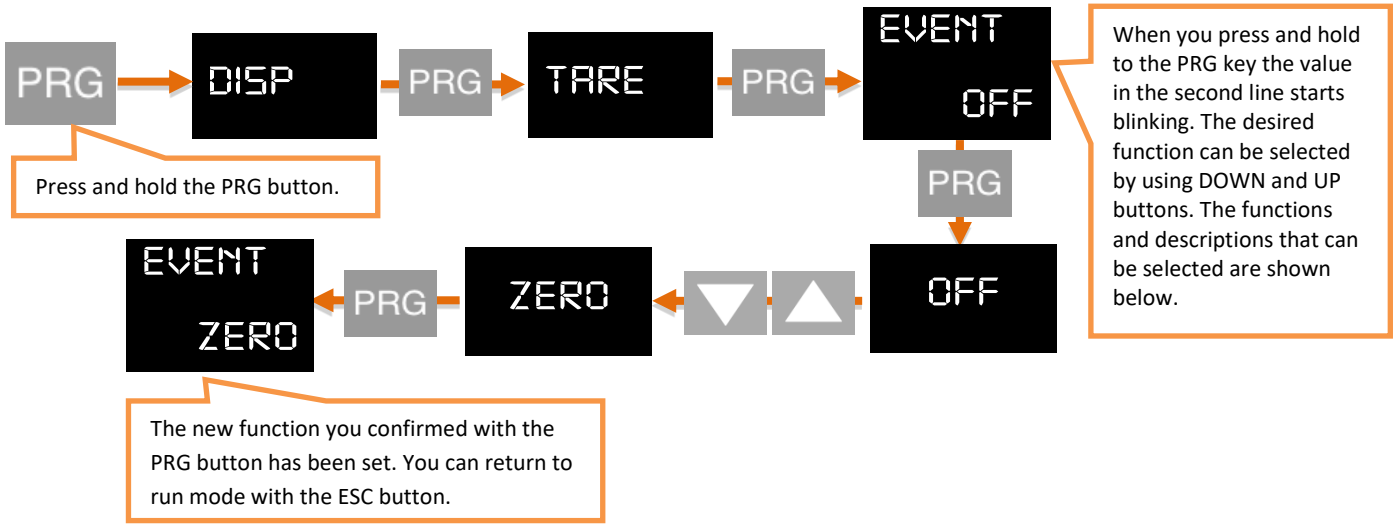


7.1.2. Tare Function (TARE)

In this menu you can specify different Tare functions.

7.1.2.1. Event

On the EVENT menu, you can select the type of Tare Function:



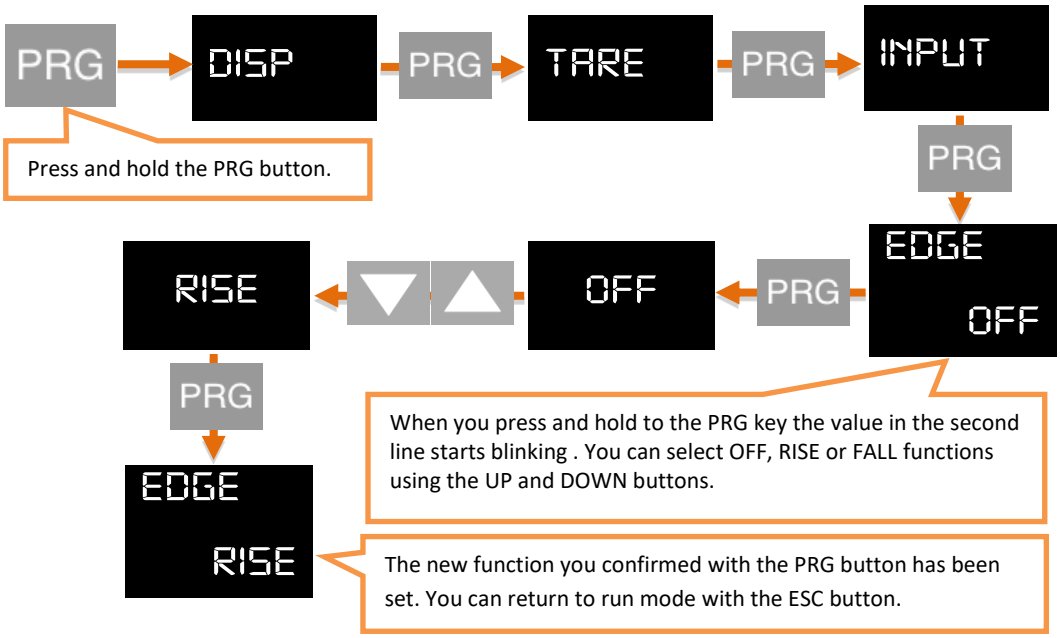
TARE Functions:

ZERO	ZERO: Then the value which is read on the sensor is made equal to zero and the **Tare** status led lights on.
PRESET	PRESET: Then the value which is read on the sensor is made equal to the set value and the **Tare** status led lights on.
R. ZERO	REPEATED ZERO: When the first time it is pressed, the value which is read on the sensor is made equal to zero and the **Tare** status led lights on. When it is pressed next, the read value returns to the state before the key is activated, and the **Tare** status led lights off.
R. PRST	REPEATED PRESET: When the first time it is pressed, the value which is read on the sensor is made equal and the **Tare** status led lights on. When it is pressed next, the read value returns to the state before the key is activated, and the **Tare** status led lights off.
OFF	Tare function is completely disabled and the **Tare** status led lights off.

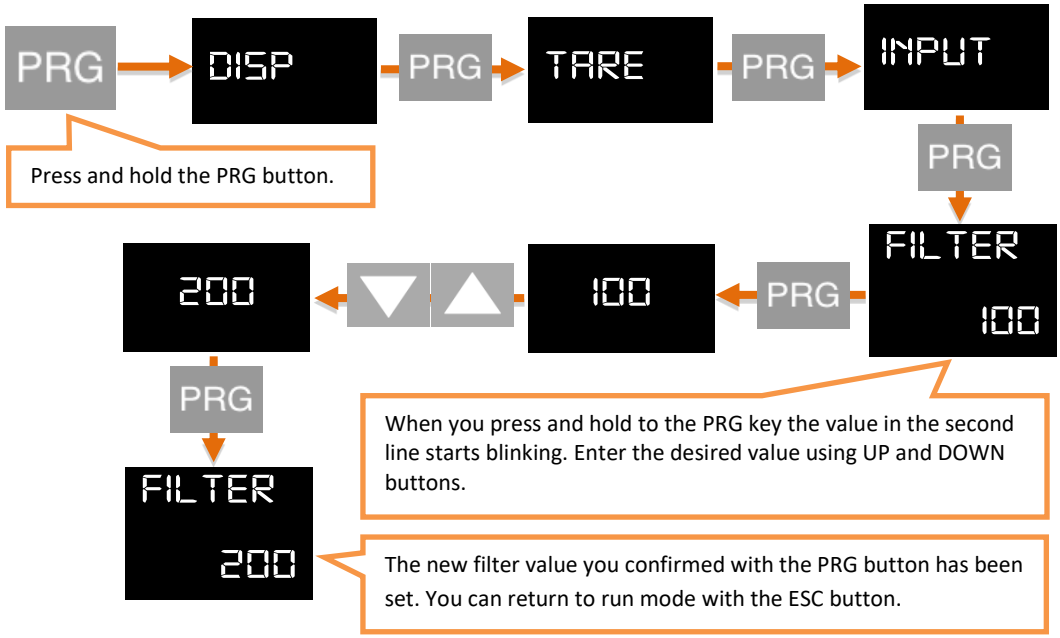
7.1.2.2. Input

If your EPA 200, which is manufactured specifically for your order, has the Digital Tare Input module, you can make settings from the INPUT menu under the Tare menu.

The EDGE option determines at which edge of the tare signal to the module will activate the tare function. Choose RISE for rising edge, FALL for falling edge. For example; When you connect this signal to a button, the RISE option activates the Tare when the button is pressed and the FALL option activates when the button is released.

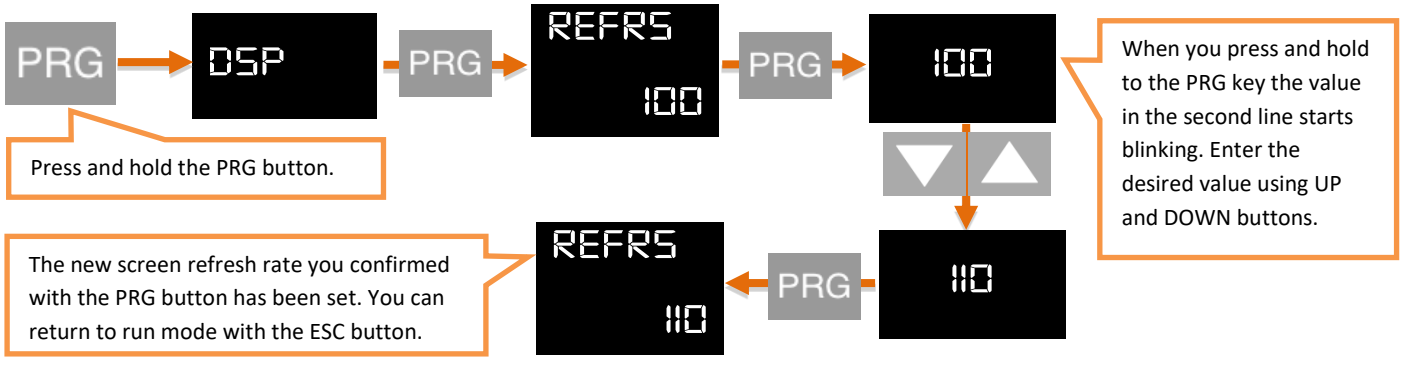


On the FILTR option, you can specify the how many miliseconds later tare signal will be checked. By default, this value is 100 ms.



7.1.3. Screen Refresh Rate (REFRS)

Indicates how many milliseconds the value displayed on the screen will be refreshed. By increasing this value, which is 100 ms by default, you can avoid or reduce the unstability on the screen, reducing the time it takes your device's sensor to react.

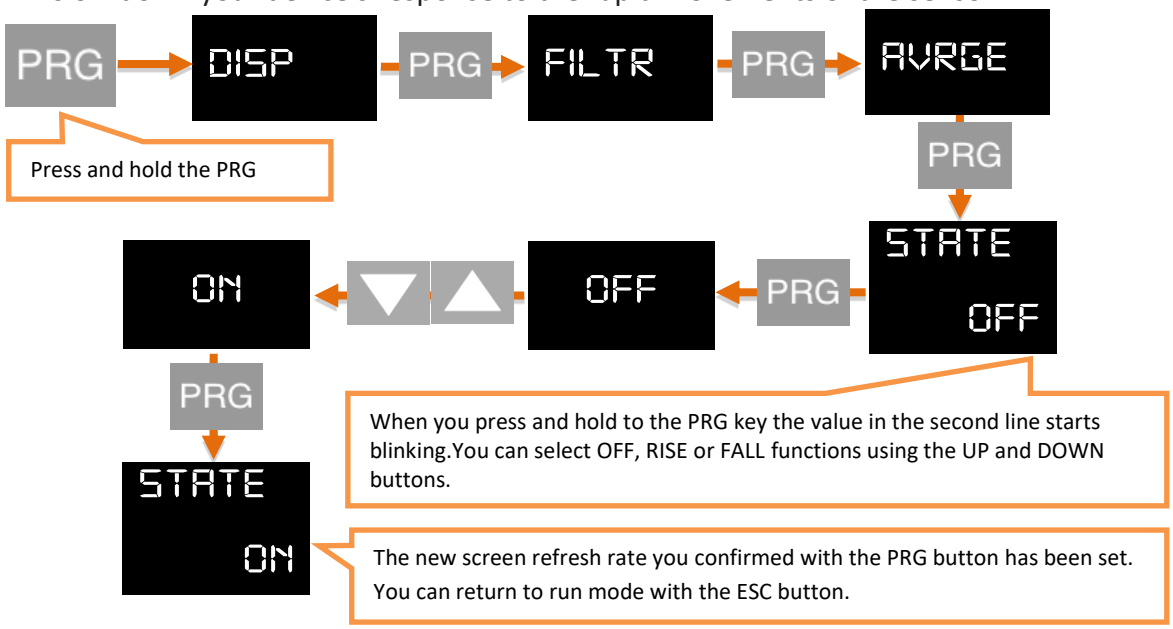


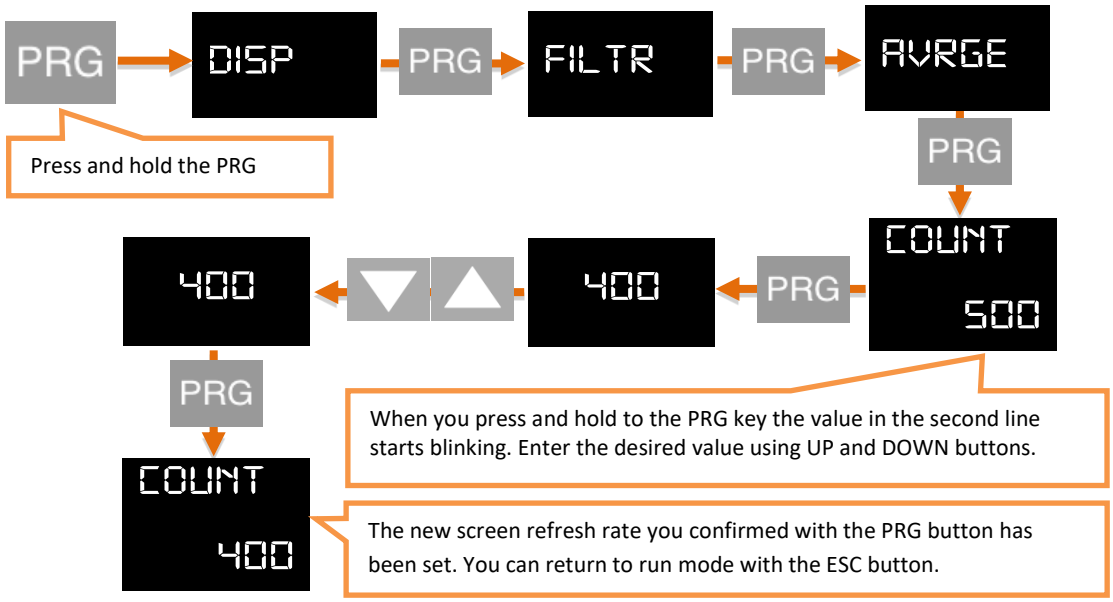
7.1.4. Prevention for Screen Flicker (FILTR)

Your EPA 200 device is programmed to display the signals it receives from the sensor connected to it by its special algorithms and to show it in the most accurate way. But; You can solve this problem with the flickering filtering method that appears on the screen for various reasons such as noise in the surroundings, sensor disturbances. There are three filtering methods. You can use these filtering methods alone or in two or three.

7.1.4.1. AVRGE (Average Calculation):

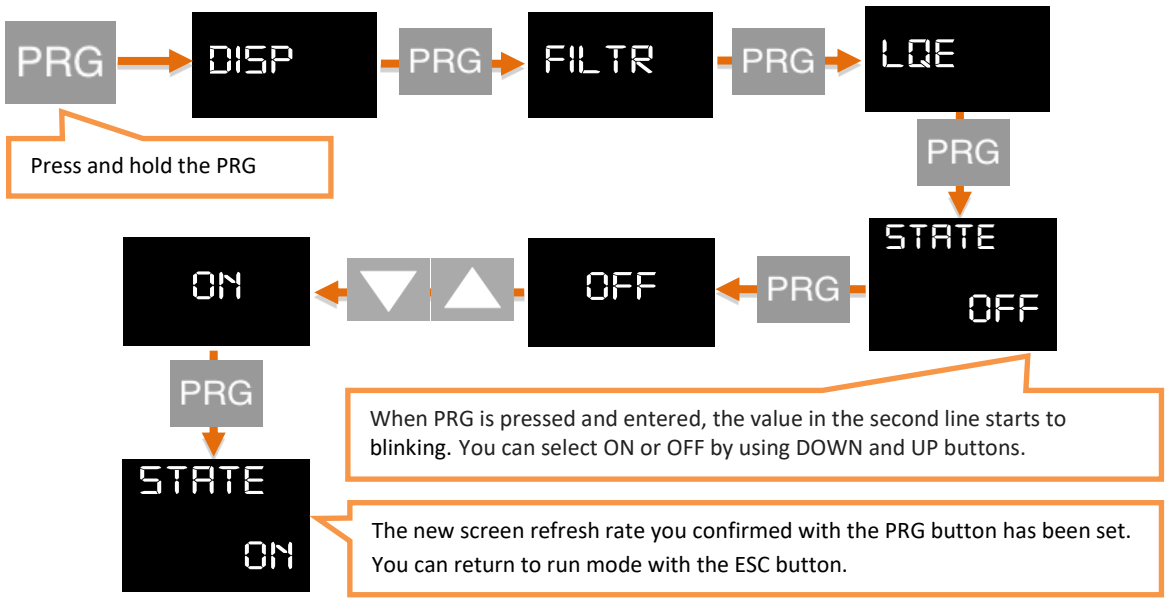
When you activate this filter by making STATE ON, your device will refresh the value displayed on the screen after reading the number of values you can select in COUNT from the sensor. For example; When COUNT is the default 500, your device will reset the value on the display by taking 500 times the sample from the sensor. Accordingly, increasing COUNT values will reduce the flicker on the screen; however, it will slow down your device's response to the rapid movements of the sensor.

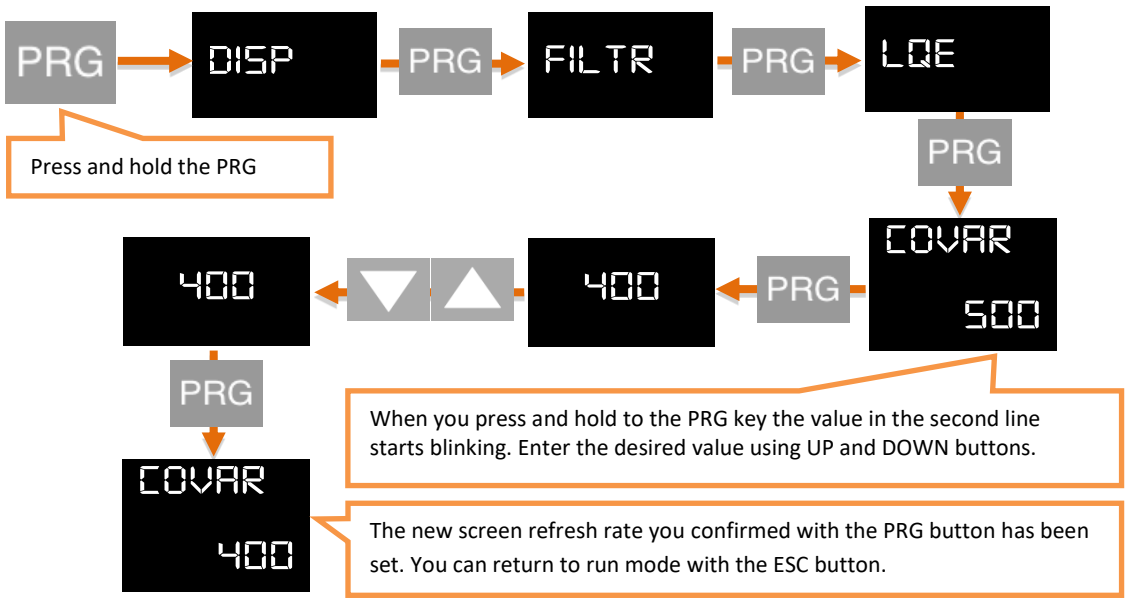




7.1.4.2. LQE (Linear Quadratic Estimation):

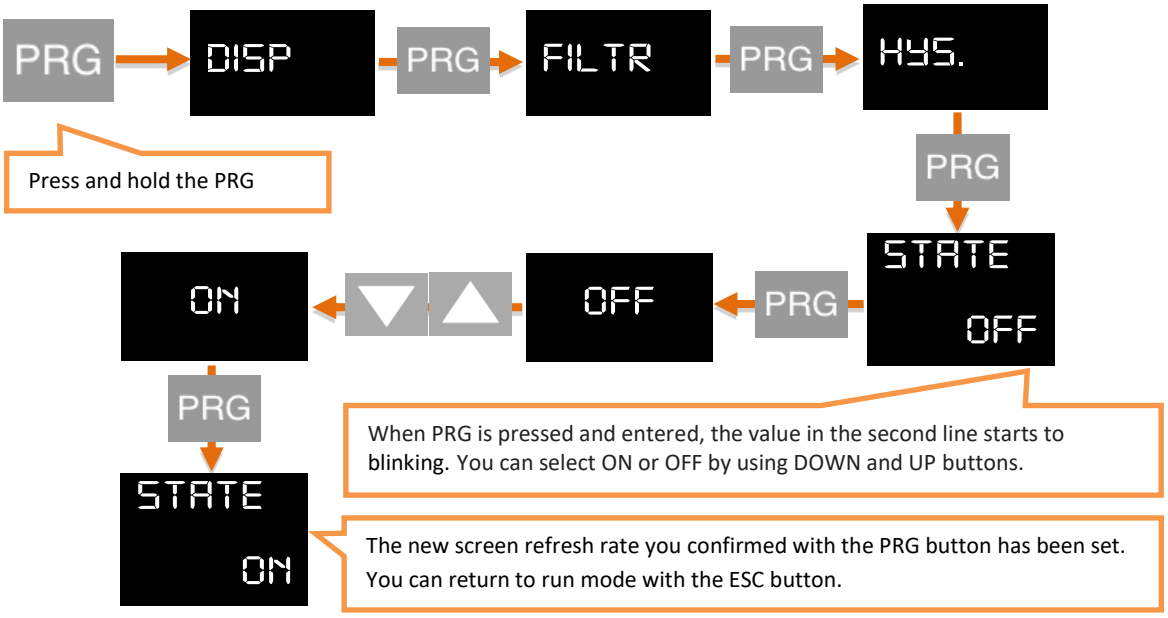
You can also activate this filter, also known as the Kalman filter, by activating STATE ON. If you decrease the COVARIANCE option of 500, the flicker on the screen will decrease; but your device will slow down the response to the sensor's rapid movements.

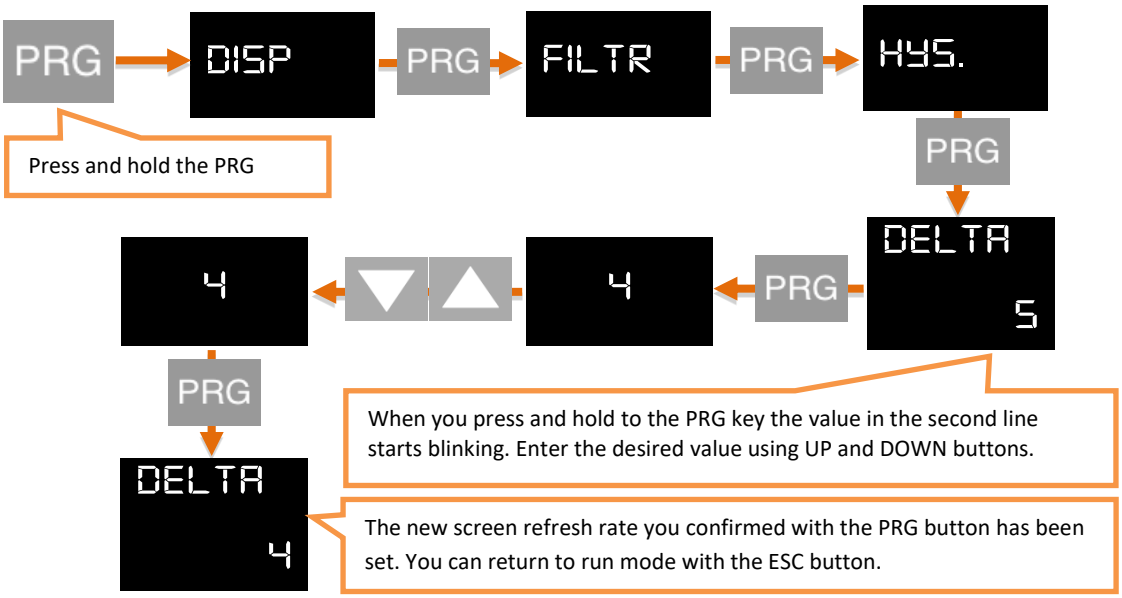


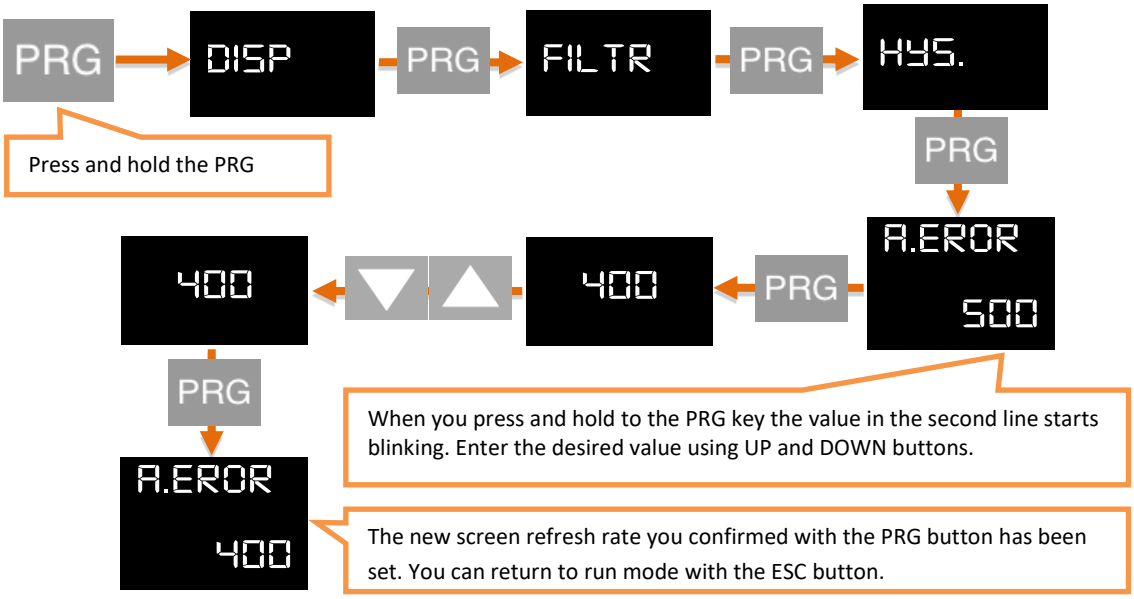


7.1.4.3. LHYS (Hysteresis Filter):

You can activate the hysteresis filter by making STATE ON. With this filter with two parameters named Delta and A.Error, the raw value read from the sensor is not reflected on the screen until Delta is changed. When the sum of the unprocessed values that are not reflected on the screen is up to A.Error, the display is updated with the average of these values.

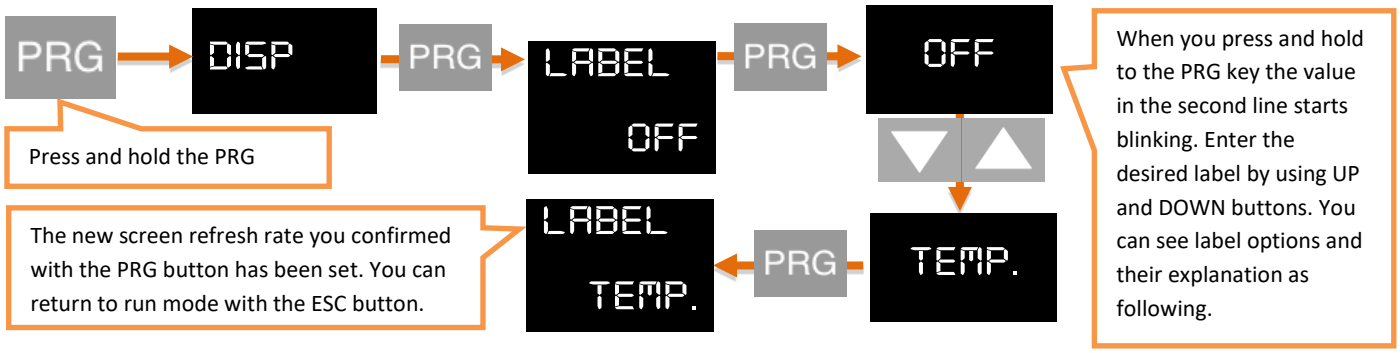

PRG
DISP
PRG
FILTR
PRG
HYS.
PRG
STATE
OFF
PRG
OFF
ON
PRG
STATE
ON
Press and hold the PRG
When PRG is pressed and entered, the value in the second line starts to blinking. You can select ON or OFF by using DOWN and UP buttons.
The new screen refresh rate you confirmed with the PRG button has been set. You can return to run mode with the ESC button.


PRG
DISP
PRG
FILTR
PRG
HYS.
PRG
DELTA
5
PRG
4
4
PRG
DELTA
4
Press and hold the PRG
When you press and hold to the PRG key the value in the second line starts blinking. Enter the desired value using UP and DOWN buttons.
The new screen refresh rate you confirmed with the PRG button has been set. You can return to run mode with the ESC button.


PRG
DISP
PRG
FILTR
PRG
HYS.
PRG
A.EROR
500
PRG
400
400
PRG
A.EROR
400
Press and hold the PRG
When you press and hold to the PRG key the value in the second line starts blinking. Enter the desired value using UP and DOWN buttons.
The new screen refresh rate you confirmed with the PRG button has been set. You can return to run mode with the ESC button.

7.1.5. LABEL (Identifying the Second Line on the Screen)

By this menu, depending on the type of sensor that you connected to the input of the EPA200, you can select which unit to write on the 2nd line of the display. OFF is selected as the factory default. In this case the second row is empty.



Label Types:

→ If the label is set to OFF, it will not write any values in line 2.

→ You can have the temperature information you get from the thermocouple or RTD sensor that you can connect externally.

→ You can get the temperature information from the rtd element located on the device internally.

→ You can provide to be shown data1 information through Can display via digital communication

→ You can provide to be shown data2 information through Can display via digital communication

→ You can have the 1st set values of the relay displayed on line 2

→ You can have the 2nd set values of the relay displayed on line 2

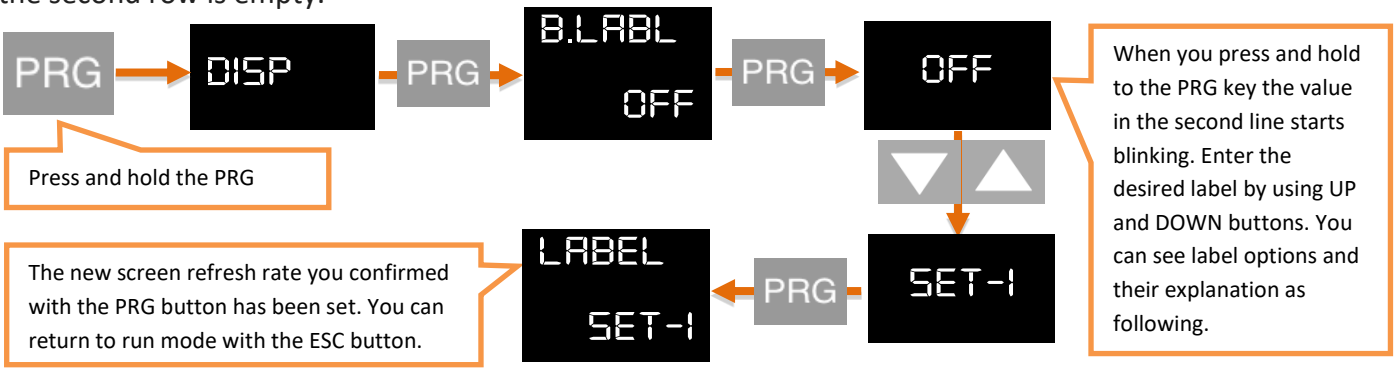
→ You can have the 3rd set values of the relay displayed on line 2

→ You can have the Preset value (PRSET) set for the Tare function to be shown in Line 2.

You can also select one of the fixed font options, such as various units or label numbers.

7.1.6. B.LABL (Identifying the First Line on the Screen)

By this menu, depending on the type of sensor that you connected to the input of the EPA200, you can select which unit to write on the 2nd line of the display. OFF is selected as the factory default. In this case the second row is empty.



Etiket Tipleri:

If the label is set to OFF, it will not write any values in line 1

You can have the 1st set values of the relay displayed on line 1

You can have the 2nd set values of the relay displayed on line 1

You can have the 3rd set values of the relay displayed on line 1

You can have the Preset value (PRSET) set for the Tare function to be shown in Line 1

You can also select one of the fixed font options, such as various units or label numbers.

8. OPERATION MODE FUNCTIONS

Your EPA 200 process controller operates in two different modes.
Your device operates in the programming mode when the settings are changed in the operation mode and the parameters are changed in the startup screen where the reading value is displayed on the sensor. This section describes the functions in operation mode.

8.1. Tare (Reset) Fonction

*** Operates only when the Tare function is active. Please refer to the description of the functions or to activate. 7.1.2 Reset (Tare).
Each time the device is in operating mode, pressing the UP button will activate Tare according to the type of tare function selected and the Tare status led will light.

8.2. Viewing Maximum and Minimum Values which are read

When you press the DOWN button while the device is in operation mode, you can see the minimum (minimum) value read from the moment the device starts. When you press the DOWN button again, you can see the highest (maximum) value read from the moment the device starts.

Not: You can use the ESC key to erase the (minimum) and (maximum) values in the memory.

9. PRODUCT CODING

When ordering your EPA 200 process controller, you can use the following coding format.

Model
EPA 200

Temperature Input
Null - No Temperature Input
PT1 - PT100
PT2 - PT1000
TR1 - Thermocouple

Communication Type
Null - No Communication Type
S1 - RS232 communication
S2 - RS485 communication
S3 - USB communication
S4 - CANopen communication

External Tare
Boş - No External Tare
T - External Tare

EPA200	-	X	-	X	-	XXX	-	XX	-	XX	-	X

Input Signal Type
P - Potentiometric
V - 0-10V
V1 - 0-5V
V3 - 0.5-4.5V
A - 4-20mA
A0 - 0-20mA
M - 3.33mV/V
L - 2mV/V
N - 2.5mV/V
C - CANopen

Supply Voltage
220V - 220 VAC
24V - 24 VAC/DC

Analog Output Signal Type
Null - No Analog Output
V0 - 0-10V output
V1 - 0-5V output
V3 - 0.5-4.5V output
A0 - 0-20mA output
A4 - 4-20mA output

Disposal of Packagings: Packaging materials consist of recyclable materials. For providing recycling, please dispose waste packagings to collecting points of authorized recycling facilities.
Disposal of E-Waste: This device is in conformity with WEEE Directive and consists of recyclable materials. This product should not be disposed with general waste for preventing negative effects on enviroment and human health. This product should be disposed to collecting points of authorized recycling facilities. Further information can be reached from authorized unit.

10. WARRANTY CERTIFICATE

Seller Company's:
Name:
Address:
Phone:
FAX:
E-mail:
Invoice Date and No:
Delivery Date and Address:

Signature, Cachet

Product Brand: ATEK

Product Code: EPA-200

Serial No:

Warranty Time: 2 Years

This product is guaranteed for 2 years against manufacturing defects.
Non-warranty situations:

- Mechanical damages
- Damages in case of transportation
- User errors

Other cases than these cases are under the manufacturer's warranty.

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