

INSTRUCTION MANUAL

FLOW CONTROLLER with TOTALIZER

Analog Inputs with RS 485 MODBUS RTU PROTOCOL

MODEL : FI 593



Table of Contents

	PAGE
1. Safety Instructions-----	2
2. Specifications -----	2
3. Input & Output Connections-----	3
4. Connecting to PC-----	3
5. Main screen-----	3
6. Configurations-----	4
6.1. Analog Input Type & Conversion Type Selection-----	4
6.2. Flow Rate (FR) & Total Flow (TF) Resolution Selection-----	5
6.3. Unit & FR Time Base Selection-----	6
6.4. TF Front Delete Selection & Analog Input Limit Settings-----	7
6.5. Flow Rate(FR) Display Scale Limit Setting-----	8
6.6. FR Analog Retransmission Output Limit Setting-----	9
6.7. Relay - 1 Assignment-----	10
6.8. Relay - 2 Assignment-----	11
6.9. Serial Communication & User Password Settings-----	12
7. Relay Setpoints-----	13
8. Delete Total Flow(TF)-----	13
9. User Calibration for Flow Rate-----	14
10.Date and Time Settings-----	15
11. Ordering Information-----	16
12. Warranty-----	16
13. Contact Us-----	16

1. SAFETY INSTRUCTIONS

Use the FI 593 only as specified in this manual. Otherwise, the protection provided by the FI 593 may be impaired.

The following definitions apply to the terms “Warning” and “Caution”.

⚠ “Warning” identifies conditions and actions that may pose hazards to the user.

⚠ “Caution” identifies conditions and actions that may damage the FI 593 being used.

⚠ Warnings

To avoid personal injury, follow these guidelines.

- ☞ **DO NOT** use the FI 593 for any application other than its work. The FI 593 was designed for Water Flow Indication & Control. Any other use of the unit may cause unknown hazards to the user.
- ☞ **DO NOT** use the unit in environments other than those listed in the Instruction Manual.
- ☞ Follow all safety guidelines listed in the Instruction Manual.
- ☞ FI 593 should only be used by Trained Personnel.
- ☞ If this FI 593 is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- ☞ Overhead clearance is required. Do not Fix the FI 593 under a Open area or other infrastructure. Always leave enough clearance to allow for safe and easy to use.
- ☞ The FI 593 is intended for indoor use only.

⚠ Cautions

To avoid possible damage to the FI 593, follow these guidelines.

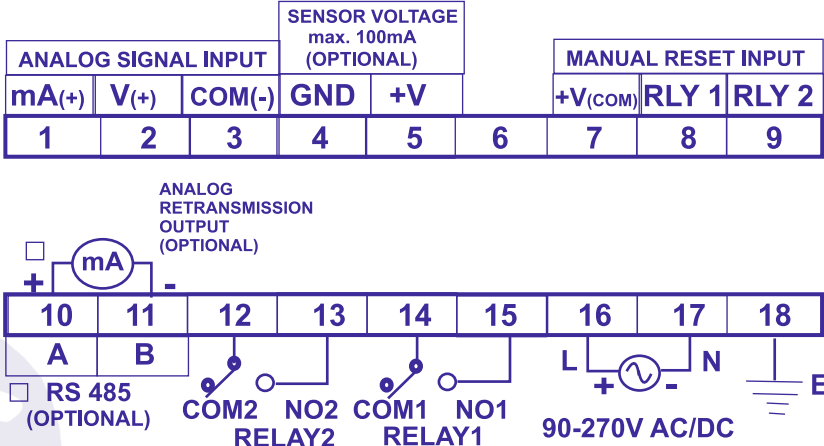
- ☞ **DO NOT** try to change the password setting values of the FI 593 .The correct setting of these parameters is important to the safety and proper operation of the FI 593.
- ☞ Always operate this instrument at room temperature between 41°F and 104°F (5°C to 40°C).Allow sufficient air circulation by leaving at least 6 inches (15 cm) of clearance around the FI 593.
- ☞ The FI 593 is a precision instrument. Although it has been designed for optimum durability and trouble free operation, it must be handled with care.

2. SPECIFICATIONS

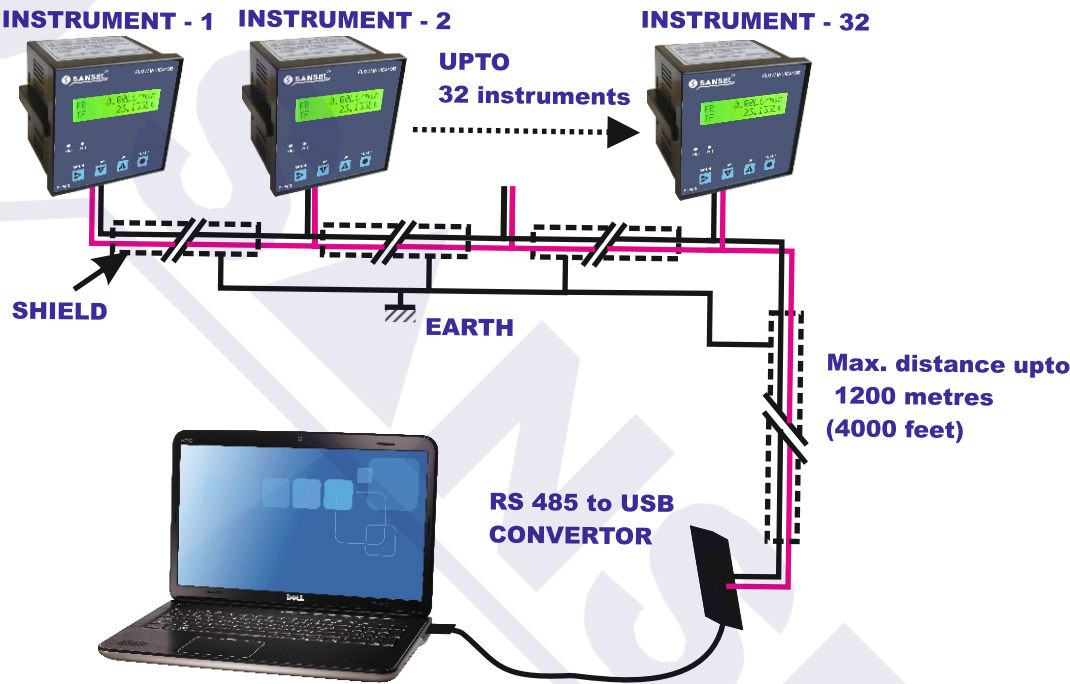
NOTE : Due to continuous improvements, Published specifications may change without notice

Model	FI 593
Display	16 Character x 2 Line LCD
Password Access	Provided for all settings
Analog Input	mAmps / Volts (any one user selectable)
Input Range	0 to 20 mA DC / 0 to 10 V DC (user scalable)
Conversion type	Square Root / Linear (any one user selectable)
Display Modes	Flow Rate (FR) , Total Flow(TF) or Batch Total (BT)
Display Range for FR	0 - 9999 (4 digit) (user scalable)
Display Range for TF / BT	0 - 99999999 (8 digit)
Flow Rate Resolution	1 / 0.1 / 0.01 (any one user selectable)
Total Flow Resolution	1 / 0.1 / 0.01 / 0.001 (any one user selectable)
Unit Selection	m ³ / litres / gallon / kg (any one user selectable)
Flow Rate Time base	secs / mins / hours (any one user selectable)
Total Flow Reset	Provided with Password Protection & Enable / Disable options
Batch Total (BT) Start	Auto with Delay / Manual in Front Key(any one user selectable)
Re transmission Output(optional)	4 - 20mA / 0 - 10V (any one Factory Presetable)
Relay Output (optional)	2 Relay (5A rated) with individual Relay assignment setting
Communication Interface(optional)	RS 485 (2 wire) or RS 232(any one Factory Presetable)
PC Software (optional)	Provided with logging, Alarm Setup, Record, Graph
Slave ID	1 to 32 (user selectable)(for RS 232 set Slave ID as 1)
Baud Rate(bps)	9600, 19200(user selectable)
Mounting	Panel Mounting
Overall Dimension	96 x 96 x 85(W x H x D) mm
Cutout Dimension	92 x 92(W x H) mm
Sensor Supply Output	12 or 24V DC ±10% (any one Factory Presetable)
Operating Supply	90 to 270V AC / DC
Operating Environment	0 to 50°C / 20 to 95 % RH non condensing

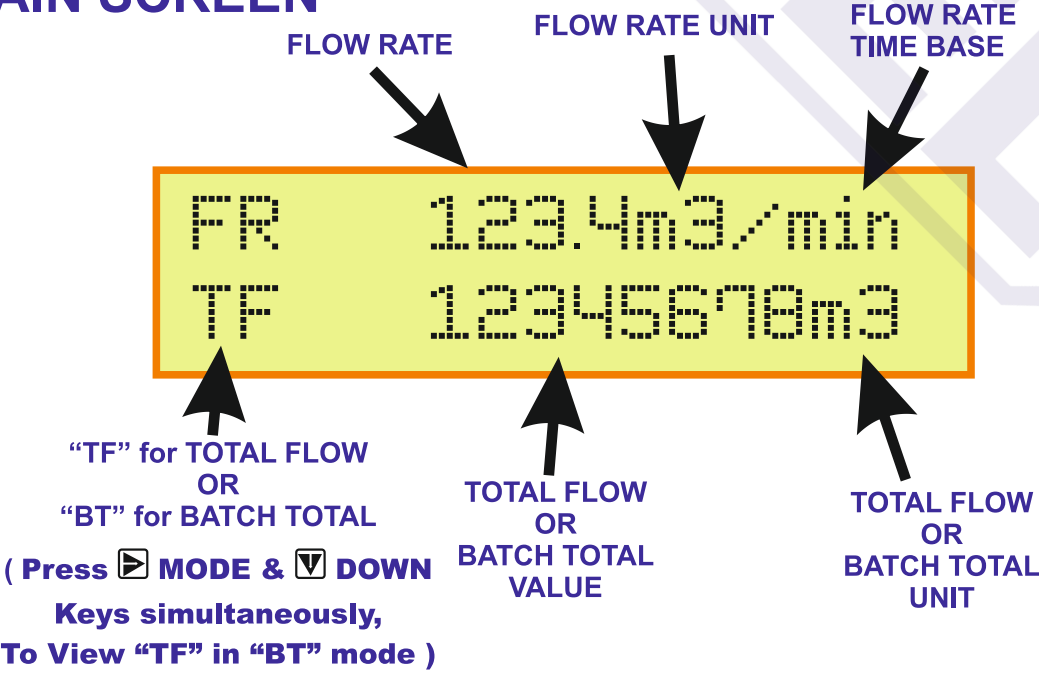
3. INPUT AND OUTPUT CONNECTIONS



4. CONNECTING TO PC



5. MAIN SCREEN

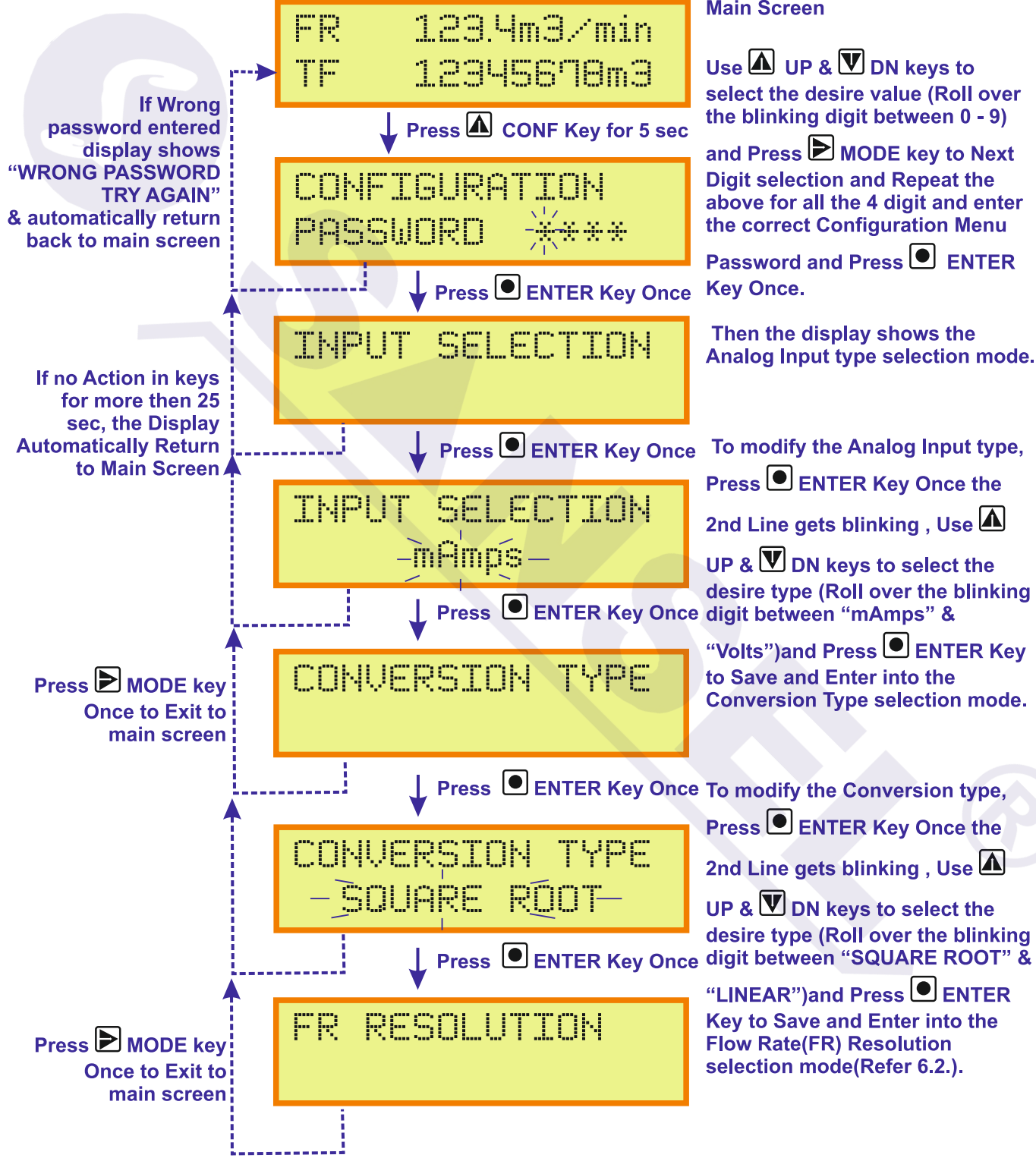


6. CONFIGURATION MENU (PASSWORD = 9753)

NOTE : During the Flow Process, Don't Configure any settings, it may cause, Error in Total Flow(TF) Value & loss of PC Logging Data.

6.1. ANALOG INPUT TYPE & CONVERSION TYPE SELECTION

In Main Screen, Enter into the “Configuration Menu”, Press CONF Key till the Display Shows follows.



6.2. FLOW RATE (FR) & TOTAL FLOW (TF) RESOLUTION SELECTION

In Main Screen, Enter into the “Configuration Menu”, Press CONF Key till the Display Shows follows.

FR 123.4m3/min
TF 12345678m3

Main Screen

Use UP & DN keys to select the desire value (Roll over the blinking digit between 0 - 9) and

Press MODE key to Next Digit selection and Repeat the above for all the 4 digit and enter the correct Configuration Menu Password and

Press ENTER Key Once.

CONFIGURATION
PASSWORD ****

Press ENTER Key Once

INPUT SELECTION

Then the display shows the Analog Input type selection mode.

Press UP Key Once

CONVERSION TYPE

Then Press UP key once the Display shows the conversion type selection mode.

Press UP Key Once

FR RESOLUTION

Then Press UP key once to scroll the Configuration menu to Flow Rate (FR) Resolution selection Mode.

Press ENTER Key Once

FR RESOLUTION
-0.01-

To modify the FR Resolution, Press ENTER Key Once the 2nd Line gets blinking , Use UP & DN keys to select the desire Resolution (Roll over the blinking digit between “1, 0.1, 0.01”)and Press ENTER Key to Save and Enter into the Total Flow(TF) Resolution selection mode.

Press ENTER Key Once

TF RESOLUTION

Press MODE key Once to Exit to main screen

Press ENTER Key Once

TF RESOLUTION
-01-

To modify the TF Resolution, Press ENTER Key Once the 2nd Line gets blinking , Use UP & DN keys to select the desire Resolution (Roll over the blinking digit between “1, 0.1, 0.01, 0.001”)and Press ENTER Key to Save and Enter into the Unit Selection Mode(Refer 6.3.).

Press ENTER Key Once

UNITS SELECTION

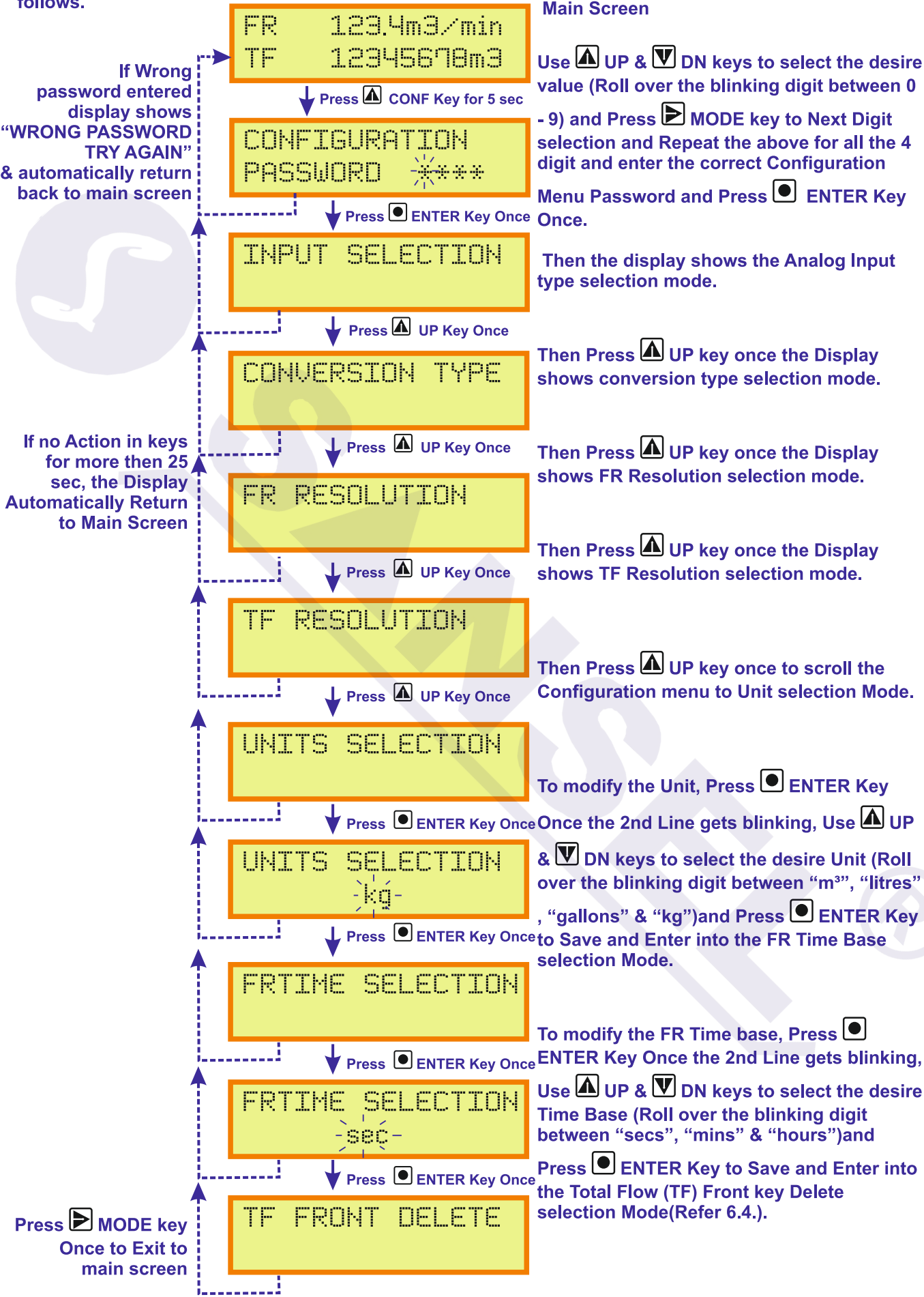
Press MODE key Once to Exit to main screen

If Wrong password entered display shows “WRONG PASSWORD TRY AGAIN” & automatically return back to main screen

If no Action in keys for more then 25 sec, the Display Automatically Return to Main Screen

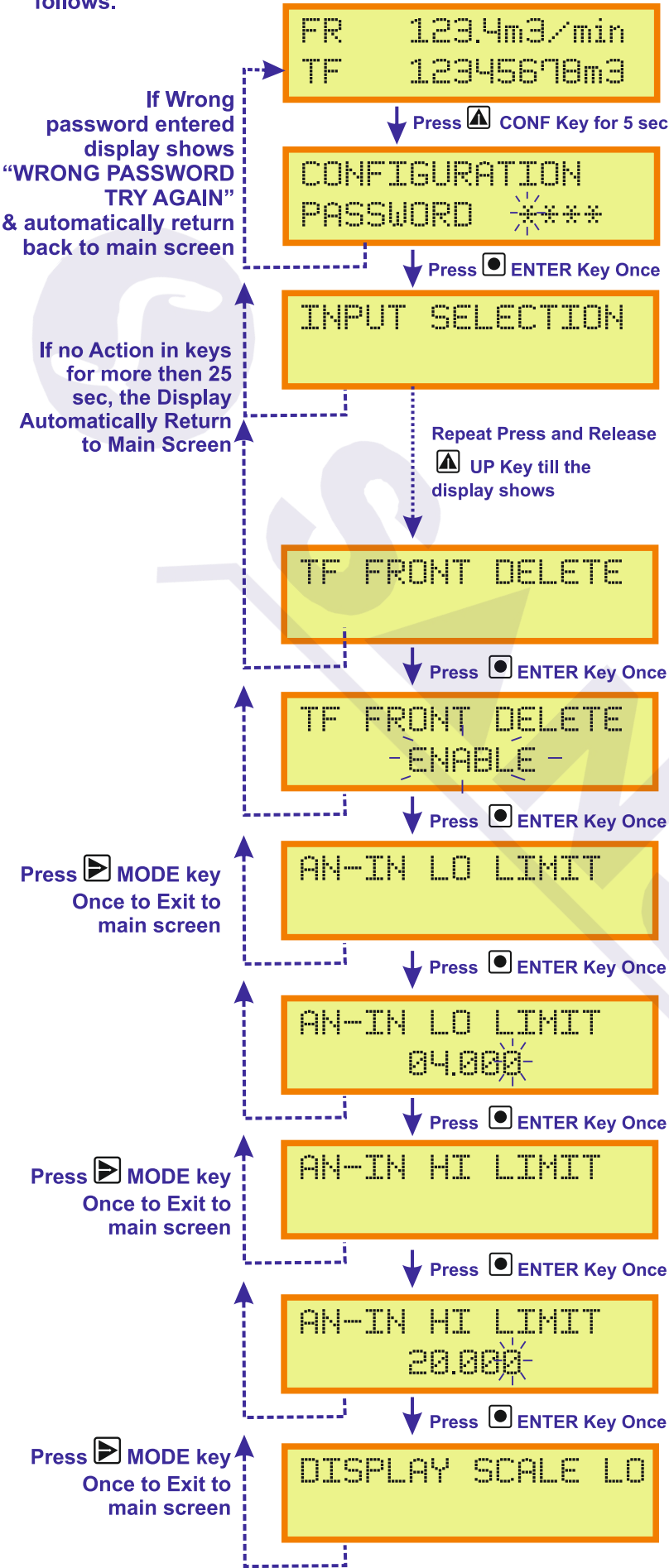
6.3. UNIT & FR TIME BASE SELECTION

In Main Screen, Enter into the “Configuration Menu”, Press CONF Key till the Display Shows follows.



6.4. TF FRONT DELETE SELECTION & ANALOG INPUT LIMIT SETTINGS

In Main Screen, Enter into the “Configuration Menu”, Press CONF Key till the Display Shows follows.



Main Screen

Use UP & DN keys to select the desire value (Roll over the blinking digit between 0 - 9) and Press MODE key to Next Digit selection and Repeat the above for all the 4 digit and enter the correct Configuration Menu Password and Press ENTER Key Once. Then the display shows the Analog Input type selection mode.

Then Press UP key to scroll the Configuration menu to TF Front key Delete mode.

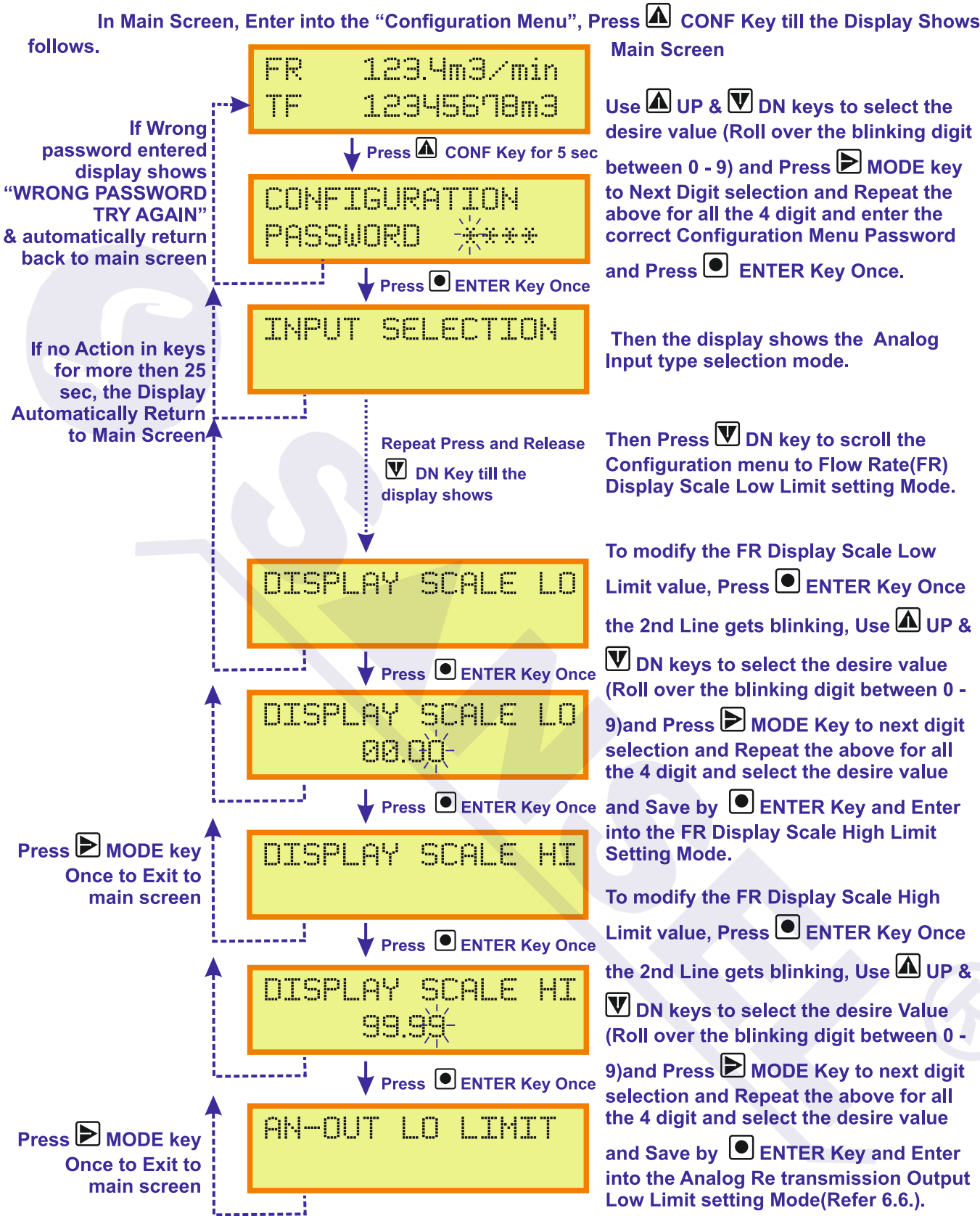
To modify the TF Front Delete Mode, Press ENTER Key Once the 2nd Line gets

blinking, Use UP & DN keys to select the desire Mode (Roll over the blinking digit between “ENABLE”& “DISABLE”)and Press ENTER Key to Save and Enter into the Analog Input Low Limit Setting Mode.

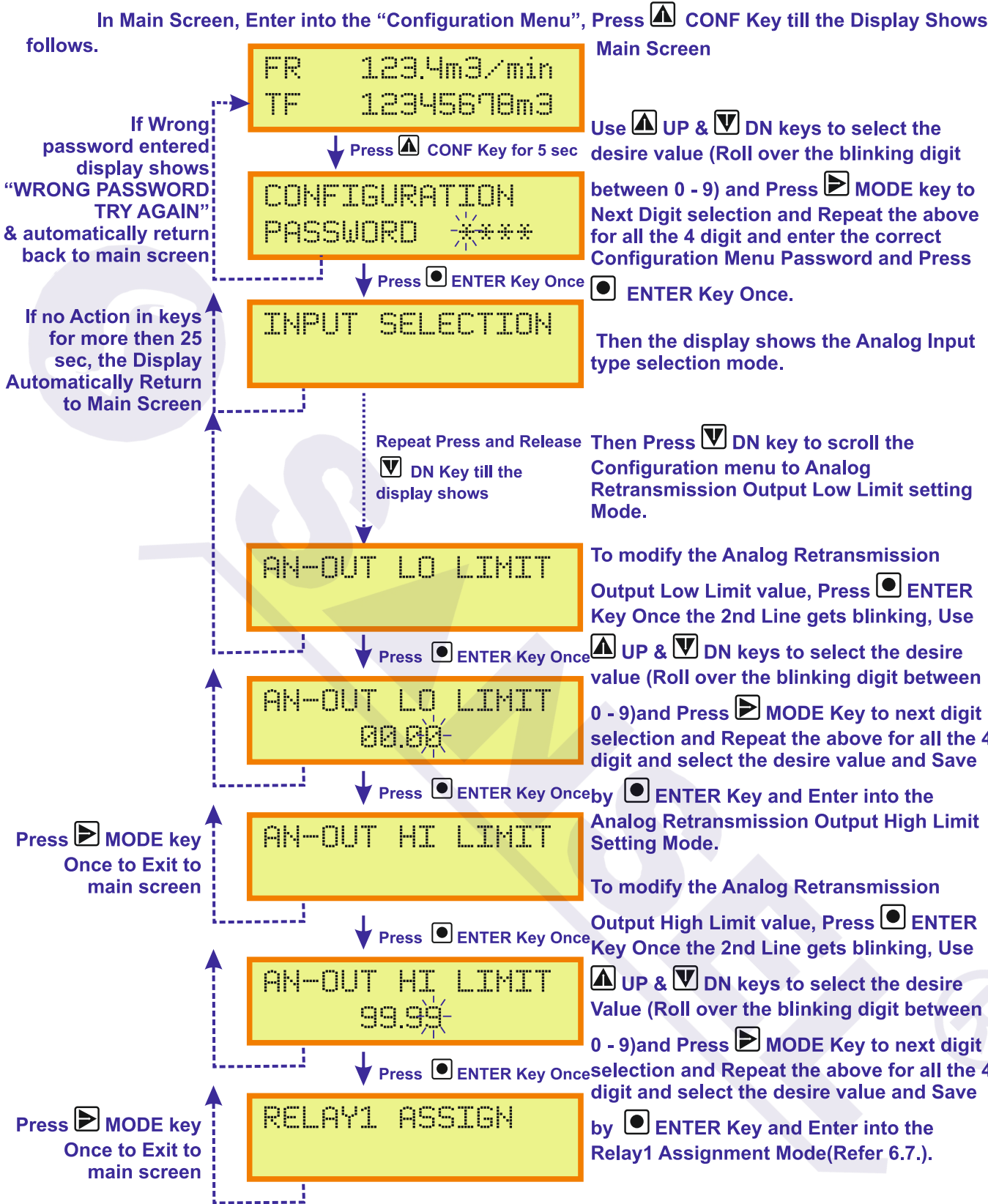
To modify the Analog Input Low Limit, Press ENTER Key Once the 2nd Line gets blinking, Use UP & DN keys to select the desire Value (Roll over the blinking digit between 0 - 9)and Press MODE Key to next digit selection and Repeat the above for all the 5 digit and select the desire value and Save by ENTER Key and Enter into the Analog Input High Limit setting Mode.

To modify the Analog Input High Limit, Press ENTER Key Once the 2nd Line gets blinking, Use UP & DN keys to select the desire Value (Roll over the blinking digit between 0 - 9)and Press MODE Key to next digit selection and Repeat the above for all the 5 digit and select the desire value and Save by ENTER Key and Enter into the FR Display Scale Low Limit setting Mode(Refer 6.5.).

6.5. FLOW RATE(FR) DISPLAY SCALE LIMIT SETTING(0 to 9999)

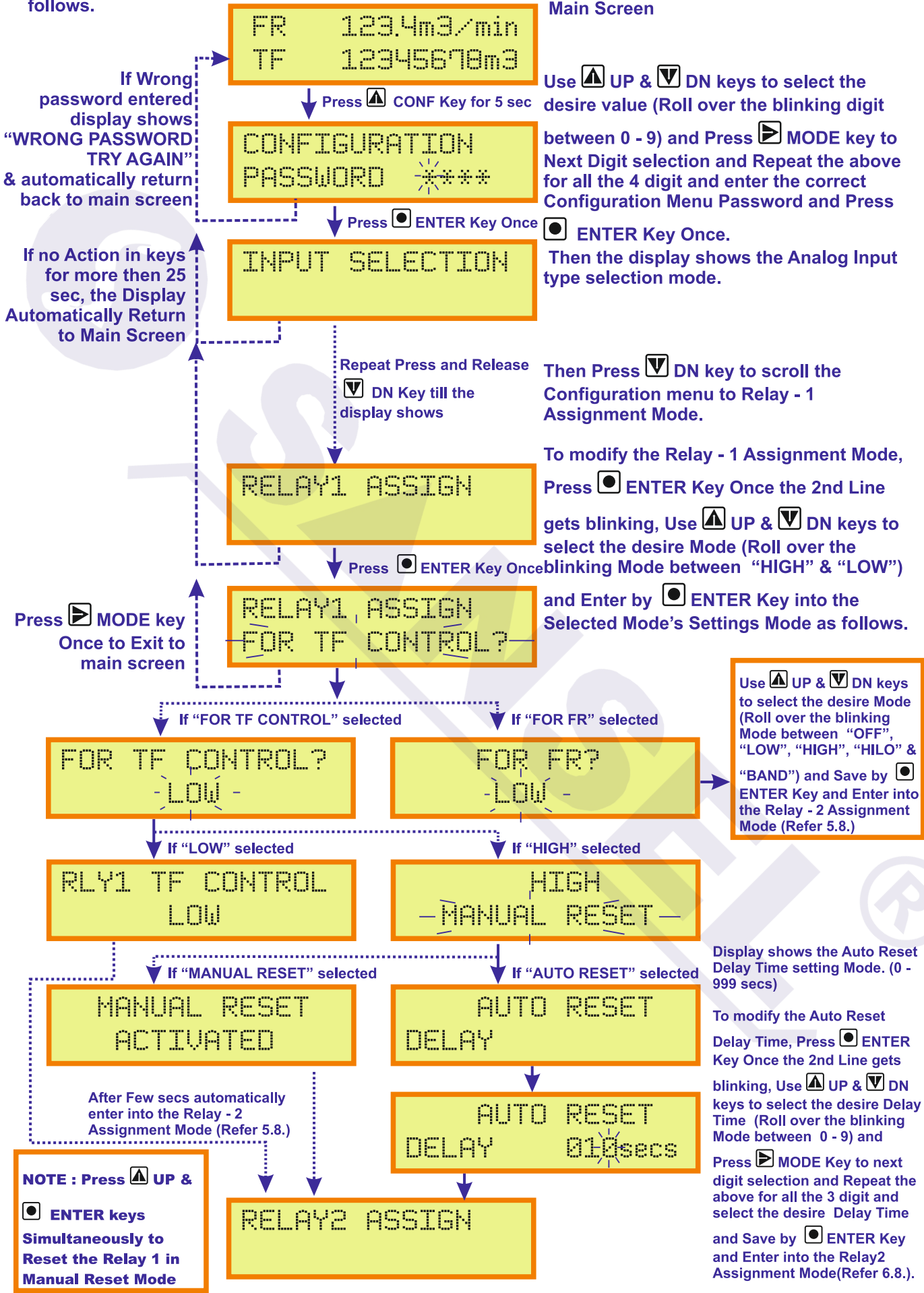


6.6. FR ANALOG RETRANSMISSION OUTPUT LIMIT SETTING(0 to 9999)



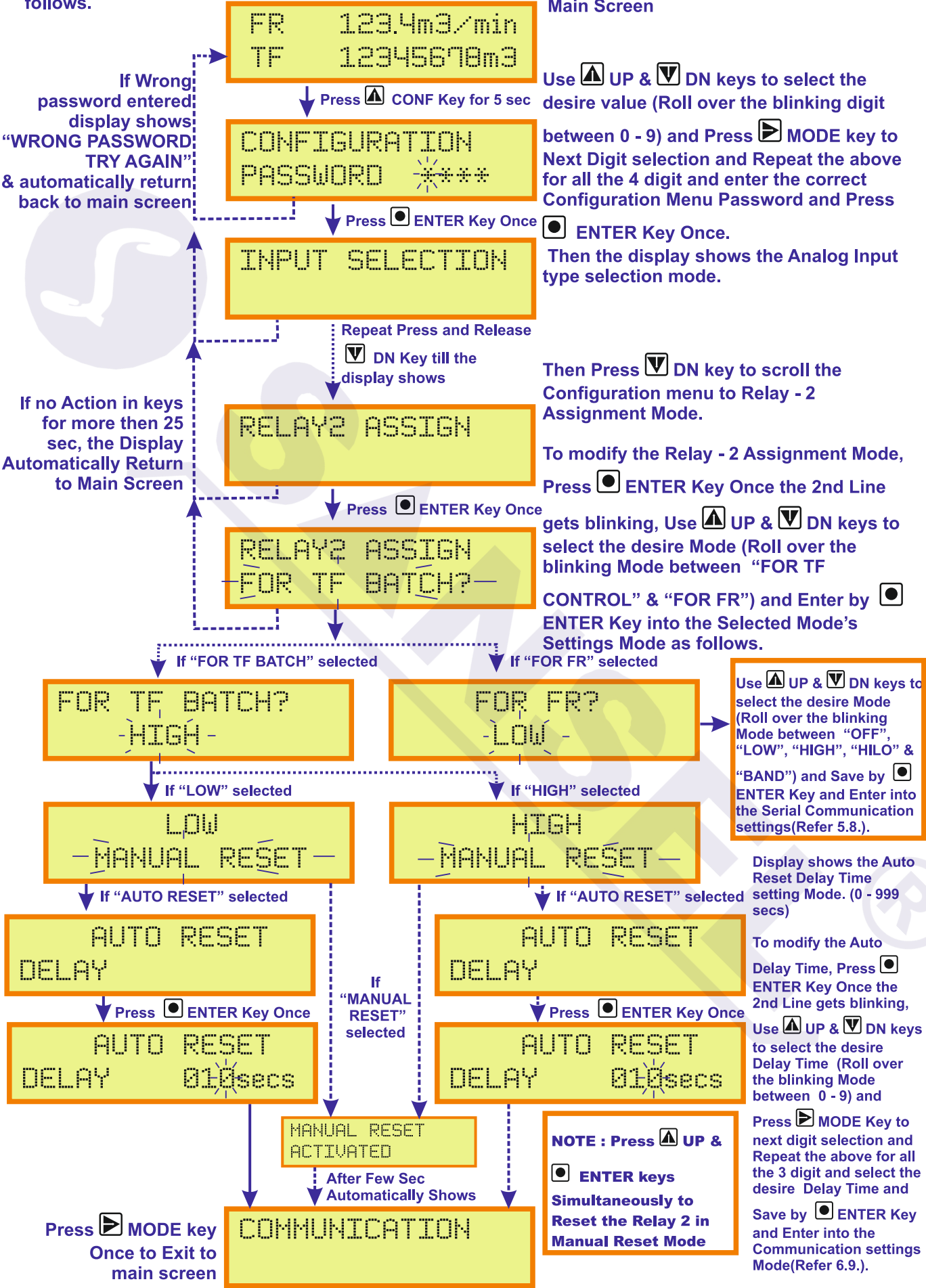
6.7. RELAY - 1 ASSIGNMENT

In Main Screen, Enter into the “Configuration Menu”, Press **▲** CONF Key till the Display Shows follows.



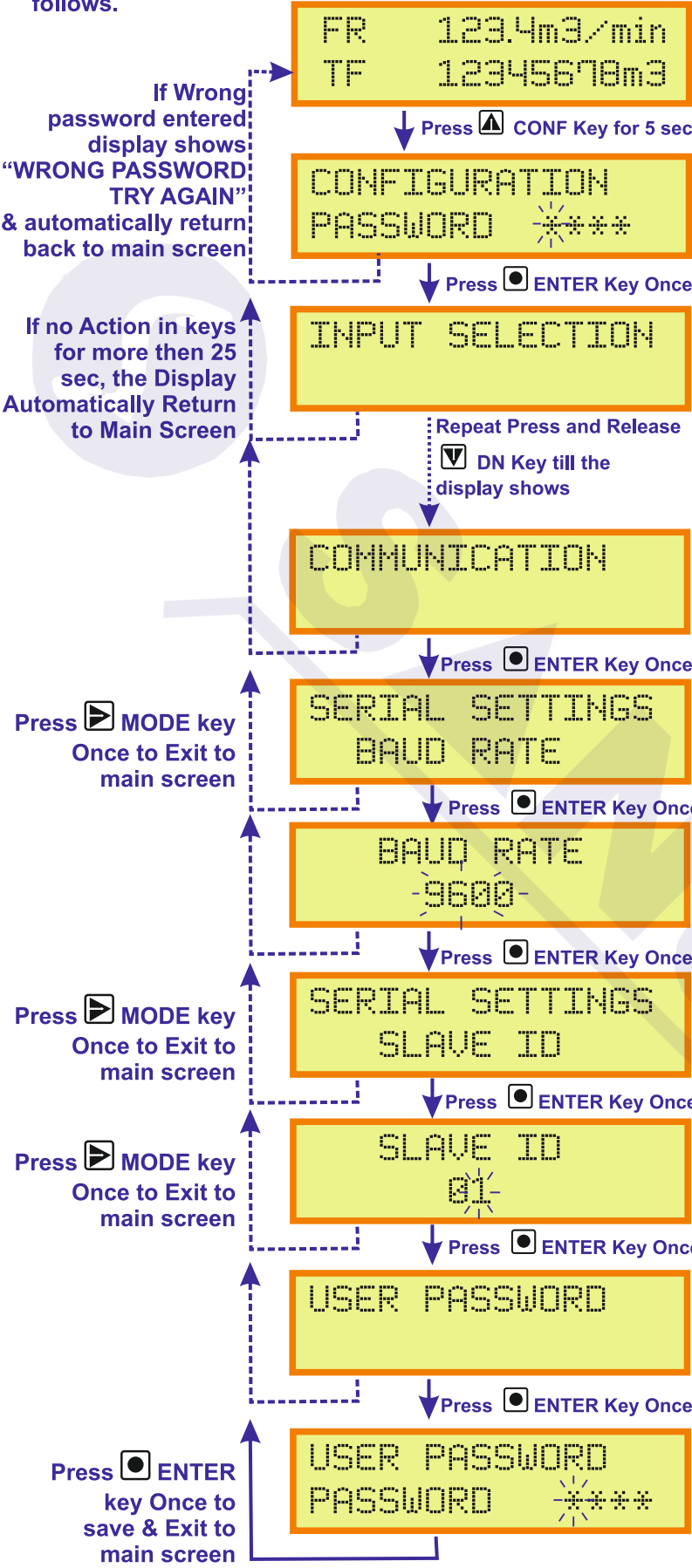
6.8. RELAY - 2 ASSIGNMENT

In Main Screen, Enter into the “Configuration Menu”, Press CONF Key till the Display Shows follows.



6.9. SERIAL COMMUNICATION & USER PASSWORD SETTINGS

In Main Screen, Enter into the “Configuration Menu”, Press CONF Key till the Display Shows Main Screen



Use UP & DN keys to select the desire value (Roll over the blinking digit between 0 - 9) and Press MODE key to Next Digit selection and Repeat the above for all the 4 digit and enter the correct Configuration Menu Password and Press ENTER Key Once.

Then the display shows the Analog Input type selection mode.

Then Press DN key to scroll the Configuration menu to Serial Communication settings.

To modify the Communication settings, Press ENTER Key Once the Display shows Baud Rate Setting Mode.

To modify the Baud rate, Press ENTER Key Once the display shows the Previously selected Baud Rate value, Use UP & DN keys to select the desire Value (Roll over the blinking Mode between "9600", "19200", "57600", "115200") and Save by ENTER Key & Enter into the Slave ID Settings Mode.(1 to 32)

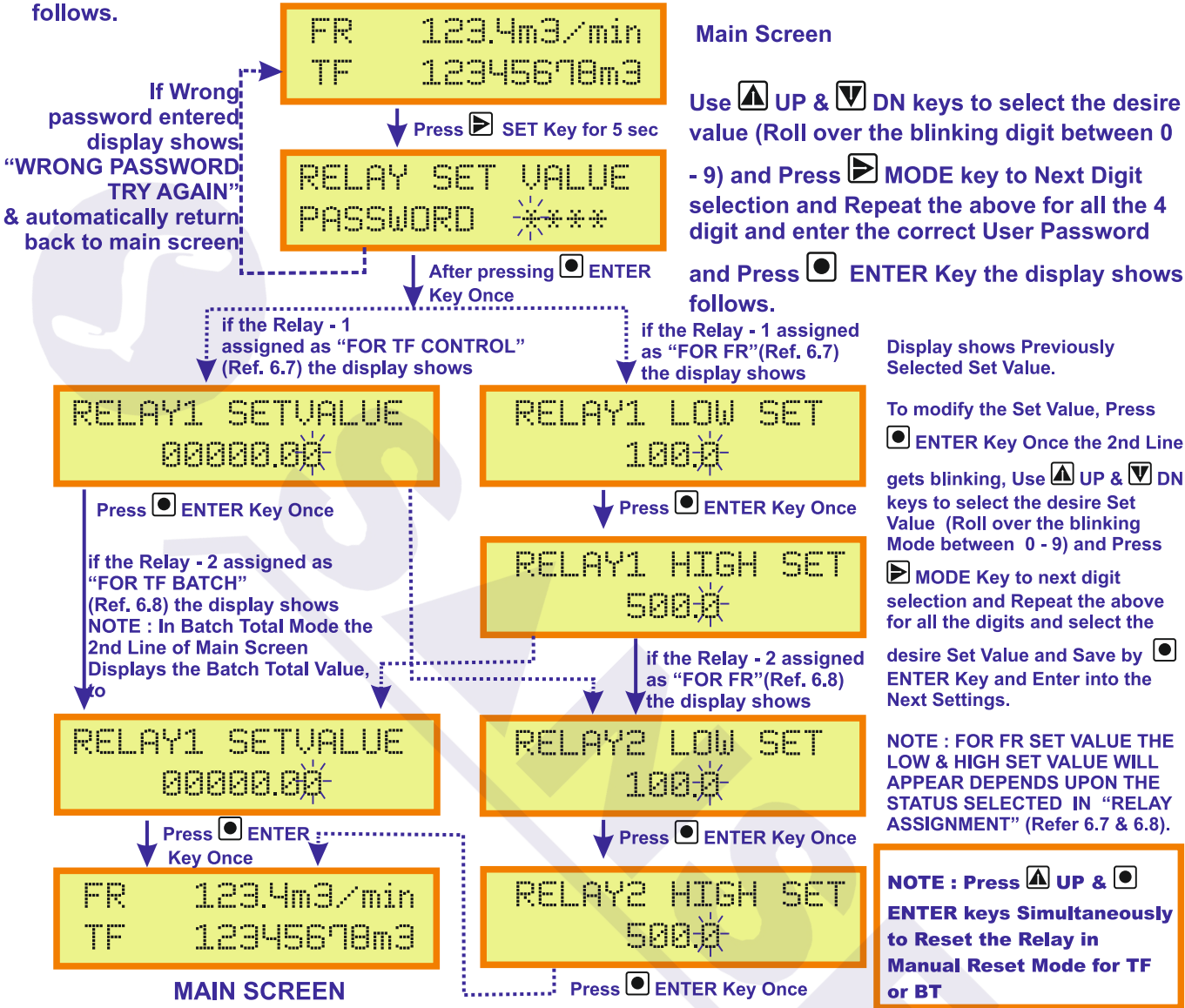
To modify the Slave ID, Press ENTER Key Once the display shows the Previously selected Slave ID value, Use UP & DN keys to select the desire Value (Roll over the blinking Mode between 0 - 9) and Press MODE Key to next digit selection and Repeat the above for all the 2 digit and select the desire Slave ID and Save by ENTER Key and Enter into the User Password Setting Mode.(0 - 9999)

To modify the User Password, Press ENTER Key Once the display gets blinking in 1st digit of Hidden value , Use UP & DN keys to select the desire Value (Roll over the blinking Mode between 0 - 9) and Press MODE Key to next digit selection and Repeat the above for all the 4 digit and select the desire User Password and Save by ENTER Key and Exit to Main Screen.

7. RELAY SET VALUE (PASSWORD = USER PASSWORD)

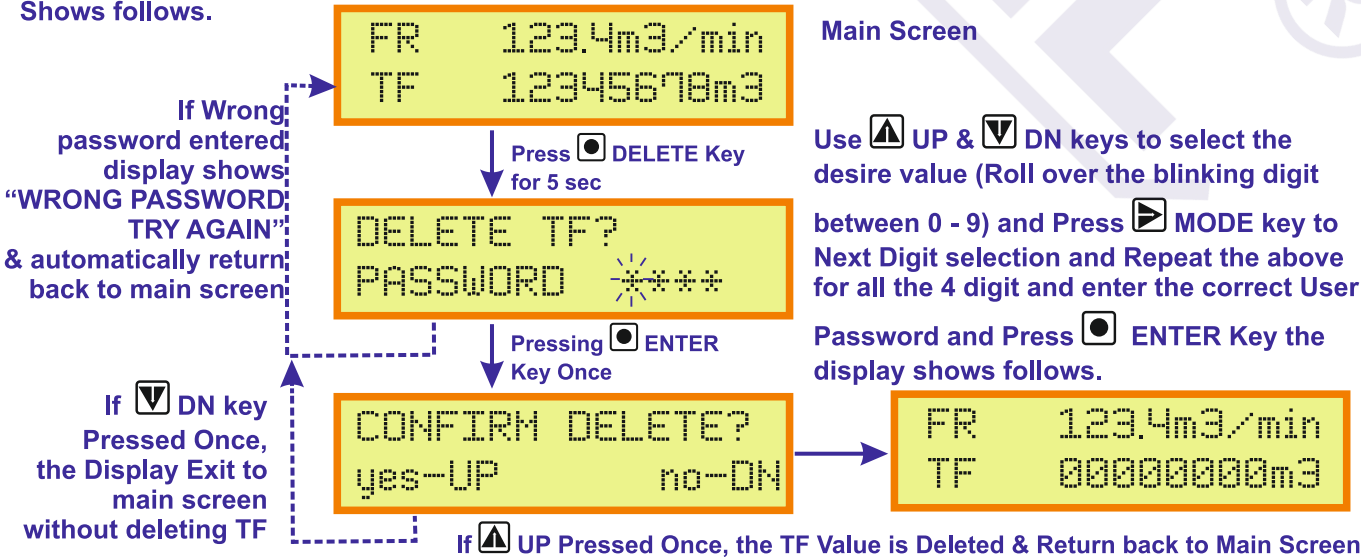
NOTE : During the Flow Process, Don't Configure Set Value, it may cause, Error in Total Flow(TF) Value & loss of PC Logging Data.

In Main Screen, Enter into the "Relay Set Value" Mode, Press SET Key till the Display Shows follows.



8. DELETE TOTAL FLOW(TF)(PASSWORD = USER PASSWORD)

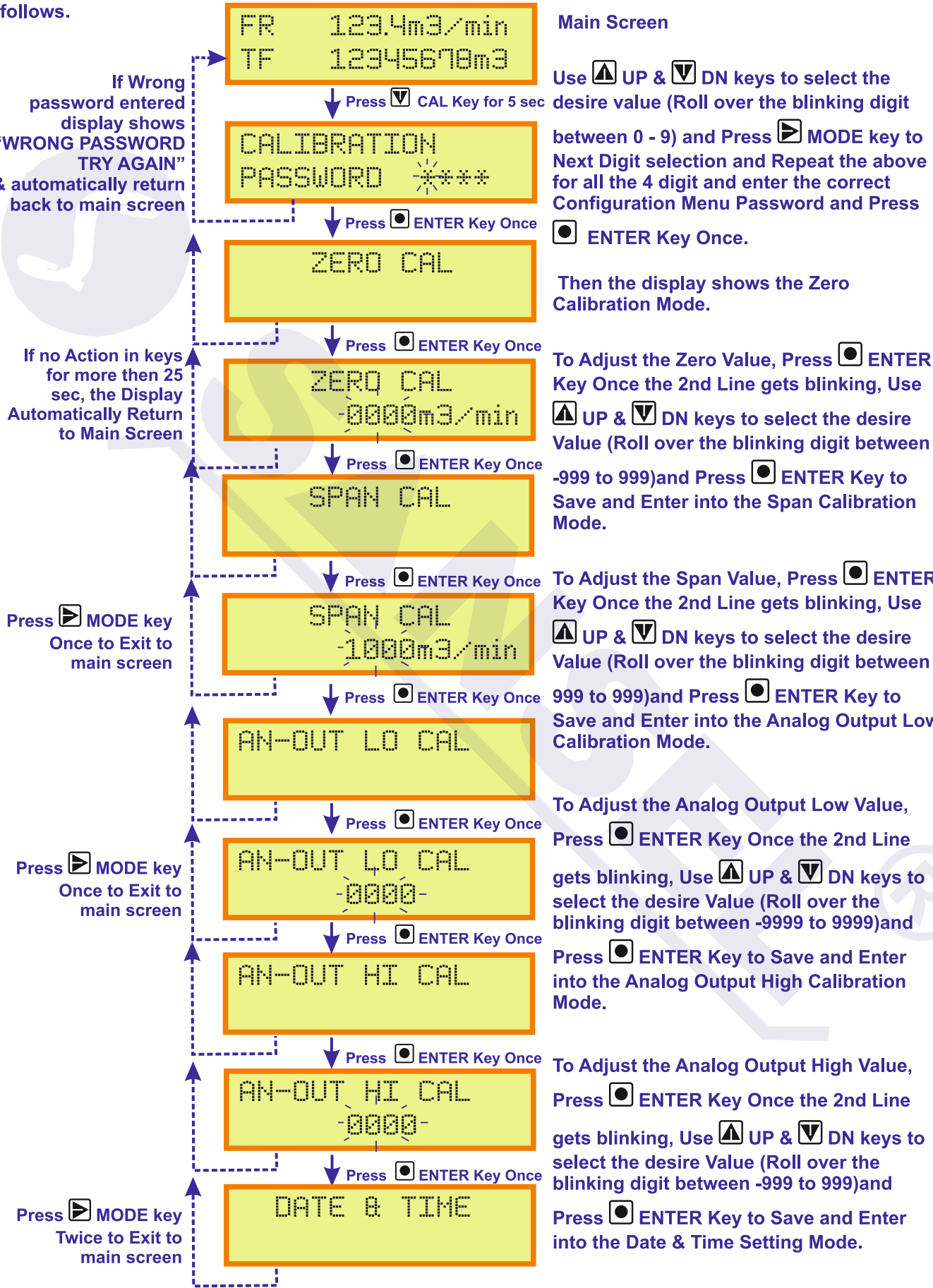
In Main Screen, Enter into the "Delete Total Flow" Mode, Press DELETE Key till the Display Shows follows.



9.CALIBRATION FOR FLOW RATE(FR)(PASSWORD = 9753)

NOTE : During the Flow Process, Don't do Calibration, it may cause, Error in Total Flow(TF) Value & loss of PC Logging Data.

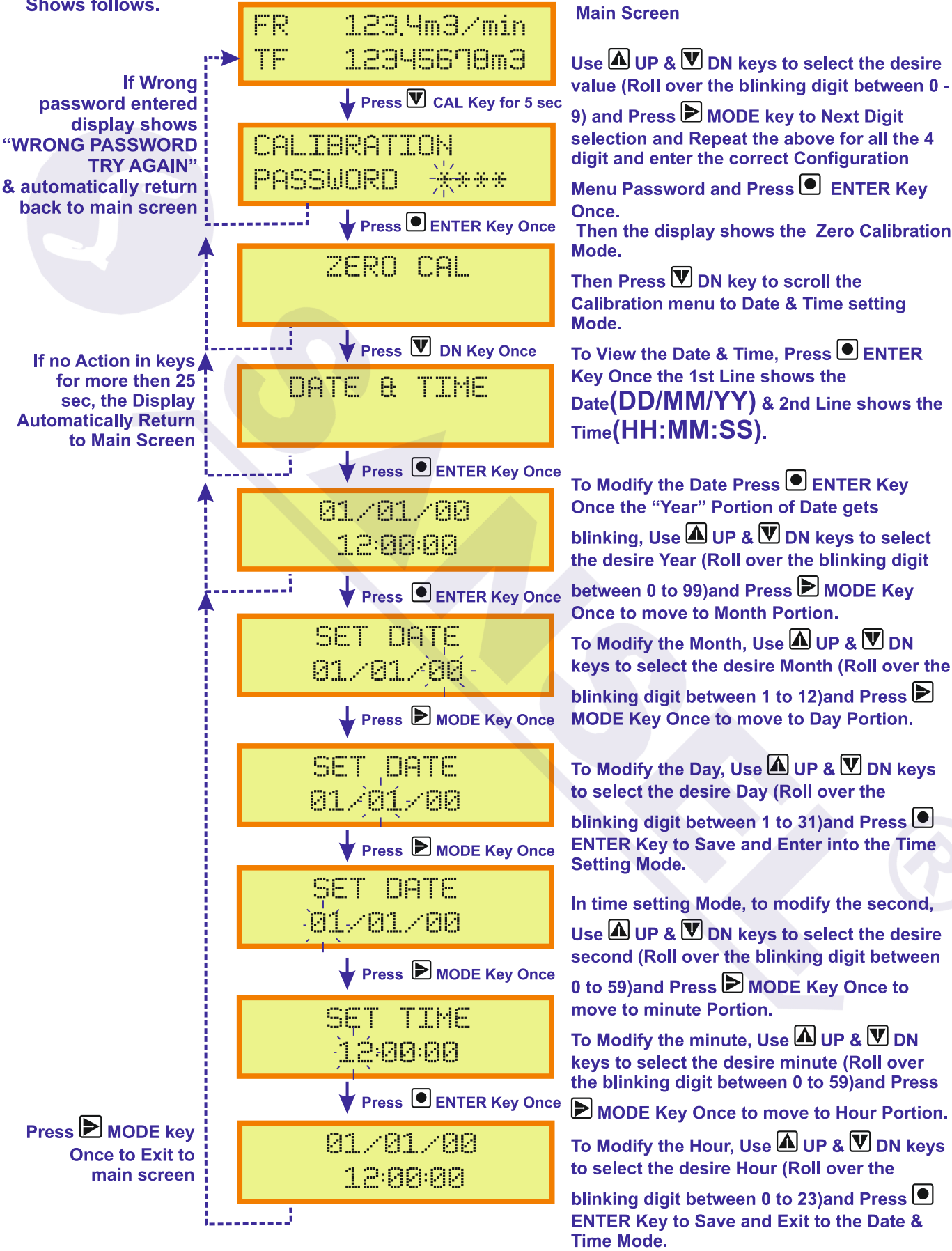
In Main Screen, Enter into the "User Calibration" Mode, Press  CAL Key till the Display Shows follows.



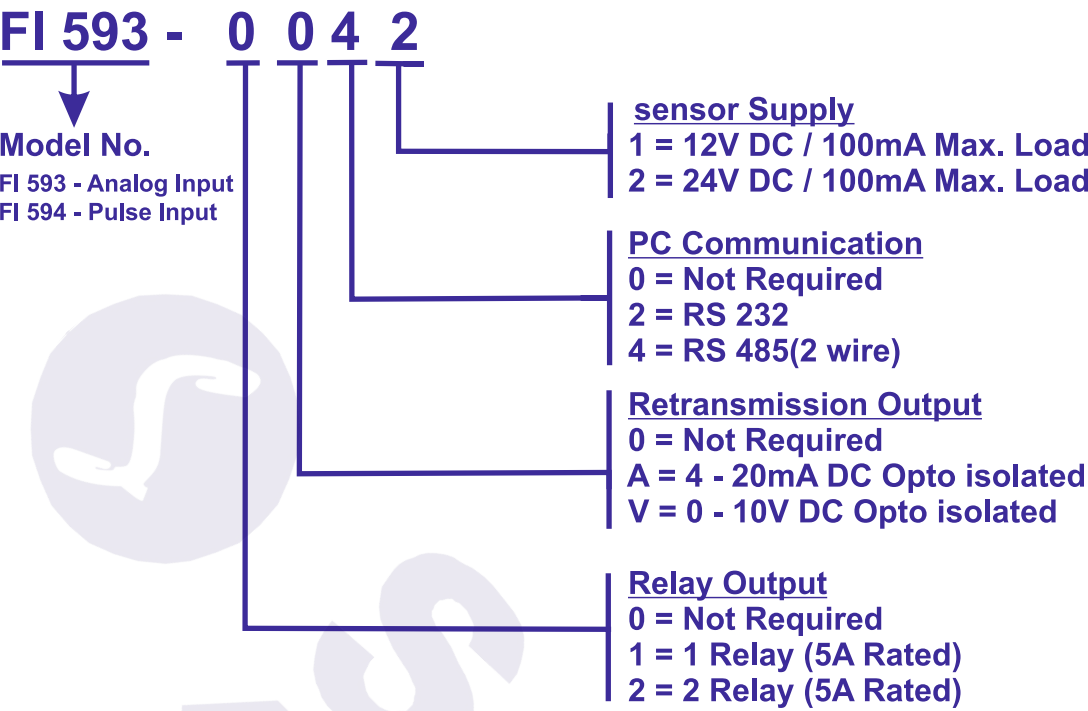
10.DATE and TIME SETTINGS(PASSWORD = 9753)

NOTE : During the Flow Process, Don't Configure Date & Time, it may cause, loss of PC Logging Data.

In Main Screen, Enter into the “Date and Time” Setting Mode, Press **▼** CAL Key till the Display Shows follows.



11. ORDERING INFORMATION



12. WARRANTY

The FI 593 is Warranted for a period of 12 Months from the date of delivery against defects in materials or workmanship. During Warranty, our liability is limited to the repair or replacement of the FI 593 at our opinion. Data subject to change without notice.

Supplier Name & Address :

Customer Name & Address :

Serial No. : _____

Date of Delivery or Despatch : _____

13. CONTACT US

SANSEL INSTRUMENTS AND CONTROLS

No.1/46, GANGA NAGAR, MMDA COLONY, MADURAVOYAL,
NEAR METTUKUPPAM, CHENNAI - 600 095, TN
PH : 91 44 23783951