

## Contents

<b>Introduction .....</b>	<b>3</b>
About <i>OctaGage</i> .....	3
Features.....	4
<b>Specifications.....</b>	<b>5</b>
Mechanical Specifications .....	5
Electrical Specifications.....	5
Environmental Specifications .....	9
<b>Front panel .....</b>	<b>10</b>
<b>Back panel and side panel .....</b>	<b>11</b>
<b>Keyboard functionality .....</b>	<b>12</b>
<b>Installation .....</b>	<b>14</b>
Standard packing list.....	14
Optional accessories (Contact manufacturer for details): .....	14
Un-Packing the <i>OctaGage</i> .....	15
Assembling the <i>OctaGage</i> .....	16
General maintenance.....	17
Protective Earth (PE) Connection.....	18
Warnings & instructions.....	18
<b>MAIN MENU .....</b>	<b>19</b>
Operating Menu .....	19
PART SETUP.....	22
LOAD SETUP .....	23
ADD SETUP .....	24
EDIT SETUP .....	26
DELETE SETUP .....	61
FILE MANAGER.....	62
Copy- to USB mass storage device.....	63
Delete Data .....	64
SYSTEM SETTINGS.....	65
BAUD RATE (RS-232) .....	66
BAUD RATE (RS-485) .....	67
DEVICE ID .....	68
KEYPAD TONE.....	69
CLOCK SETTINGS .....	70

ADMIN PASSWORD.....	74
PROBE SENSITIVITY.....	77
<b>MEASUREMENT MODE .....</b>	<b>79</b>
<b>DISPLAY FORMAT .....</b>	<b>81</b>
DRO.....	81
DIAL.....	81
BAR GRAPH.....	81
RUN CHART.....	82
<b>CALIBRATION .....</b>	<b>83</b>
STEP CALIBRATION.....	83
SIMULTANEOUS CALIBRATION .....	85
<b>PRESET MODE.....</b>	<b>87</b>
<b>PROBE COUNT .....</b>	<b>92</b>
<b>COMMUNICATION AND I/O CONNECTIONS .....</b>	<b>93</b>
LVDT SENSOR CONNECTION .....	93
FOOTSWITCH.....	93
RS232 INTERFACE.....	93
RS485 INTERFACE.....	93
DIGITAL I/O .....	94
ETHERNET PORT.....	94
<b>COMMUNICATION PROTOCOL.....</b>	<b>95</b>
<b>ORDERING INFORMATION.....</b>	<b>99</b>
<b>READER FEEDBACK.....</b>	<b>100</b>

## Introduction

### About OctaGage

The “*OctaGage*” is a state of the art digital display unit for dimensional measurements with highest precision and accuracy. User can connect up to 8 nos. of LVDT sensors for measurement. The instrument can be factory set to suit various types and makes of LVDT sensors. Different views like digital read out, dial, bar graph are standard options for the user.

### Features:

Sleek & robust aluminium enclosure for operation in harsh shop floor conditions.

One touch “data copy to USB Mass Storage Device” facility.

In built RTC for date & time stamp.

Probe combination possible with equation editor.

5 setup storage for easy parameter loading and usage.....

Easy to use set up and navigation makes the *OctaGage* an ideal instrument for user on the shop floor or in the measurement laboratory for dimensional measurements.

### Intended use:

*OctaGage* is 8 Channel Linear Variable Differential Transformer Digital Read-Out (LVDT DRO) which is used for static and/or dynamic measurement of dimensions of a part in various modes of measurement like Current, Maximum, Minimum, Differential (TIR), and Average while in process or post process. LVDT DRO is intended to be used in Industrial environment.

### Warning CLASS A product:

This is a CLASS A product and is not to be used or installed in Domestic / Residential Environments / Buildings. This product may cause interference if used in residential areas such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference.

### Warning Life saving and / or safety applications:

This product is not meant for any life saving and / or safety applications.

### Warning related to Power supply to the *OctaGage*:

The *OctaGage* is tested for Emission and Immunity for industrial environments with Meanwell AC to DC adaptor GS60A24-P1J at 230VAC, 50Hz.

It is recommended to use *OctaGage* with Meanwell AC to DC adaptor GS60A24-P1J at 230VAC, 50Hz only.



Must not be thrown into general waste but should be collected separately and recycled under local regulations

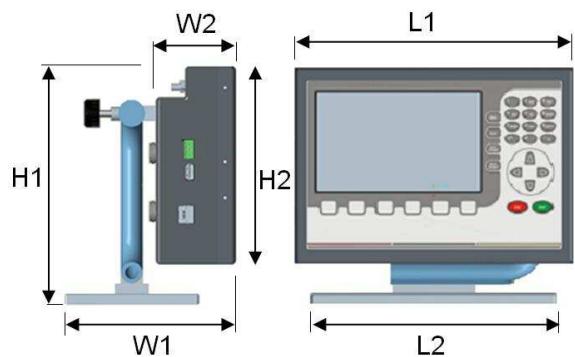
## Features

<b>Input Channels</b>	Maximum up to 8 Nos. LVDT sensors. (Refer Ordering information for type, make, model of LVDT sensors)
<b>Resolution</b>	0.1µm/ 0.5µm/1µm/ 5µm/10µm
<b>Units</b>	mm , inch
<b>Measurement Modes</b>	CUR, MIN, MAX, TIR, AVG.
<b>Output Results</b>	Maximum up to 8 per Part Setup
<b>Part Setups</b>	Maximum up to 5
<b>Result Formula Editor</b>	Result formula can be edited for combinations of LVDT channels and / or other results.
<b>Indications</b>	Pass, Fail, Warning
<b>Calibration</b>	Single master / Double master configurable
<b>User Interface</b>	7" Colour LCD display (Dot Matrix: 800 x 480- RGB)
	Keypad (Highly efficient 3D tactile keys)
<b>PC Interface</b>	RS-232, RS485, Ethernet (For Firmware Upgrade Only)
<b>USB host interface</b>	USB2.0 Compliant, For Mass Storage Device.
<b>Digital Outputs</b>	8 outputs, Isolated, Open collector
<b>Digital Inputs</b>	8 Inputs, Isolated
<b>Footswitch interface</b>	Available
<b>Display Views</b>	Digital Readout/ Dial / Bar graph / Run Chart
<b>Memory</b>	In built micro SD card of 1GB for data storage (Contact manufacturer for additional storage capacity)

## Specifications

### Mechanical Specifications:

Weight ≈ 3 Kg



#### Dimensions

Length	L1≈262mm	L2≈230mm
Width (Depth)	W1≈144mm	W2≈74mm
Height	H1≈224mm	H2≈187mm

### Electrical Specifications:

#### Display Specifications:

Display	Colour WVGA TFT
LCD type	TFT, Negative, Transmissive
Backlight Type	LED, Normally White
Colours	262,144 colors
Resolution	Dot Matrix: 800 x 480
Viewing Area	7"

## Digital Inputs:

I/O - 25 pin D connector



Number of Digital Inputs	8
Isolation	Optically-isolated, Input-output isolation voltage- 5kV (RMS)
Input type	Single ended
Maximum Input Voltage	+30VDC
Nominal Input Voltage	+24VDC
Input Current	15mA
Response time	20 ms Minimum
Maximum Interface Cable Length	Less than 3 Meters

## Digital Outputs:

I/O- 25 pin D connector



Number of Digital Outputs	8
Isolation	Optically-isolated, Input-output isolation voltage- 5kV (RMS)
Output type	Open Collector
Maximum Collector-emitter Voltage	+30VDC
Maximum Collector Current	60mA
Nominal Collector-emitter Voltage	+24VDC
Response time	20 ms Minimum
Maximum Interface Cable Length	Less than 3 Meters

## RS232 Interface:

RS232-9 pin D Connector



Number RS232 Interfaces	1
Connections	RXD, TXD, Ground
Isolated	NO
Supported Baud Rates (KbPS)	2400, 9600, 19200, 38400, 57600, 115200
Supported Communication Type	Full Duplex
Maximum Interface Cable Length	Less than 3 Meters
Interface Cable Type	0.25 mm <sup>2</sup> , 3 Core, Shielded

## RS485 Interface (Optional):

**RS485**

Number RS485 Interfaces	1
Connections	A, B, Ground
Isolated	NO
Supported Baud Rates (Kbps)	2400, 4800, 9600, 19200, 38400, 57600, 115200
Supported Communication Type	Half Duplex
Maximum Interface Cable Length	Less than 3 Meters
Interface Cable Type	0.25 mm <sup>2</sup> , 3 Core, Shielded

## Ethernet Interface:

(Only for program firmware update as mentioned in the 'Firmware Update Procedure' in separate document and not for any other Purpose, contact manufacturer for the 'Firmware Update Procedure')

Number Interfaces	1
Support	Supports one 10/100Base-T Port with Automatic Polarity Detection and Correction
Isolated	NO
Supported Baud Rates (KbPS )	Integrated MAC and 10/100Base-T PHY
Supported Communication Type	IEEE 802.3™ Compliant Fast Ethernet Controller, Supports Half and Full-Duplex Operation
Maximum Interface Cable Length	Less than 3 Meters
Interface Cable Type	CAT5

## USB Host Interface:

Number Interfaces	1
Support	USB 2.0-compliant full speed Host
Isolated	NO
Maximum Interface Cable Length	No Cables, For direct connection of USB 2.0 compliant Mass Storage Device of 8GB maximum storage capacity.

**Power Supply:**

(The *OctaGage* is tested for Emission and Immunity for industrial environments with Meanwell AC to DC adaptor GS60A24-P1J at 230VAC, 50Hz.

It is recommended to use *OctaGage* with Meanwell AC to DC adaptor GS60A24-P1J at 230VAC, 50Hz only.)

Nominal Input Voltage	+24 ±3% VDC
Maximum Current	1000mA
Nominal Current	350mA
Internal Fuses	Thermal resettable fuses directly soldered on the printed circuit board, not to be replaced / changed by the user.
Connector	5A current rating up to 30V DC at 65°C, Standard type P1J: 2.1 ID, 5.5 OD Length11mm, tuning fork type, Pin Size (In./mm) 0.080"/2.0, center positive, Other type available by customer requested

**LVDT Probe Interface:**

Maximum up to 8 LVDT probes. Refer ordering information or contact factory for various types and makes of LVDT sensors.

**Environmental Specifications****Storage and Transportation:**

Temperature: 20°C to 55 °C non-condensing

Humidity: 60% rh non-condensing

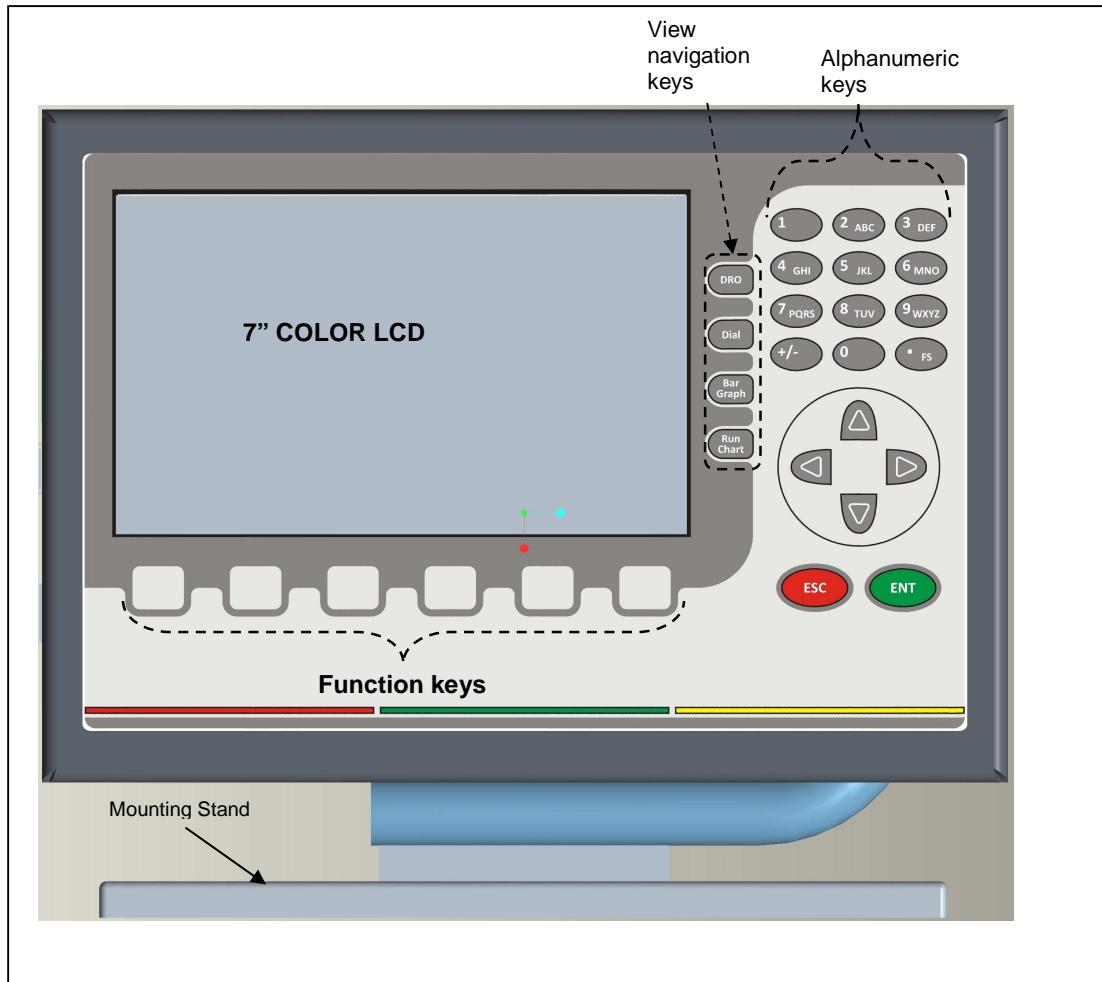
**Operating Conditions:**

Temperature: 20°C to 45 °C non-condensing

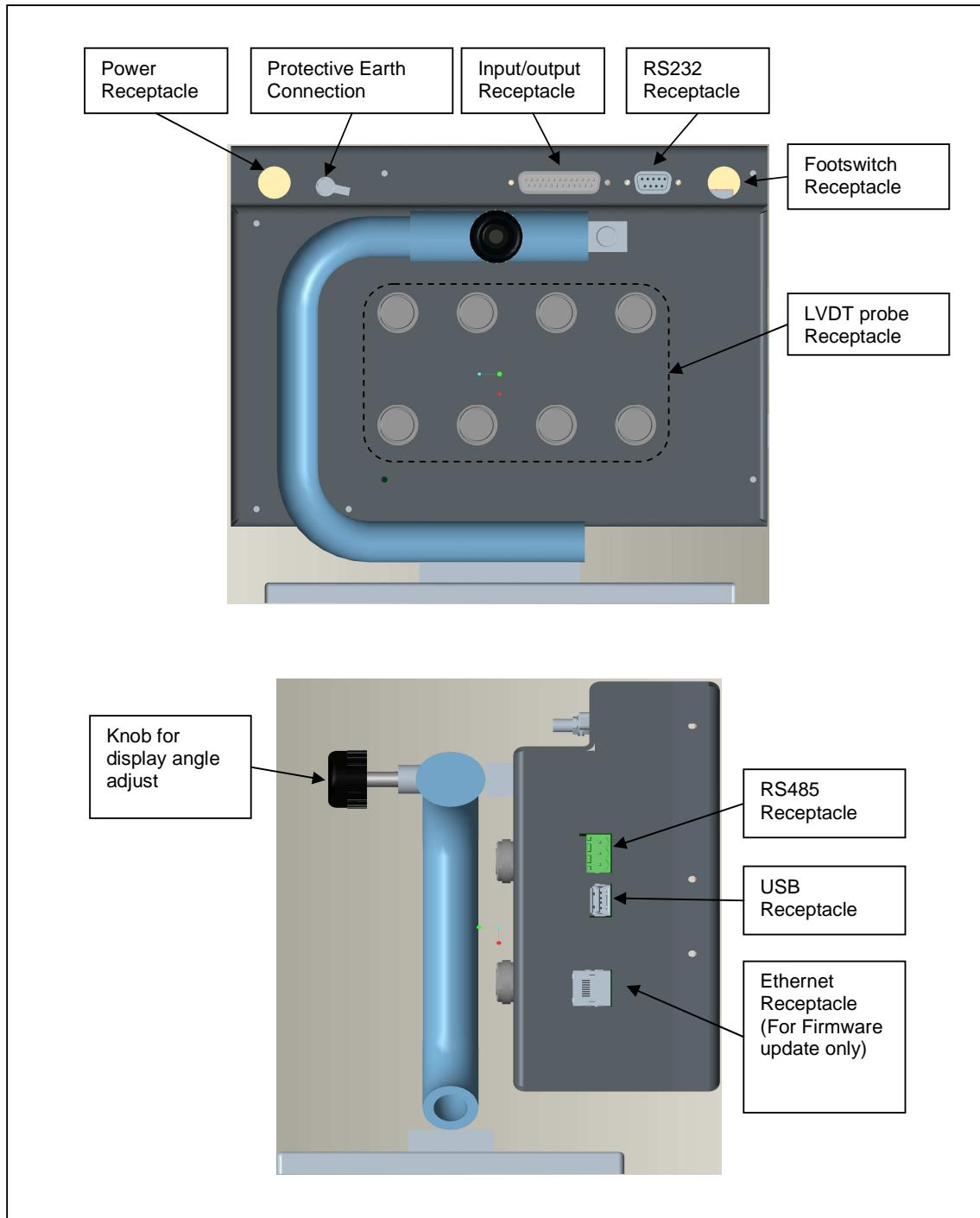
Humidity: 60% rh non-condensing

Altitude: Maximum up to 1000mtrs.

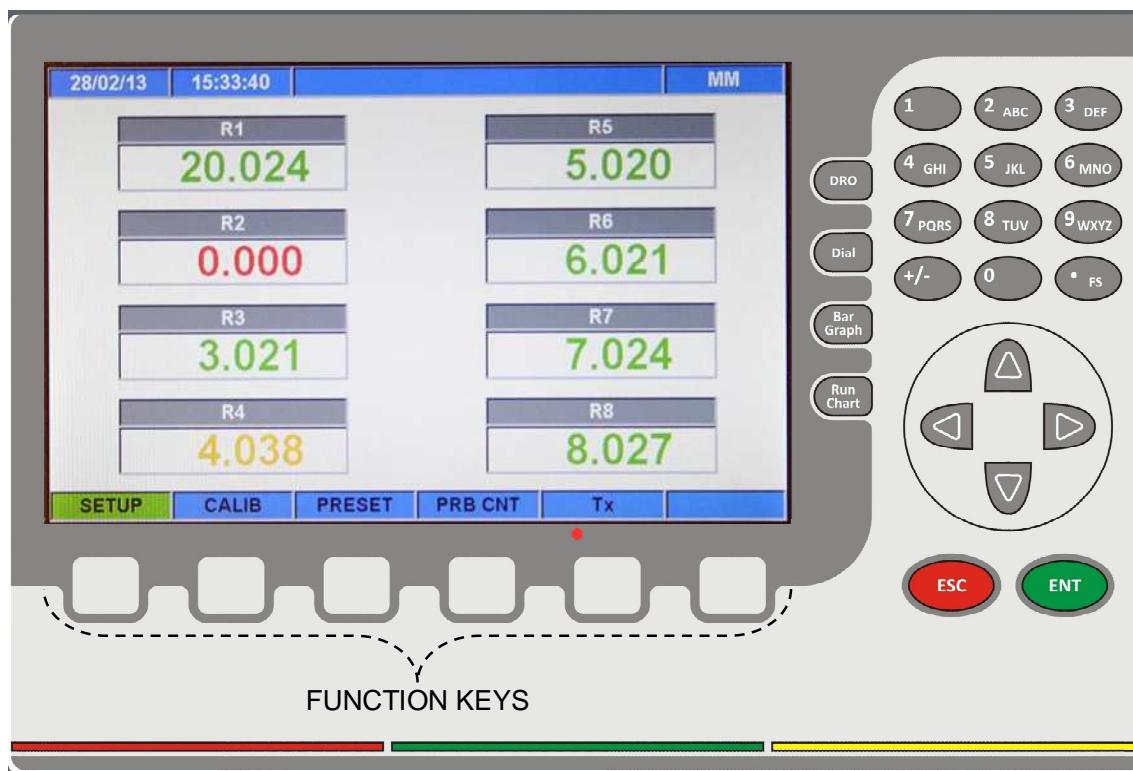
## Front panel



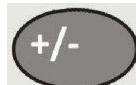
## Back panel and side panel



## Keyboard functionality



Key	Functionality
DRO	DRO – To view dimensions in DRO mode. (Digital Read Out)
Dial	DIAL – To view dimensions in Dial mode.
Bar Graph	Bar graph – To view dimensions in Bar graph mode.
Run Chart	Run Chart – To view dimensions in Run Chart mode. Only single result can be selected for view in this mode
ENT	ENTER - To save edited parameters in setup or preset mode
ESC	ESCAPE - To exit from a selected screen in setup mode

	“.” -To take decimal point entry while editing numeric value FS (Footswitch) -To provide footswitch action in measurement mode.
	- To scroll setup mode parameters (UP Key)
	- To scroll setup mode parameters (DOWN Key)
	- To shift cursor while taking date/time entry or label/part info. entry in setup mode (LEFT Key)
	- To shift cursor while taking date/time entry or label/part info. entry in setup mode (RIGHT Key)
	-To give sign while taking numeric entry or label/part info entry
	Alphanumeric keys - To take numeric entry in preset or setup mode for setting values of parameters To take alphanumeric entry for label editing in setup mode

## Installation

### Standard packing list



Ensure all components listed in the standard packing list are received.

Item	Quantity
<i>OctaGage</i>	1
Mounting Stand Accessories – Base plate, Stand, Holder, Knob, M6 Allen screws (4 nos.), M6 Allen key	1 Set
Protective Earth Connection Accessories – Cable 2 meters, Flat washer, Spring washer, Knurled washer	1 Set
RS232 Cable (Male to Female, 2 meter)	1
Warranty registration card	1
Quick installation guide	1

### Optional accessories (Contact manufacturer for details):

Item
24V <sub>DC</sub> adapter (Meanwell GS60A24-P1J)

RS485 cable (2 meter), 3 pin MSTB male connector

Input-Output Cable (25Pin D-Sub Male to Flying leads, 1.5 meter)
Ethernet CAT5 cable (2 meter)
Relay modules
Foot switch assembly
LVDT Probes

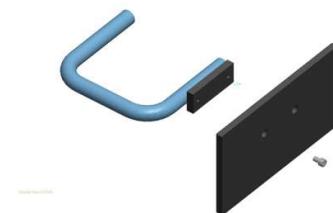
**Un-Packing the OctaGage**

Note : *OctaGage* is supplied in recyclable packing. Preserve all the packing material in good condition so it can be used for re packing if the instrument is to be transported to another location OR returned to the factory for repairs / warranty claims.



**Assembling the OctaGage**

1.



Assemble the mounting stand with the base plate using M6 Allen screws from bottom side.

2.



Now assemble holder with the display unit using M6 Allen screws

3.



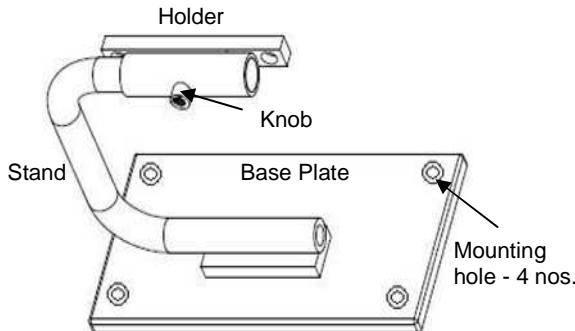
Insert the stand into the holder's groove.

4.



Fit and adjust the knob provided on holder to suit your required viewing angle.

5. Place the whole assembly on the stable surface.



6. For fixing the base plate on a leveled surface; four mounting holes are provided.

**General maintenance**

Ensure instrument power supply is switched off and instrument is disconnected from the power supply and other all interfaces.

**1. Cleaning of Powder coated metal surfaces**

-Cleaning of powder coated metal surfaces (external body of the instrument) to be done by warm damped cotton cloth, and then by dry cloth.



Interface connectors to be protected while cleaning, ensure water never comes in contact with the interface connectors and their pins.

**2. Cleaning of Keyboard**

-Keyboard surface to be cleaned by warm damped cotton cloth, and then by dry cloth.



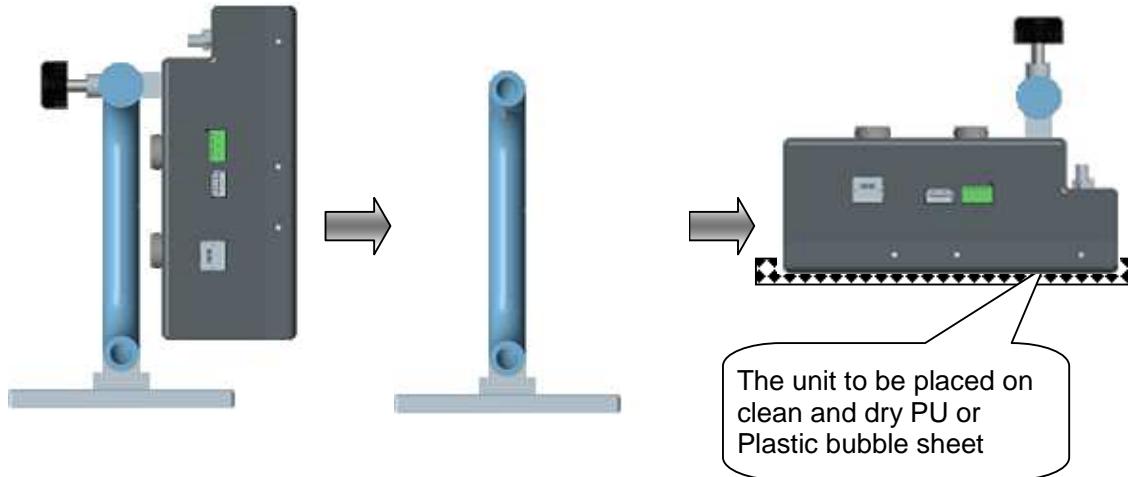
Ensure water does not enter into the instrument from keyboard edges.

**3. Cleaning of Stand**

-Cleaning of powder coated metal surfaces (various parts of the stand including the knob) to be done by warm damped cotton cloth, and then by dry cloth. Please refer Assembling and Disassembling of the OctaGage Section – in the instruction manual.

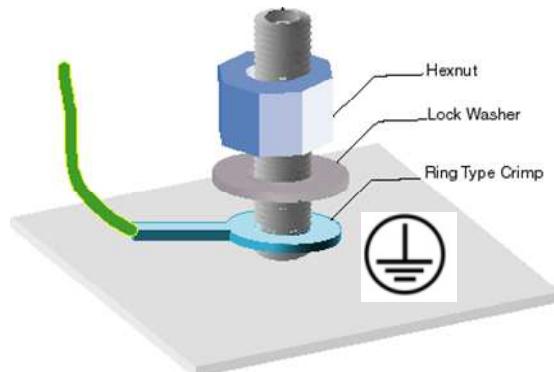


Ensure instrument is removed from stand and kept aside properly.



### Protective Earth (PE) Connection

Follow steps to provide Protective Earth connection to the unit.



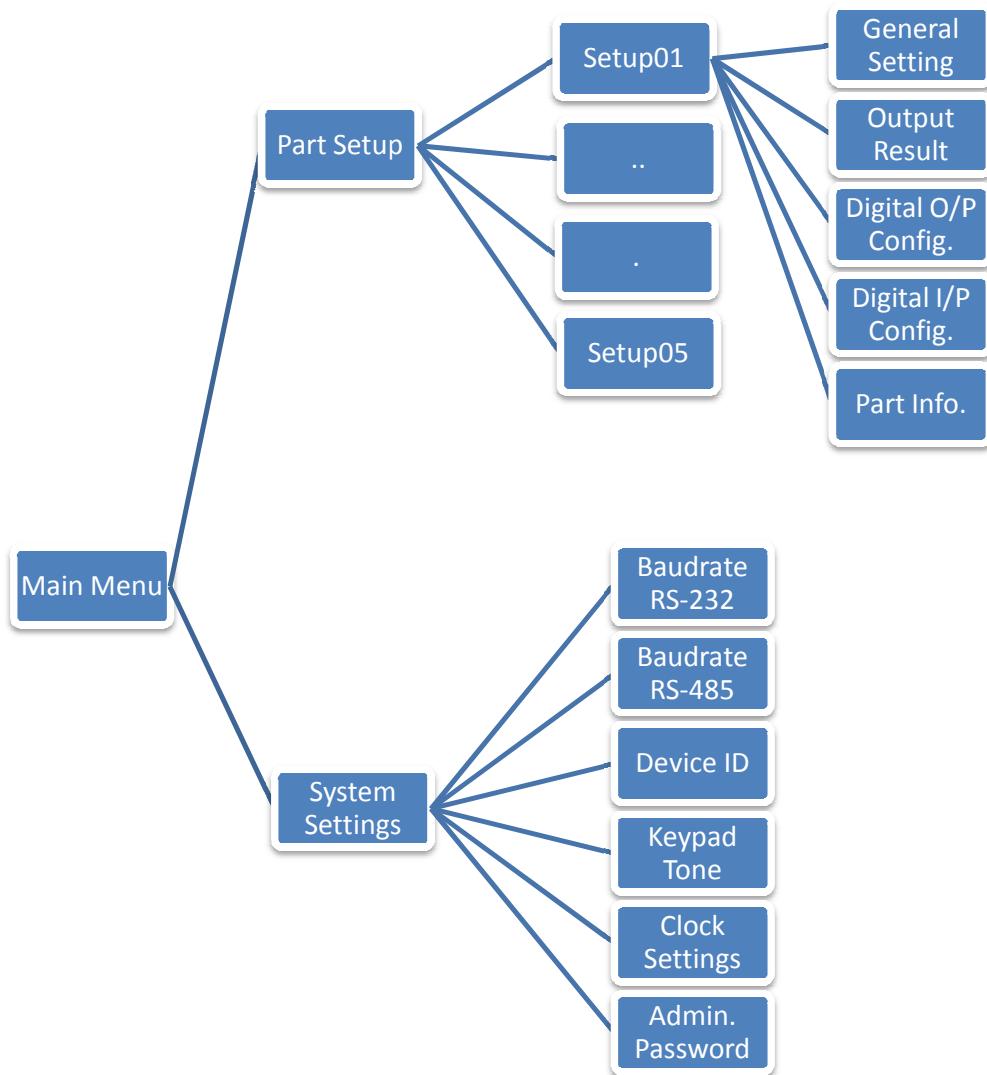
Ensure Protective Earth (PE) connection to the instrument before connecting the Power Supply.

### Warnings & instructions

- ❖ Keep the instrument at a clean and dry place.
- ❖ Keep enough space in the front and at the back of the instrument.
- ❖ Do not keep any other object on the instrument.
- ❖ Do not operate this instrument in an explosive atmosphere.
- ❖ Instrument should be operated by trained personnel only.
- ❖ This instrument contains no user repairable parts. Do not open the covers. If any service is needed, the equipment should be returned to the manufacturer only. Use the same packing received from manufacturer to send back the instrument in case of repairs / replacement / warranty claims.
- ❖ Any attempt to dismantle the equipment or to open the cover will invalidate the warranty.
- ❖ Ensure that "Protective Earth (PE)" is connected to the equipment. Loss of Protective Earth (PE) may create possibility of an electric shock, irregular behaviour of the instrument functionalities.
- ❖ Instrument should not be exposed to direct sunlight, heat, dust, any chemical / solutions or fumes of any chemical or solutions.

## MAIN MENU

### Operating Menu



Ensure to operate the keyboard with clean and dry hands.

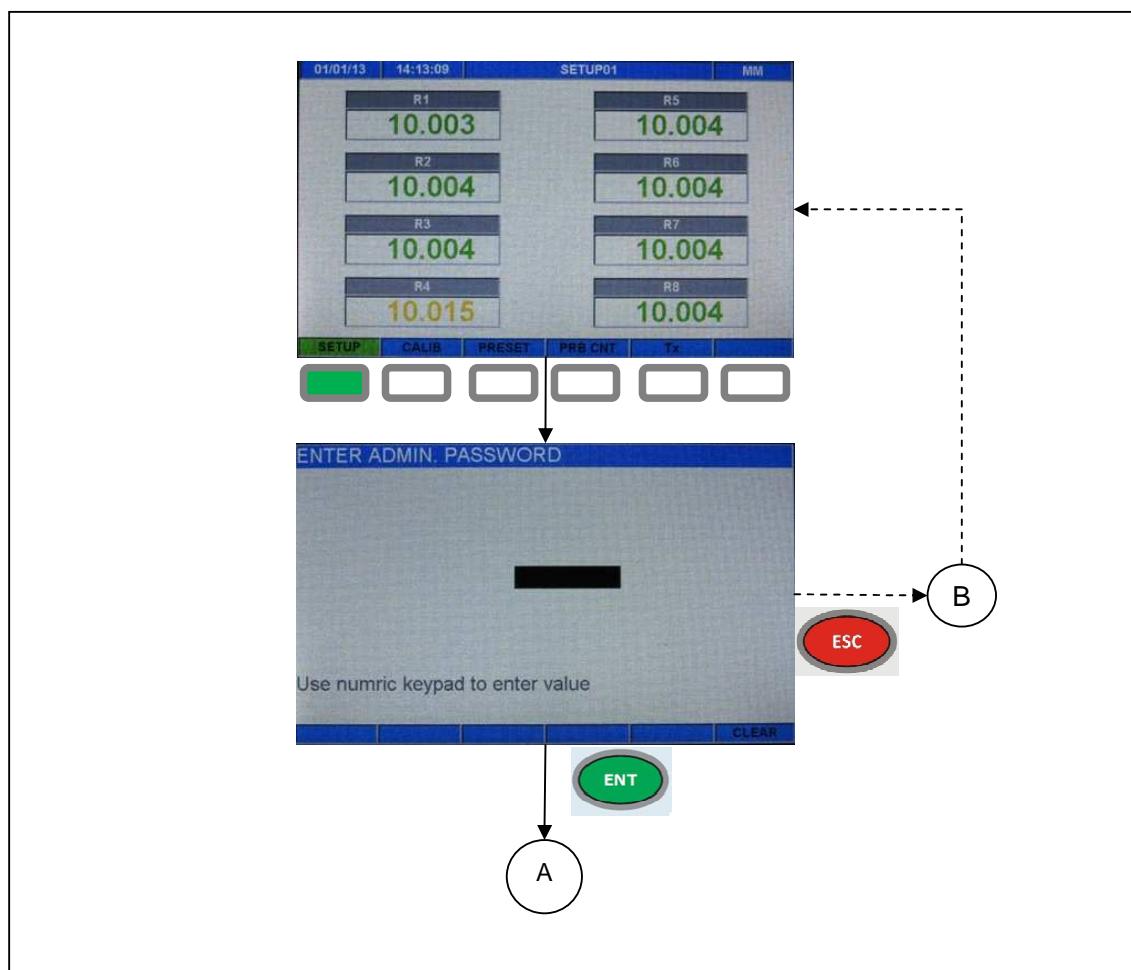
## MAIN MENU (Cont.)

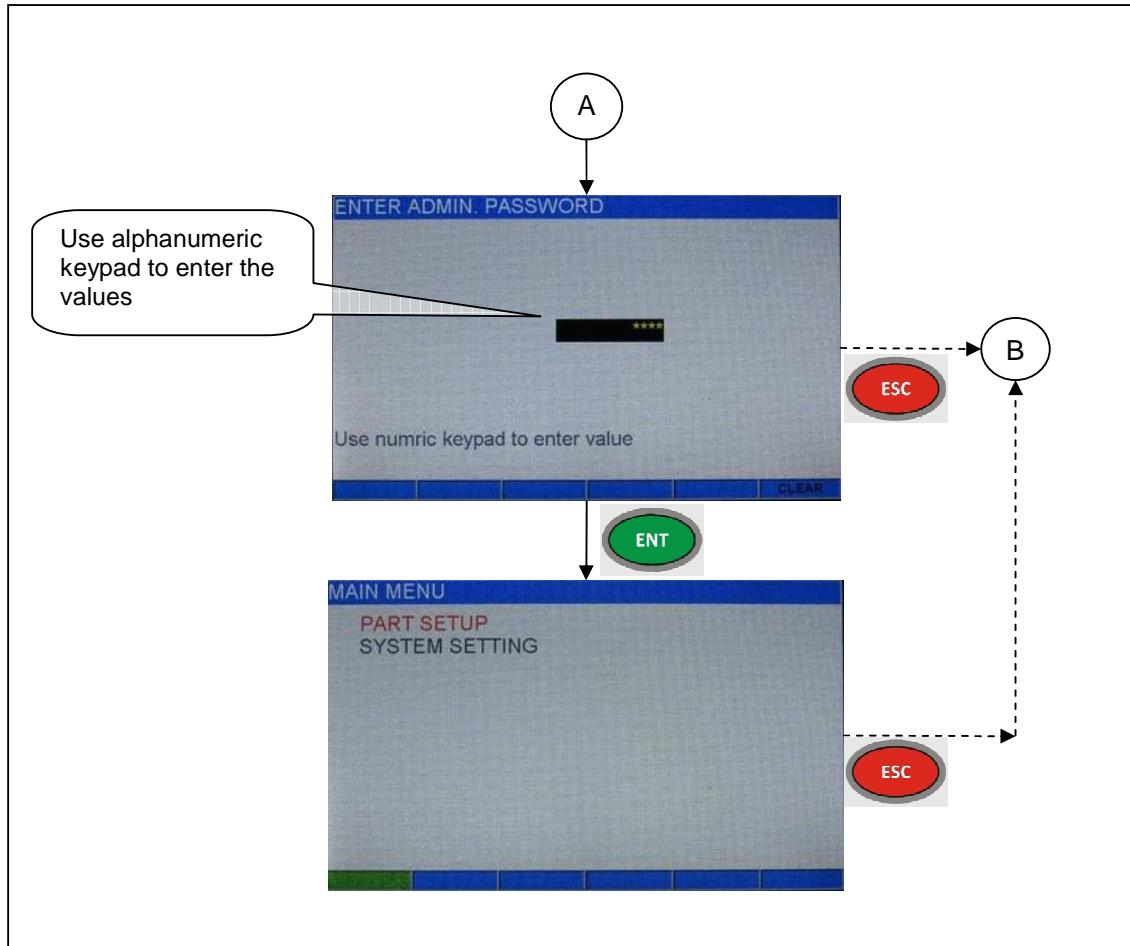
Here digital readout configuration settings can be done.

### Steps to enter into 'MAIN MENU':

1. At measurement mode screen, press 'SETUP' function key. 'ENTER SETUP PASSWORD' screen will be displayed. Here user will be asked to enter password to go inside MAIN MENU.
2. Use alphanumeric keys ('0' to '9') to enter password. On every key press, '\*' symbol will appear on display.
3. After entry of 4 digit password, press 'ENT' key. On correct password entry user will enter into 'MAIN MENU', else error message will be flashed.
4. At any instance, press 'CLEAR' function key to reset the display and re-enter password.
5. At any instance press 'ESC' key to go back to measurement mode screen.

### *Operational Flowchart:*





Password length is of 4 digits. Default password is “0000”.

Forgot password ?.....Contact Supplier / Manufacturer.

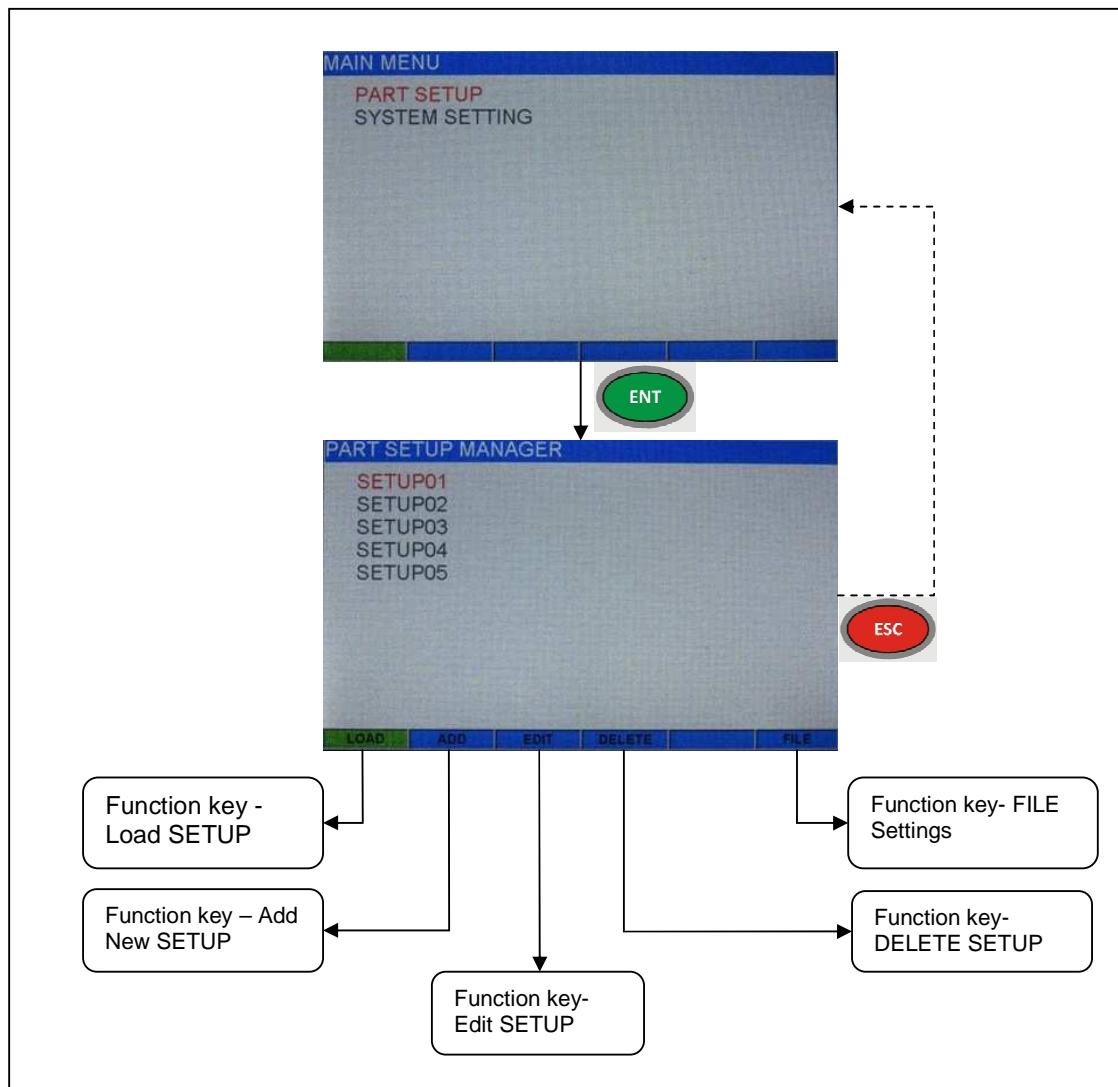
## PART SETUP

Here, a new setup can be created or existing setup can be loaded, edited or deleted. Also log file transfer can be done.

### Steps to enter into PART SETUP:

1. At the 'MAIN MENU' screen, select 'PART SETUP' option using 'UP/DOWN' key.
2. 'PART SETUP MANAGER' screen will appear. Here list of created parts will be displayed.
3. Use 'UP/DOWN' key to scroll between setups.
4. At any instance press 'ESC' to go back to previous menu.

### Operational Flowchart:

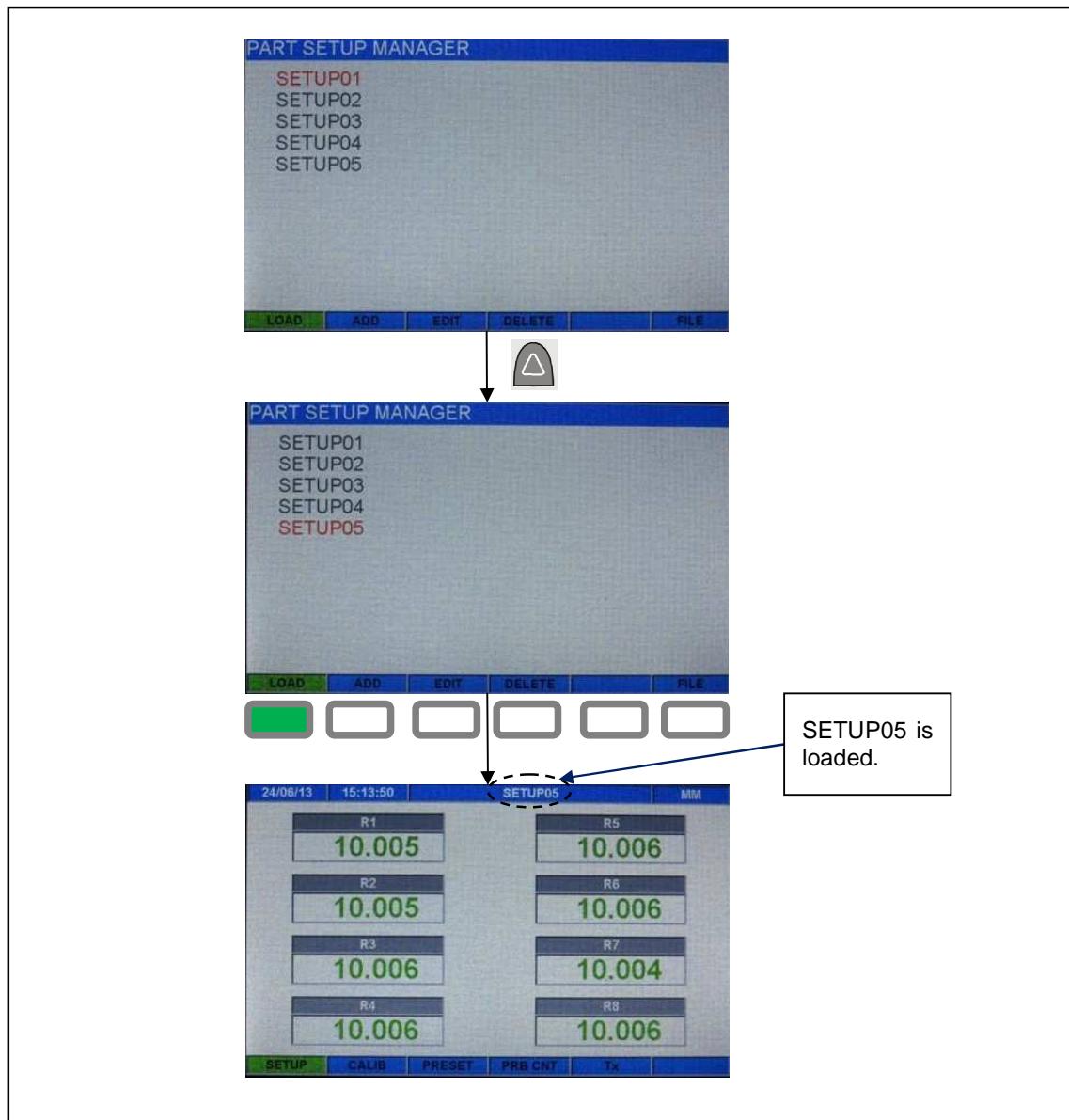


**LOAD SETUP**

Here, user can load desired setup for the measurement.

**Steps to load SETUP:**

1. At 'PART SETUP MANAGER' screen, select desired setup number using 'UP/DOWN' arrow key.
2. Press 'LOAD' function key.
3. Measurement mode screen will appear.

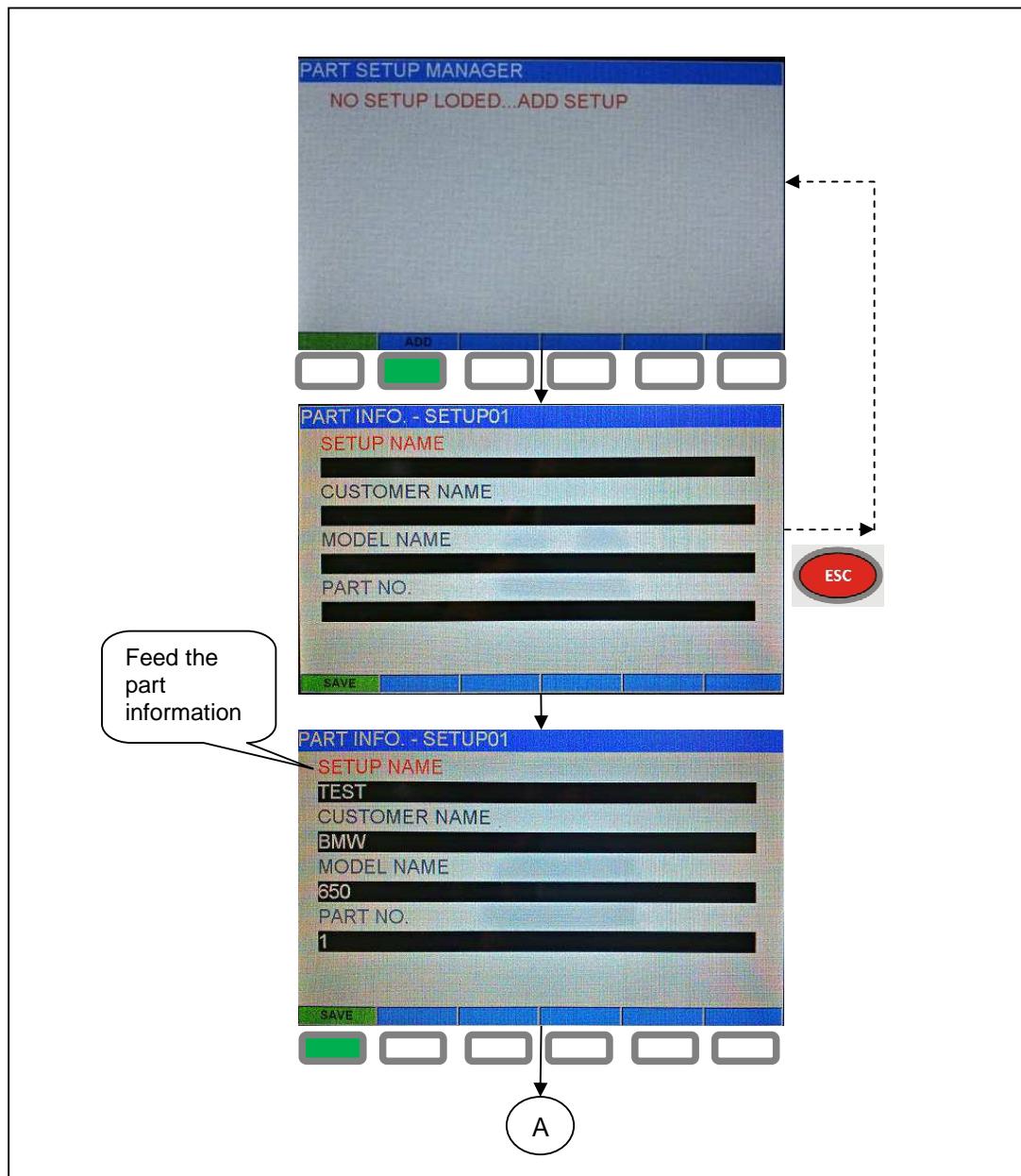
**Operational Flowchart:**

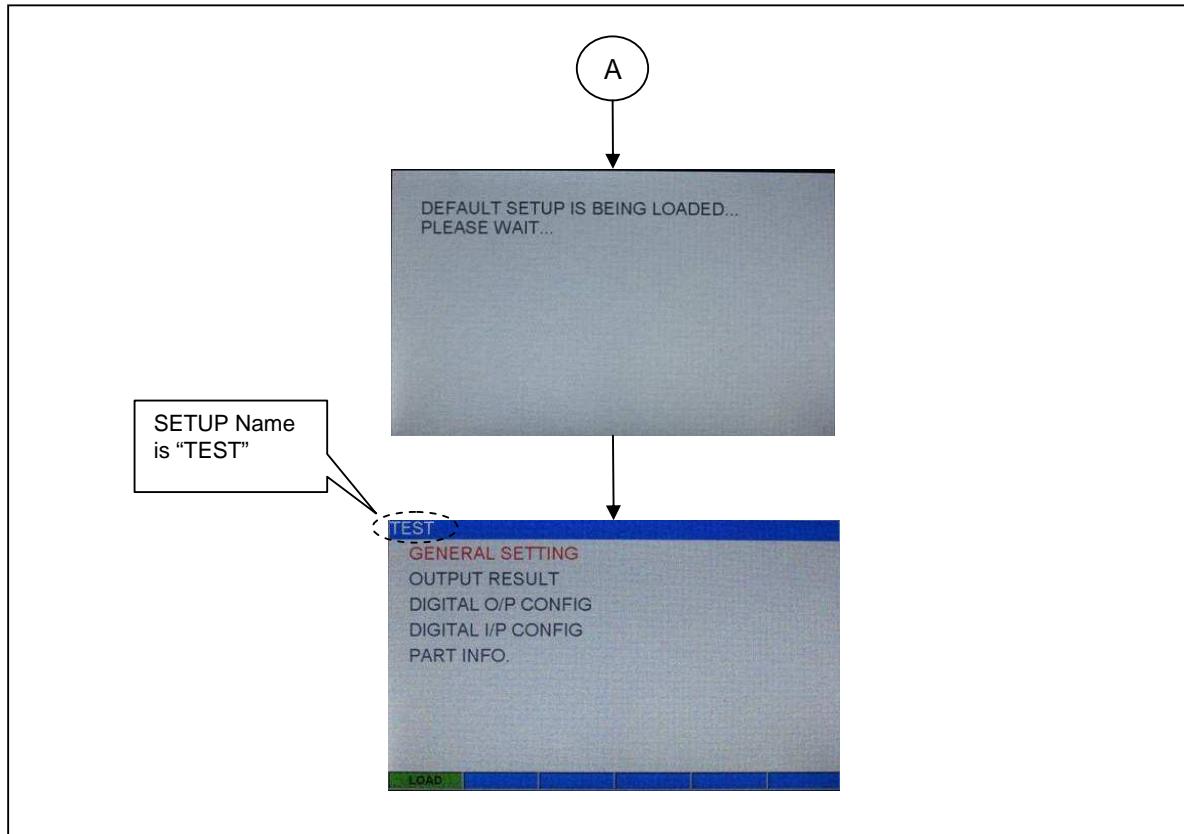
**ADD SETUP**

Here, new part setup can be created.

**Steps to create a new SETUP:**

1. At 'PART SETUP MANAGER' screen, press 'ADD' function key.
2. 'PART INFO' screen with new setup number will appear. User can feed part information such as Customer Name, Model Name and Part Number.
3. Once part information is entered, press 'SAVE' function key.
4. A new setup will get created with default settings.

***Operational Flowchart:***



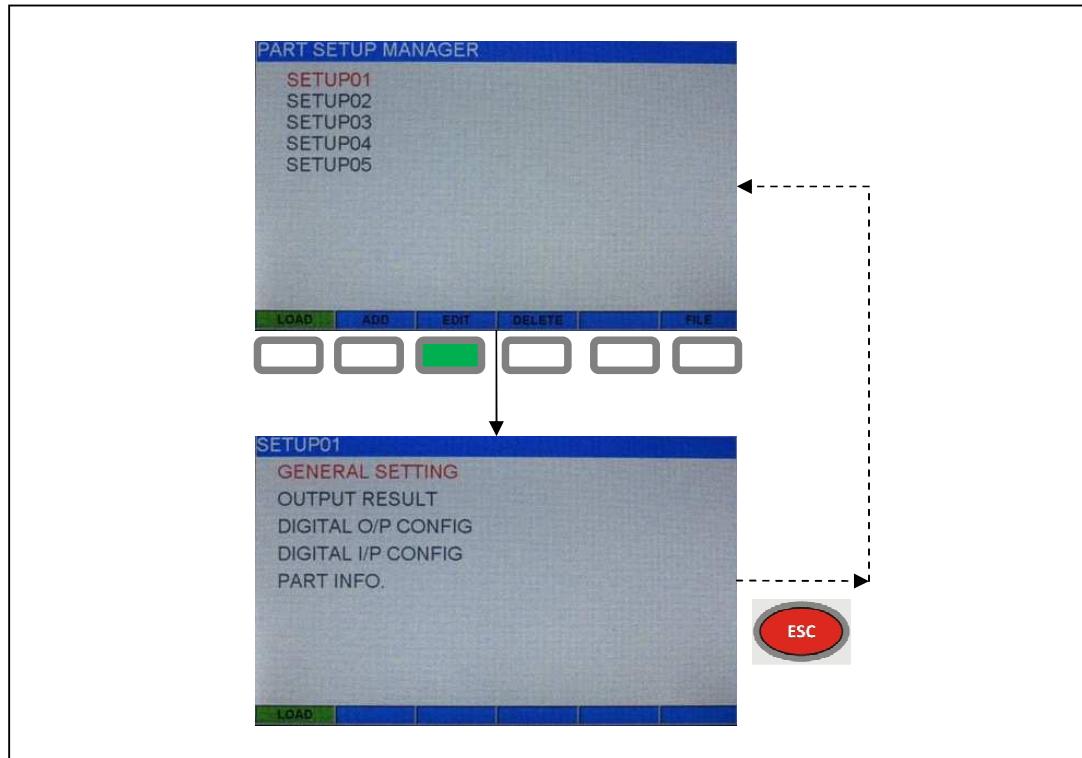
Maximum Up to 5 part setups can be created

**EDIT SETUP**

Here, settings related to particular setup viz. *General Setting, Output Results, Digital I/O configuration, Part Information* can be done.

**Steps to Edit Setup:**

1. At 'PART SETUP MANAGER' screen, list of available setups in unit will be displayed.
2. Select a setup to be edited using 'UP/DOWN' key.
3. Press EDIT function key. 'EDIT SETUPxx' screen will be displayed. Now, user can edit this selected setup.
4. At any instance press ESC key to go back to the previous menu.

**Operational Flowchart:**

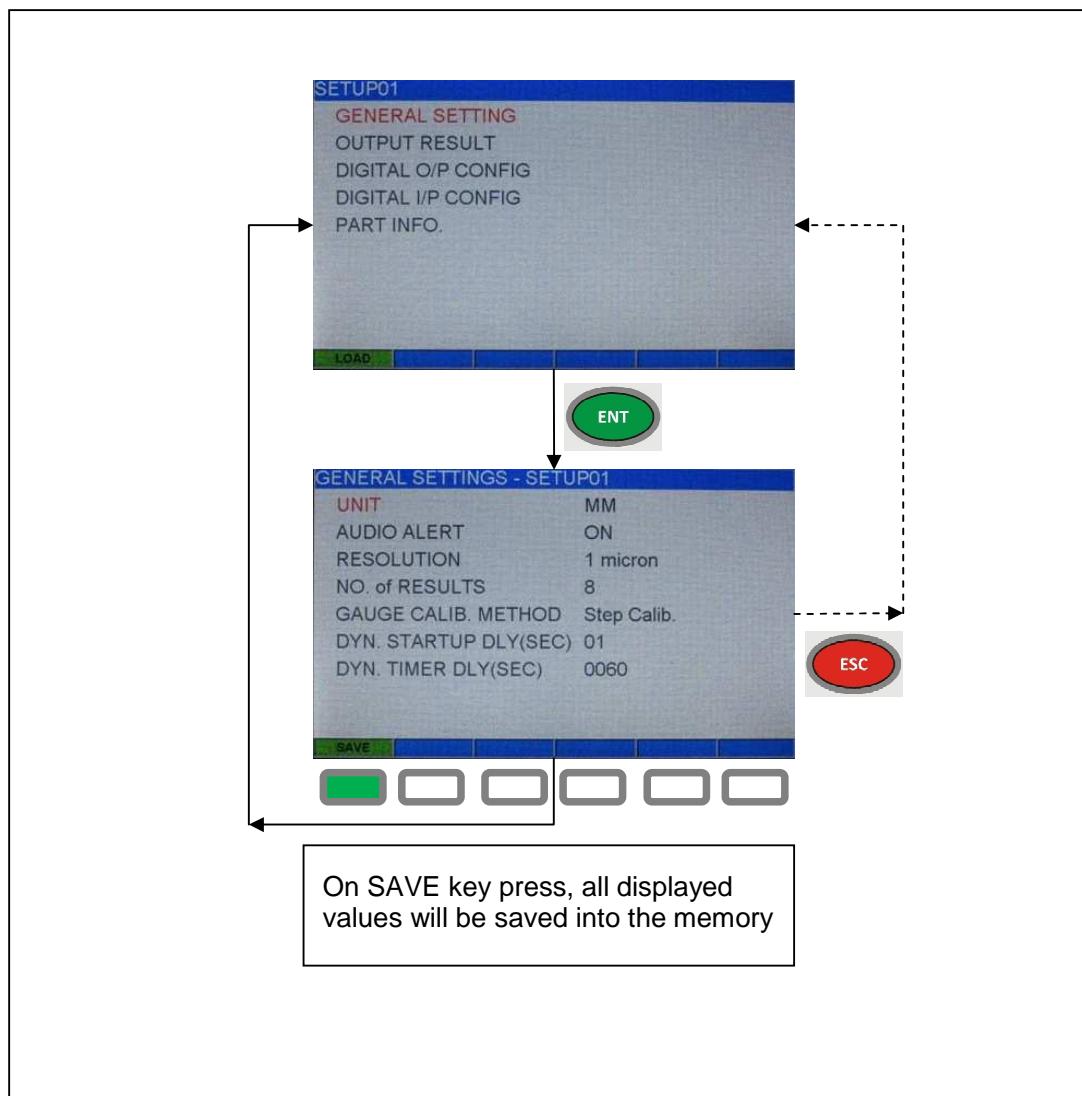
## GENERAL SETTINGS

Here unit, audio alert, resolution, number of results, gauge calibration method, dynamic start up delay and dynamic timer delay settings can be done.

### Steps to edit General Settings:

1. At 'SETUPxx' screen, using 'UP/DOWN' keys select 'GENERAL SETTINGS' parameter.
2. Press 'ENT' key. Screen displays different parameters with their present settings. Highlighted parameter represents selection.
3. Once parameter editing is finished, press 'SAVE' function key to save changes.
4. At any instance of the time press 'ESC' key to go back to the previous menu.

### *Operational Flowchart:*



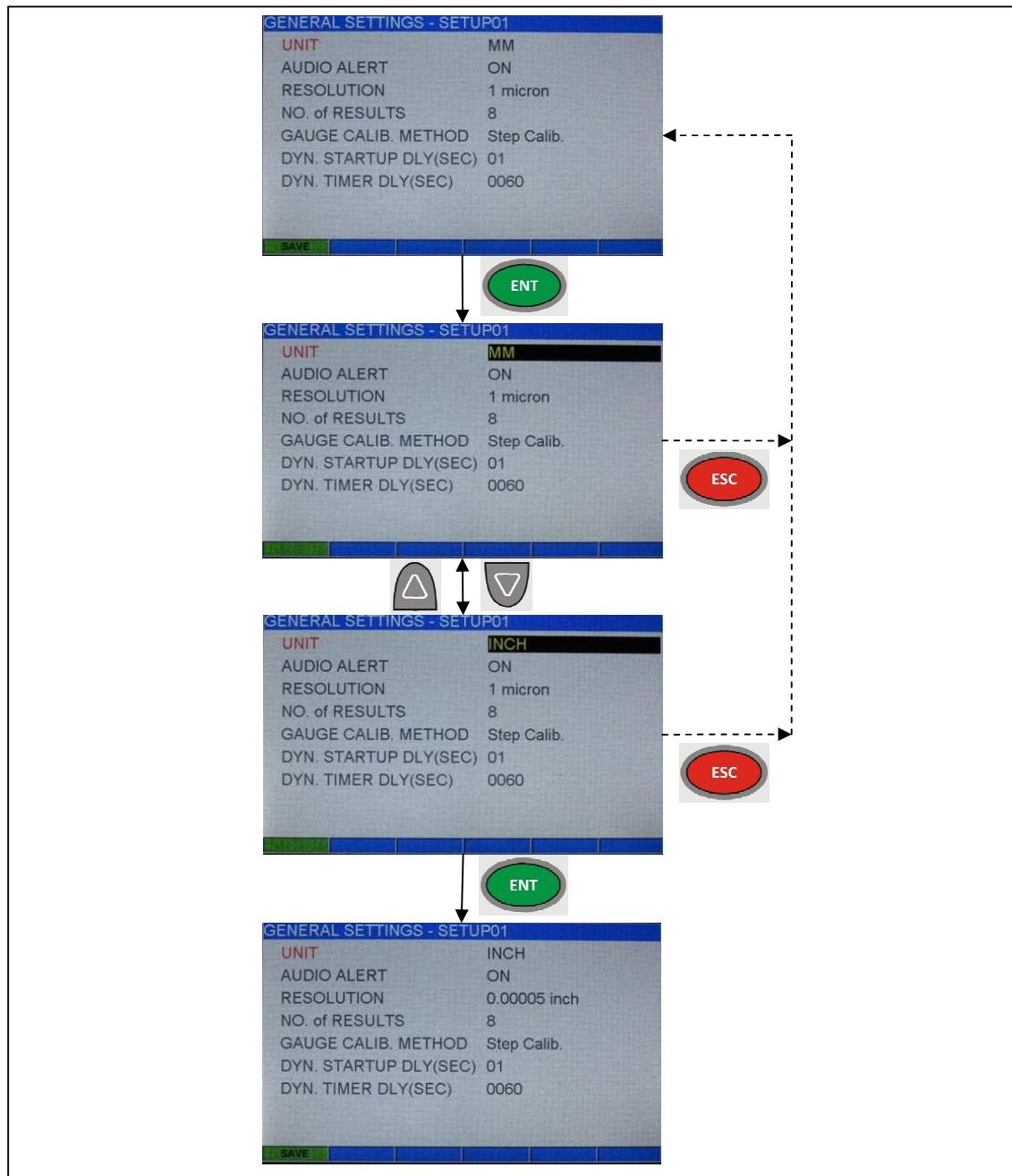
## UNIT

Here, measurement unit can be selected.

### Steps to edit:

1. At General Setting default screen, using ‘UP/DOWN’ key, select “UNIT” parameter.
2. Press ‘ENT’ key. Present unit setting will be highlighted.
3. Change setting, if required by using ‘UP/DOWN’ key.
4. Press ‘ENT’ key to confirm the selection.
5. Press ‘ESC’ key to go to the previous menu.

### *Operational Flowchart:*



## AUDIO ALERT

In built buzzer gives audio alert for values out of tolerances

### Steps to edit:

1. At General Setting default screen, using 'UP/DOWN' key, select "AUDIO ALERT" parameter.
2. Press 'ENT' key. Present AUDIO ALERT setting will be highlighted.
3. Change setting, if required by using 'UP/DOWN' key.
4. Press 'ENT' key to confirm the selection.
5. Press 'ESC' key to go to the previous menu.

### *Operational Flowchart:*



## RESOLUTION

Here digital display resolution can be selected.

### Steps to edit:

1. At General Setting default screen, using 'UP/DOWN' key, select "RESOLUTION" parameter.
2. Press 'ENT' key. Present resolution setting will be highlighted.
3. Change setting, if required by using 'UP/DOWN' key.
4. Press 'ENT' key to confirm the selection.
5. Press 'ESC' key to go to the previous menu.

Display range: mm

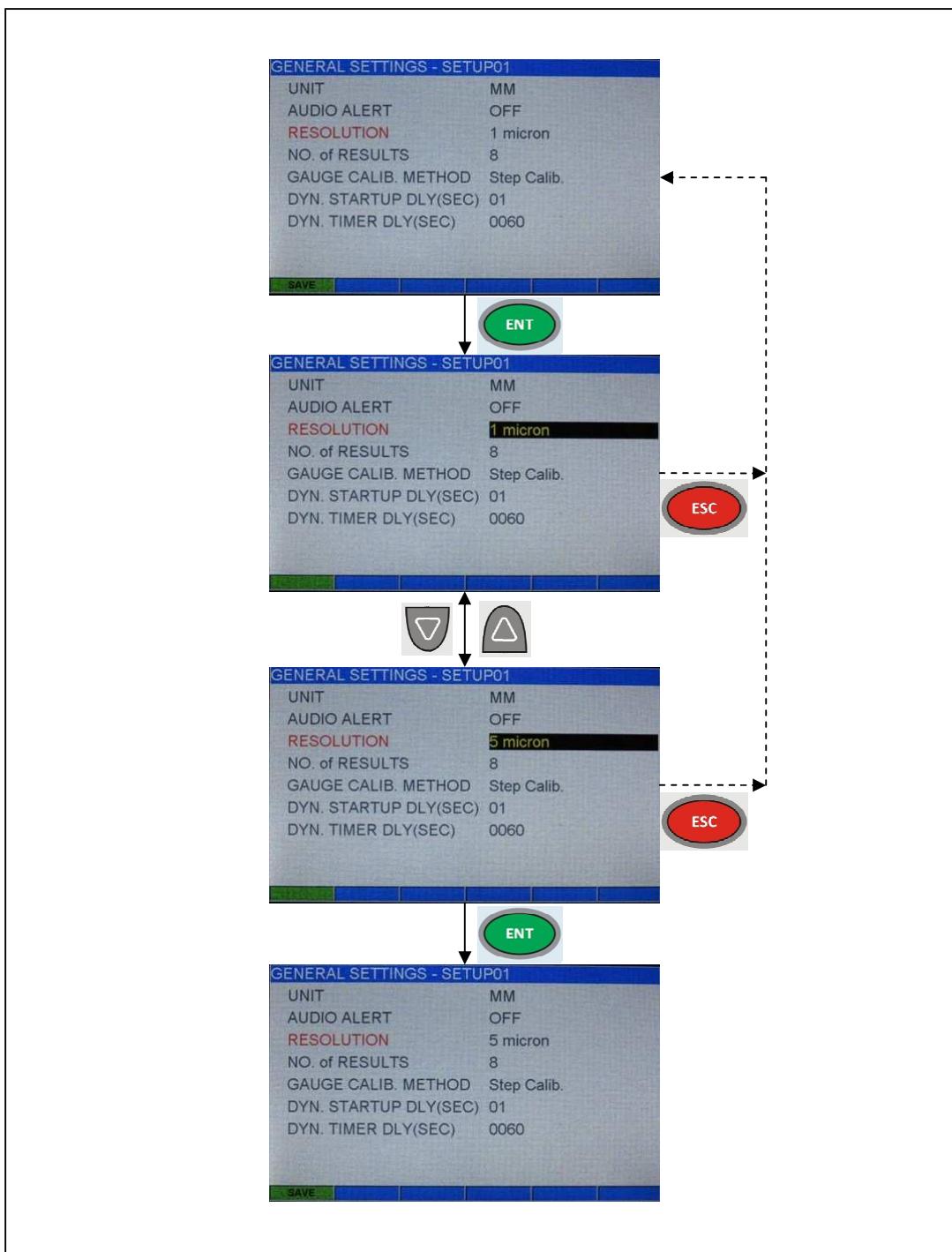
Resolution	Display Range
0.1µ (micron)	+/-99.999.9mm
0.5µ (micron)	+/-99.999.5mm
1µ (micron)	+/-999.999mm
5µ (micron)	+/-999.995mm
10µ (micron)	+/-9999.99mm

Display range: inch

Resolution	Display Range
0.000005"	+/-9.999995"
0.00002"	+/-99.99998"
0.00005"	+/-99.99995"
0.0002"	+/-99.9998"
0.0005"	+/-99.9995"



Above display ranges will be considered while taking tolerances, nominal value, preset value, master dimensions entry.

**Operational Flowchart:**

## NUMBER OF RESULTS



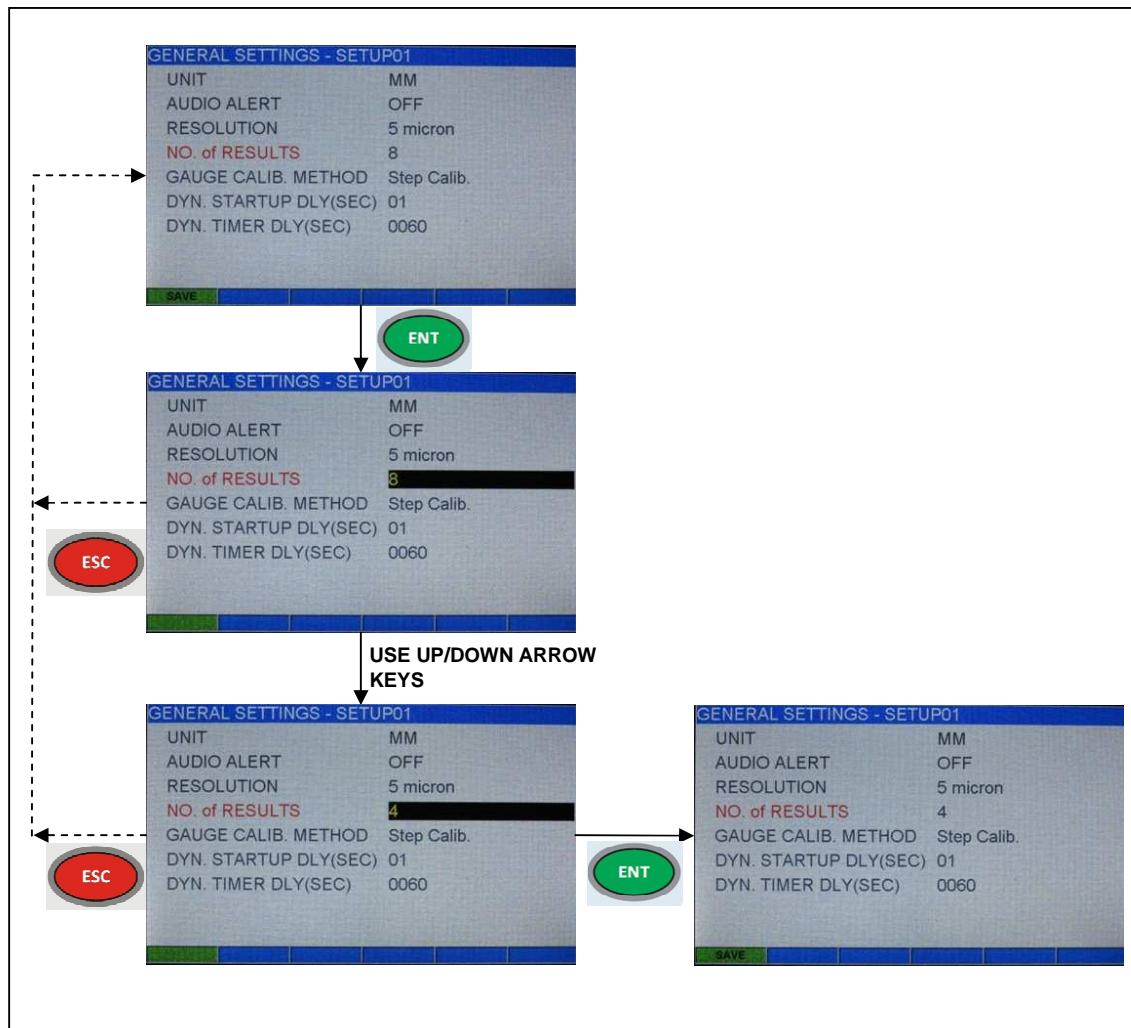
*Up to 8 results can be set in the unit*

Here number of output results to be measured in measurement mode can be selected.

### Steps to edit:

1. At General Setting default screen, using ‘UP/DOWN’ key, select “NUMBER OF RESULTS” parameter.
2. Press ‘ENT’ key. Present number of results setting will be highlighted.
3. Change setting, if required by using ‘UP/DOWN’ key.
4. Press ‘ENT’ key to confirm the selection.
5. Press ‘ESC’ key to go to the previous menu.

### Operational Flowchart:



## GAUGE CALIBRATION METHOD

Here user can select 2 point gauge calibration method (DOUBLE MASTERING) to be used in measurement mode.



Step calibration method is used when selected results in measurement mode are to be calibrated separately. Simultaneous calibration method is used when all selected results are to be calibrated at a time.

### Steps to edit:

1. At General Setting default screen, using 'UP/DOWN' key, select "GAUGE CALIBRATION METHOD" parameter.
2. Press 'ENT' key. Present calibration method setting will be highlighted.
3. Change setting, if required by using 'UP/DOWN' key.
4. Press 'ENT' key to confirm the selection.
5. Press 'ESC' key to go to the previous menu.

### Operational Flowchart:



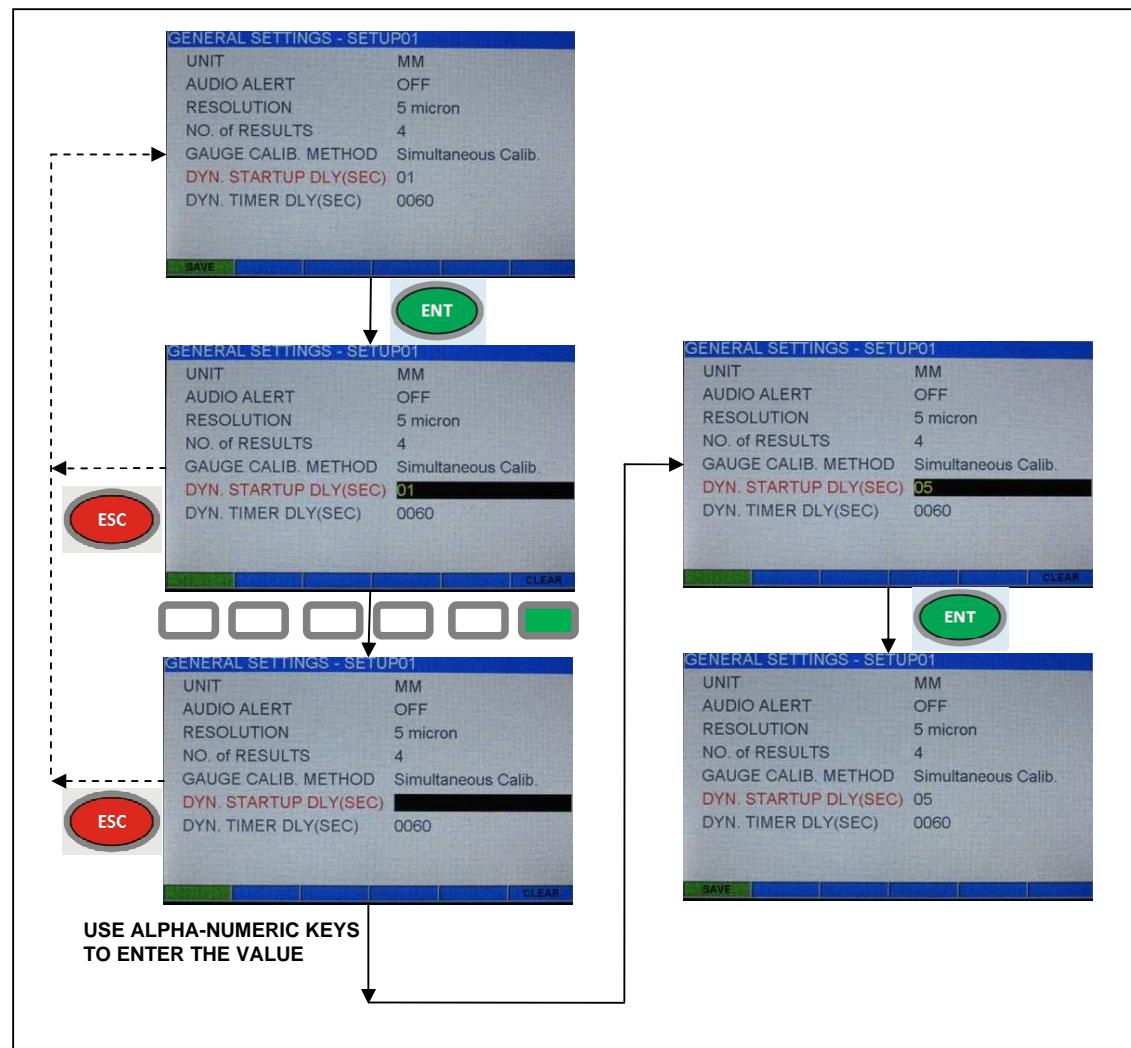
## DYNAMIC STARTUP DELAY

It is a time delay between external trigger event given to the unit and actual start of the measurement cycle. So in dynamic mode (i.e. output result is in MIN / MAX / TIR/ AVG mode) on footswitch press, actual measurement process starts once this delay is elapsed.

### Steps to edit:

1. At General Setting default screen, using 'UP/DOWN' key, select 'DYN. STARTUP DELAY' parameter.
2. Press 'ENT' key. Present set delay value (in seconds) will get highlighted.
3. To start the editing, use 'CLEAR' function key.
4. Use alphanumeric keypad to enter the value between 0sec to 59 sec
5. Use 'ENT' key, to save the edited value temporarily.
6. At any instance, use 'ESC' key to go back to previous screen.

### Operational Flowchart:



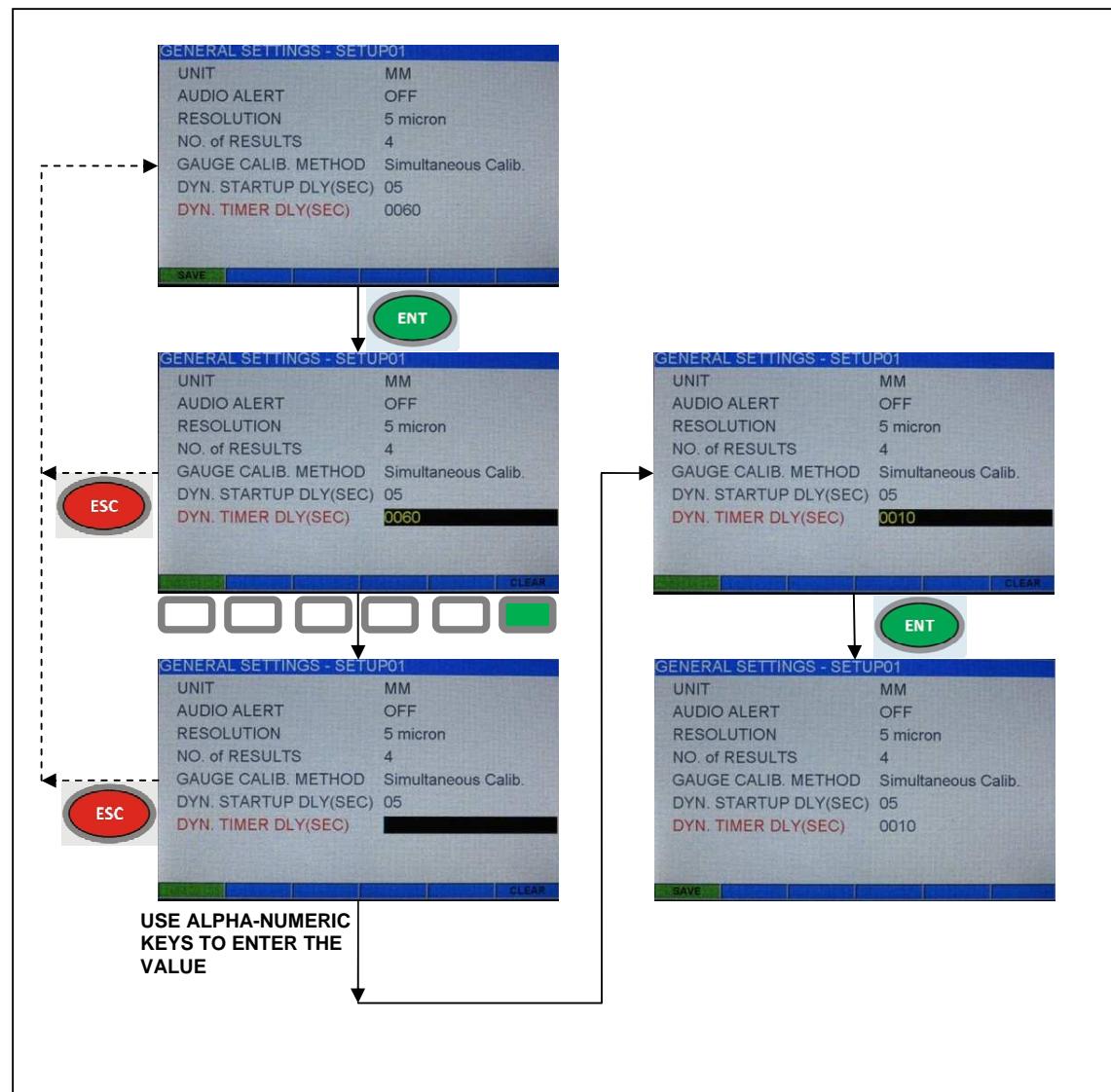
## DYNAMIC TIMER DELAY

It is a time delay in seconds for which dynamic mode measurements can be taken. Once this delay elapsed dynamic mode readings will get freeze.

### Steps to edit:

1. At General Setting default screen, using 'UP/DOWN' key, select 'DYN. TIMER DELAY' parameter.
2. Press 'ENT' key. Present set delay value (in seconds) will get highlighted.
3. To start the editing, use 'CLEAR' function key.
4. Use alphanumeric keypad to enter the value between 0sec to 3600 sec
5. Use 'ENT' key, to save the edited value temporarily.
6. At any instance, use 'ESC' key to go back to previous screen.

### Operational Flowchart:



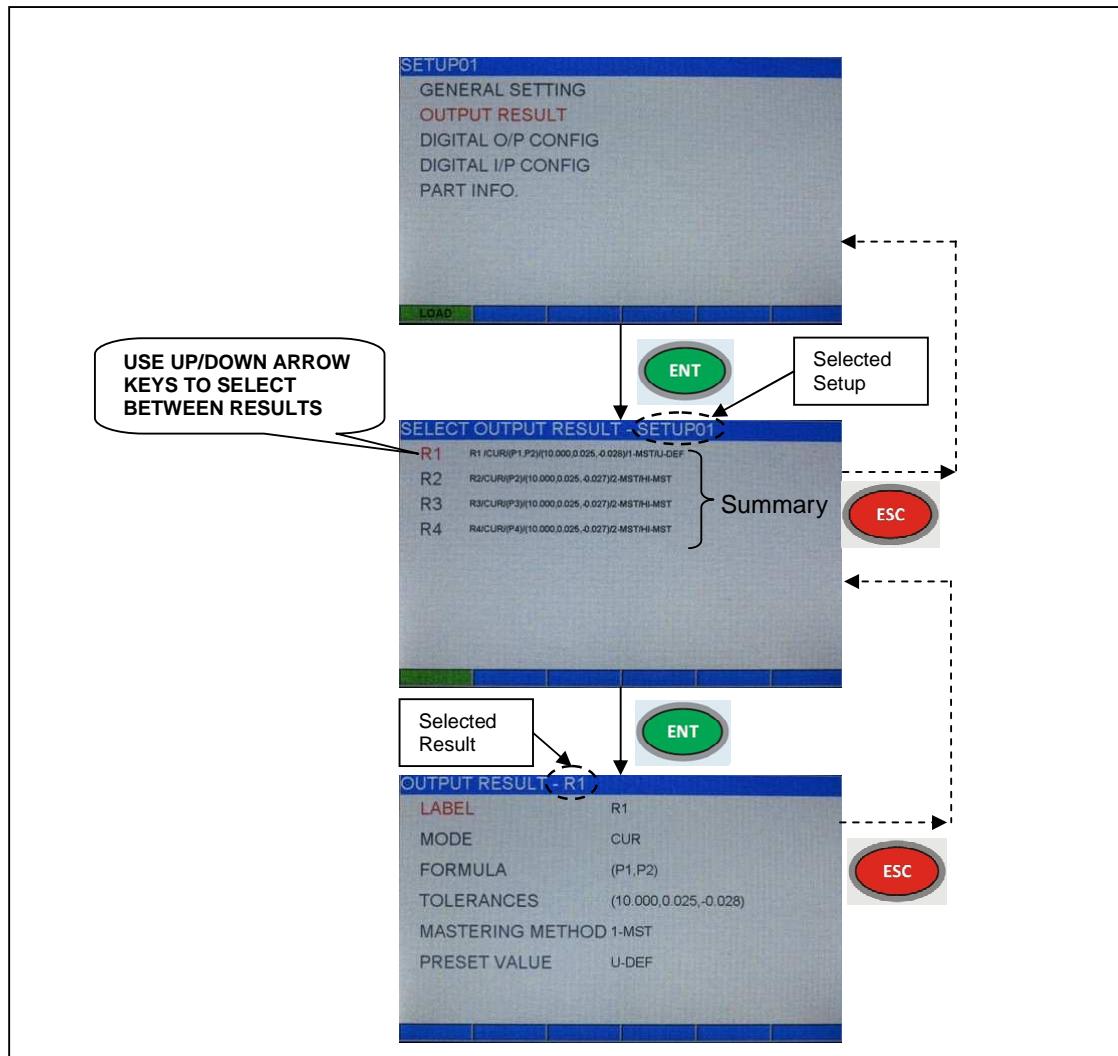
## OUTPUT RESULT

Here output result's parameters like **label**, **operating mode**, **formula**, **tolerances**, **mastering method**, **preset type** settings can be done.

### Steps to enter into OUTPUT RESULT:

1. In 'SETUPxx' menu, use UP/DOWN arrow key to select "OUTPUT RESULT" and press 'ENT' key.
2. 'SELECT OUTPUT RESULT – SETUPxx' screen will appear.
3. At any instance press 'ESC' key to go back to 'OUTPUT RESULT - Rx' screen.

### Operational Flowchart:



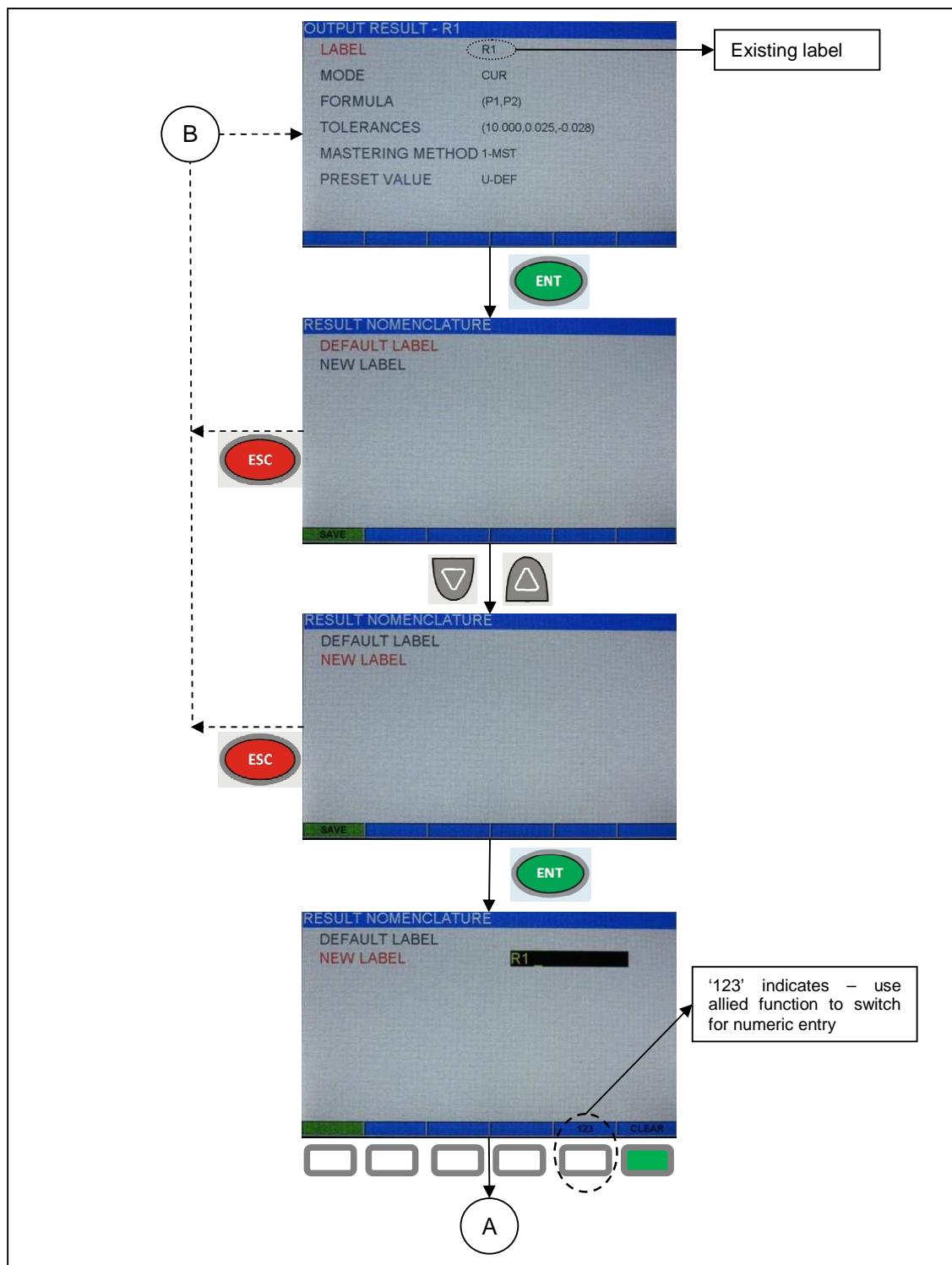
## RESULT LABEL

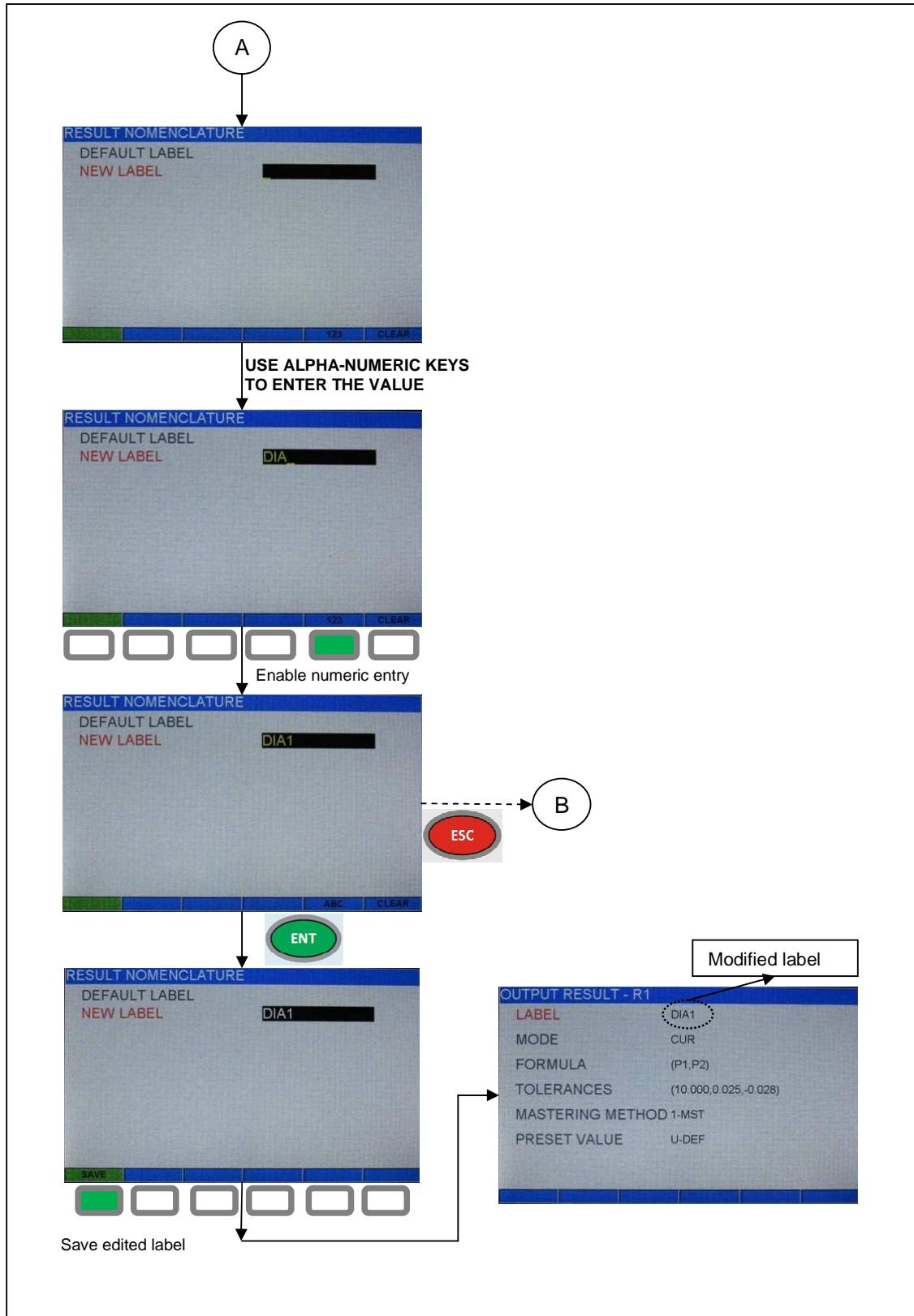
Here nomenclature for the result can be given.

Result can have the label of maximum 8 characters. Label can be user defined or default. In case of default label, result no. (R1, R2...R8) is assigned as result nomenclature.

### Steps for editing LABEL:

1. In 'OUTPUT RESULT – Rx' menu, use UP/DOWN arrow key to select "LABEL" option and press 'ENT' key.
2. Now 'RESULT NOMENCLATURE' screen will appear and previously set label type (default label / new label) will be highlighted.
3. At 'RESULT NOMENCLATURE' screen, select 'NEW LABEL' option and press 'ENT' key. Here present result label will be displayed.
4. Use 'CLEAR' function key to clear the display and start editing. Here cursor at home position will appear.
5. Use alphanumeric keypad to enter a character.
6. Use 'ABC' function key to activate alphabetic entry.
7. Use '123' function key to activate numeric entry.
8. Use LEFT / RIGHT arrow keys for shifting cursor.
9. Once editing is done, press 'ENT' key to save the edited label temporarily.
10. Press 'SAVE' key to save the edited value into the memory.
11. At any instance press 'ESC' key to go back to previous screen.

***Operational Flowchart:***



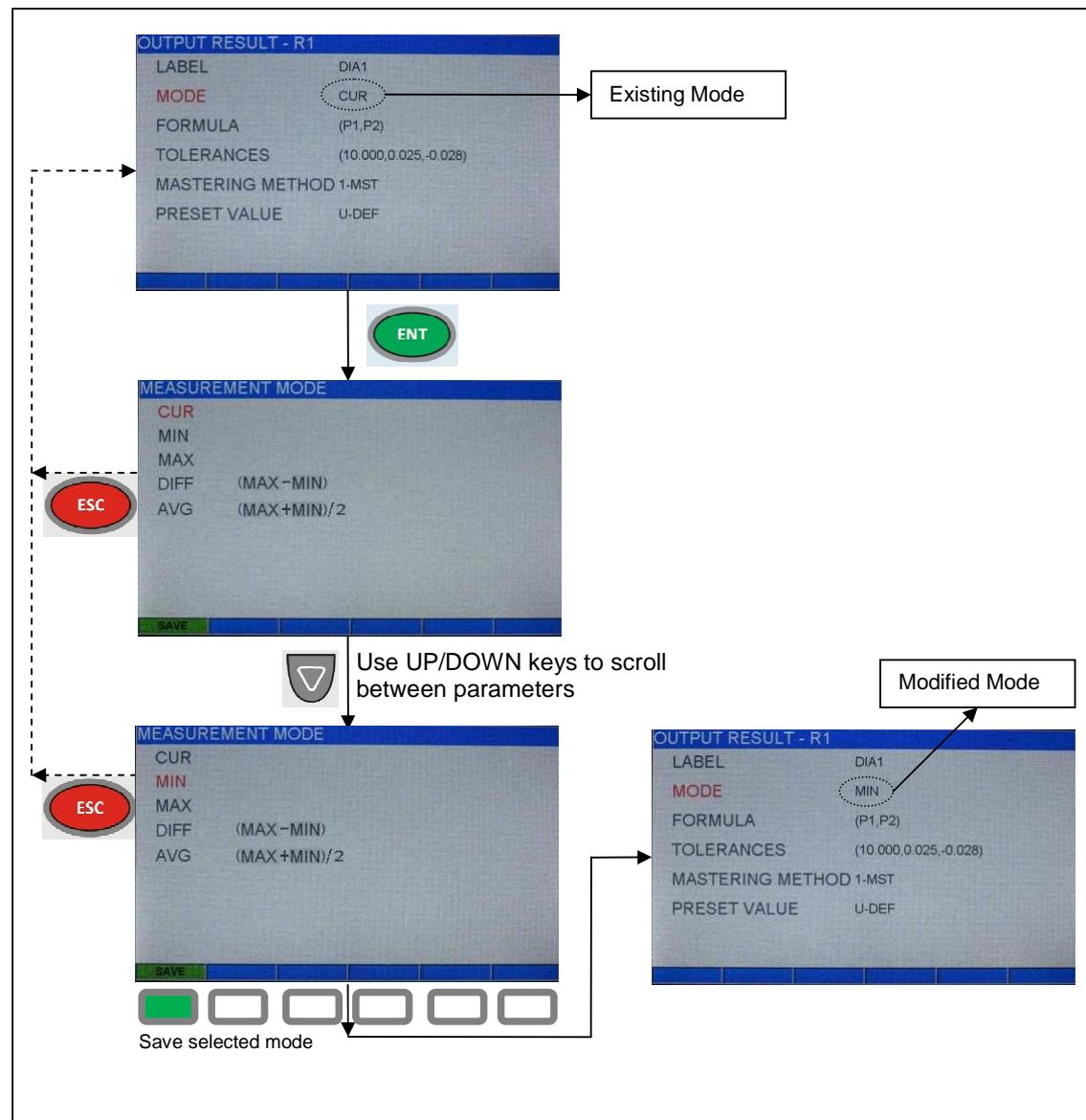
## OPERATING MODE

Here measurement mode for the selected output result can be set.

### Steps to edit MODE:

1. At 'OUTPUT RESULT – Rx' screen, using UP/DOWN key select 'MODE' parameter and press ENT key.
2. 'MEASUREMNT MODE' selection screen with highlighted present mode will be displayed. Change it, if required by using 'UP/DOWN' keys.
3. Press 'SAVE' to save the selected mode.
4. At any instance press 'ESC' to go back to previous screen.

### *Operational Flowchart:*



## FORMULA

Output combination is done using formula multiplier and related probe combination.

### Possible combinations

Formula based on channel inputs or previously selected results can be constructed.

#### Formula for R1 result can be based on channel inputs only:

$$R1 = \left\{ \begin{array}{l} \pm(P1_{\text{Channel}} \times P1_{\text{Multiplier}}) \pm(P2_{\text{Channel}} \times P2_{\text{Multiplier}}) \pm(P3_{\text{Channel}} \times P3_{\text{Multiplier}}) \\ \pm(P4_{\text{Channel}} \times P4_{\text{Multiplier}}) \pm(P5_{\text{Channel}} \times P5_{\text{Multiplier}}) \pm(P6_{\text{Channel}} \times P6_{\text{Multiplier}}) \\ \pm(P7_{\text{Channel}} \times P7_{\text{Multiplier}}) \pm(P8_{\text{Channel}} \times P8_{\text{Multiplier}}) \end{array} \right\} \times \text{Formula}_{\text{Multiplier}}$$

#### Formula for R2 result can have either of following combinations:

1. Formula based on selected channel inputs:

$$R2 = \left\{ \begin{array}{l} \pm(P1_{\text{Channel}} \times P1_{\text{Multiplier}}) \pm(P2_{\text{Channel}} \times P2_{\text{Multiplier}}) \pm(P3_{\text{Channel}} \times P3_{\text{Multiplier}}) \\ \pm(P4_{\text{Channel}} \times P4_{\text{Multiplier}}) \pm(P5_{\text{Channel}} \times P5_{\text{Multiplier}}) \pm(P6_{\text{Channel}} \times P6_{\text{Multiplier}}) \\ \pm(P7_{\text{Channel}} \times P7_{\text{Multiplier}}) \pm(P8_{\text{Channel}} \times P8_{\text{Multiplier}}) \end{array} \right\} \times \text{Formula}_{\text{Multiplier}}$$

2. Formula based on previously selected results – R1:

$$R2 = \{ \pm(R1_{\text{Result}} \times R1_{\text{Multiplier}}) \} \times \text{Formula}_{\text{Multiplier}}$$

Similarly,

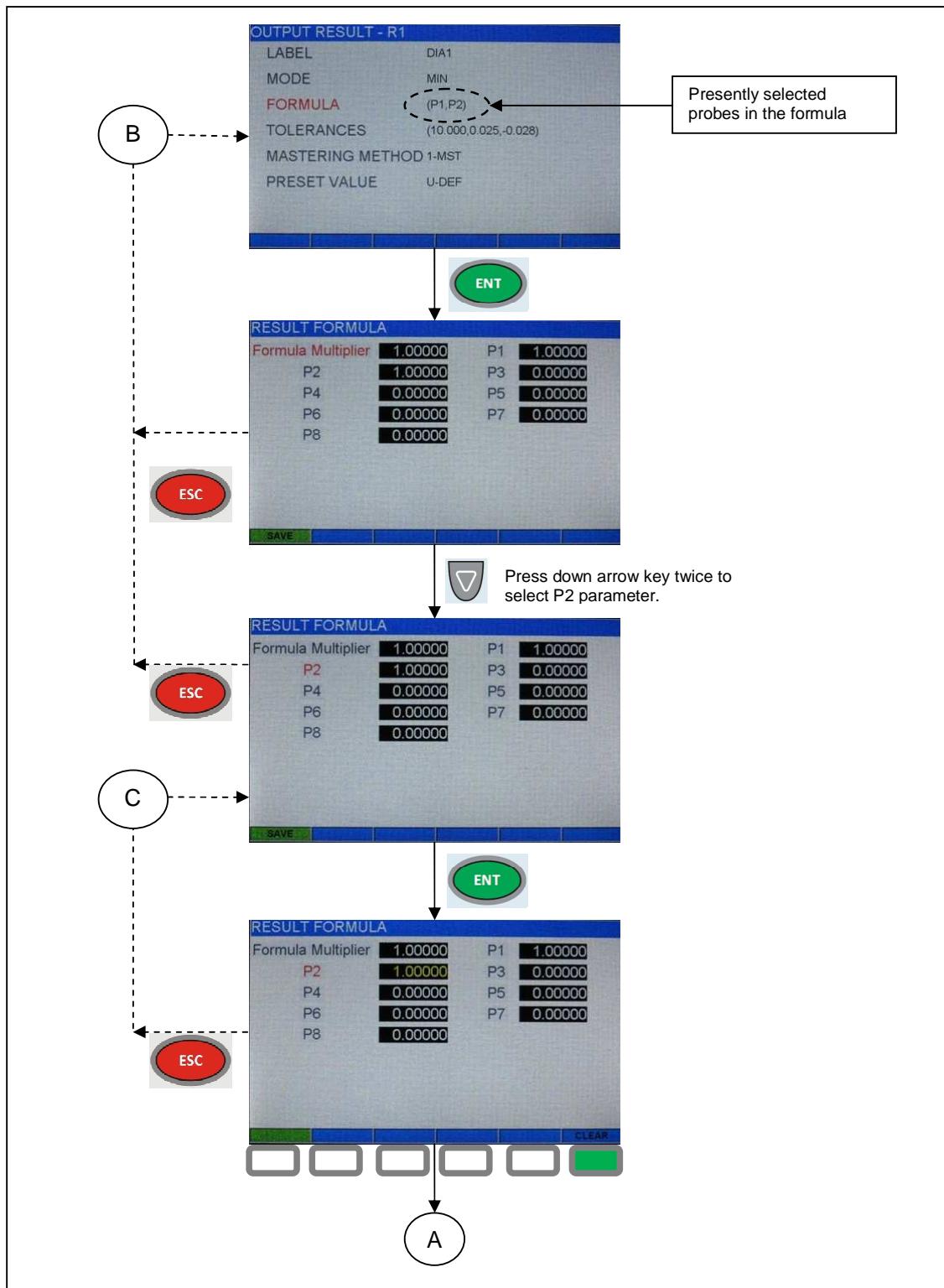
#### Formula for R8 result can have either of following combinations:

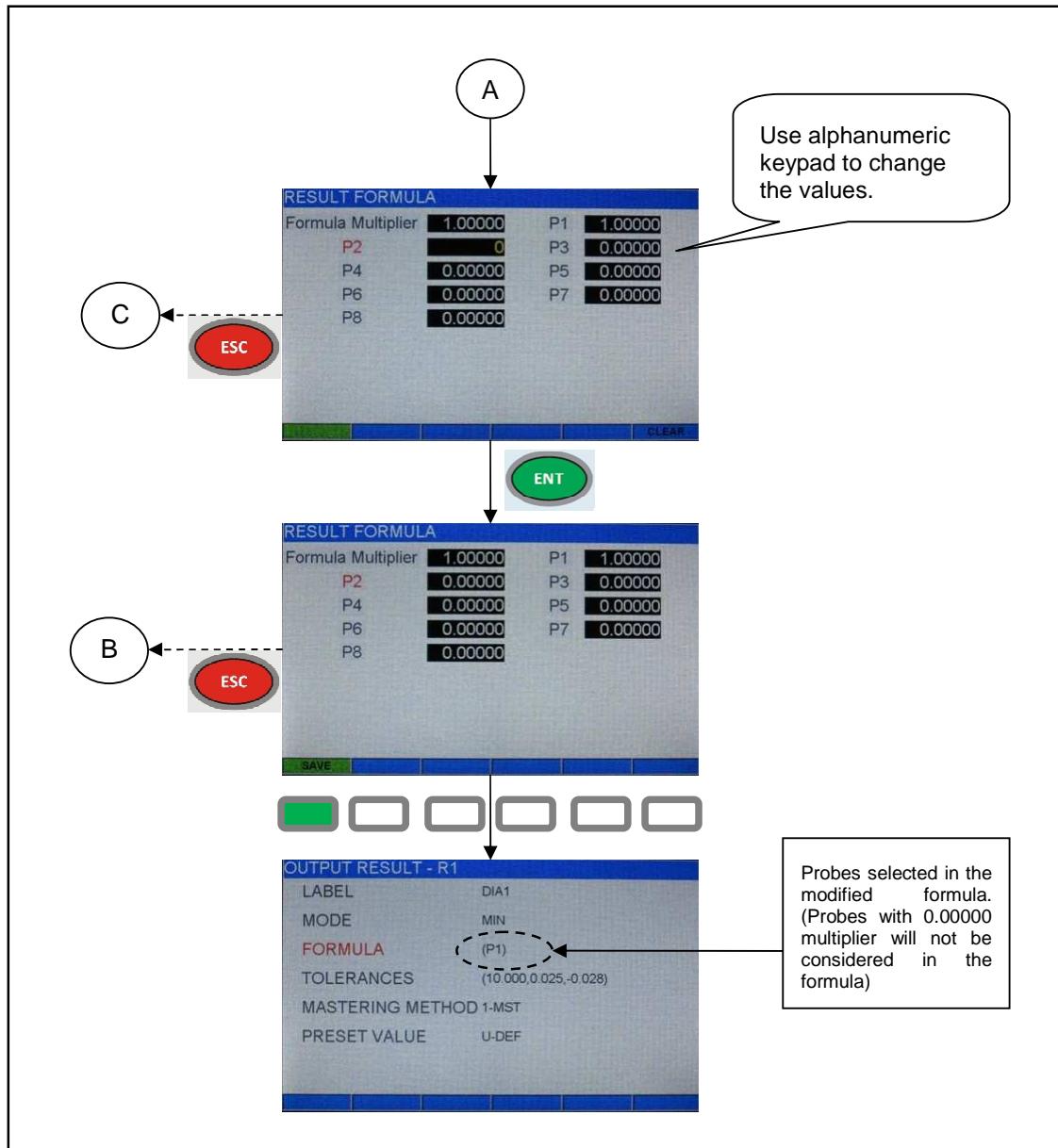
Formula based on selected channel inputs:

$$R8 = \left\{ \begin{array}{l} \pm(P1_{\text{Channel}} \times P1_{\text{Multiplier}}) \pm(P2_{\text{Channel}} \times P2_{\text{Multiplier}}) \pm(P3_{\text{Channel}} \times P3_{\text{Multiplier}}) \\ \pm(P4_{\text{Channel}} \times P4_{\text{Multiplier}}) \pm(P5_{\text{Channel}} \times P5_{\text{Multiplier}}) \pm(P6_{\text{Channel}} \times P6_{\text{Multiplier}}) \\ \pm(P7_{\text{Channel}} \times P7_{\text{Multiplier}}) \pm(P8_{\text{Channel}} \times P8_{\text{Multiplier}}) \end{array} \right\} \times \text{Formula}_{\text{Multiplier}}$$

Formula based on previously selected results – R1, R2...R7:

$$R8 = \left\{ \begin{array}{l} \pm(R1_{\text{Result}} \times R1_{\text{Multiplier}}) \pm(R2_{\text{Result}} \times R2_{\text{Multiplier}}) \pm(R3_{\text{Result}} \times R3_{\text{Multiplier}}) \\ \pm(R4_{\text{Result}} \times R4_{\text{Multiplier}}) \pm(R5_{\text{Result}} \times R5_{\text{Multiplier}}) \pm(R6_{\text{Result}} \times R6_{\text{Multiplier}}) \\ \pm(R7_{\text{Result}} \times R7_{\text{Multiplier}}) \end{array} \right\} \times \text{Formula}_{\text{Multiplier}}$$

**Operational Flowchart:**



**Examples:****Bore Gauge measurement:**

Output result R01 measures inner diameter of the job. We wish to use 'P1' probe for this measurement, then set formula for R1 as follows;

Formula multiplier = +1.00000

P1's multiplier = -1.00000

P2 to P8 multiplier = 0.00000

$$\phi_{d1} = -P1 = (P1 \times -1.00000) \times (1.00000)$$

**Diameter and Thickness measurement:**

Output result R1 measures diameter or thickness using P1 & P2 channels.

Now formula for diameter or thickness measurement using 2 probes is,

$$R1 = P1 + P2 = [P1 \times (+1.00000) + P2 \times (+1.00000)] \times 1.00000$$

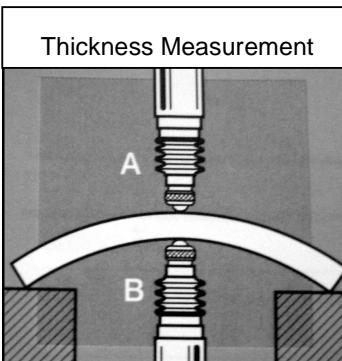
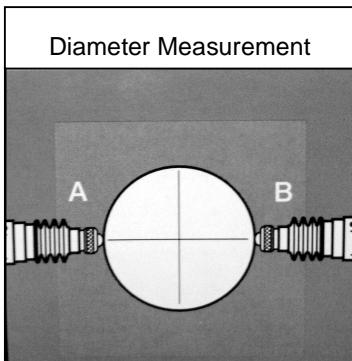
Hence, Formula multiplier = +1.00000

P1 multiplier = +1.00000

P2 multiplier = +1.00000

P3 to P8 multiplier = 0.00000

$$R1 = (P1+P2) \times 1.00000$$



**Step height, Taper and Shaft alignment measurement:**

Output result R1 measures diameter or thickness using P1 & P2 channels.

$$R1 = P1 - P2 = [P1 \times (+1.00000) + P2 \times (-1.00000)] \times 1.00000$$

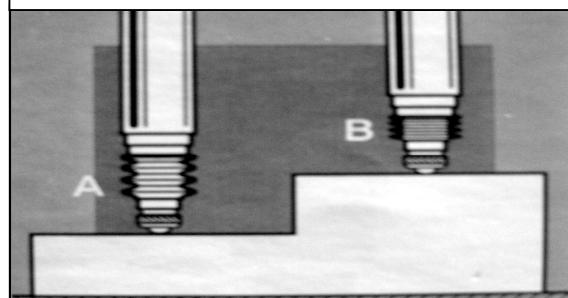
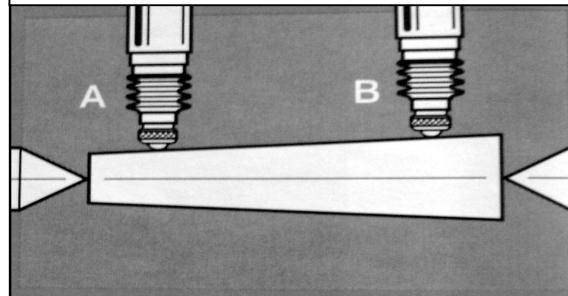
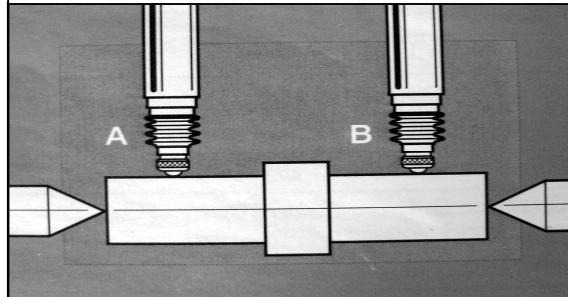
Hence, Formula multiplier = +1.00000

P1 multiplier = +1.00000

P2 multiplier = -1.00000

P3 to P8 multiplier = 0.00000

$$(P1-P2) * 1.00000$$

**STEP HEIGHT MEASUREMENT****TAPER MEASUREMENT****SHAFT ALIGNMENT MEASUREMENT**

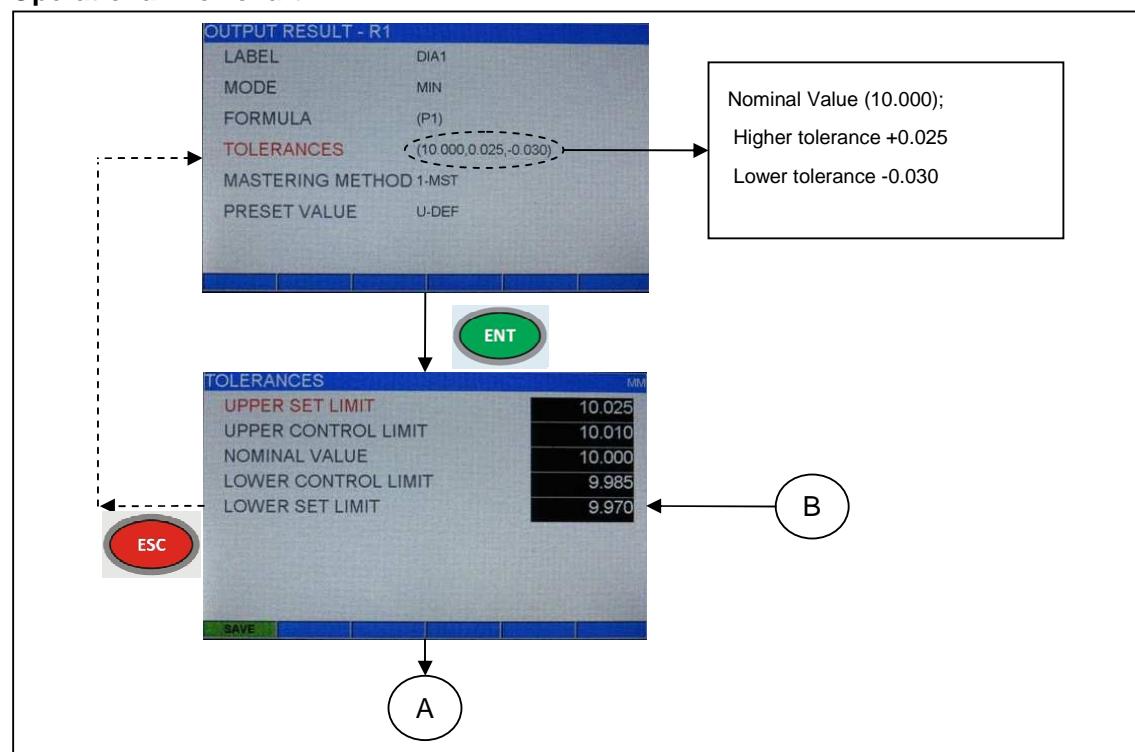
## TOLERANCES

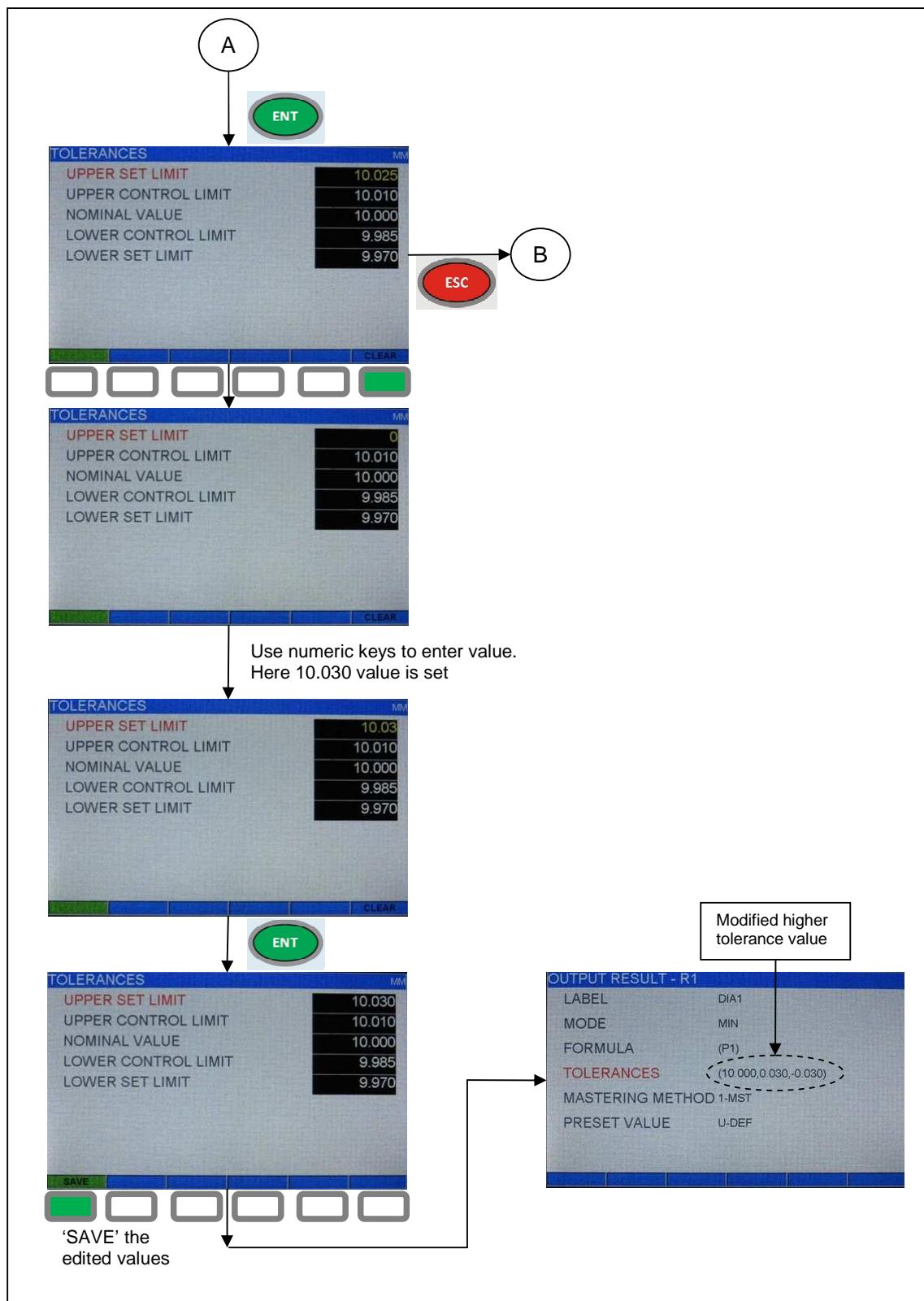
Here tolerance and nominal values for the selected output result (dimension) can be set.

### Steps to edit TOLERANCES:

1. At 'OUTPUT RESULT - Rx' screen, using 'UP/DOWN' key, select TOLERANCES parameter & then press 'ENT' key.
2. Previously set tolerances and nominal values will be displayed. Here 'UPPER SET LIMIT' parameter is highlighted.
3. At 'TOLERANCES' screen, use UP/DOWN key to select parameter whose value is to be modified.
4. Now press 'ENT' key to go for editing the selected parameter. Here value of the parameter will get highlighted.
5. Press 'CLEAR' function key.
6. Now display will reset to zero.
7. Use alphanumeric keypad to enter the numeric value. Range within which value should be entered depends on selected resolution. Any value which is out of the specified range will not be accepted.
8. Use '+/-' key to give a sign to the value.
9. At any instance press 'CLEAR' key to reset the edited value.
10. At any instance press 'ESC' key to go back to previous screen.
11. After entering desired value, press 'ENT' key to accept the edited value. Here value will be saved temporarily & will be displayed on 'SET TOLERANCE' screen
12. Once all parameters on 'TOLERANCES' screen are set, press 'SAVE' key to save settings. Unit will check whether entered values are in proper sequence and if no error occurs, values will get saved into the memory.

### Operational Flowchart:



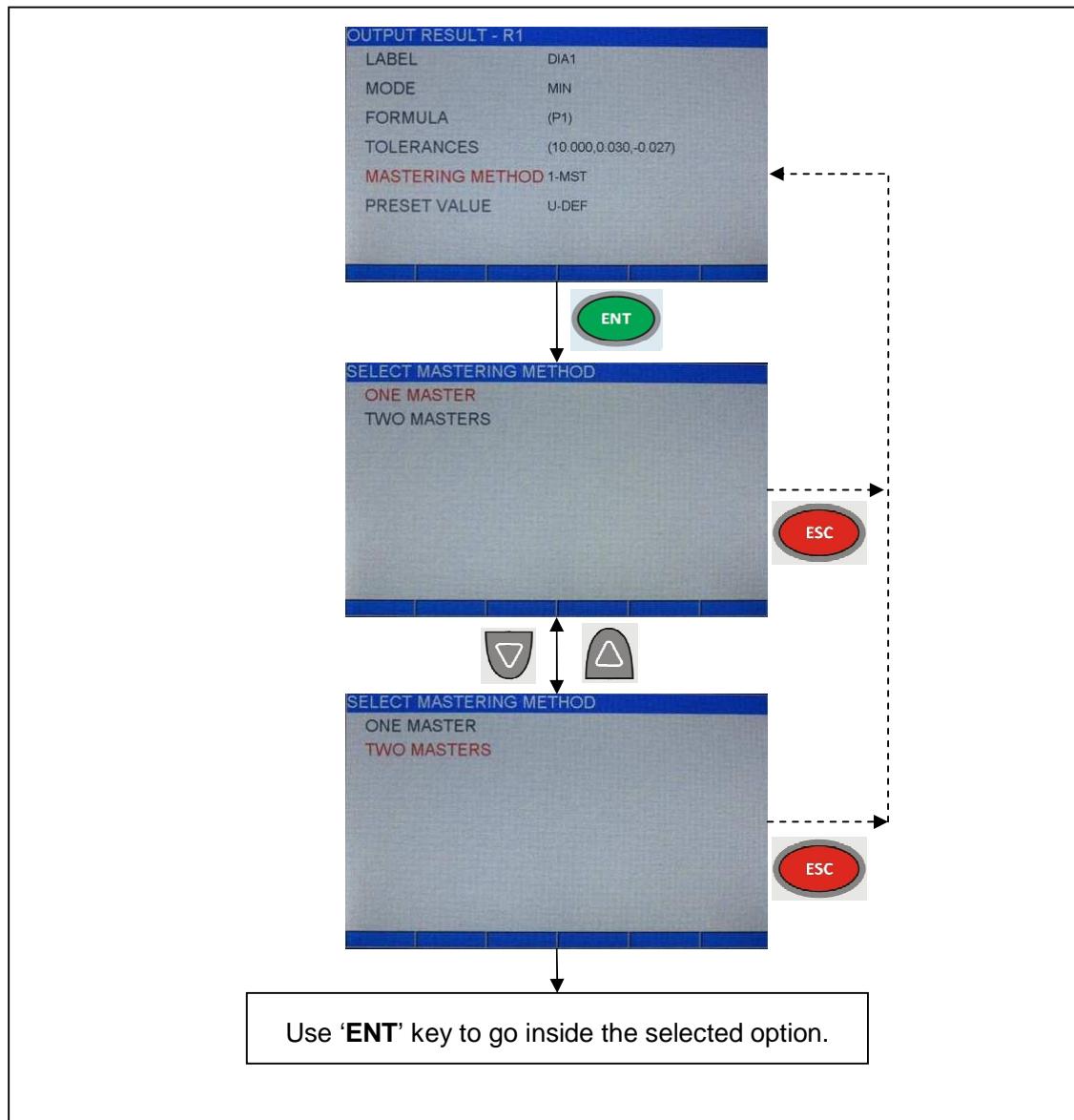


## MASTERING METHOD

Mastering method (single mastering or double mastering) to be used in measurement mode is selected and corresponding master values can be set.

### MASTERING METHOD setting steps:

1. At 'OUTPUT RESULT - Rx' screen, using UP/DOWN keys select 'MASTERING METHOD' parameter.
2. Press ENT key.
3. "SELECT MASTERING METHOD" screen with highlighted last selected option will be displayed. Change it if require using UP/DOWN key. Press ENTER to go inside the selected option for further values setting.
4. At any instance press 'ESC' to go back to previous screen.



**DOUBLE MASTERING-** Used when 2 masters are available for the user for calibration.

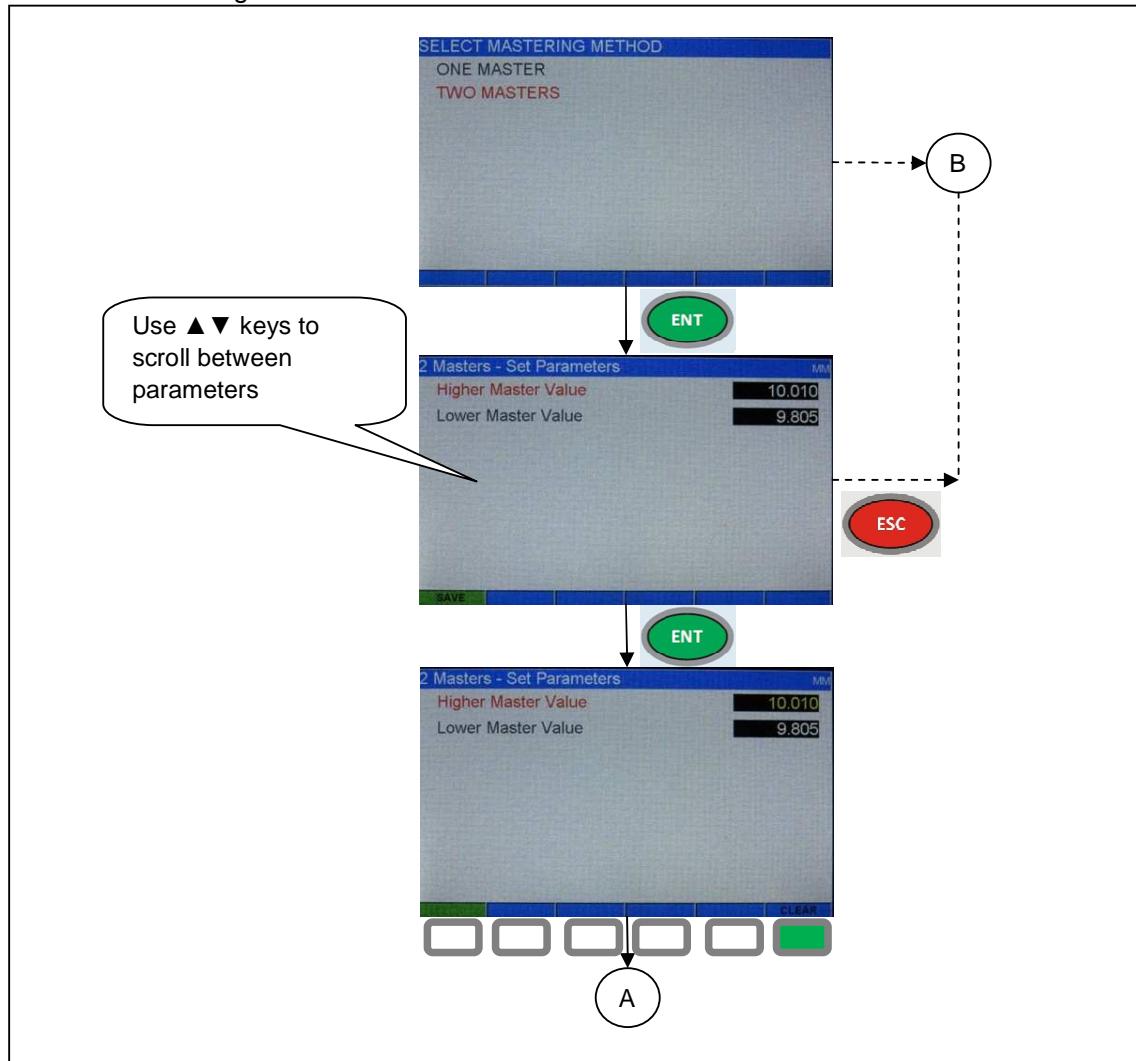
Master values to be used in gauge calibration can be set.

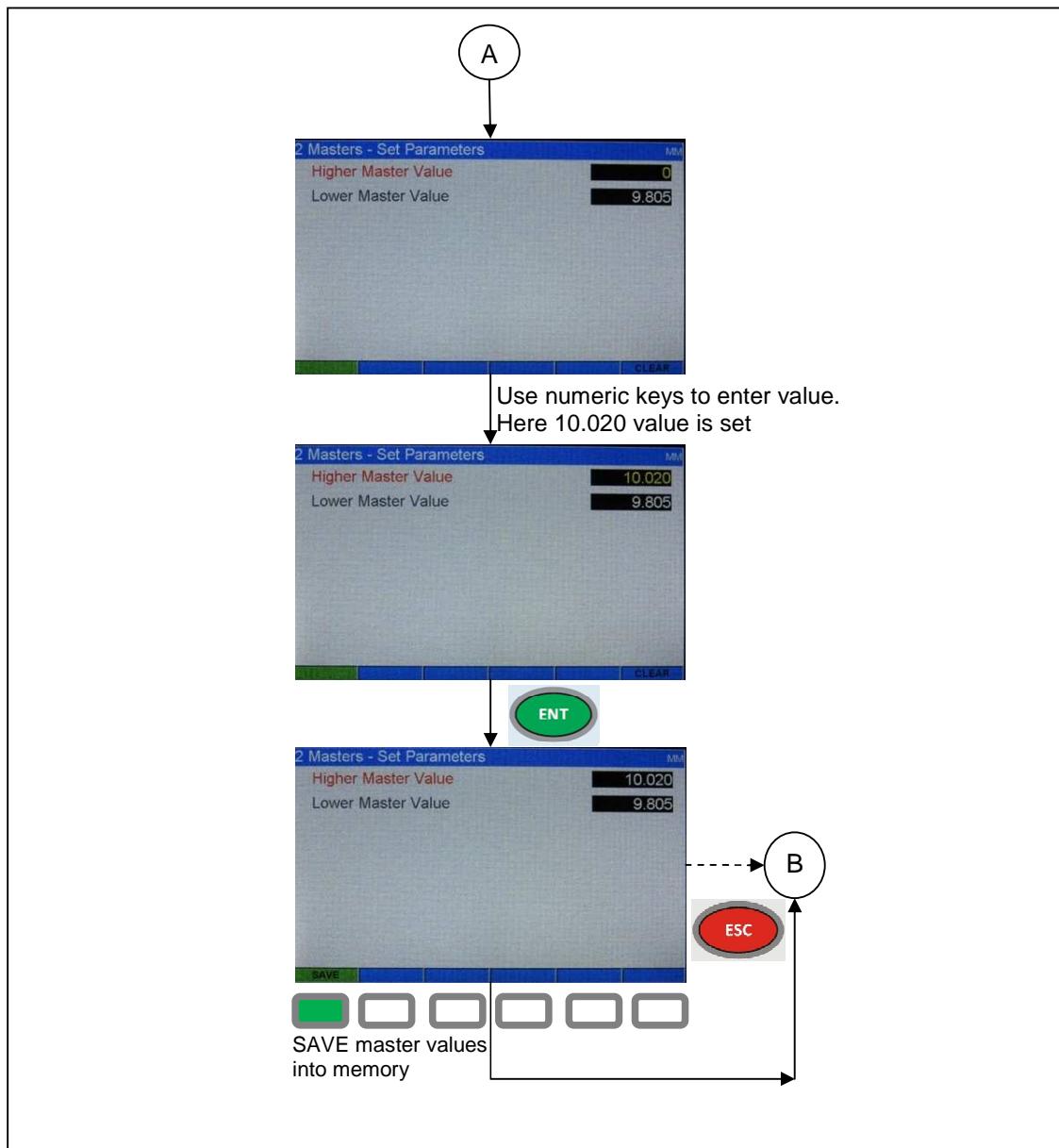
**Steps to set Master Values:**

1. Select 'Higher Master Value' parameter using UP/DOWN arrow keys.
2. Use 'ENT' key, its value will get highlighted with yellow colour.
3. Use 'CLEAR' function key to reset the value to zero.
4. Use alphanumeric keypad to edit the value.
5. Once value editing is finished, press 'ENT' key to accept the edited value, value colour will be changed to white.
6. Now select 'Lower Master Value' parameter using UP/DOWN arrow keys.
7. Follow the procedure from step no.2 to step no. 5 to set lower master value.
8. Once both parameter's values are set, use 'SAVE' key to save the edited values.
9. At any instance while editing use ESC key to exit the edit mode.
10. At any instance while editing use CLEAR function key to reset the edited value to zero.

**Operational Flowchart:**

EXAMPLE: Edit Higher Master Value





Gauge calibration is only applicable for the results based on channel inputs.

**SINGLE MASTERING:** Used when only one master is available for calibration

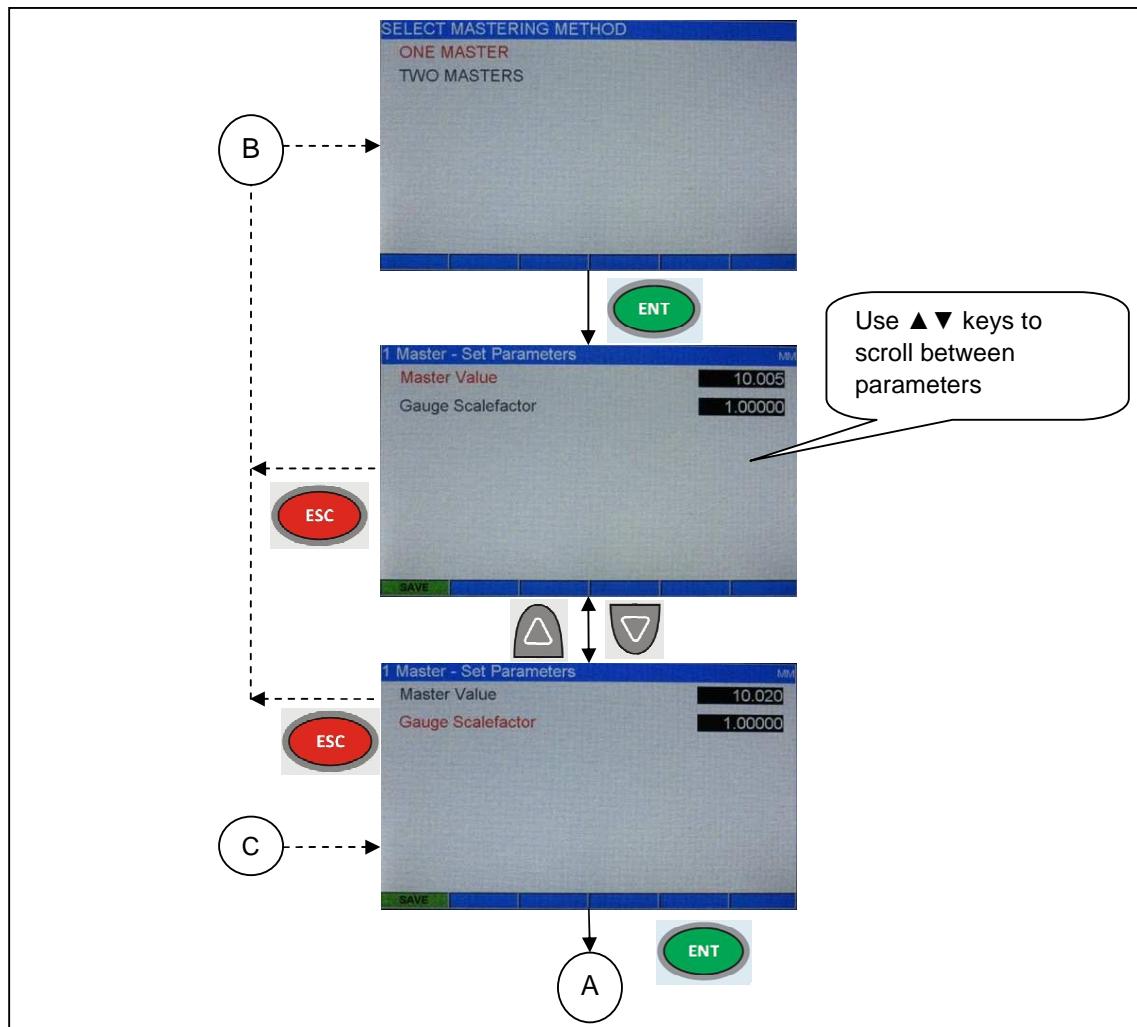
Here master values to be used in gauge calibration can be set.

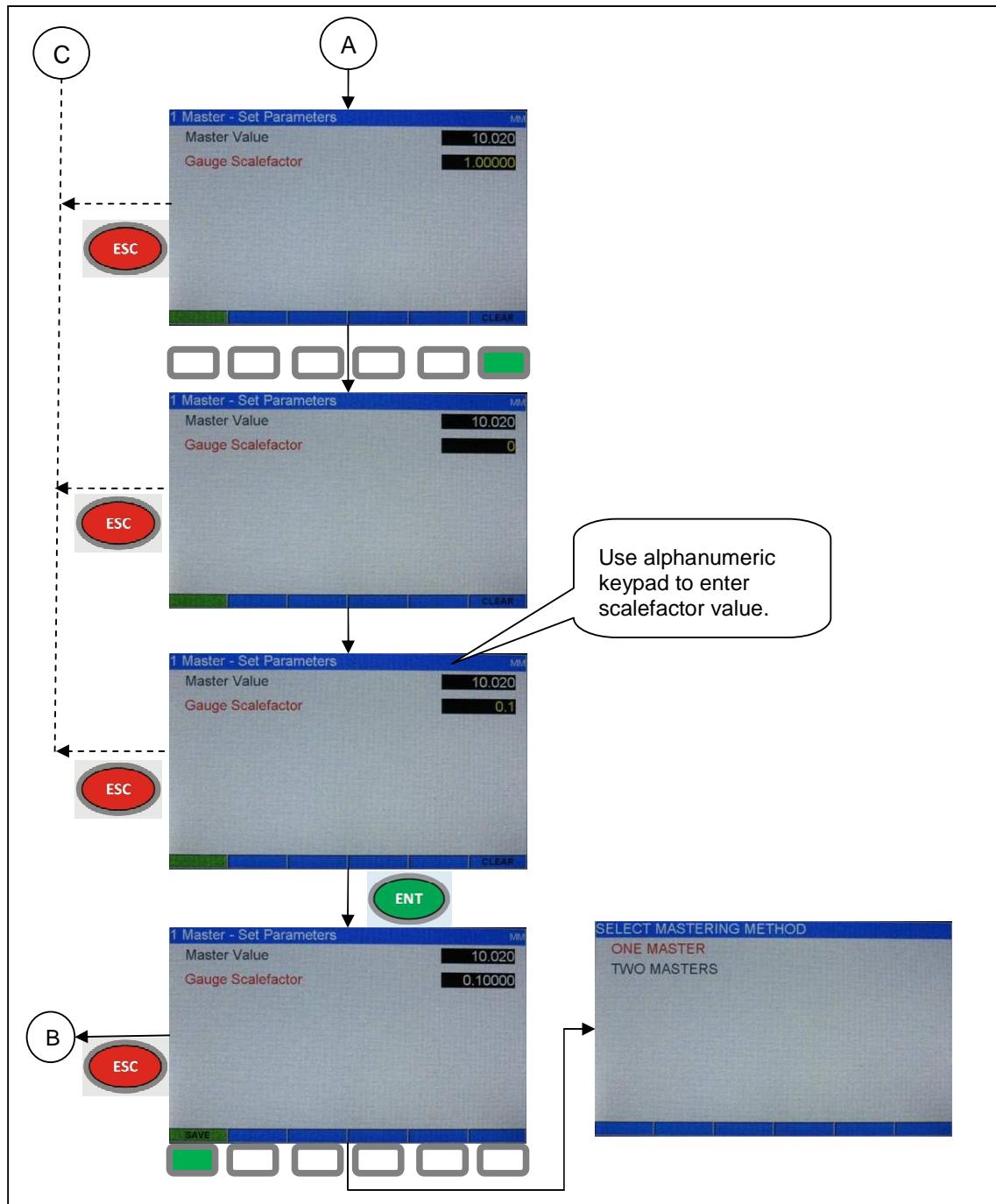
**Steps to edit single master parameters:**

1. Select parameter to be edited using UP/DOWN arrow keys.
2. Use 'ENT' key. Here selected parameter's value will get highlighted with yellow colour.
3. Use 'CLEAR' function key to reset the value to zero.
4. Use alphanumeric keypad to edit the value.
5. Once value editing is finished, press 'ENT' key to accept the edited value. Here value colour will be changed to white.
6. Once both parameter's values are set, use 'SAVE' key to save the edited values.
7. At any instance while editing use ESC key to exit the edit mode.
8. At any instance while editing use CLEAR function key to reset the edited value to zero.

**Operational Flowchart:**

EXAMPLE: Edit the gauge scale factor





1. It is recommended to perform two point calibration (DOUBLE MASTERING) before going for single mastering.
2. By default gauge scale factor value is 1.00000 or -1.00000 depending on dimension under measurement.
3. Gauge scale factor value depends on two point calibration.

## PRESET VALUE

Here user can set the presetting option to be used in measurement mode.

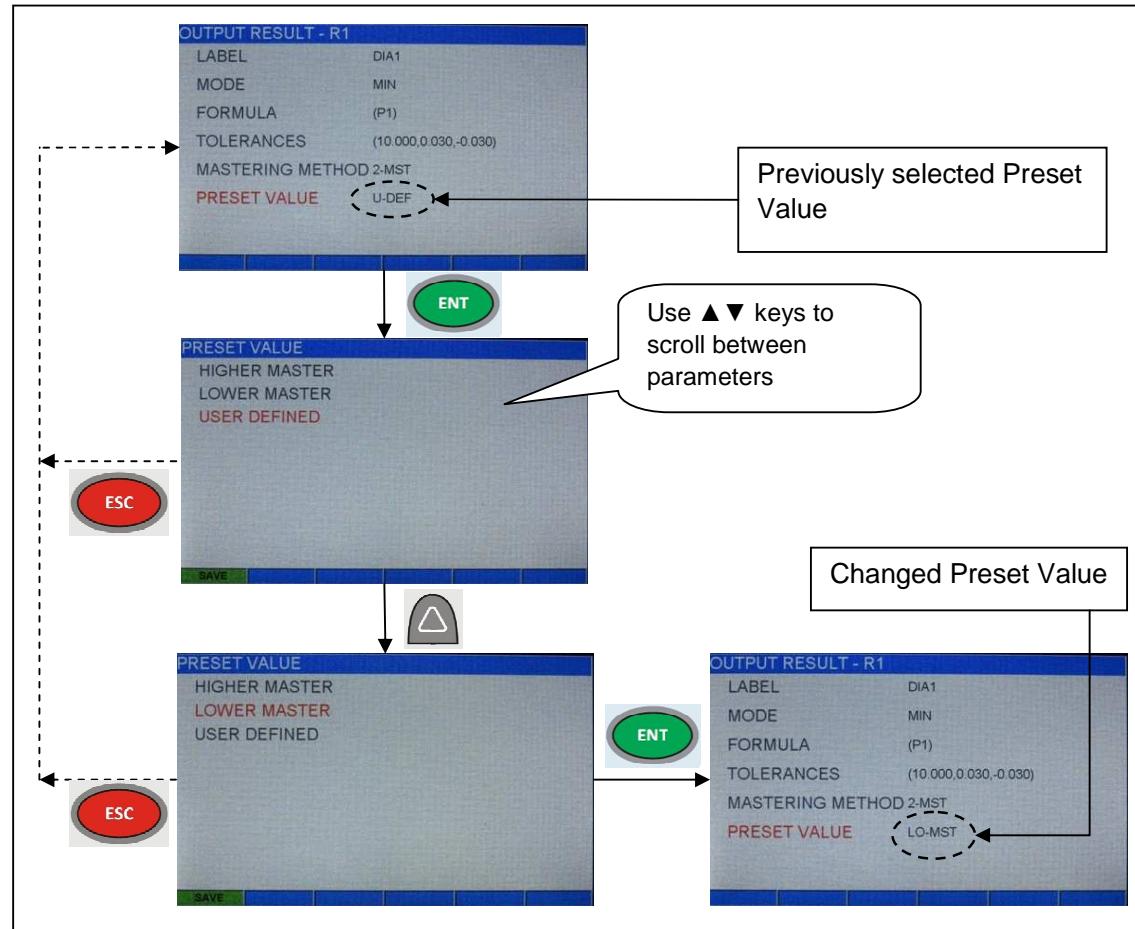
There are 3 options available –

1. Higher Master – In measurement mode, output result can be preset to higher master value only. (This higher master value entry is already set in 2 Masters – mastering method.)
2. Lower Master – In measurement mode, output result can be preset to lower master value only. (This lowerer master value entry is already set in 2 Masters – mastering method.)
3. User Defined – In measurement mode, output result can be preset to any value within selected display resolution. (This value can be set during measurement mode.)

### Preset Type Setting Steps:

1. At ‘OUTPUT RESULT - Rx’ screen, using UP/DOWN keys select ‘PRESET VALUE’ parameter and press ENT key.
2. ‘PRESET VALUE’ screen with previously selected option is displayed.
3. Use UP/DOWN key to select another option.
4. Use ‘SAVE’ function key to save the edited value.
5. At any instance press ‘ESC’ to go back to previous screen.

### Operational Flowchart:

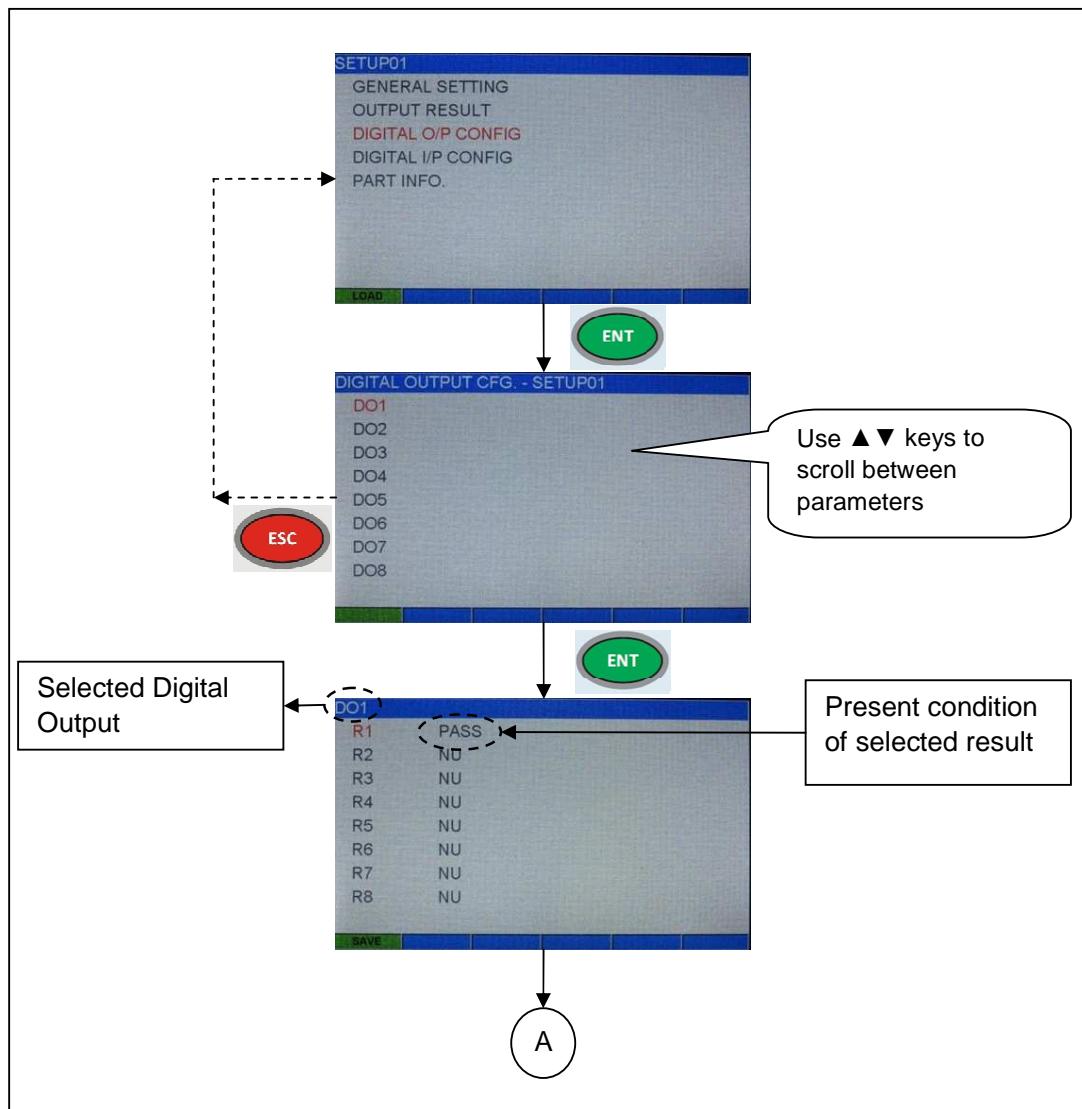


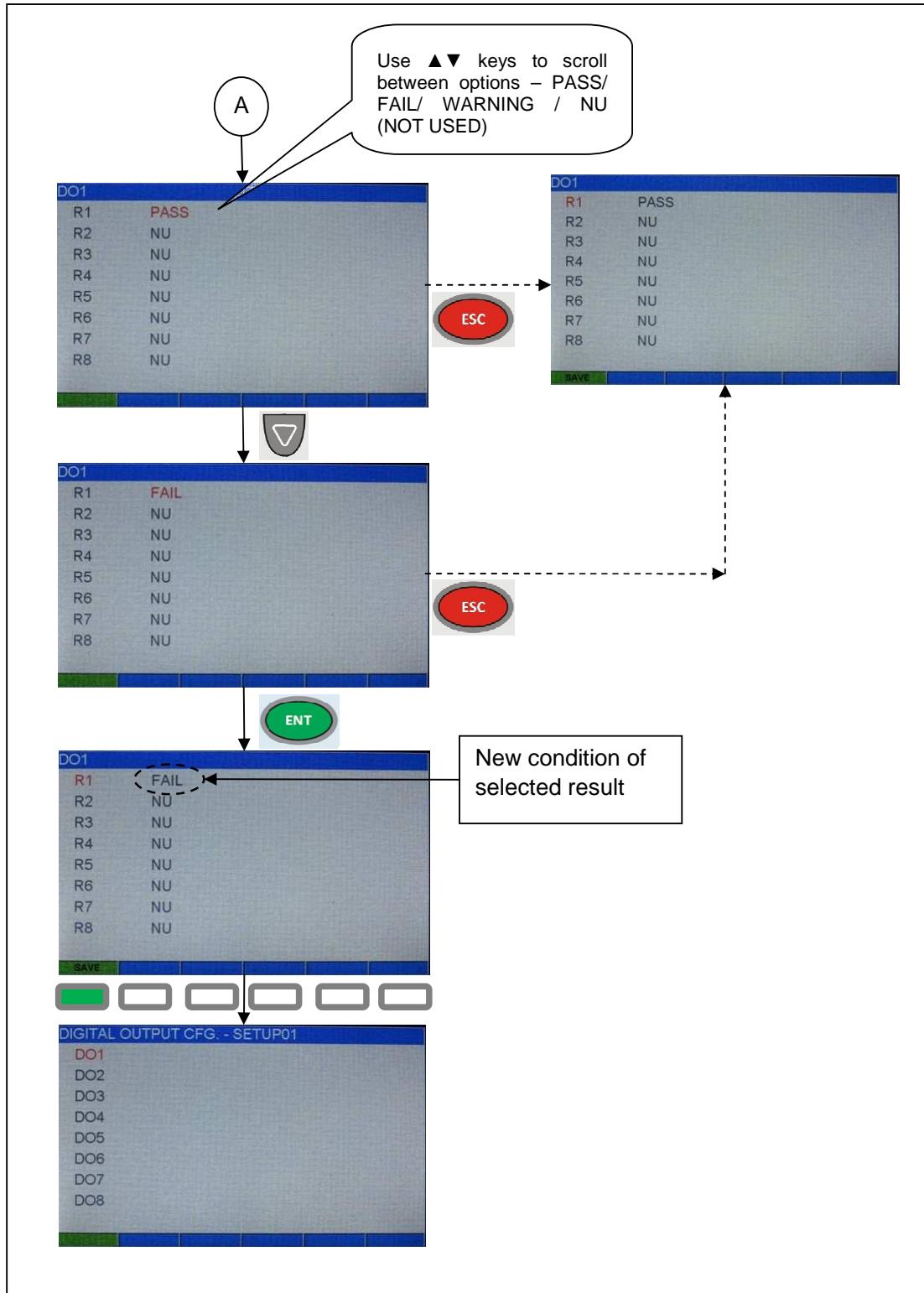
## DIGITAL OUTPUT CONFIGURATION

Here isolated digital output's operating condition based on selected results and their operating region(PASS / FAIL / WARNING) can be set.

**Example:** Refer following flow chart, where DO1 output becomes ON only if R1 result is in FAIL region.

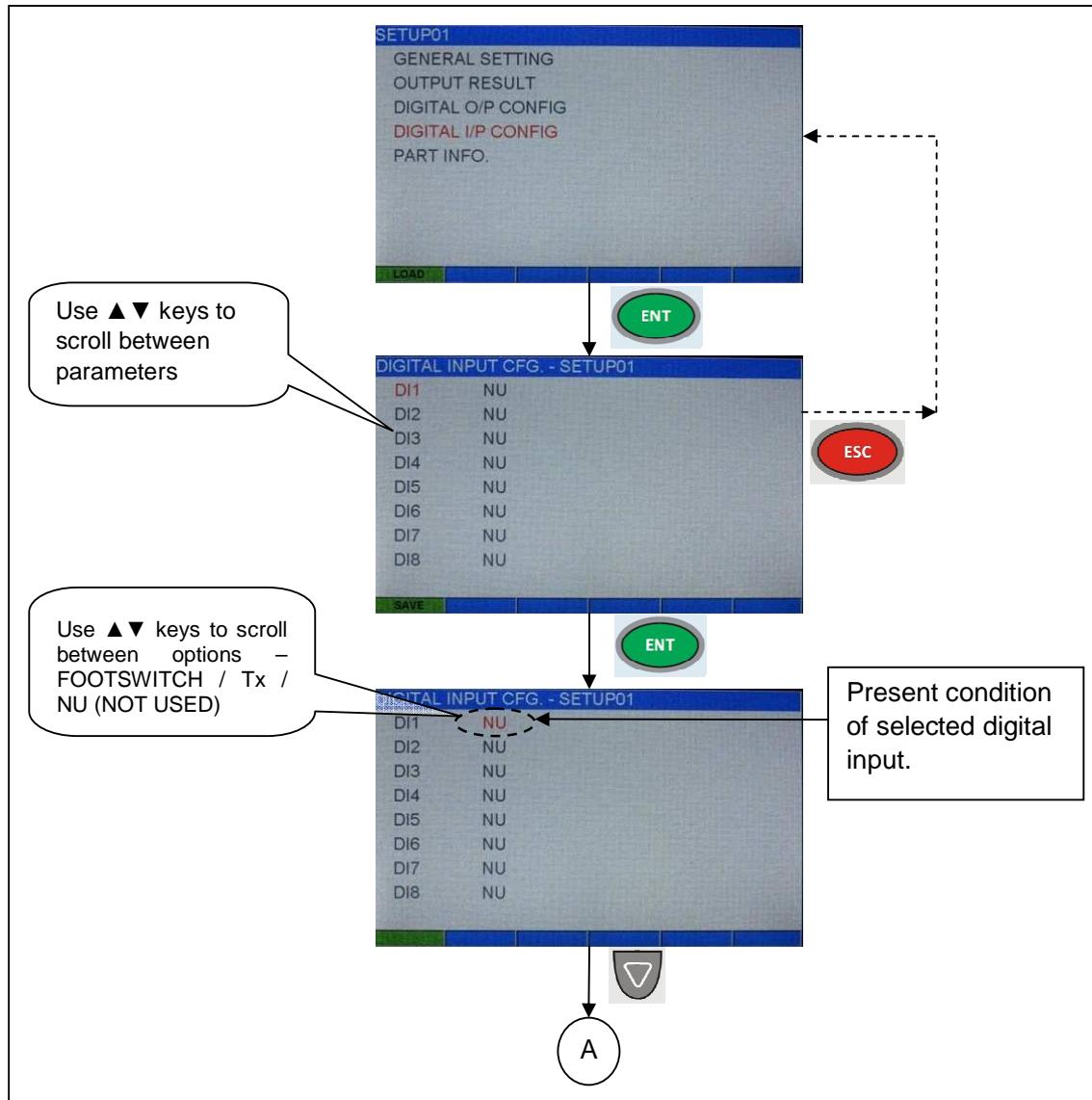
### **Operational Flowchart:**

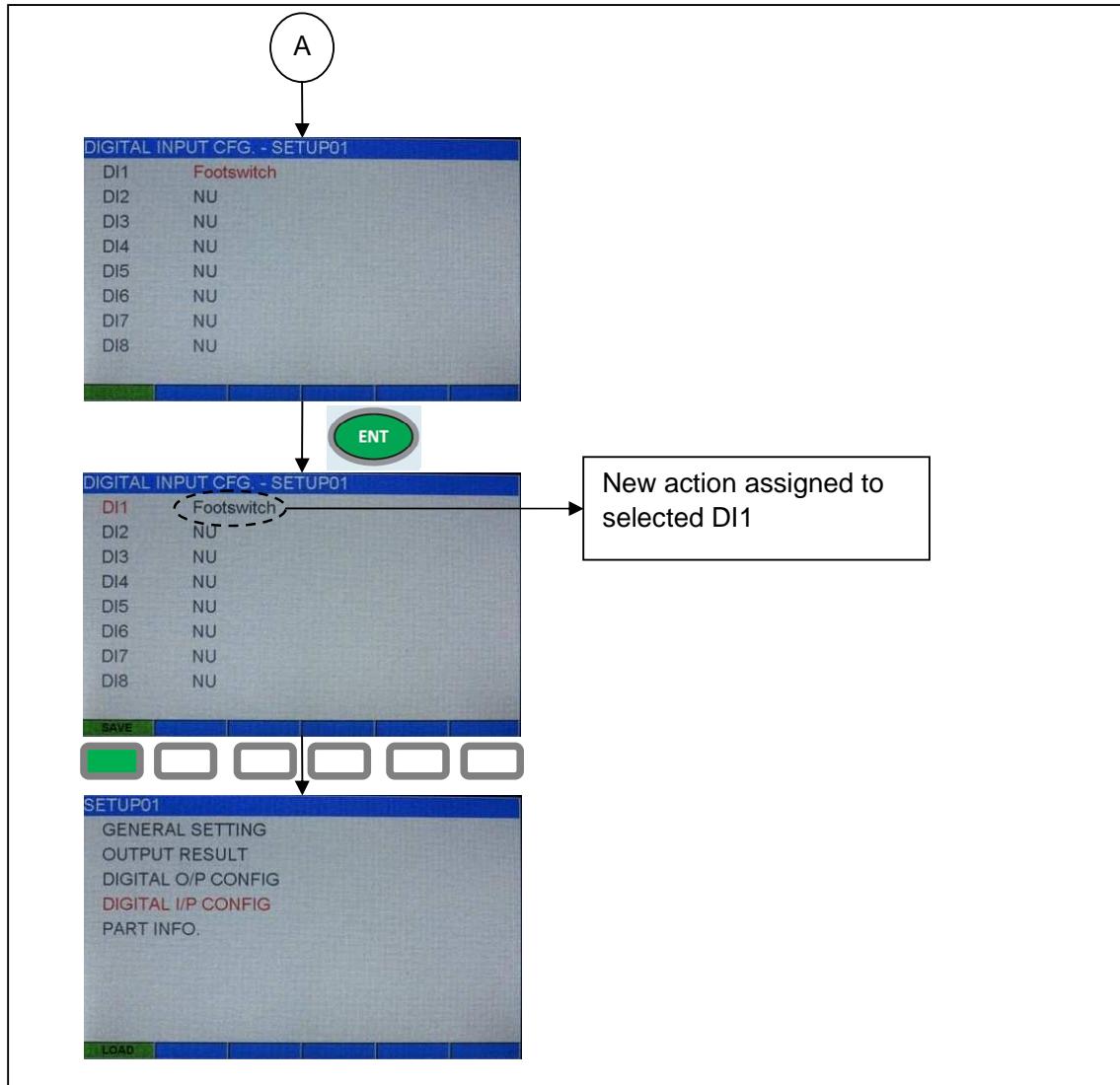




## DIGITAL INPUT CONFIGURATION

Here isolated digital inputs can be configured to perform footswitch action or transmission action. Here, input action, such as Footswitch, transmit, NU (not in use), can be set.





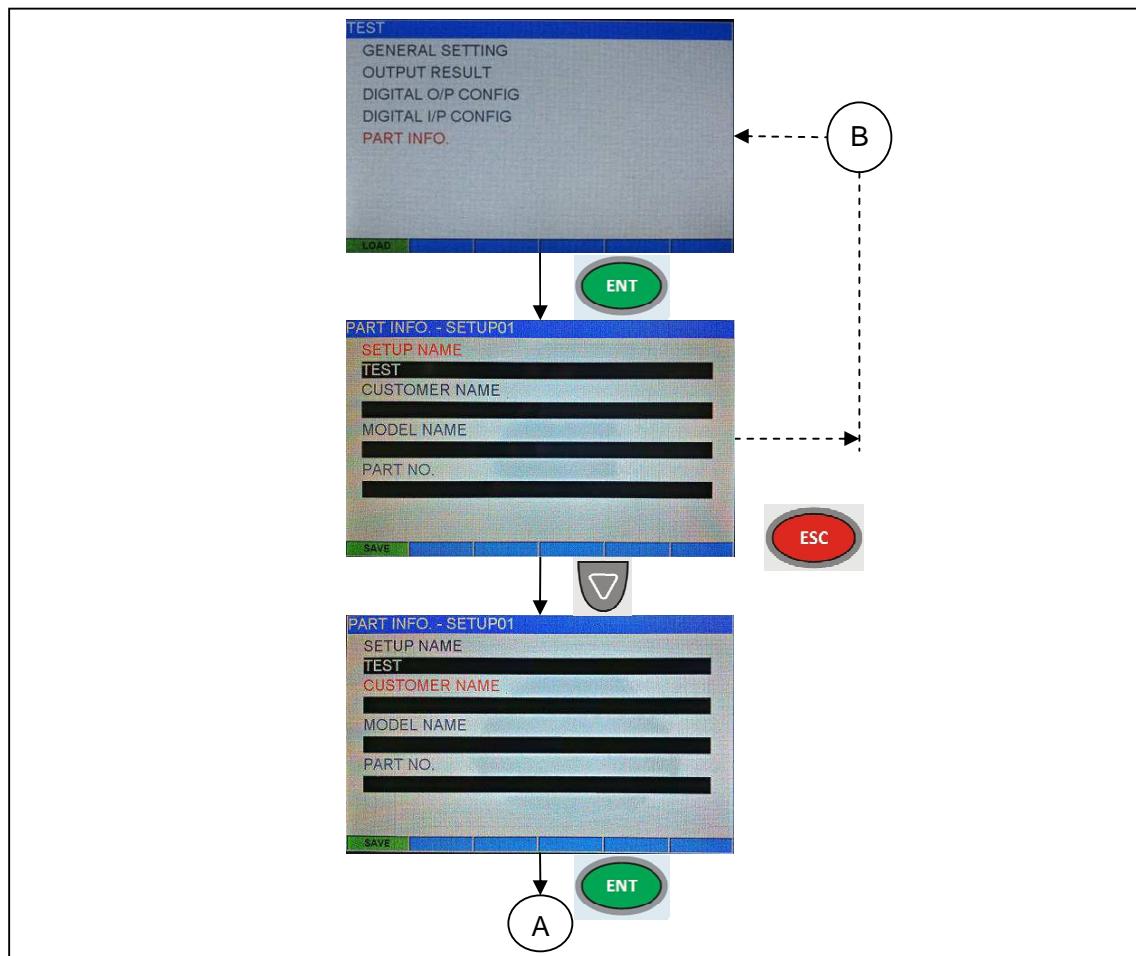
## PART INFO

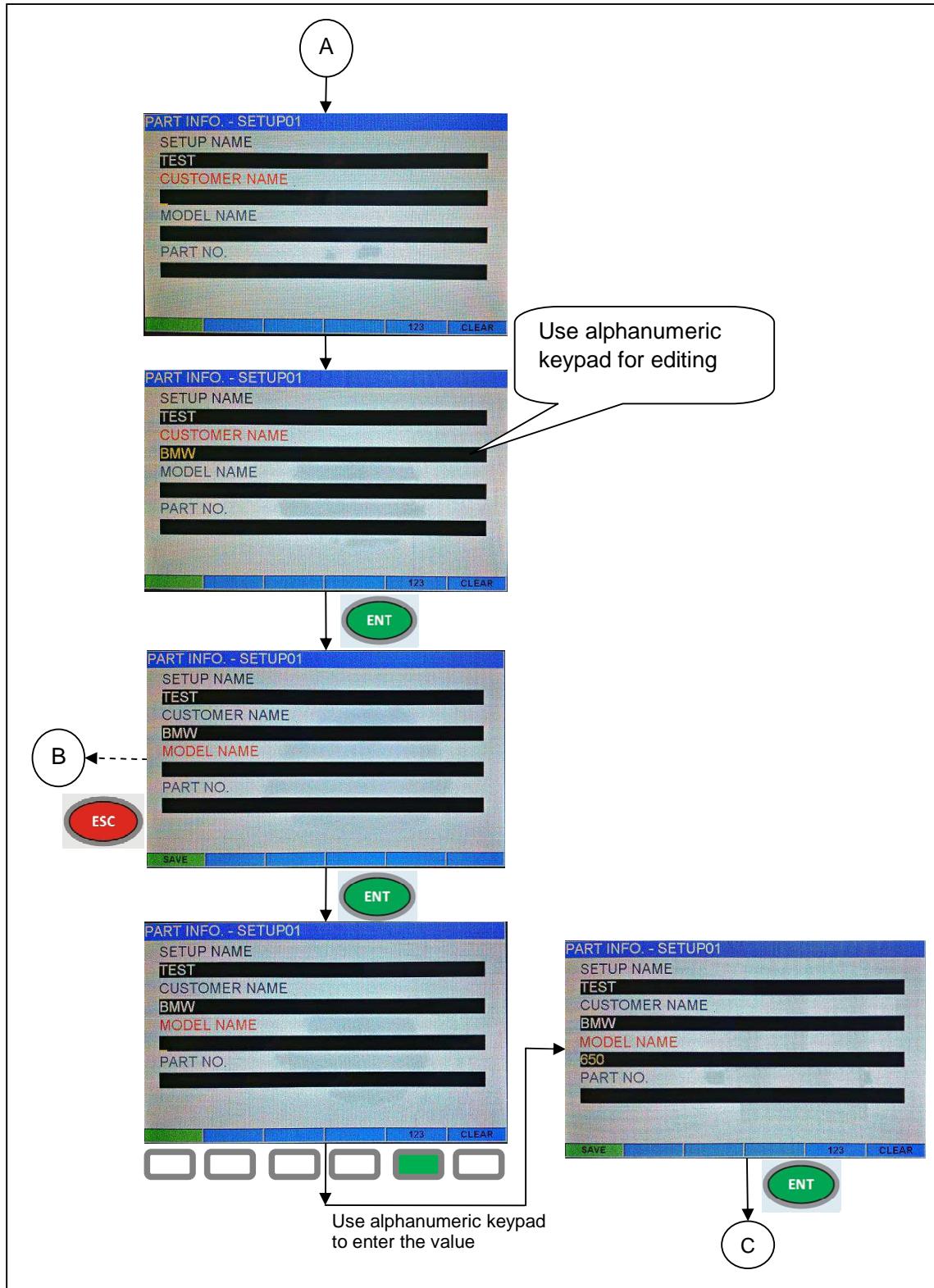
Here, customer name, model name and part number can be set.

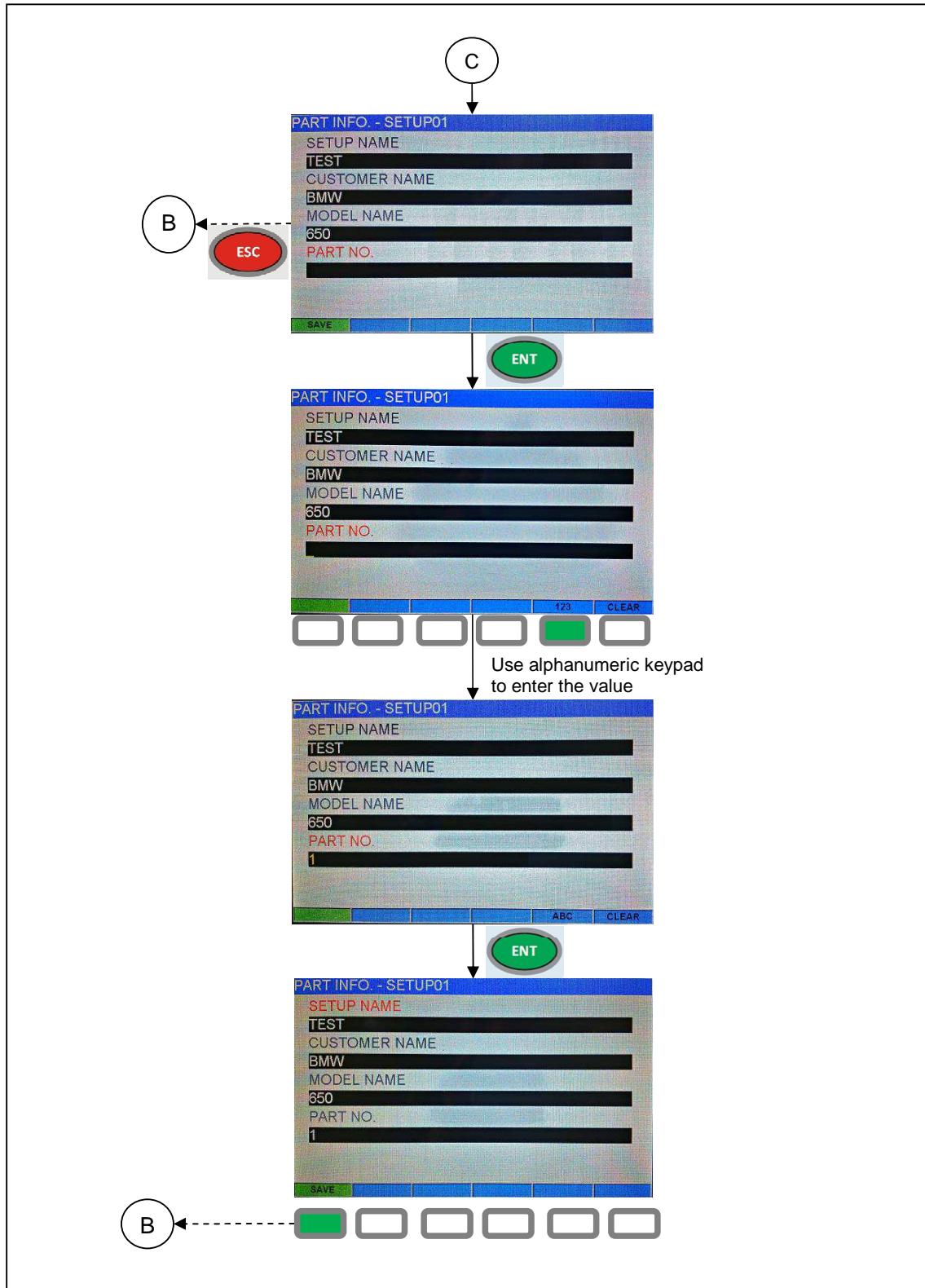
### Steps for editing Part Information:

1. In 'SETUPxx' menu, use UP/DOWN arrow key to select "PART INFO" option and press 'ENT' key. Now 'PART INFO. - SETUPxx' screen will appear.
2. Use 'UP/DOWN' keys to select the parameter to be edited.
3. Press 'ENT' key, selected parameter's value will get highlighted.
4. Use 'CLEAR' function key to clear the display and start editing. Here cursor at home position will appear.
5. Use alphanumeric keypad to enter a character.
6. Use 'ABC' function key to activate alphabetic entry.
7. Use '123' function key to activate numeric entry.
8. Use LEFT / RIGHT arrow keys for shifting cursor.
9. Once editing is done, press ENT function key to save the edited value temporarily.
10. Once editing of all parameters is done then press SAVE key to save the edited values in memory.
11. At any instance press 'ESC' key to go back to previous screen.

### Operational Flowchart:





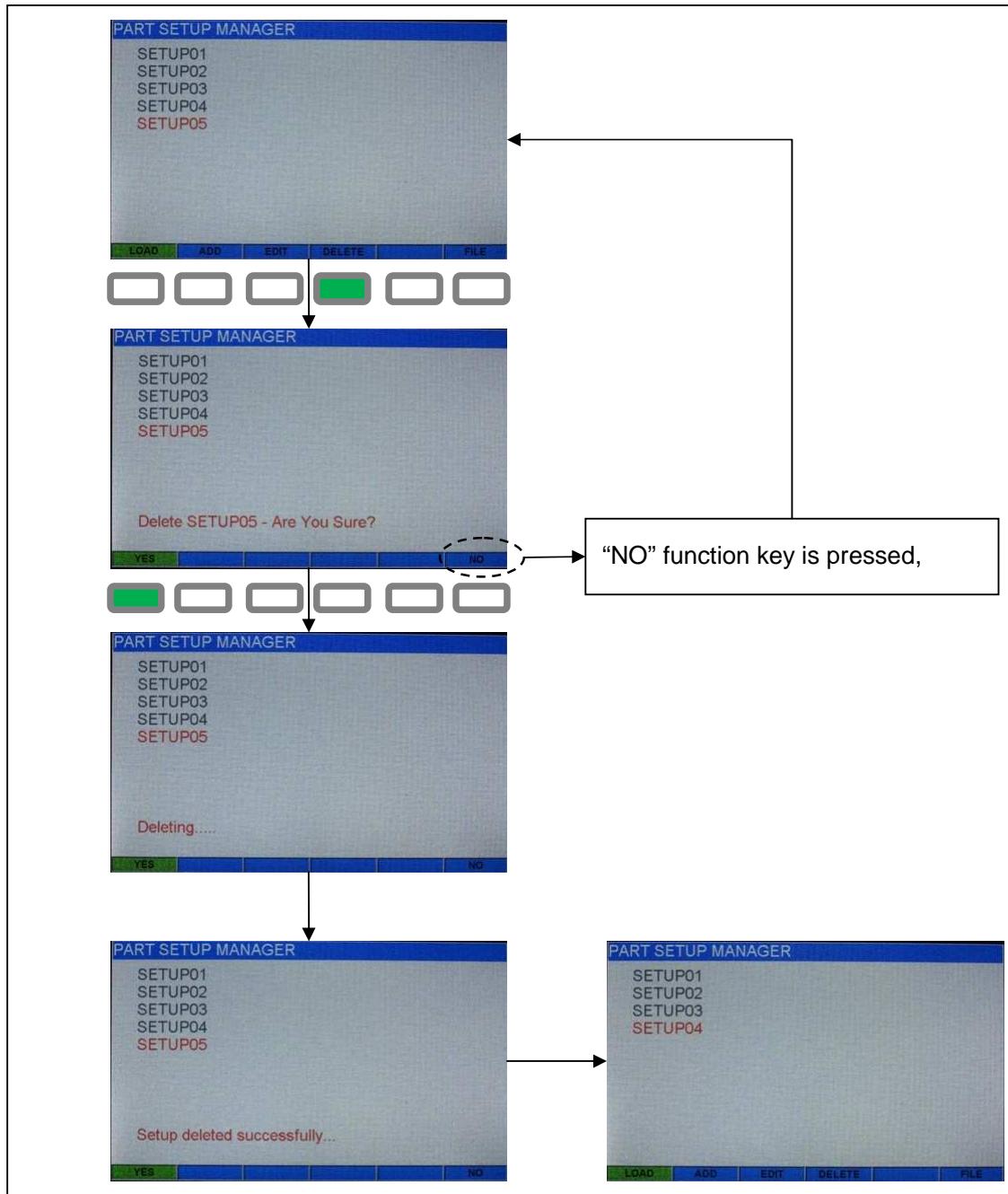


## DELETE SETUP

User can delete a setup.

Once setup is deleted its parameter settings and its log file cannot be retrieved.

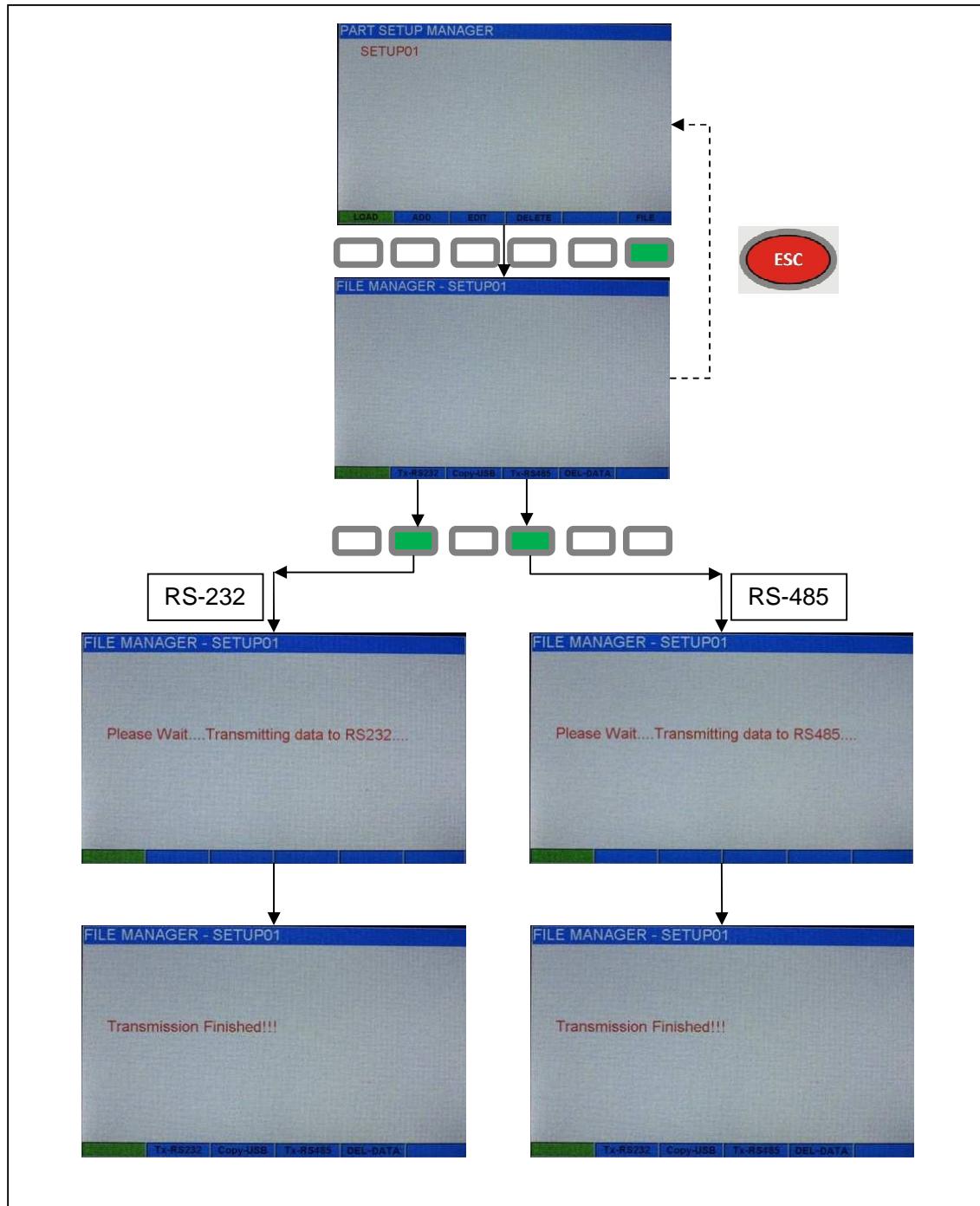
### *Operational flowchart:*



## FILE MANAGER

User can transmit the LOG file of desired setup through RS232 or RS485 interface. Also user can copy it into the USB thumb drive.

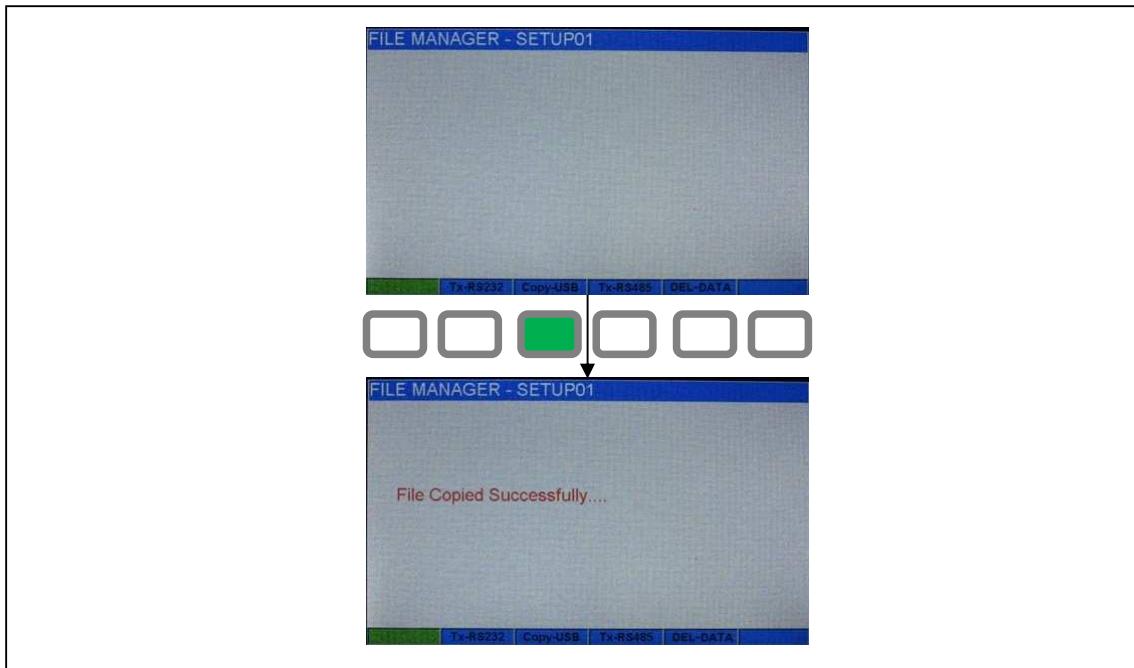
*Operational Flowchart for RS232 and RS485:*



**Copy- to USB mass storage device**

User can copy stored log file into the USB thumb drive.

*Operational Flowchart:*



## Delete Data

Here readings stored in measurement mode can be erased.

### Operational flowchart:



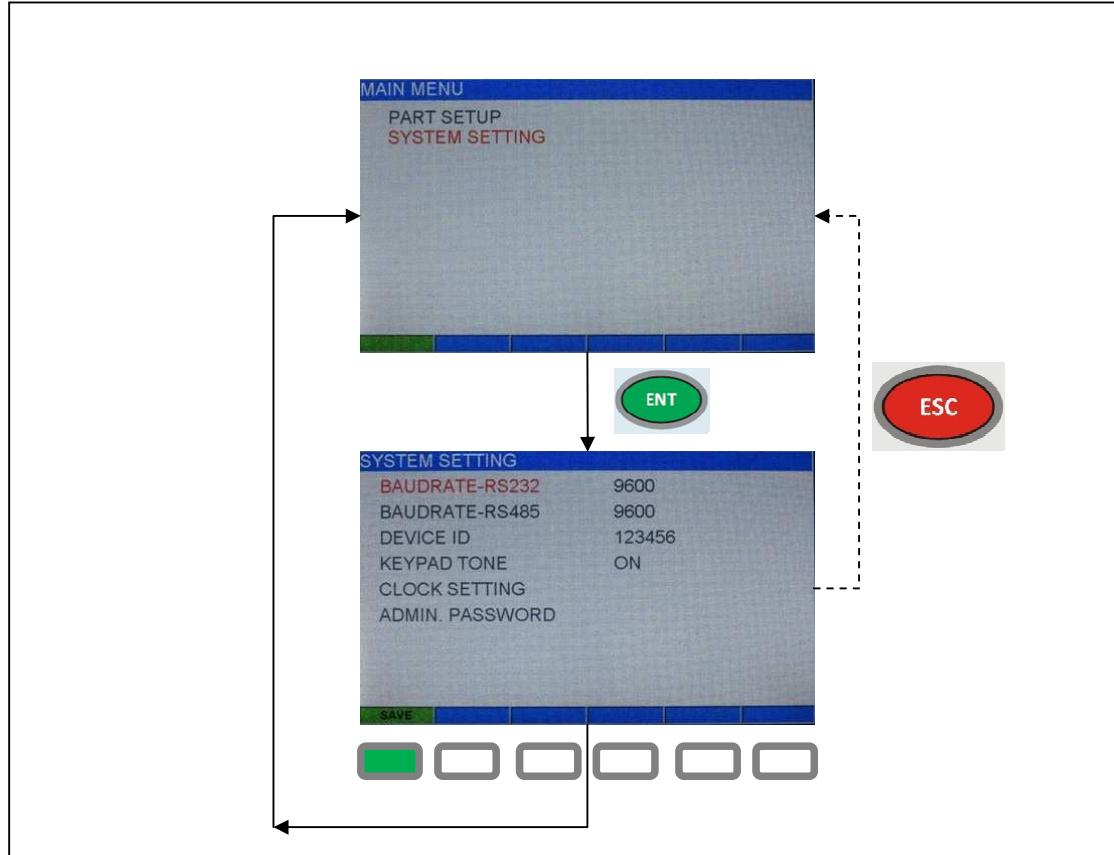
## SYSTEM SETTINGS

**Baud rate Settings (RS-232 & RS-485), Device ID, Keypad Tone, Clock Setting and Administrator Password**

### Steps to enter the SYSTEM SETTINGS:

1. At 'MAIN MENU' screen, use 'UP/DOWN' key to select 'SYSTEM SETTINGS' option.
2. Press 'ENT' key to confirm the selection. Here, 'SYSTEM SETTING' screen will appear.
3. Once parameter editing is finished, press 'SAVE' function key to save changes.
4. At any instance, press 'ESC' to go back to the previous menu.

### *Operational Flowchart:*



**BAUD RATE (RS-232)**

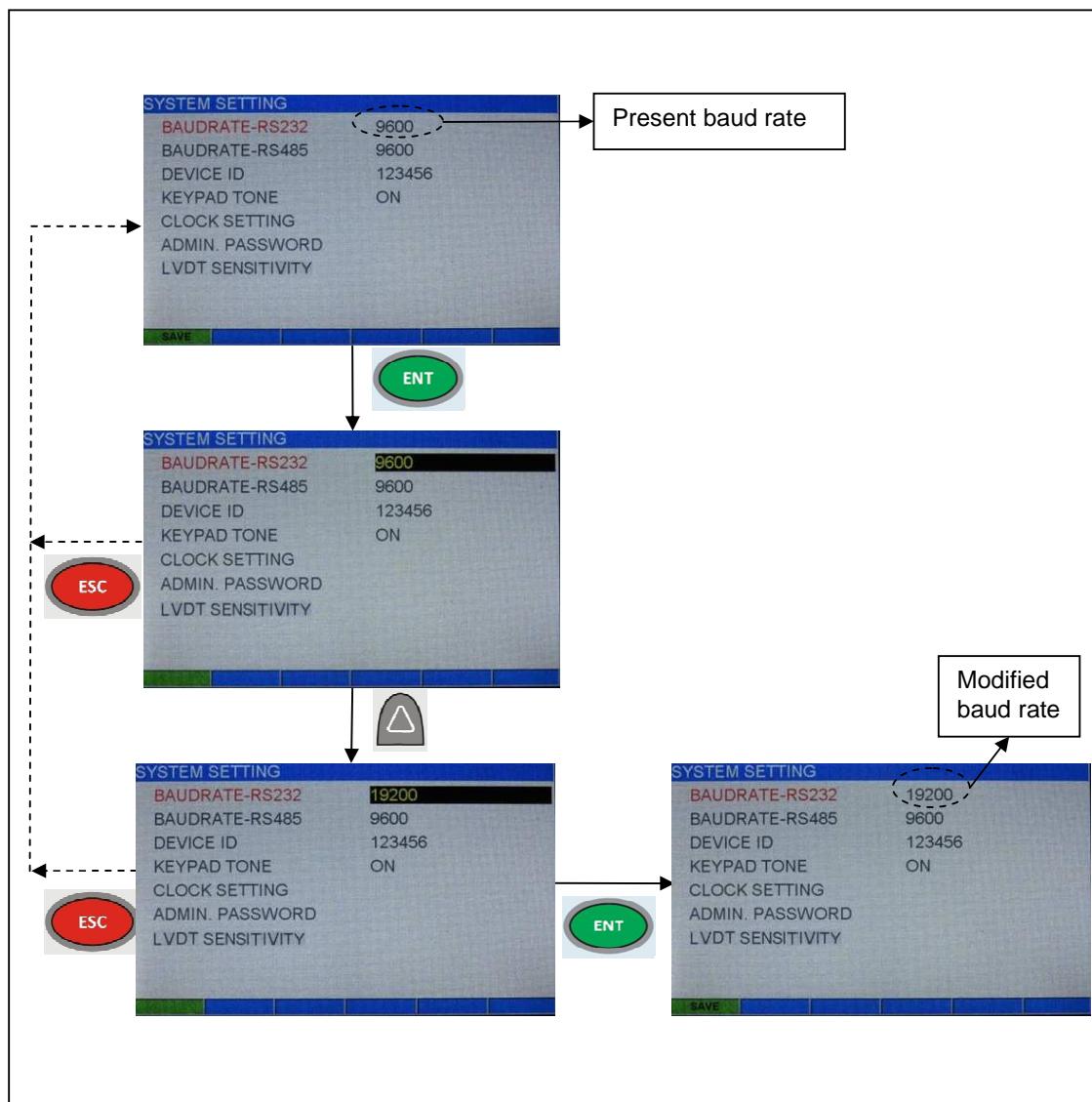
Baud rate can be set in range from 2400bps to 115200bps.

Always keep following setting for communication port at PC side:

**Parity: None, Data Bits: 8, Stop Bit(s): 1, Flow control: None**

**Steps to edit:**

1. At ‘SYSTEM SETTING’ screen, using ‘UP/DOWN’ key, select “BAUDRATE-RS232” parameter.
2. Press ‘ENT’ key. Present baud rate setting will be highlighted.
3. Change setting, if required by using ‘UP/DOWN’ key.
4. Press ‘ENT’ key to confirm the selection.
5. Press ‘ESC’ key to go to the previous menu.

**Operational Flowchart:**

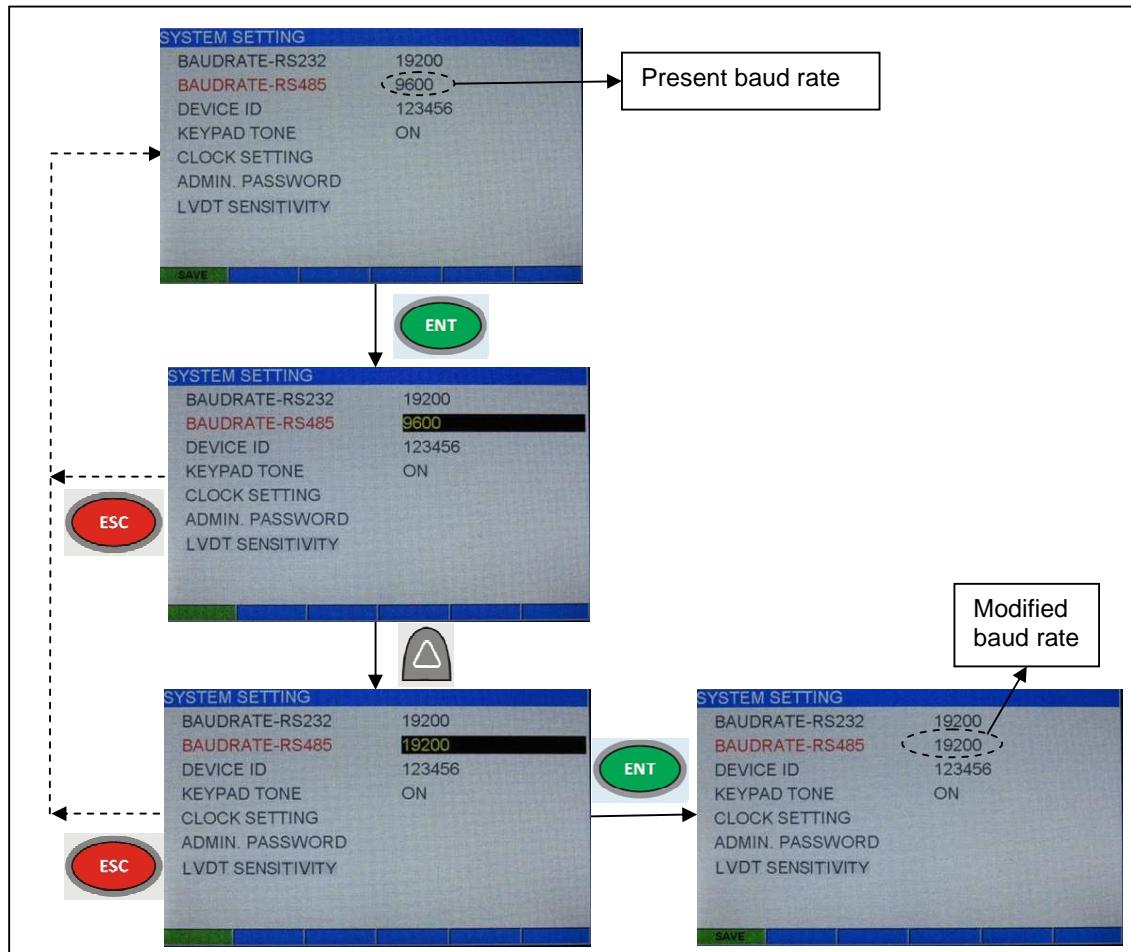
## BAUD RATE (RS-485)

Baud rate can be set in range from 2400bps to 115200bps.

### Steps to edit:

1. At ‘SYSTEM SETTING’ screen, using ‘UP/DOWN’ key, select “BAUDRATE-RS485” parameter.
2. Press ‘ENT’ key. Present baud rate setting will be highlighted.
3. Change setting, if required by using ‘UP/DOWN’ key.
4. Press ‘ENT’ key to confirm the selection.
5. Press ‘ESC’ key to go to the previous menu.

### Operational Flowchart:

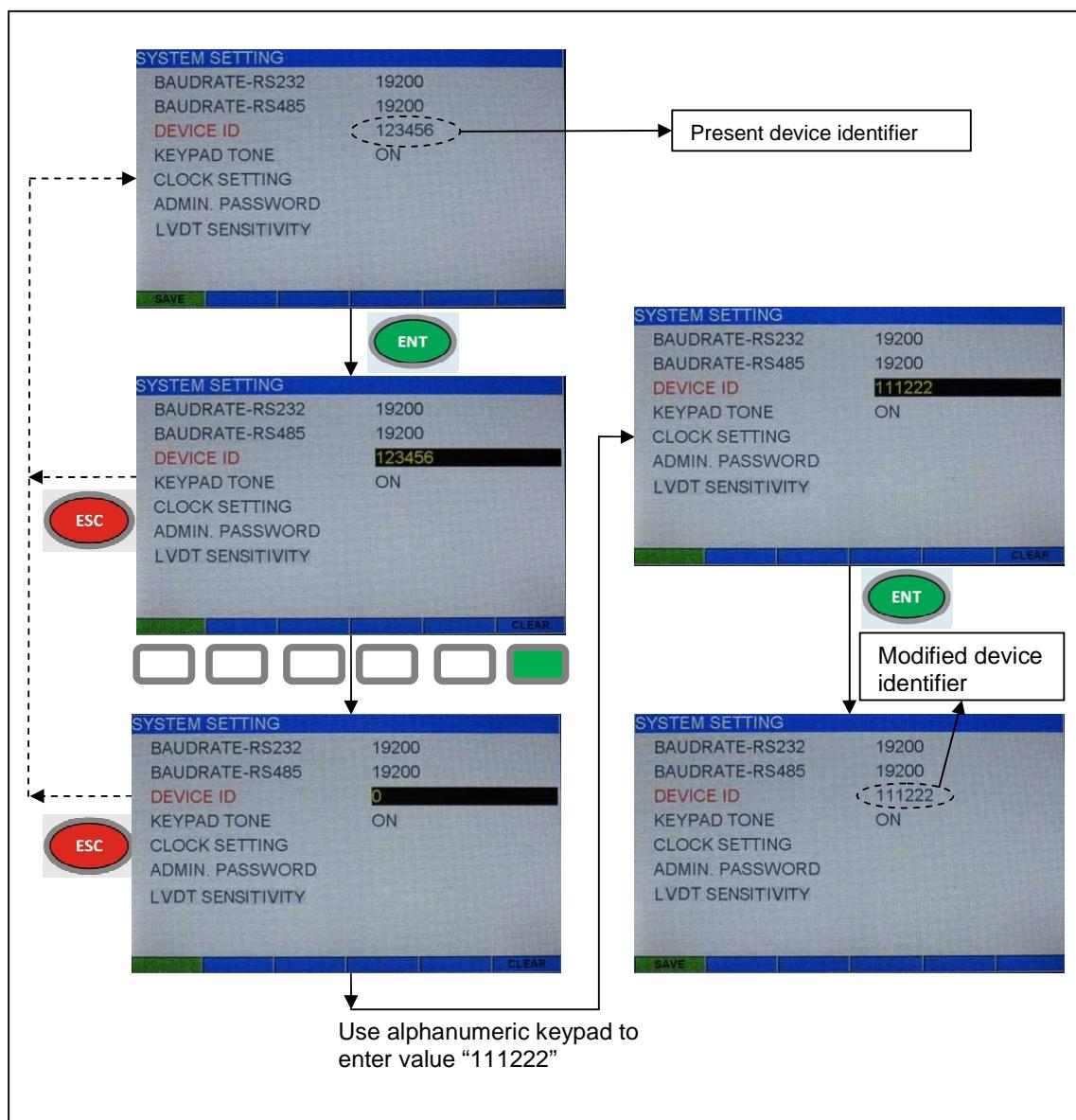


**DEVICE ID**

Device ID can be set from '000000-999999'

**Steps to change the DEVICE ID:**

1. At 'SYSTEM SETTING' screen, use 'UP/DOWN' key to select 'DEVICE ID' Parameter, then press 'ENT' key.
2. Previous device ID will be highlighted.
3. Press 'CLEAR' key to start the editing. Here value will get reset to zero.
4. Use alphanumeric keypad, to feed the new DEVICE ID.
5. Press 'ENT' key to confirm the DEVICE ID
6. At any instance of the time press 'ESC' to go back to the previous menu.

***Operational Flowchart:***

### KEYPAD TONE

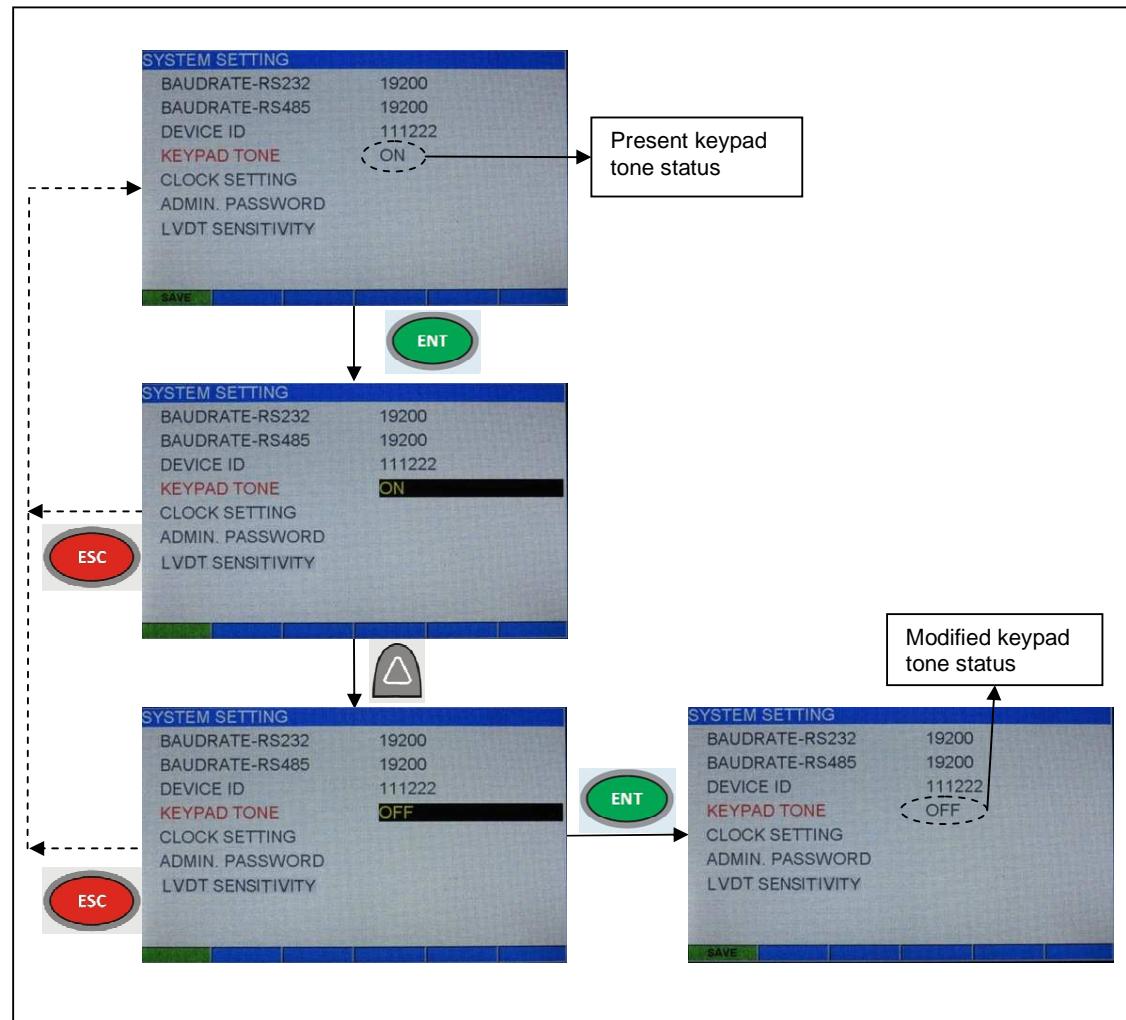
At each screen in SETUP MODE, PRESET MODE and CALIBRATION MODE unit gives small beep for valid keypad operation and long beep for invalid keypad usage.

Keypad tone can set ON / OFF to disable small beep on valid key press.

#### Steps to edit the KEYPAD TONE:

1. At the 'SYSTEM SETTING' screen using 'UP/DOWN' keys, select 'KEYPAD TONE' option.
2. Press 'ENT' key previous status of keypad tone will be displayed
3. Change the keypad tone status, if required, using 'UP/DOWN' keys
4. Press 'ENT' key to confirm the selection.
5. At any instance, press 'ESC' key to go back to the previous menu.

#### Operational Flowchart:



**CLOCK SETTINGS**

Date can be set in DD-MM-YY format and time can be set in 24 hours, HH-MM-SS format.

**Steps to set Clock:**

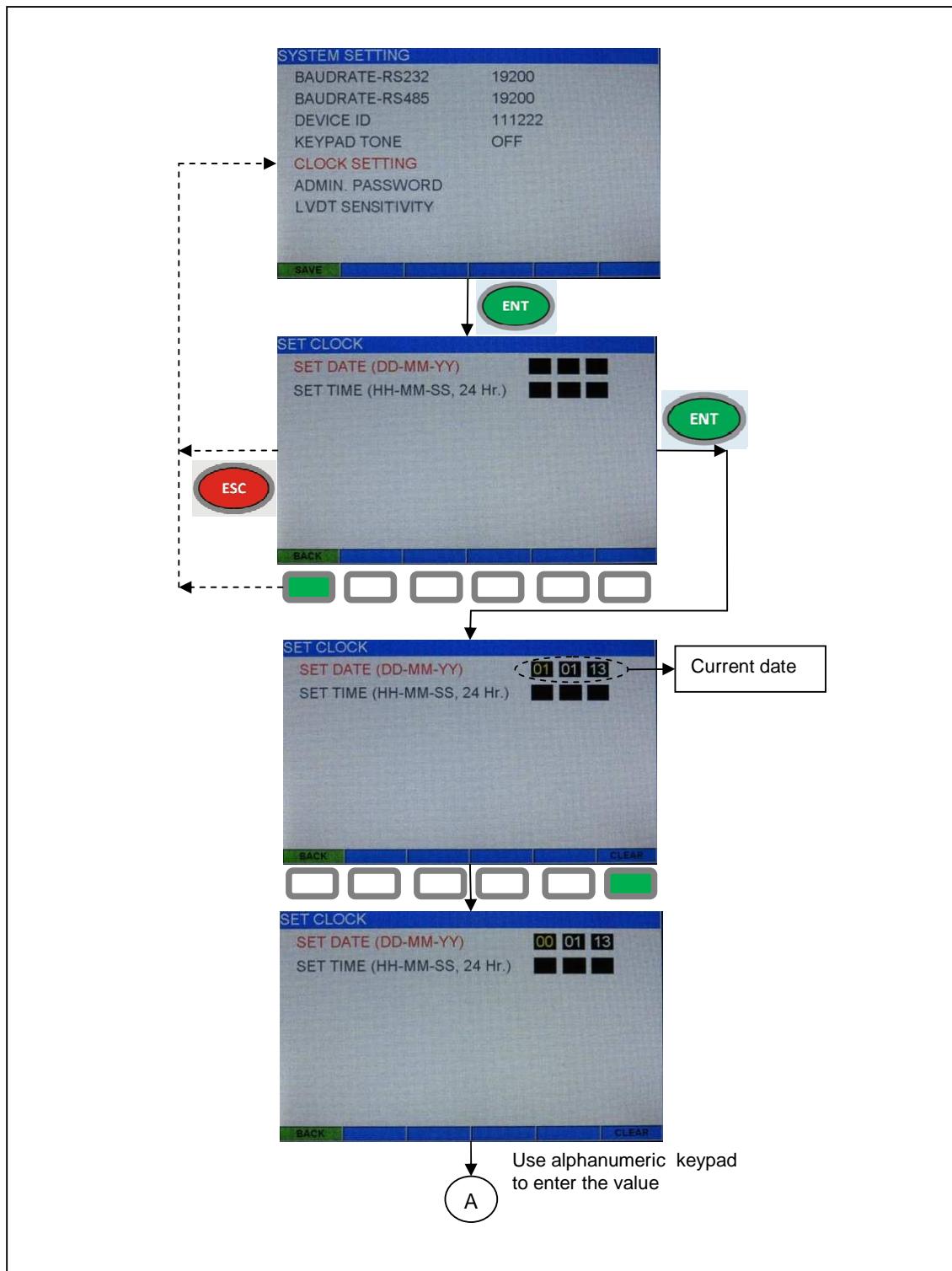
1. At 'SYSTEM SETTING' default screen, using UP/DOWN key, select "CLOCK" parameter & press ENT key.
2. Use 'UP/DOWN' key to select 'SET DATE' or 'SET TIME' parameter for further modification.

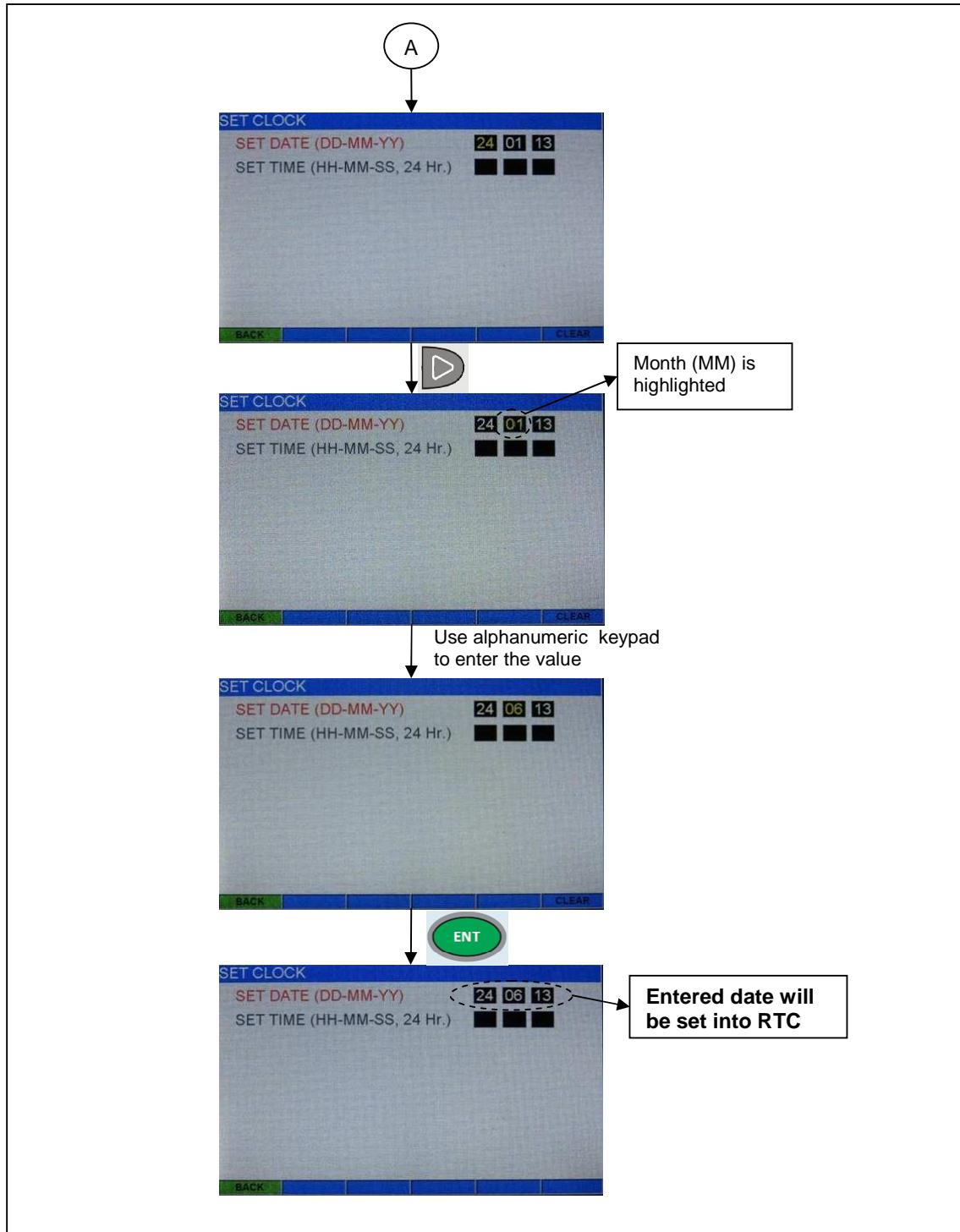
**Steps to edit the date:**

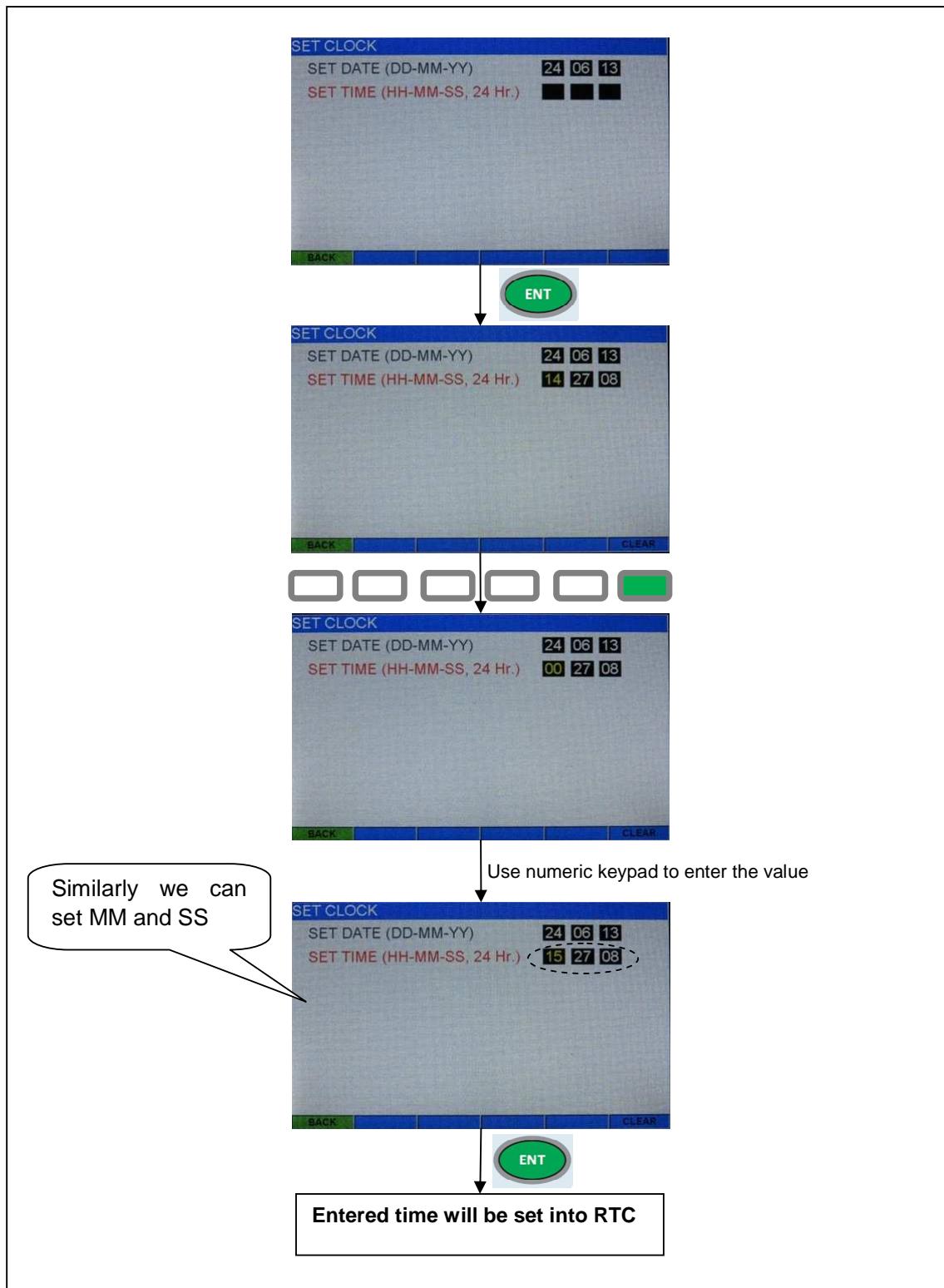
1. Select 'SET DATE (DD-MM-YY)' option and press ENT key. current date will be displayed.
2. Use numeric keypad '0' to '9' keys to set current date value (01 to 31), current month value (01 to 12), current year value (00 to 99).
3. At any instance, user can select parameter i.e. DD or MM or YY using LEFT or RIGHT key. Selected parameter's digits will get highlighted.
4. Once editing is finished, press 'ENT' key for confirmation of the edited values.
5. At any instance press 'CLR' key to reset the edited value.
6. At any instance press 'ESC' key to back to previous screen.

**Steps to edit the time:**

1. Select 'SET TIME (HH-MM-SS, 24 Hr.)' option & press ENT key
2. Use numeric keypad '0' to '9' keys to set current hour value (00 to 23), current minute value (00 to 59), current seconds value (00 to 59).
3. At any instance, user can select parameter i.e. HH or MM or SS using LEFT or RIGHT key. Selected parameter's digits will get highlighted.
4. Once editing is finished, press 'ENT' key for confirmation of the edited values.
5. At any instance press 'CLR' key to reset the edited value.
6. At any instance press 'ESC' key to back to previous screen.

***SET DATE - Operational Flowchart:***



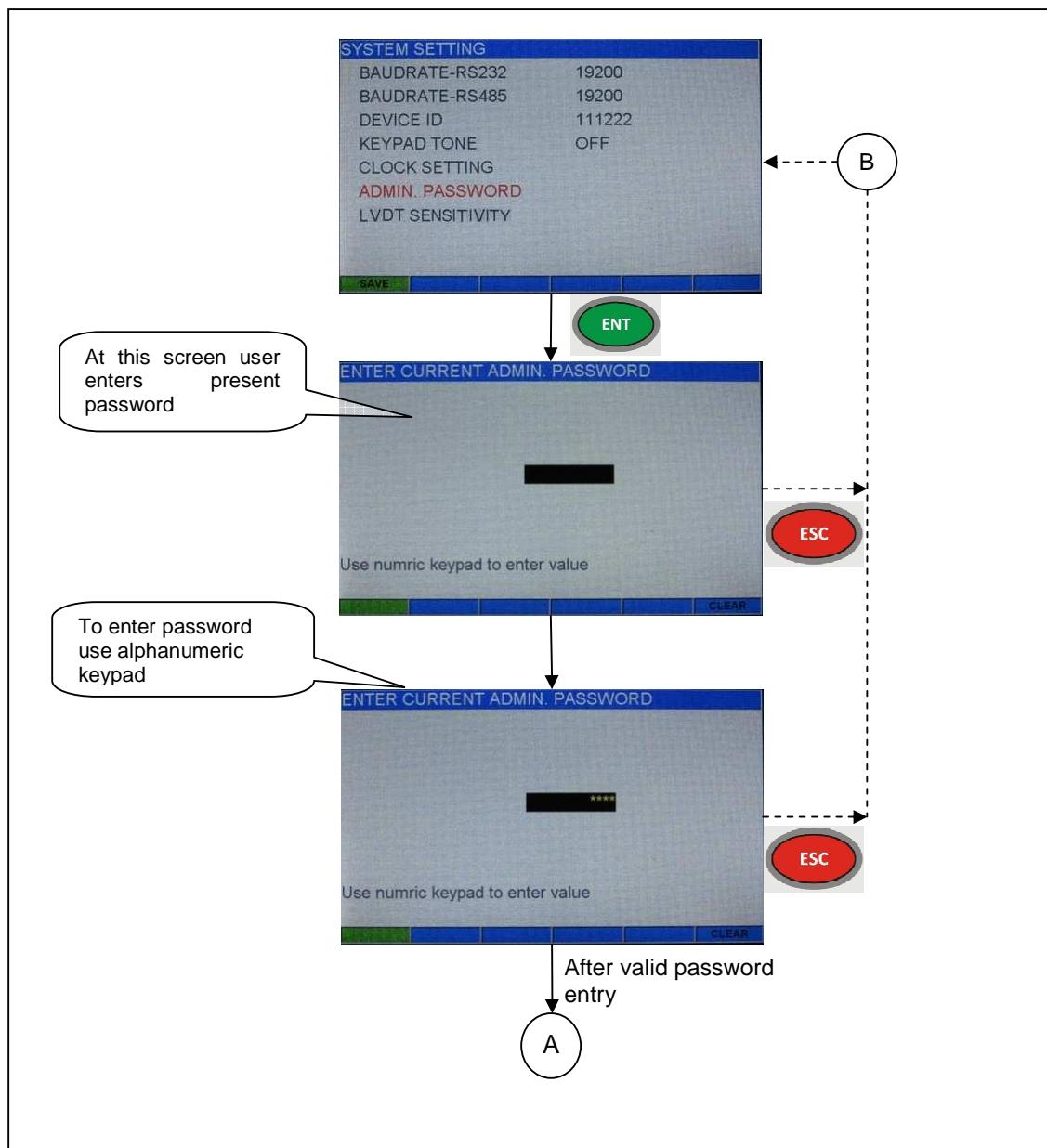
**SET TIME – Operational Flowchart:**

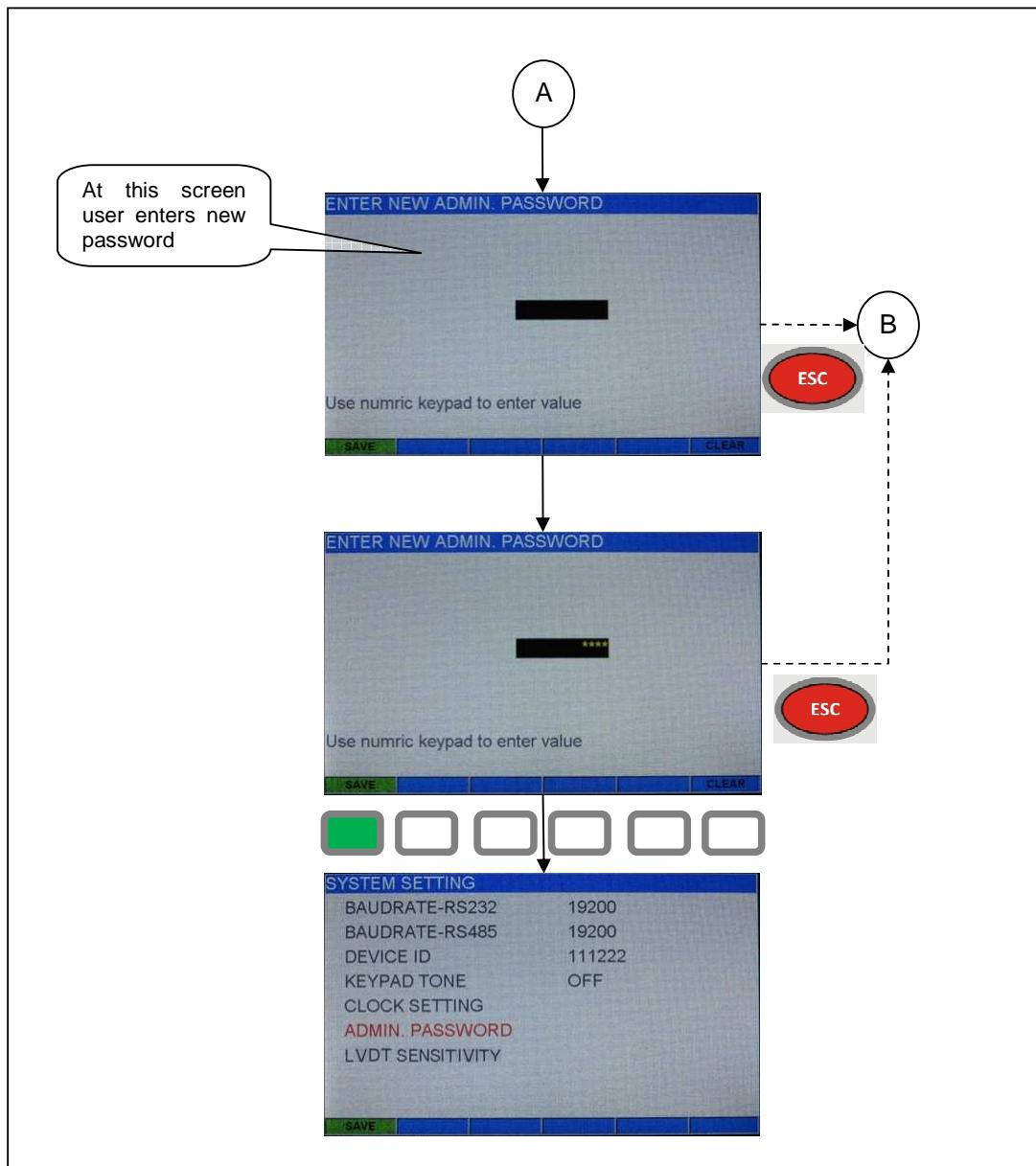
## ADMIN PASSWORD

Password protection is provided to limit access to the setup mode parameters, so that non-authorized person cannot change the set values.

### Steps to set new password:

1. At 'SYSTEM SETTING' screen, use 'UP/DOWN' key to select 'ADMIN PASSWORD' parameter, then press 'ENT' key.
2. 'ENTER CURRENT PASSWORD' screen will appear. User is supposed to feed present ADMIN password.
3. Use alphanumeric keys to enter current password. On every key press '\*' symbol will appear on display.
4. After entry of 4 digit password, press 'ENT' key.
5. If the password entry is correct then 'ENTER NEW PASSWORD' screen will appear. Otherwise error message will be displayed.
6. Only numeric entries are allowed.
7. Use alphanumeric keys ('0' to '9') to enter new password.
8. After entry of 4 digit password, press 'SAVE' key to save the changed password in memory. If password length is less than 4 digits then error beep will be heard.
9. At any instance press 'ESC' key to back to previous screen.

**Operational Flowchart:**



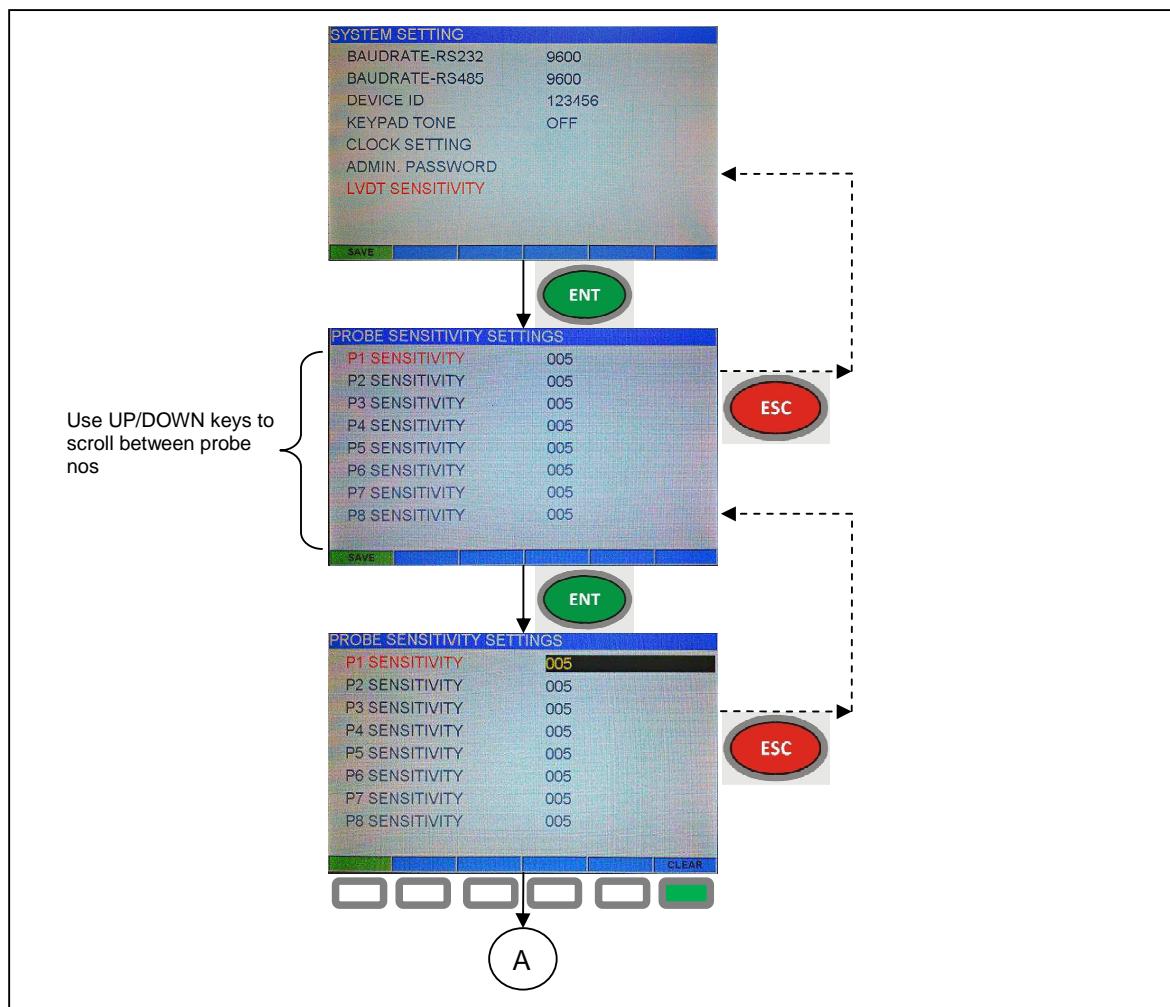
## PROBE SENSITIVITY

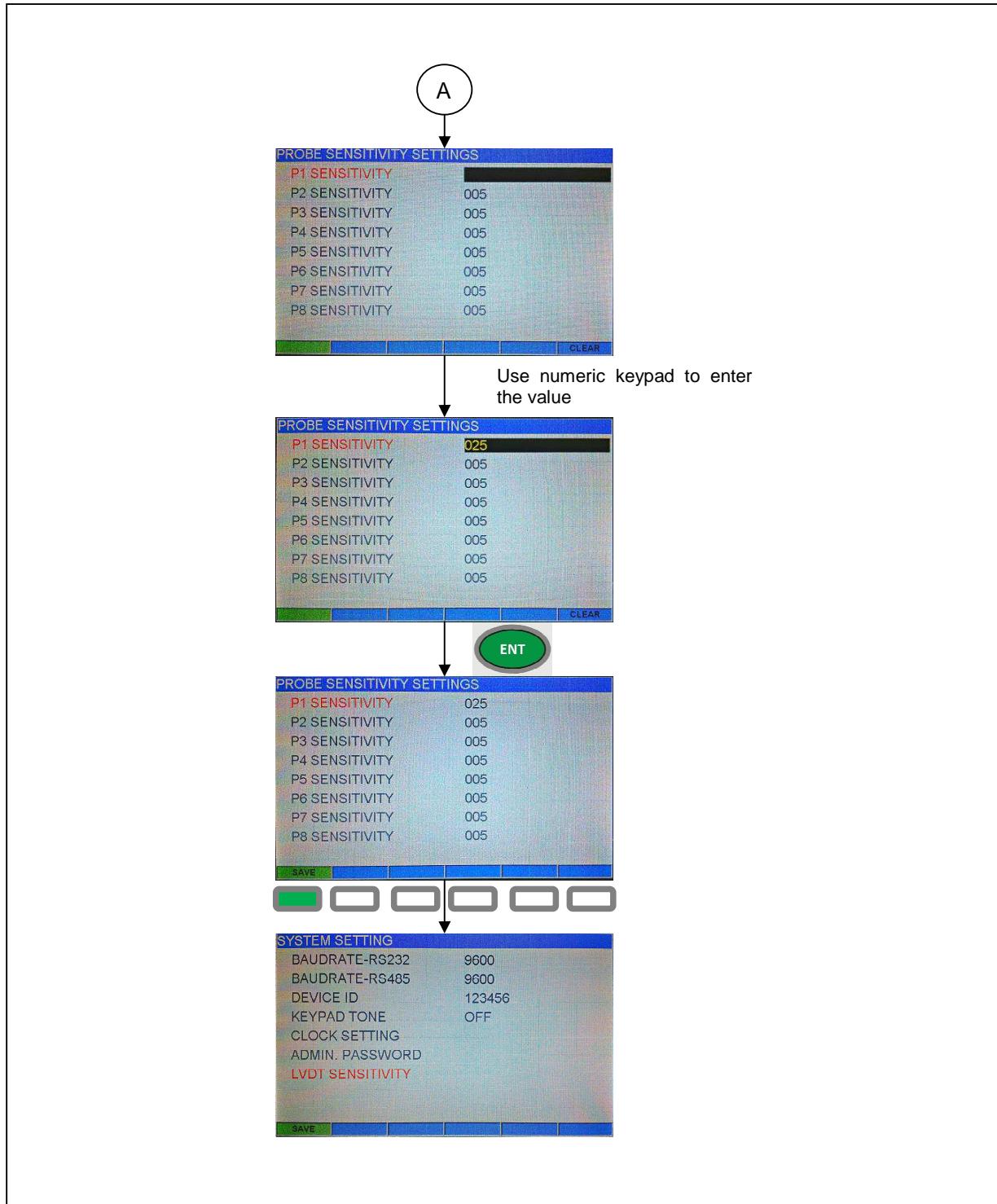
Here user can set the sensitivity factor for each probe. Sensitivity value can be set in the range of 1 to 255. Default value for sensitivity is 5. For higher values user will get more stable readings.

Steps to edit sensitivity

1. At 'SYSTEM SETTING' default screen, using 'UP/DOWN' key, select 'LVDT SENSITIVITY' parameter.
2. Press 'ENT' key. 'PROBE SENSITIVITY SETTINGS' screen will be displayed. Probe no. and their respective sensitivity values will get displayed.
3. Use UP/DOWN key to select the probe number.
4. After selecting a probe, press 'ENT' key to confirm the selection. Here selected probe's sensitivity value will get highlighted.
5. To start the editing, use 'CLEAR' function key.
6. Use numeric keypad to enter the value between 1 to 255.
7. Use 'ENT' key, to save the edited value temporarily.
8. At any instance, use 'ESC' key to go back to previous screen.
9. Once editing sensitivity setting of all probes is done, press 'SAVE' function key to save the set values permanently.

Operational Flowchart:

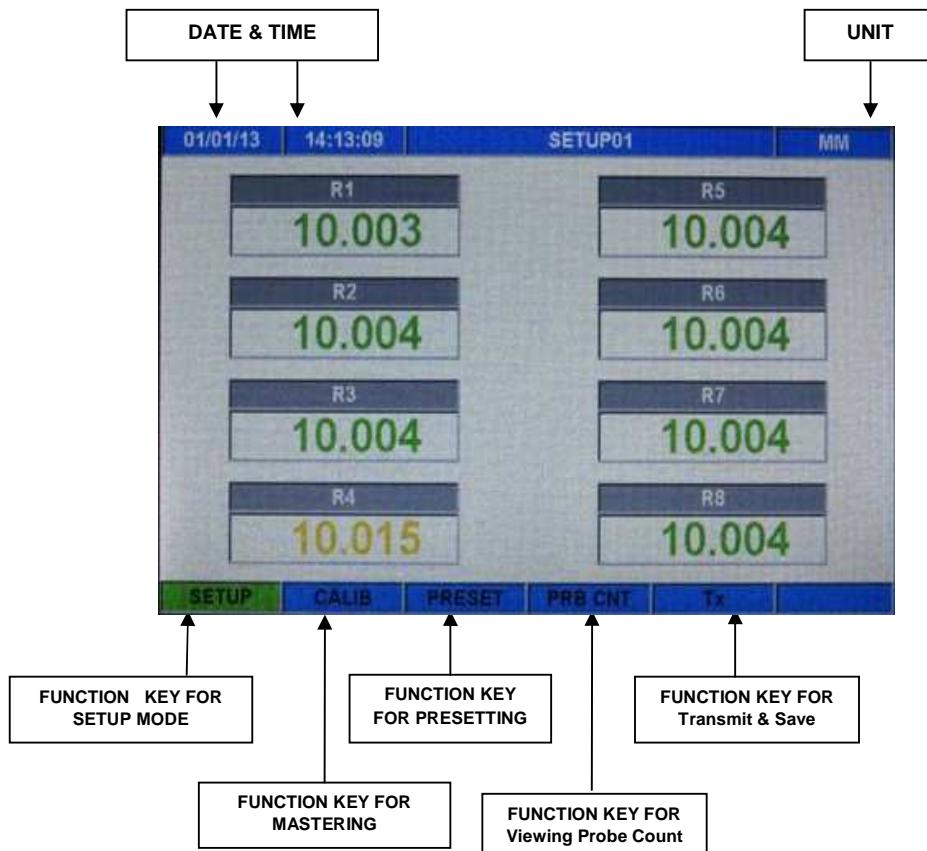




## MEASUREMENT MODE

This is default mode of operation. At power up, user enters into this mode. Measurement view can be of type – DRO / DIAL /BAR GRAPH/ RUNCHART.

Here output results along with measured values are displayed.



### REGIONS OF OPERATION:

Working Region	Condition	Reading colour
PASS	Reading value is within upper & lower control limits (UCL <= reading <= LCL)	Green
WARNING	Reading value is between USL & UCL or between LCL & LSL.	Yellow
FAIL	Reading value is above upper set limit or lower set limit (reading > USL) or (reading < LSL)	Red

Measurement mode actives keys:

**'SETUP' key:**

After correct password entry user can configure the DRO for desired measurement.

**'CALIB' key:**

User will enter into 'Calibration Mode' (Refer section)

**'PRESET' key:**

User will enter into preset mode where selected output can be set to any desired value. (Refer section)

**'PRB CNT' function key:**

Here user can view individual probe's count. User is supposed to set probe into the fixture across zero.

**'Tx' key (Transmit and Save):**

Readings on display along with current date and time will be saved into memory and transmitted to PC through RS232 port.

On every 'Tx' key press; 'Transmitting' message will be flashed at right hand side top.

**'./FS' key or Footswitch Action:**

If all selected results are in current mode ('CUR'), then readings on display along with current date and time will be saved into memory and transmitted to PC through RS232 and RS485 port.

Footswitch action in dynamic mode (MIN / MAX / TIR / AVG):

Delay Setting in Setup Mode	Measurement mode action
STARTUP DELAY = 02 SEC TIMER DELAY = 10 SEC	2 seconds after footswitch press - result will reset to its current value and then for next 10 seconds result will continue to operate in selected mode. Once 10 seconds are elapsed latest reading will get frozen.
STARTUP DELAY = 0 SEC TIMER DELAY = 10 SEC	Result will reset to current value instantly after footswitch press and then for next 10 seconds result will continue to operate in selected mode. Once 10 seconds are elapsed latest reading will get frozen.
STARTUP DELAY = 0 SEC TIMER DELAY = 0 SEC	Here on every footswitch press result will reset to its current value instantly. Result remains in measurement mode till next footswitch action.

## DISPLAY FORMAT

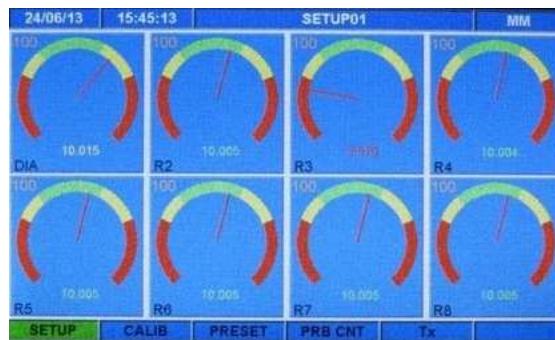
### DRO

Using DRO key user can switch to this view where dimensions under measurements can be viewed in big font. Here reading's colour changes as per its region of working.



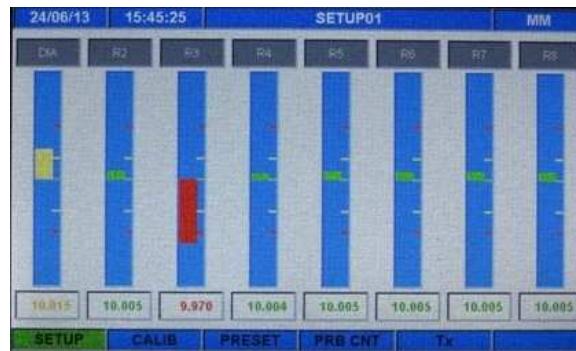
### DIAL

Using Dial key user can switch to this view. Pointer of the dial, points to PASS/ FAIL/WARNING region.



### BAR GRAPH

Using BAR-GRAPH key user can switch to this view. Bar colour changes as per PASS/ FAIL/WARNING region.



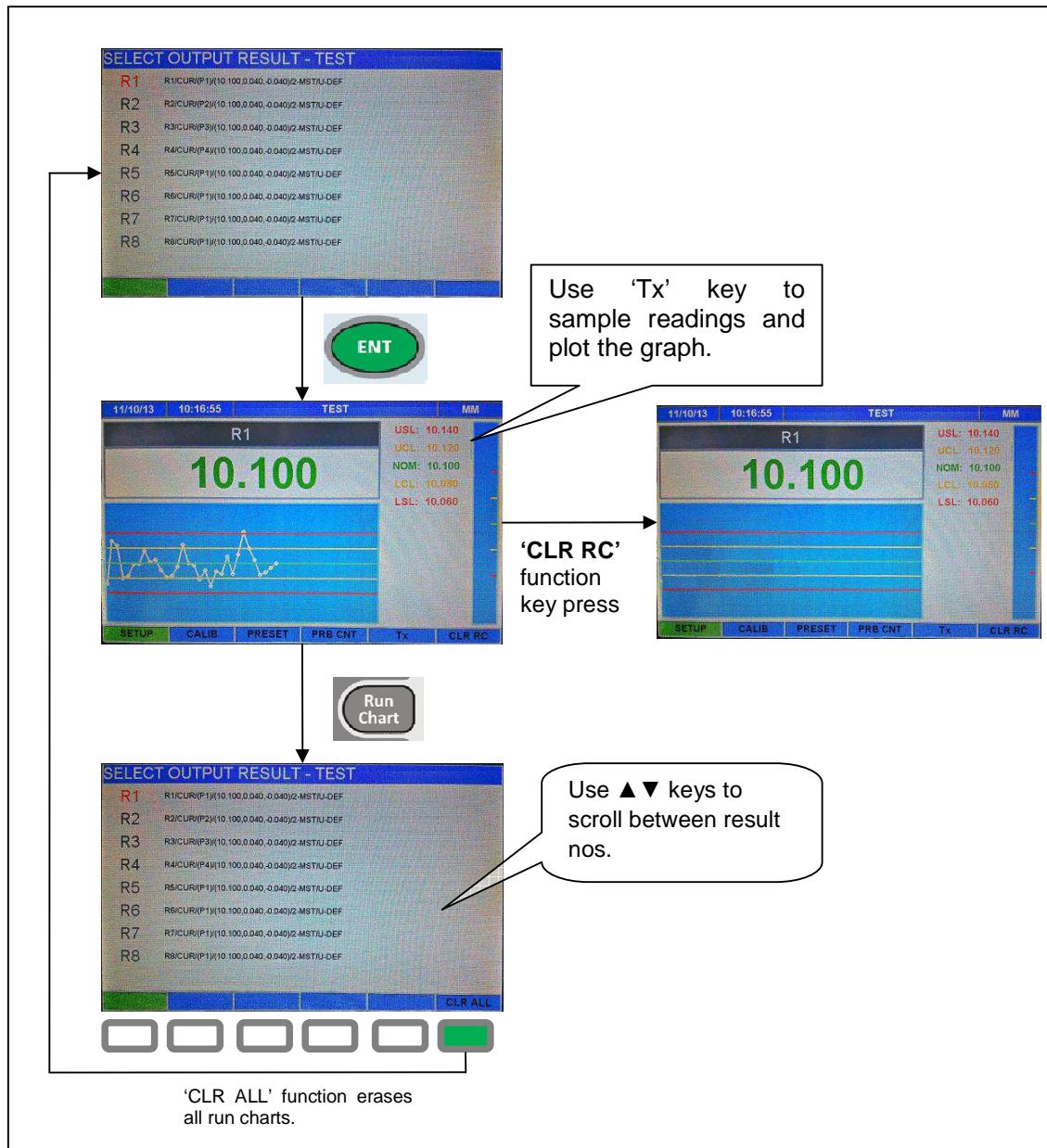
## RUN CHART

Using 'RUN CHART' key user can switch to this view. User can view run chart of maximum 50 samples.

### Steps to view run chart:

1. Select result of which run chart is to be viewed.
2. On 'Tx' key press,
  - Readings of all results will get captured & saved into the memory & also get transmitted through RS232 & RS485 port.
  - Selected result's reading will get plotted on to the graph.
3. Run chart of individual result can be erased using 'CLR RC' function key.
4. Run chart of all results can be erased using 'CLR ALL' function key.

### Operational Flowchart:



## CALIBRATION

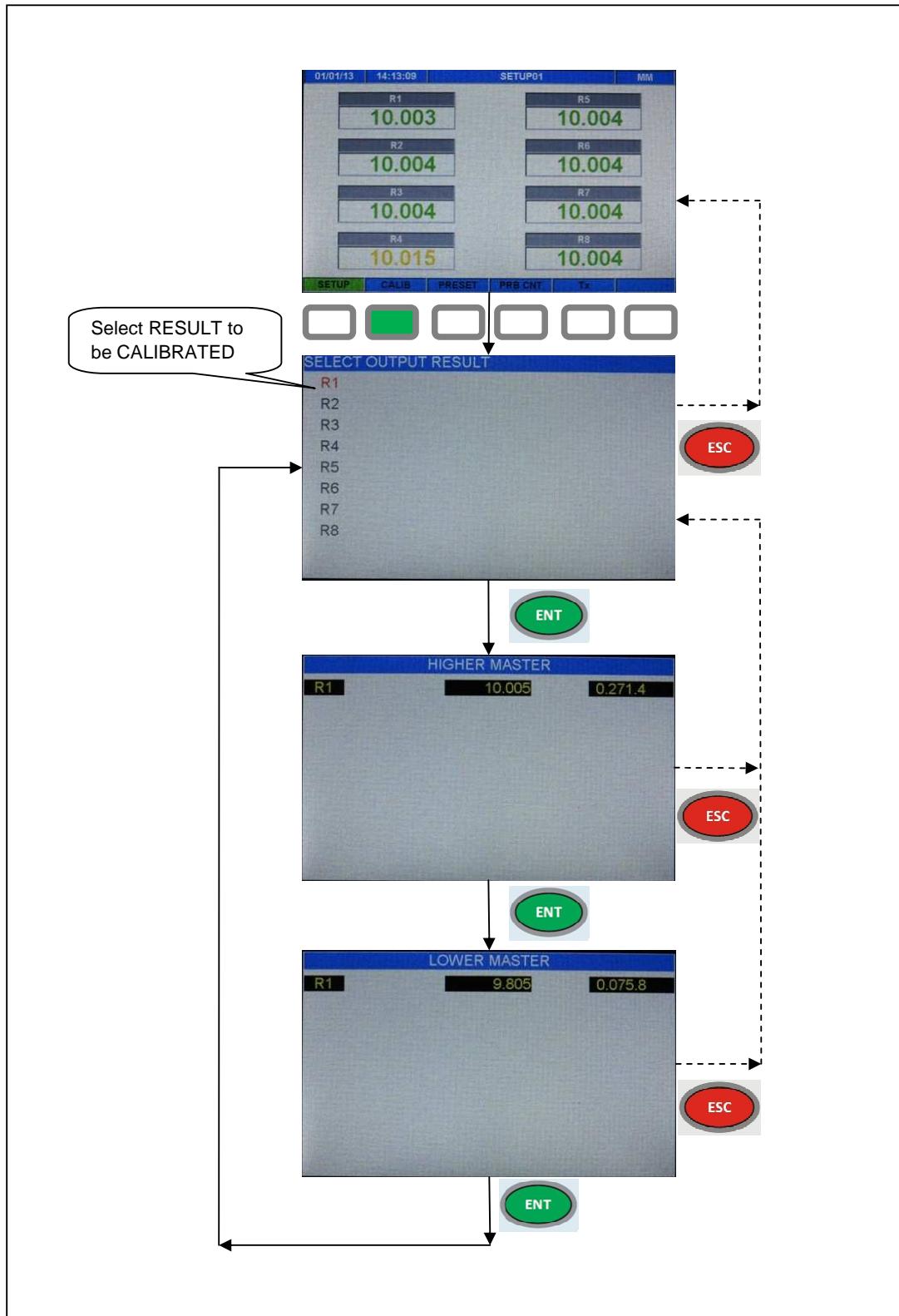
The *OctaGage* is equipped with state of the art Auto calibration facility. It is recommended to calibrate the unit with masters before any measurement.

### STEP CALIBRATION

In this mode, all output results in measurement mode are calibrated one by one, by selecting a single output result at a time.

#### Steps to perform 'STEP CALIBRATION':

1. In setup mode, make sure 'Step Calibration' method is selected.
2. In measurement mode, press 'CALIB' function key to go for two point calibration process.
3. Select output result of which calibration is to be done. Use 'UP/DOWN' key to select output result & confirm it using ENT key.
4. On ENT key press, selected output result number, its higher master value & corresponding resultant probe(s) displacement will be displayed. At this screen put higher master in gauge properly & press ENT key to accept the higher master reference value.
5. Now in next screen, selected output result number, its lower master value & corresponding resultant probe(s) displacement will be displayed. Here put lower master in gauge properly & press ENT key to accept lower master reference value.
6. Select another output for calibration using UP/DOWN key or if calibration of all output results are done then press 'ESC' key to go back to 'MEASUREMENT MODE'
7. At any screen, press 'ESC' key to back to 'MEASUREMENT MODE'.

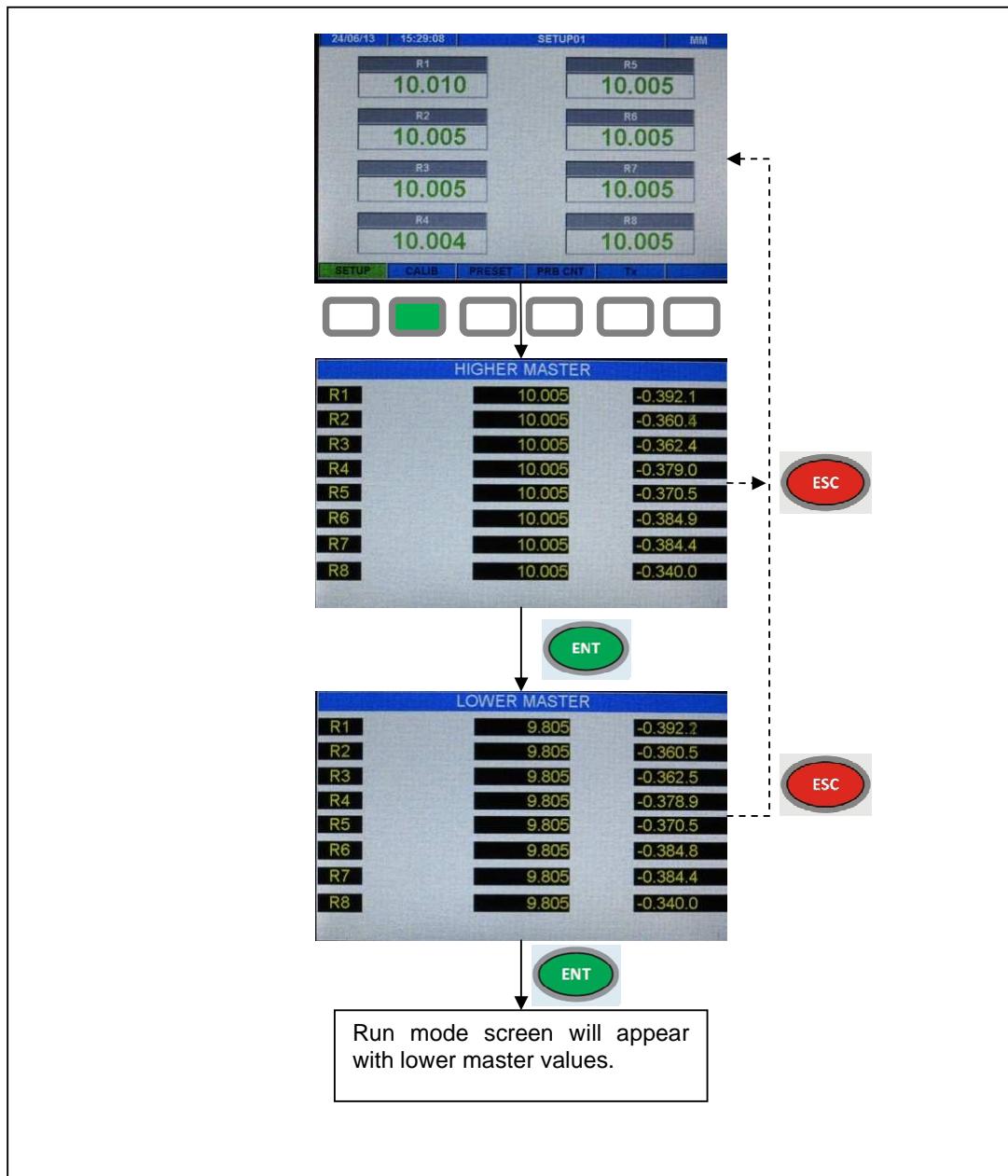
**Operational flowchart for Step Calibration:**

**SIMULTANEOUS CALIBRATION**

In this mode, all output results in measurement mode are calibrated simultaneously.

**Steps to perform ‘SIMULTANEOUS CALIBRATION’:**

1. In setup mode, make sure ‘Simultaneous Calibration’ method is selected.
2. In measurement mode, press ‘CALIB’ key to go for two point calibration process. Here all selected output result numbers, its higher master values & corresponding resultant probe(s) displacement(s) will be displayed. At this screen put higher master in gauge properly & press ENT key to accept the higher master reference values.
3. Lower master values & corresponding resultant probe(s) displacement(s) will be displayed. At this screen put lower master in gauge properly & press ENT key to accept the lower master reference values. Here calibration process ends.
4. At any screen, press ‘ESC’ key to back to ‘MEASUREMENT MODE’.

**Operational flowchart:**

## PRESET MODE

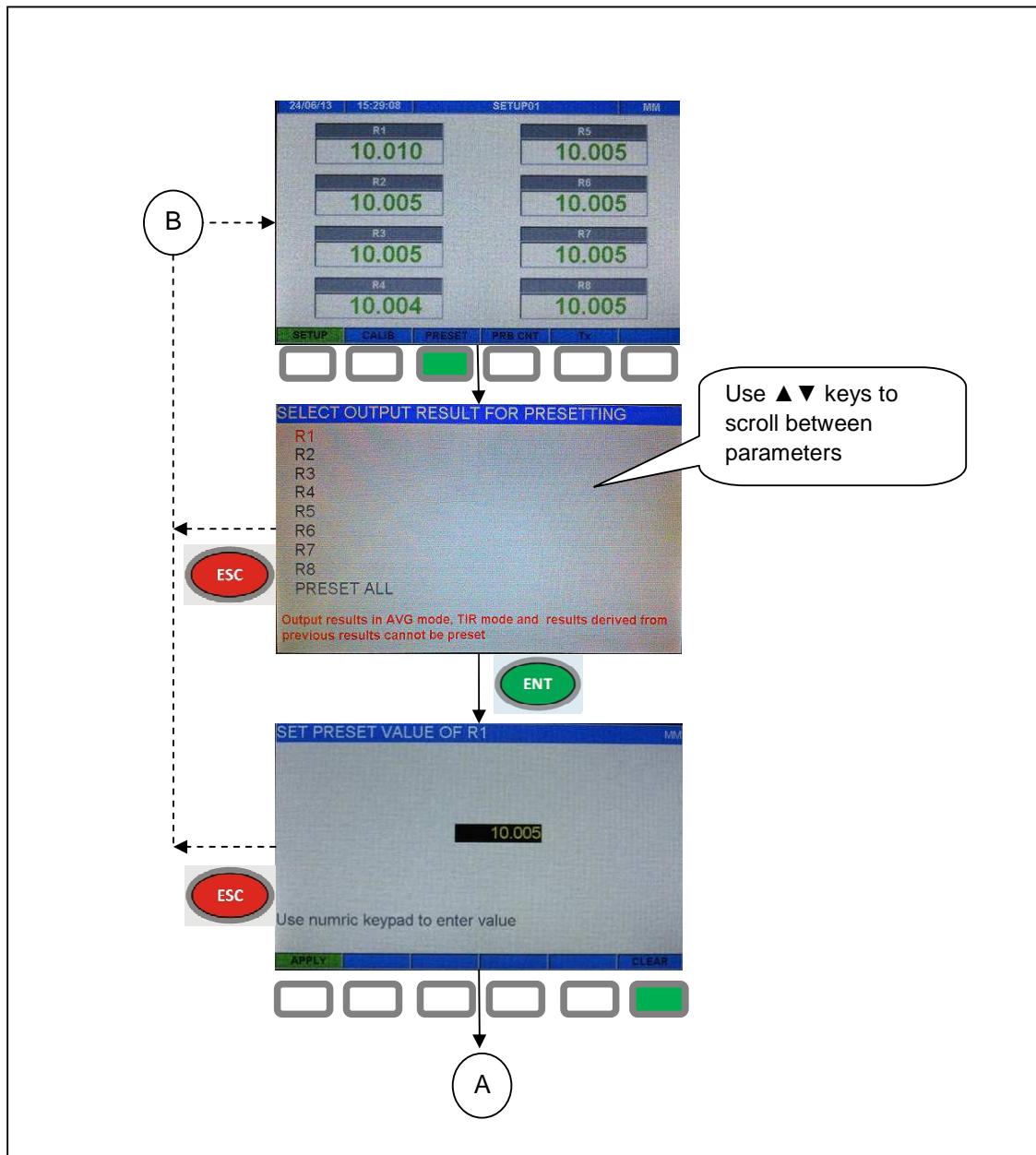
In measurement mode, user can preset the selected dimension under measurement to its higher master or lower master value or to any user defined value.

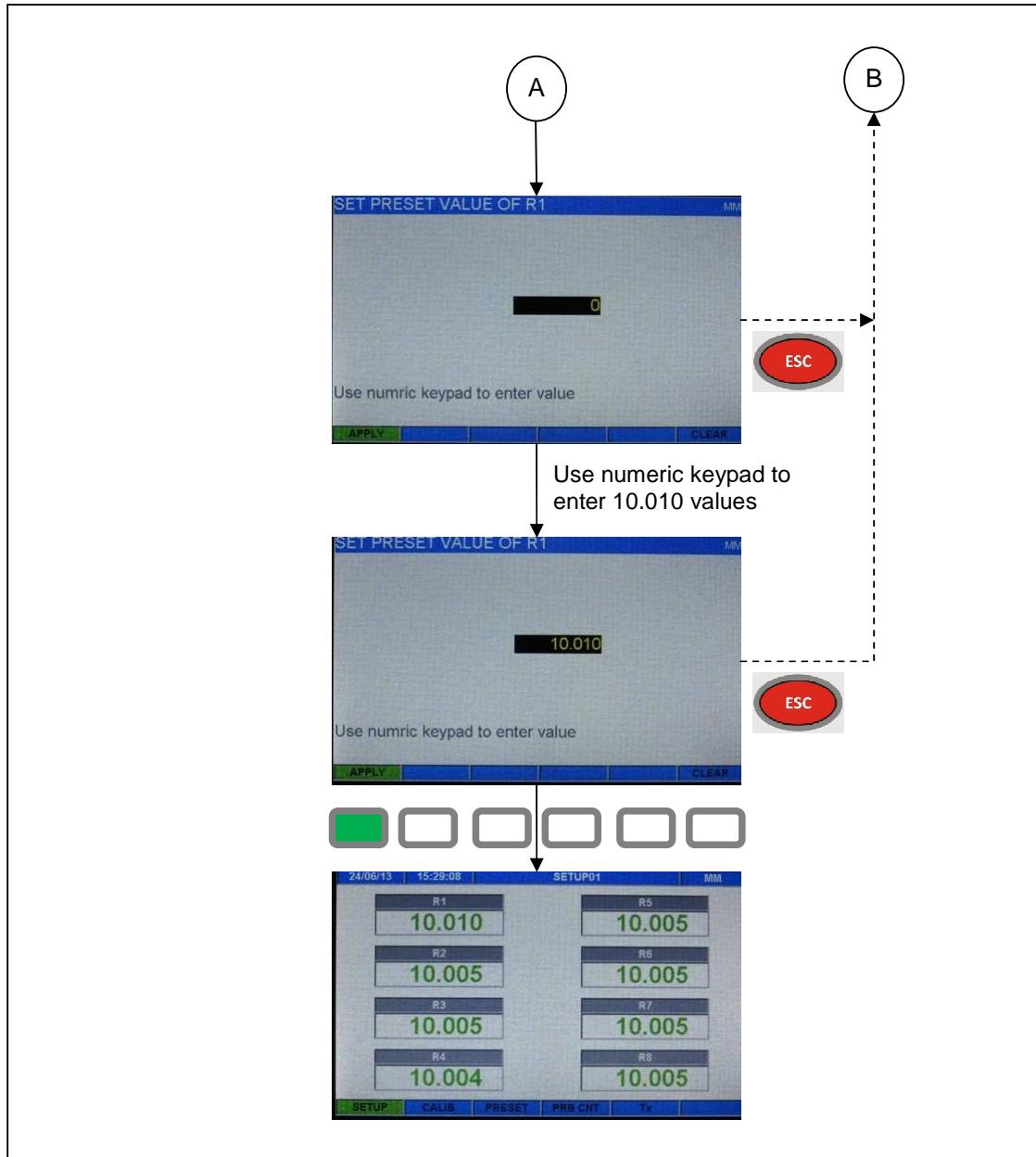
### Steps to preset a result:

1. At measurement mode default screen, press 'PRESET' key to enter into this mode. Here user will be asked to select a result number to which preset value is to be applied. Or user may select 'PRESET ALL' option to preset all outputs to their respective preset values.
2. Use 'UP/DOWN' key to select a result number and press ENT key to go inside the selected result.
3. Now press 'ENT' key to go for editing. Previously set preset value will be displayed.
4. If 'User Defined' option is set for the result in the setup mode then,
  - Use 'CLEAR' function key to start the editing. Here displayed value will reset to zero.
  - Use alphanumeric keypad to enter the numeric value. (e.g. 10.075). Range within which value should be entered depends on selected resolution. Any value which is out of the specified range will not be accepted.
  - Use '+/-' key to give a sign to the value.
  - At any instance, use 'CLR' key to reset the edited value.
  - At any instance, use 'APPLY' function key to preset the dimension to set value.If 'Higher Master / Lower Master' option is set for the result in the setup mode then, use 'APPLY' function key to preset the dimension to set value.
5. At any instance, use 'ESC' key to go back to measurement mode.
6. When 'PRESET ALL' option is selected, all output results with their preset values will be displayed. Here user can edit the preset values of user defined results only.

### Steps for editing preset value of the result,

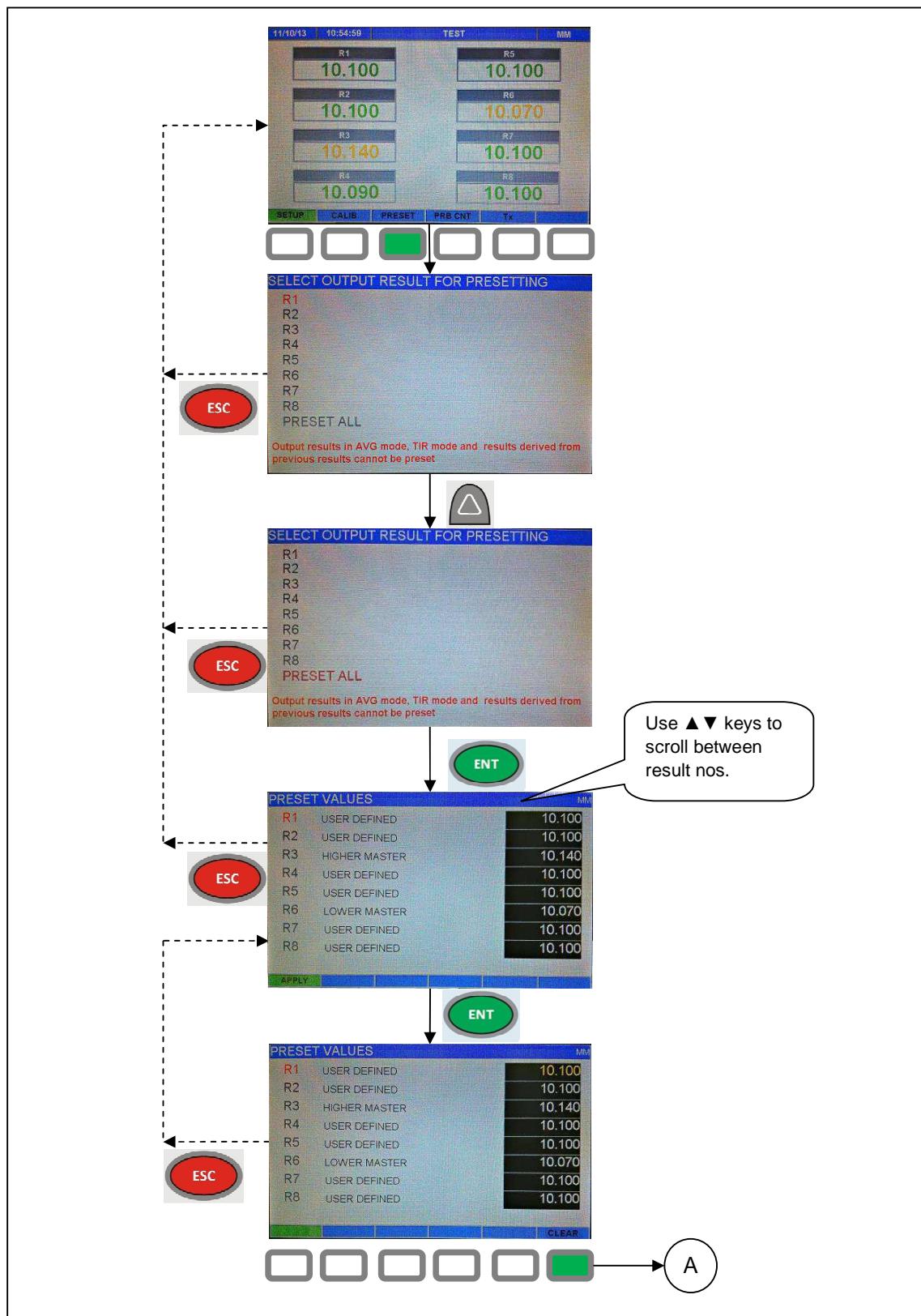
- 6.1. Use UP/DOWN arrow key to select the result no. for which preset value is 'USER DEFINED'.
- 6.2. Press ENT key. Here previously set value will get highlighted. (If user selects result no. for which preset value is not 'USER DEFINED', then on 'ENT' key press unit will give long error beep)
- 6.3. Press 'CLEAR' function key. Here value will get reset.
- 6.4. Use alphanumeric keypad to enter the numeric value. Range within which value should be entered depends on selected resolution. Any value which is out of the specified range will not be accepted.
- 6.5. Use '+/-' key to give a sign to the value.
- 6.6. Once editing is done, press 'ENT' key to save the edited value temporarily.
- 6.7. Use 'APPLY' function key, to preset all the dimensions to respective preset value.

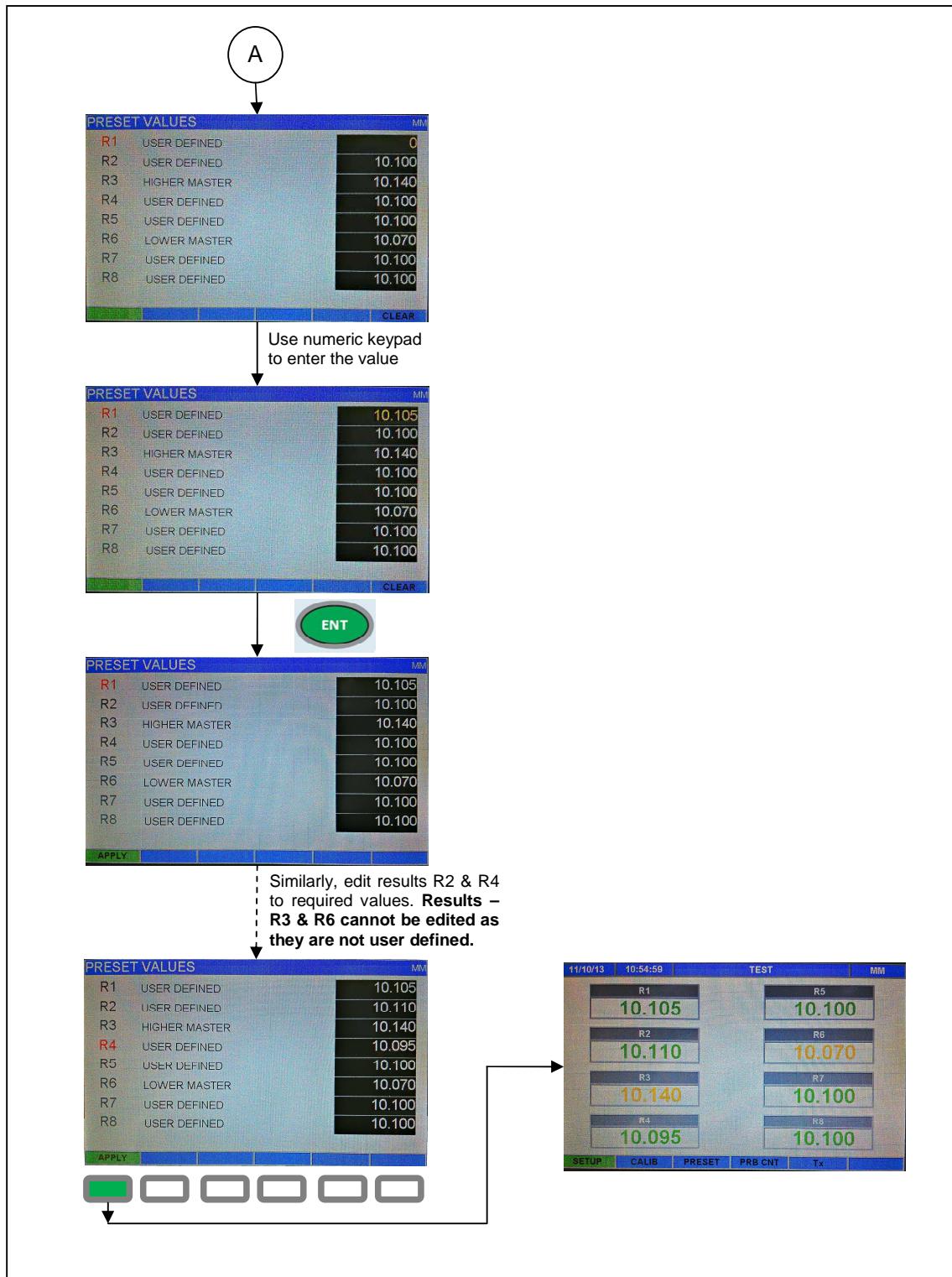
**Presetting in user defined mode:****Operational Flowchart:**



**Preset all the results:**

**Operational Flow-chart:**





If the 'PRESET VALUE' is set to 'HIGHER MASTER' or 'LOWER MASTER' then, presetting will be done as per the value of 'HIGHER MASTER' or 'LOWER MASTER'.

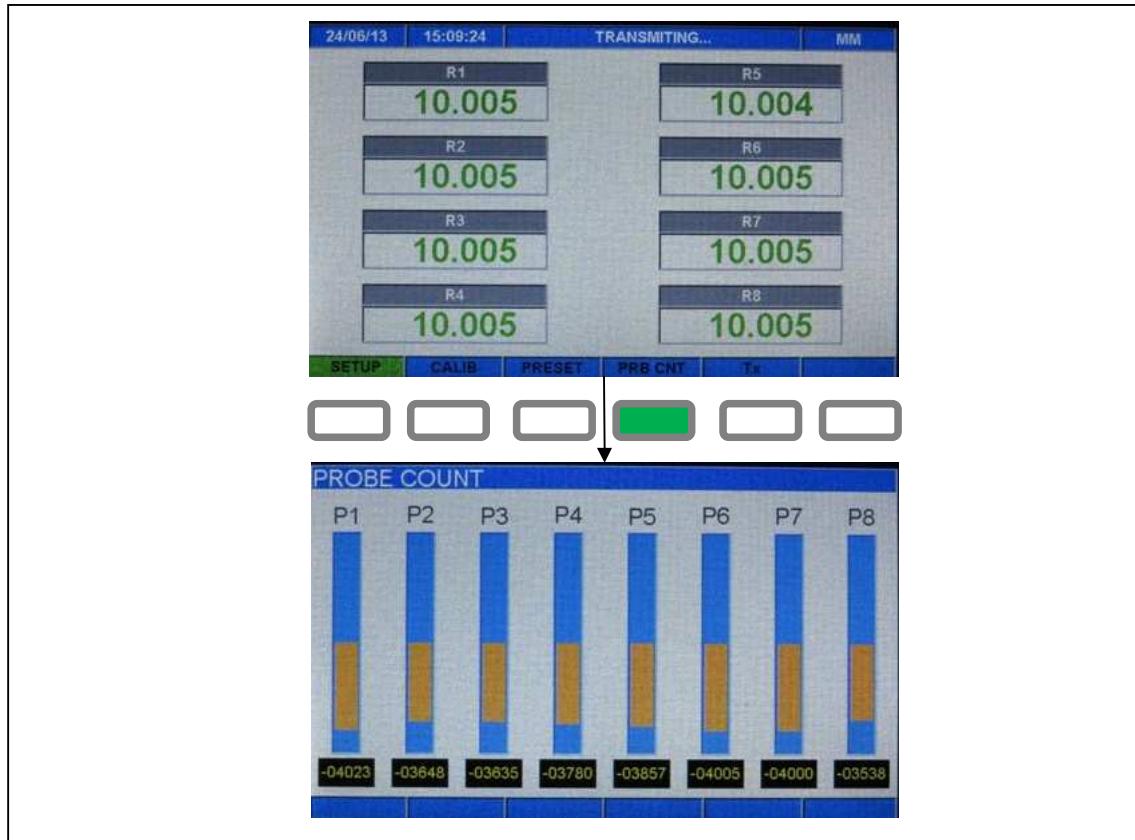
## PROBE COUNT

The probe count view allows the user to set probes into the fixture in desired count range. It is recommended to use any LVDT sensor along its null position (near Zero)

Step to enter 'PROBE COUNT' screen:

1. At 'Measurement Mode' screen, press 'PRB CNT' key to enter Probe Count screen.
2. Here, each probe's ADC count is displayed.
3. Press 'ESC' key to go back to the 'Measurement Mode' screen.

**Operational Flow-chart:**



## COMMUNICATION AND I/O CONNECTIONS



Safety / Precaution related to Electrostatic Discharge. Interface pins are ESD sensitive; do not touch/connect the pins without proper ESD protection care.

### LVDT SENSOR CONNECTION

'5 pin DIN' sockets (P1, P2, ...P8) are provided for connecting LVDT probes.

Only compatible LVDT probe types to be connected. Please check your instrument back for compatible LVDT probe type mentioned; if not found then contact manufacturer.

Contact manufacturer for specifications and other connection details.

### FOOTSWITCH

3 PIN MX396 CONNECTOR (MALE):

Footswitch connectivity

- To transfer serial data out in current mode
- To execute dynamic mode cycle in MIN/MAX/TIR/AVG mode

Pin No.	Description
1	+Ve Connection
3	-Ve Connection
2	PE Connection

### RS232 INTERFACE

9 PIN D CONNECTOR (FEMALE):

Pin No.	Description
2	Transmit Data
3	Receive Data
5	Signal Ground
1,4,6,7,8,9	Not Used

### RS485 INTERFACE

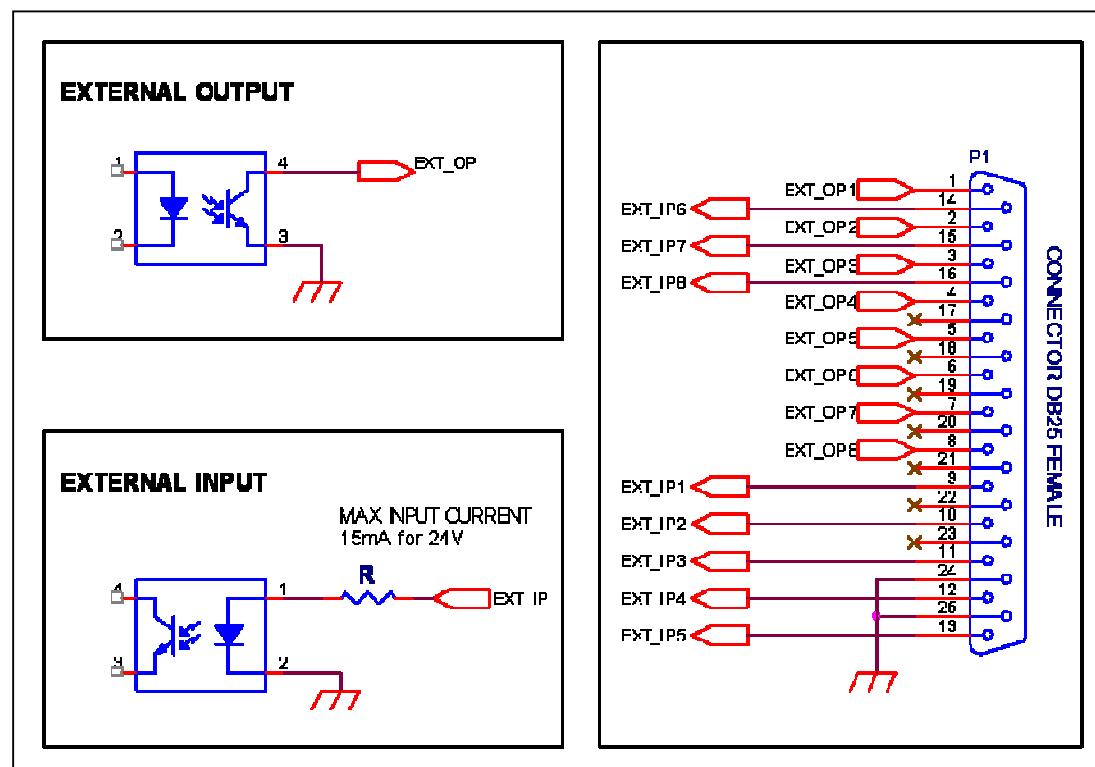
3 PIN MKDSN (PLUG):

Pin No.	Description
1	A
2	B
3	Signal Ground

**DIGITAL I/O**

## 25 - PIN D-Sub CONNECTOR (FEMALE)

Pin No.	Description	Pin No.	Description
1	Isolated Digital Output 1	10	Isolated Digital Input 2
2	Isolated Digital Output 2	11	Isolated Digital Input 3
3	Isolated Digital Output 3	12	Isolated Digital Input 4
4	Isolated Digital Output 4	13	Isolated Digital Input 5
5	Isolated Digital Output 5	14	Isolated Digital Input 6
6	Isolated Digital Output 6	15	Isolated Digital Input 7
7	Isolated Digital Output 7	16	Isolated Digital Input 8
8	Isolated Digital Output 8	24,25	External ground
9	Isolated Digital Input 1	21,22,23	NC

**ETHERNET PORT**

Only for program firmware update as mentioned in the 'Firmware Update Procedure' in separate document and not for any other Purpose, contact manufacturer for the 'Firmware Update Procedure'.

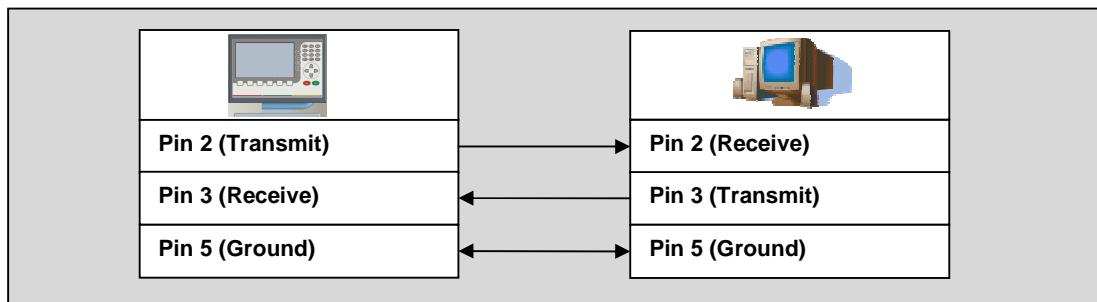
## COMMUNICATION PROTOCOL:

The *OctaGage* has an RS232 interface to support data output to computer. The “**RS232**” connector (*9 pin Sub-D female*) is located at the rear of the *OctaGage*.

**Readings can be taken out of the unit by,**

1. 'Tx' function key
2. Isolated digital input configured for the transmission action.
3. 'FS' key or isolated digital input configured for the footswitch action – only if all output results under measurement are in current mode

### RS232 communication cable details:



### Communication settings:

Parameter	Value
Baud rate in kbps (Programmable)	2400, 4800, 9600, 19200, 38400, 57600, 115200
Data bits	8
Stop bits	1
Parity	NONE
Flow control	NONE

**Output String Format:**

Case 1: NO. OF RESULTS = 1

DDDDDD;C901T/D;HH:MM:SS;DD/MM/YY;**C01M**;+XXX.XXX<CR>

Where,

DDDDDD	Device ID (Ranges from 000000 – 999999)
;	String separator
C901T/D	C - Channel 901 - Channel no. 901 T/D - Time & Date
HH:MM:SS	Time in 24 hours format HH = Hours, MM = Minutes, SS = Seconds
DD/MM/YY	Date format DD = Date, MM = Month, YY = Year
C01M	C -Channel (Always followed with 3 digit no.) 01 -Output result no. (= 1) M -Measurement mode (1 = CUR, 2 = MIN; 3 = MAX, 4 = DIFF, 5 = AVE)
+XXX.XXX	Reading value with sign (corresponds to preceding channel no.)
<CR>	Carriage return

E.g.

123456;C901T/D;17:59:51;05/09/13;C011;+010.005&lt;CR&gt;

Where,

123456	Device ID (Ranges from 000000 – 999999)
;	String separator
C901T/D	C - Channel 901 - Channel no. 901 T/D - Time & Date
17:59:51	Time in 24 hours format HH = Hours = 17, MM = Minutes = 59, SS = Seconds = 51
05/09/13	Date format DD = Date = 05, MM = Month = 09, YY = Year = 13
C011	C -Channel (Always followed with 3 digit no.) 01 -Output result no.( = 1) M -Measurement mode ( = CUR)
+010.005	Reading value with sign
<CR>	Carriage return

**Case 2: NO. OF RESULTS = 2**DDDDDD;C901T/D;HH:MM:SS;DD/MM/YY;**C01M**;+XXX.XXX;**C02M**;+XXX.XXX <CR>

Where,

DDDDDD	Device ID (Ranges from 000000 – 999999)
;	String separator
C901T/D	C - Channel 901 - Channel no. 901 T/D - Time & Date
HH:MM:SS	Time in 24 hours format HH = Hours, MM = Minutes, SS = Seconds
DD/MM/YY	Date format DD = Date, MM = Month, YY = Year
C01M	C -Channel (Always followed with 3 digit no.) 01 -Output result no.(= 1) M -Measurement mode (1 = CUR, 2 = MIN; 3 = MAX, 4 = DIFF, 5 = AVE)
C02M	C -Channel (Always followed with 3 digit no.) 02 -Output result no.(= 2) M -Measurement mode (1 = CUR, 2 = MIN; 3 = MAX, 4 = DIFF, 5 = AVE)
+XXX.XXX	Reading value with sign (corresponds to preceding channel no.)
<CR>	Carriage return

E.g.

123456;C901T/D;17:59:51;05/09/13;**C011**;+010.005;**C021**;+020.005<CR>

Where,

123456	Device ID (Ranges from 000000 – 999999)
;	String separator
C901T/D	C - Channel 901 - Channel no. 901 T/D - Time & Date
17:59:51	Time in 24 hours format HH = Hours = 17, MM = Minutes = 59, SS = Seconds = 51
05/09/13	Date format DD = Date = 05, MM = Month = 09, YY = Year = 13
C011, C021	C -Channel (Always followed with 3 digit no.) 01 -Output result no. (= 1) M -Measurement mode (= CUR)
+010.005	Reading value of channel C011 with sign
+020.005	Reading value of channel C021 with sign
<CR>	Carriage return

**Similarly,**

**For No. of results = 8, string format will be :-**

DDDDDD;C901T/D;HH:MM:SS;DD/MM/YY;**C01M**;+XXX.XXX;**C02M**;+XXX.XXX;**C03M**;+XXX.XXX;**C04M**;+XXX.XXX;**C05M**;+XXX.XXX;**C06M**;+XXX.XXX;**C07M**;+XXX.XXX;**C08M**;+XXX.XXX<CR>

E.g.

123456;C901T/D;17:59:51;05/09/13;**C011**;+010.005;**C021**;+020.005;**C031**;+030.005;**C041**;+040.005;**C051**;+050.005;**C061**;+060.005;**C071**;+070.005;**C081**;+080.005<CR>

Here results and their respective readings will be;

C011 = +010.005,

C021 = +020.005,

C031 = +030.005,

C041 = +040.005,

C051 = +050.005,

C061 = +060.005,

C071 = +070.005,

C081 = +080.005

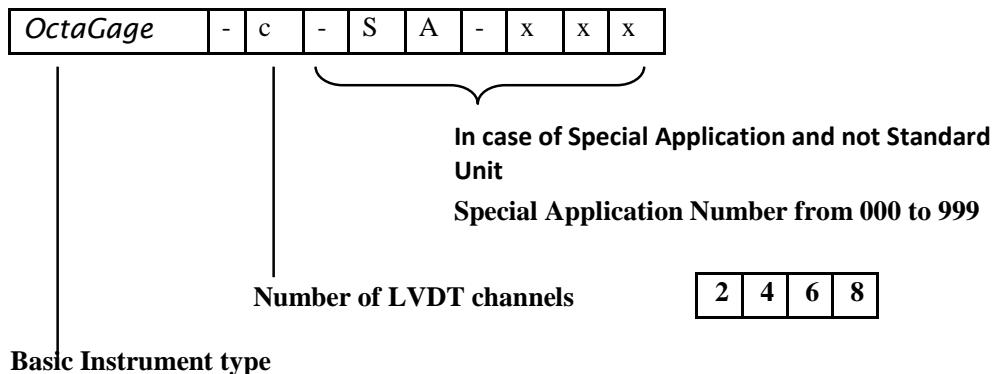
## ORDERING INFORMATION

In case OF Standard Unit:

Model: *OctaGage-c*  
SN: mmYY-nnnnnn  
Compatible Probe:  
Manufacturer: Versa Controls, India  
[www.versacontrols.com](http://www.versacontrols.com)

In case OF Special Application:

Model: *OctaGage-c-SA-xxx*  
SN: mmYY-nnnnnn  
Compatible Probe:  
Manufacturer: Versa Controls, India  
[www.versacontrols.com](http://www.versacontrols.com)



Compatible Probe: Contact manufacturer while ordering the *OctaGage*.

## READER FEEDBACK

It is our intention to provide you with the best documentation possible to ensure successful use of your Versa Control Instrument. If you wish to provide your comments and ways in which our documentation can better serve you, please e-mail your comments to us at [info@versacontrols.com](mailto:info@versacontrols.com).

Please list the following information, and use this outline to provide us with your comments about this document.

Name: \_\_\_\_\_

Organization: \_\_\_\_\_

Organization Address: \_\_\_\_\_

City / State / ZIP / Country: \_\_\_\_\_

Telephone: (\_\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

Department (optional): \_\_\_\_\_

Instrument Installation Year, Month and Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Instrument serial number: \_\_\_\_\_

Instruction manual Version Number: \_\_\_\_\_

Would you like a reply? Y / N

Questions:

1. What are the best features of this instrument and the related instruction manual?

2. How does this instruction manual meet your needs of operating and configuring the instrument?

3. Do you find the instruction manual easy to follow? If not, why?

4. What additions to the instruction manual do you think would enhance the usefulness and subject?

5. What deletions from the instruction manual could be made without affecting the overall usefulness?

6. Is there any incorrect or misleading information (what and where)?

7. How would you improve this document?