



INSTRUCTION MANUAL

FLOW RATE INDICATOR with TOTALIZER Pulse Input with RS 485 MODBUS RTU PROTOCOL MODEL : FI 594



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1. SAFETY INSTRUCTIONS

Use the FI 594 only as specified in this manual. Otherwise, the protection provided by the FI 594 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 594 being used.

⚠ Warnings

To avoid personal injury, follow these guidelines.

- ✎ **DO NOT** use the FI 594 for any application other than its work. The FI 594 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 594 should only be used by Trained Personnel.
- ✎ If this FI 594 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 594 under a Open area or other infrastructure. Always leave enough clearance to allow for safe and easy to use.
- ✎ The FI 594 is intended for indoor use only.

⚠ Cautions

To avoid possible damage to the FI 594, follow these guidelines.

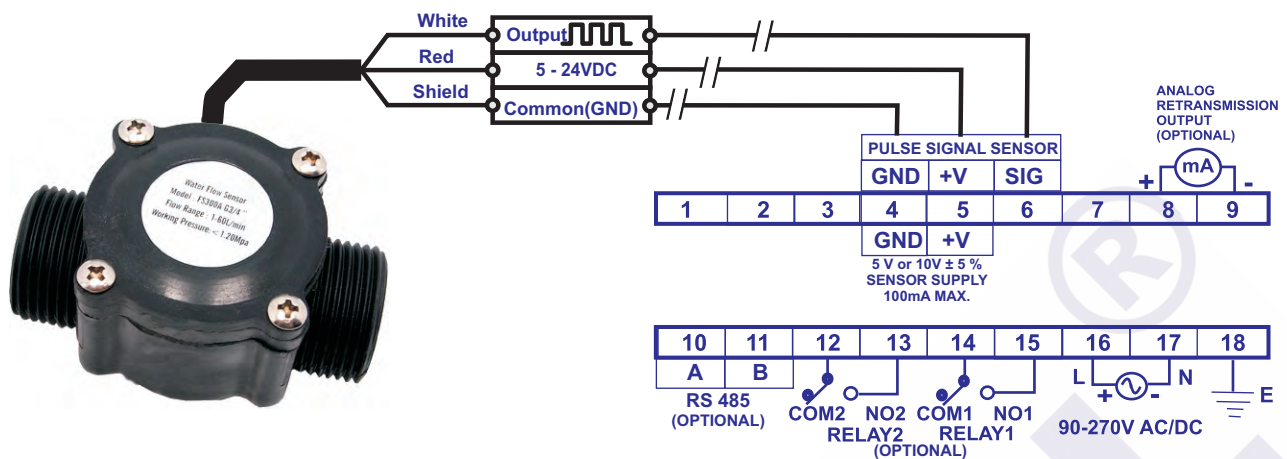
- ✎ **DO NOT** try to change the password setting values of the FI 594 .The correct setting of these parameters is important to the safety and proper operation of the FI 594.
- ✎ Always operate this instrument at room temperature between 41°F and 104°F (5°C to 40°C).Allow sufficient air circulation by leaving at least 6 inches (15 cm) of clearance around the FI 594.
- ✎ The FI 594 is a precision instrument. Although it has been designed for optimum durability and trouble free operation, it must be handled with care.

2. SPECIFICATIONS

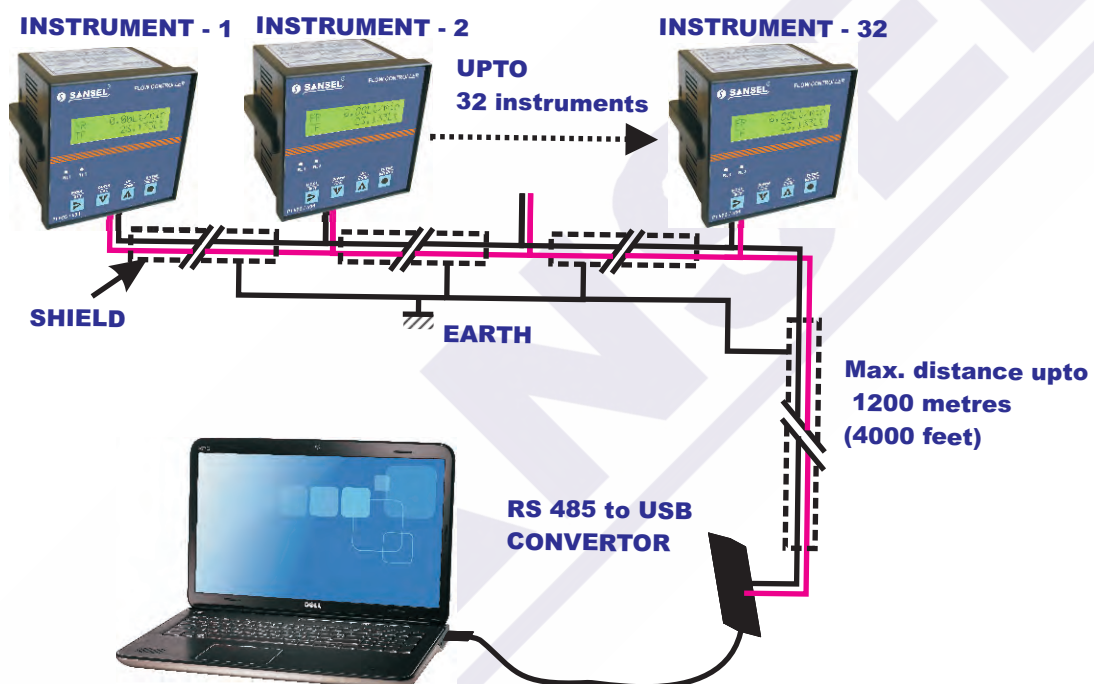
NOTE : Due to continuous improvements, Published specifications may change without notice

Model	FI 594
Display	16 Character x 2 Line LCD
Password Access	Provided for all settings
Signal Input	Pulse Input
Display Modes	Flow Rate (FR) , Total Flow(TF) or Batch Total (BT)
Display Range for FR	0 - 99999 (5 digit)
Display Range for TF / BT	0 - 99999999 (8 digit)
User Calibration Factor	0 - 99999999 (8 digit)(user selectable)
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 (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)
Communication PROTOCOL	MODBUS RTU
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 65(W x H x D) mm
Cutout Dimension	92 x 92(W x H) mm
Sensor Supply Output	5 or 10V DC $\pm$ 5% (any one Factory Presetable)
Operating Supply	90 to 270V AC / DC
Operating Environment	0 to 50°C / 20 to 95 % RH non condensing
Weight (Approx.)	300 gram

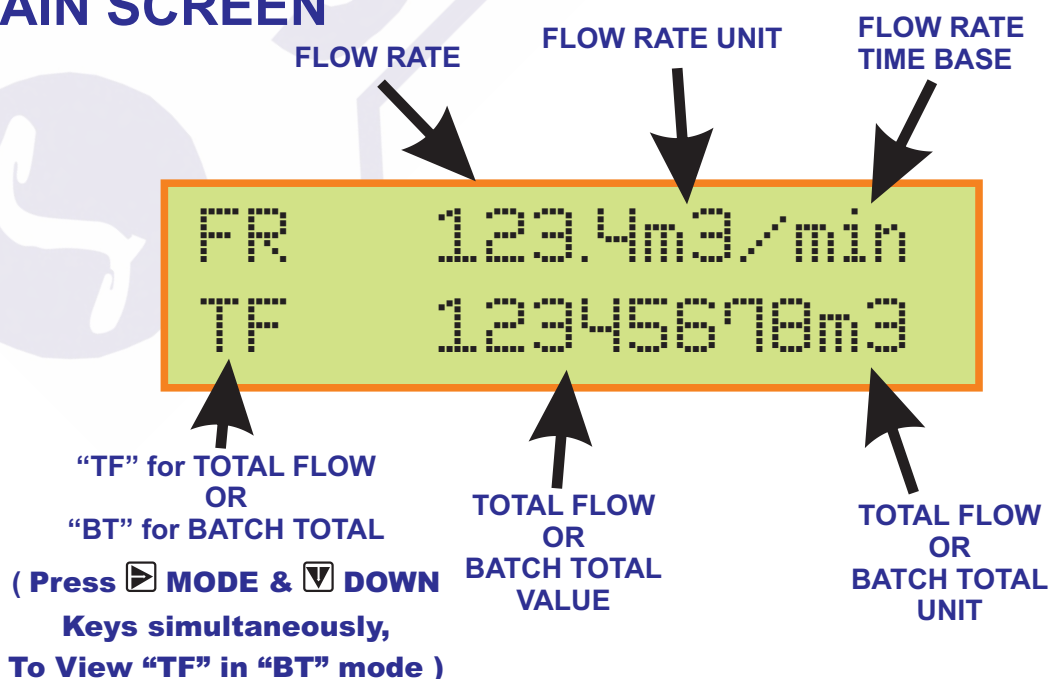
3. INPUT AND OUTPUT CONNECTIONS



4. CONNECTING TO PC



5. MAIN SCREEN

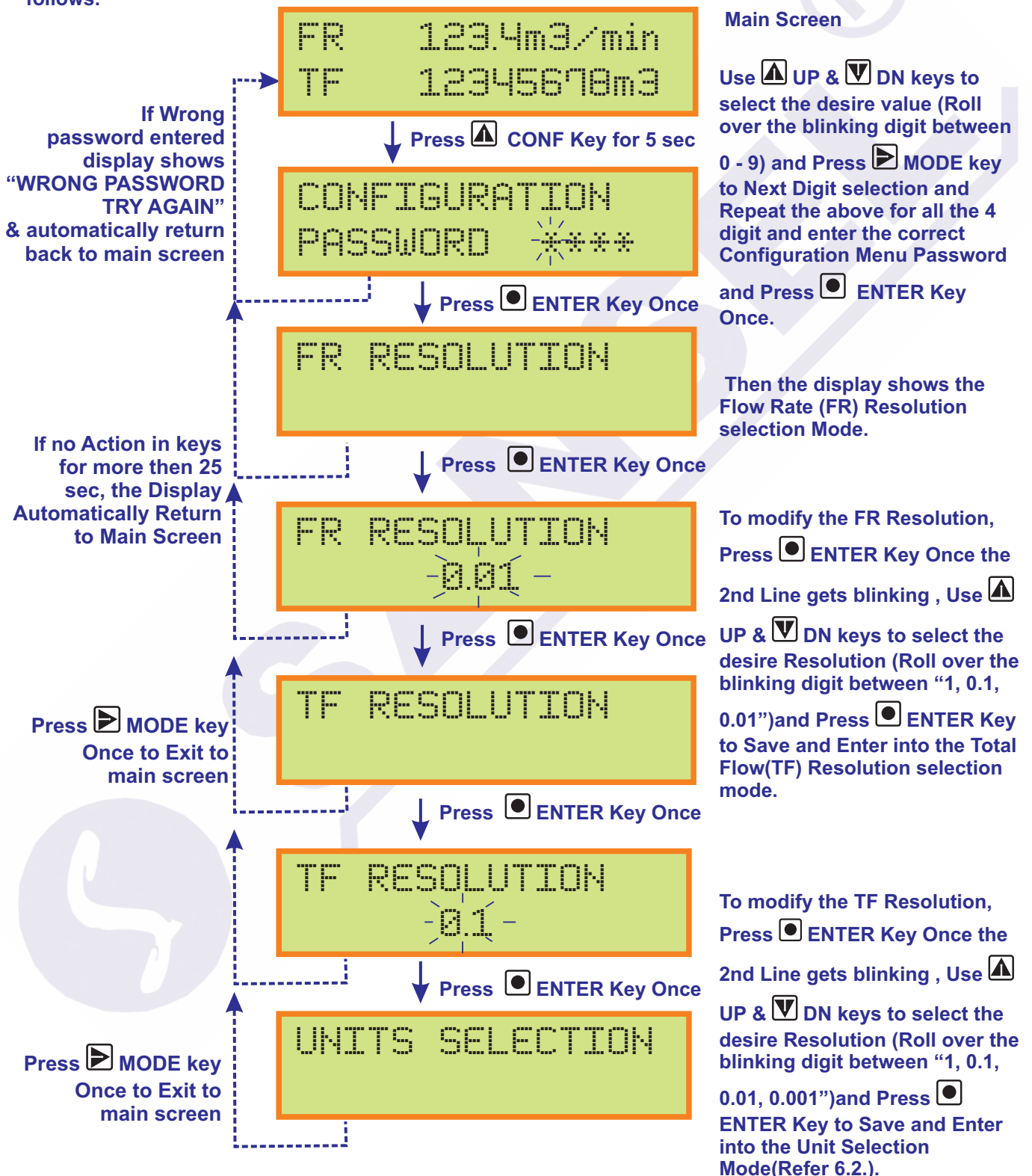


6. CONFIGURATION MENU (PASSWORD = 9753)

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

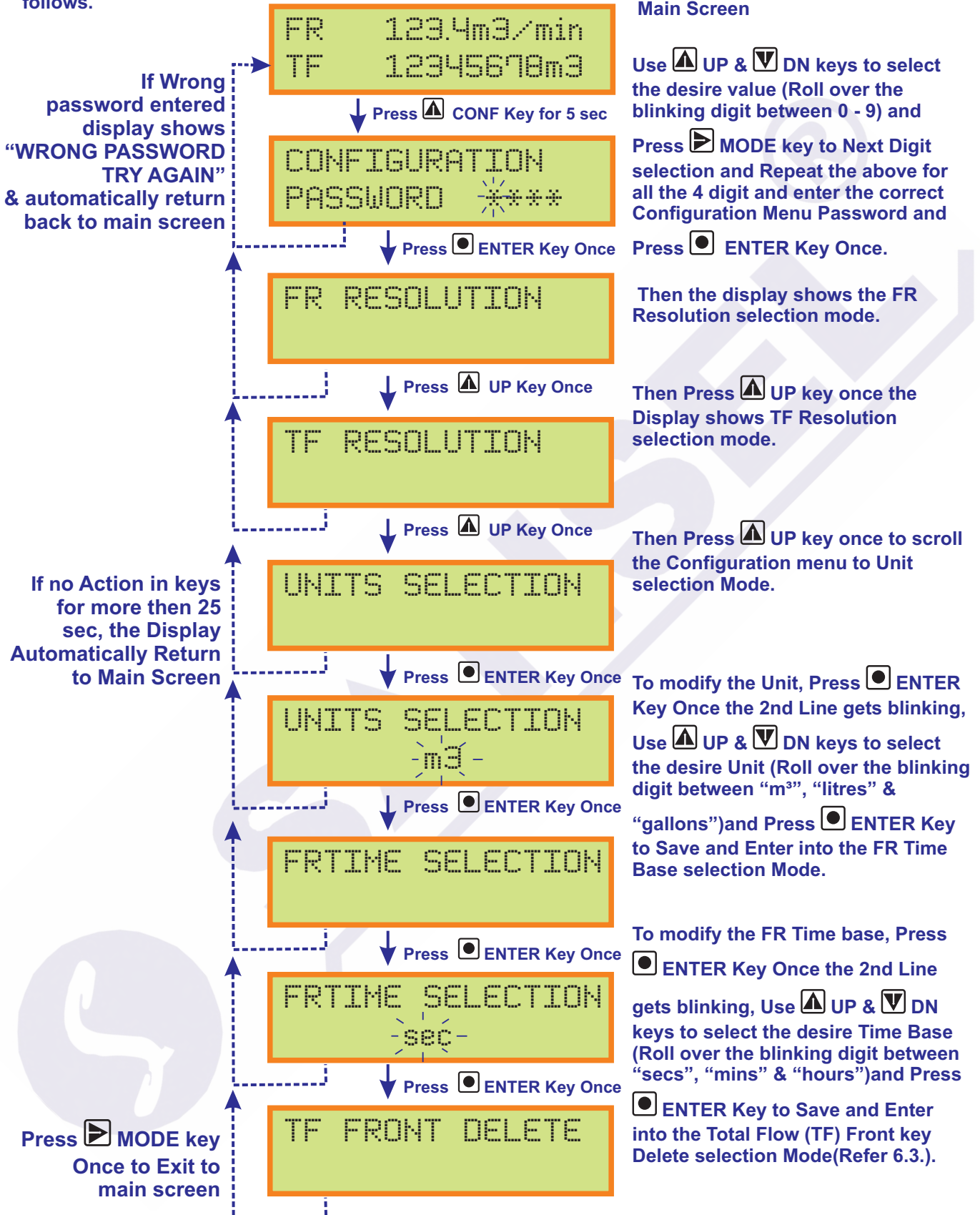
6.1. FLOW RATE (FR) & TOTAL FLOW (TF) RESOLUTION SELECTION

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



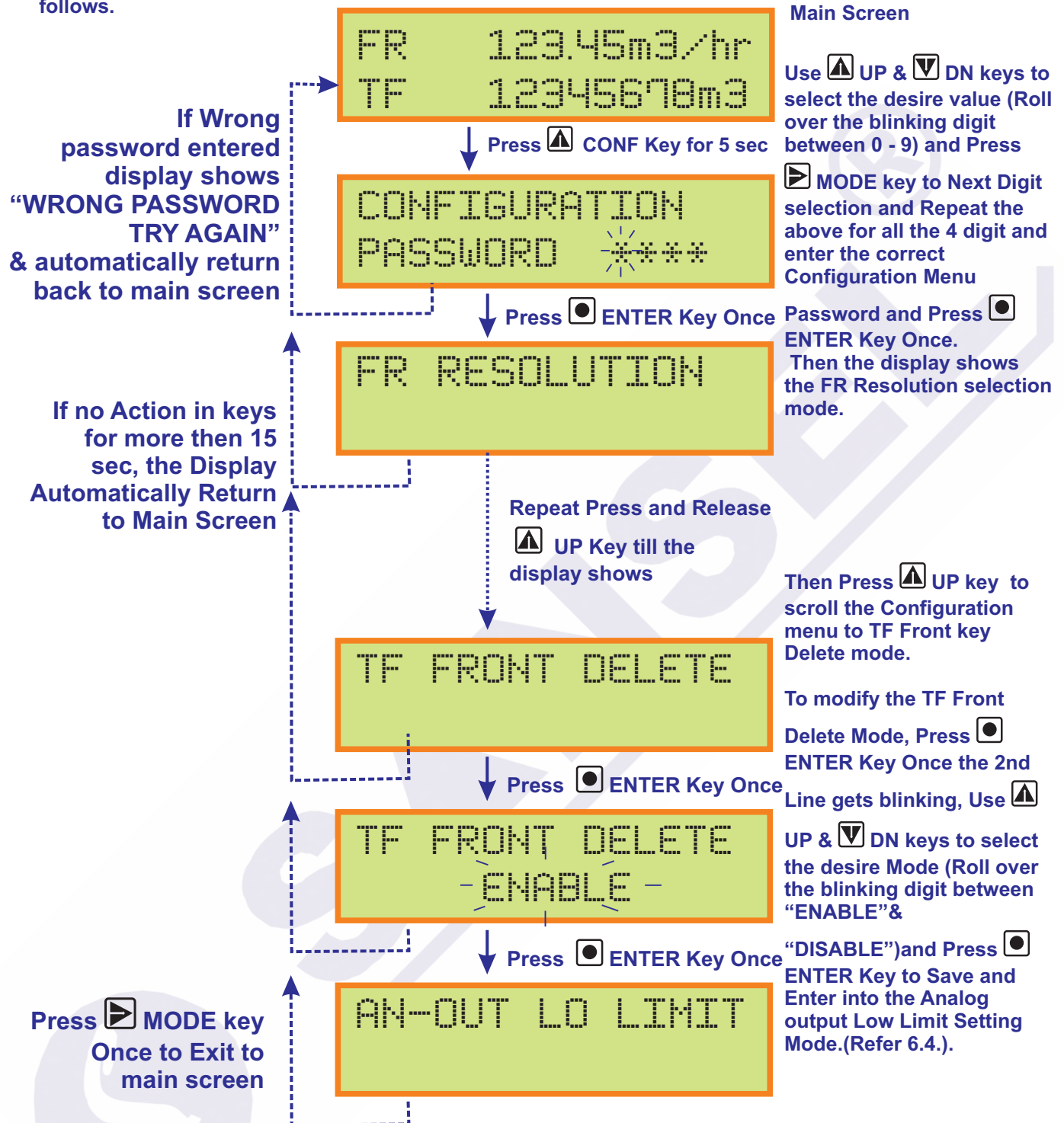
6.2. UNIT & FR TIME BASE SELECTION

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



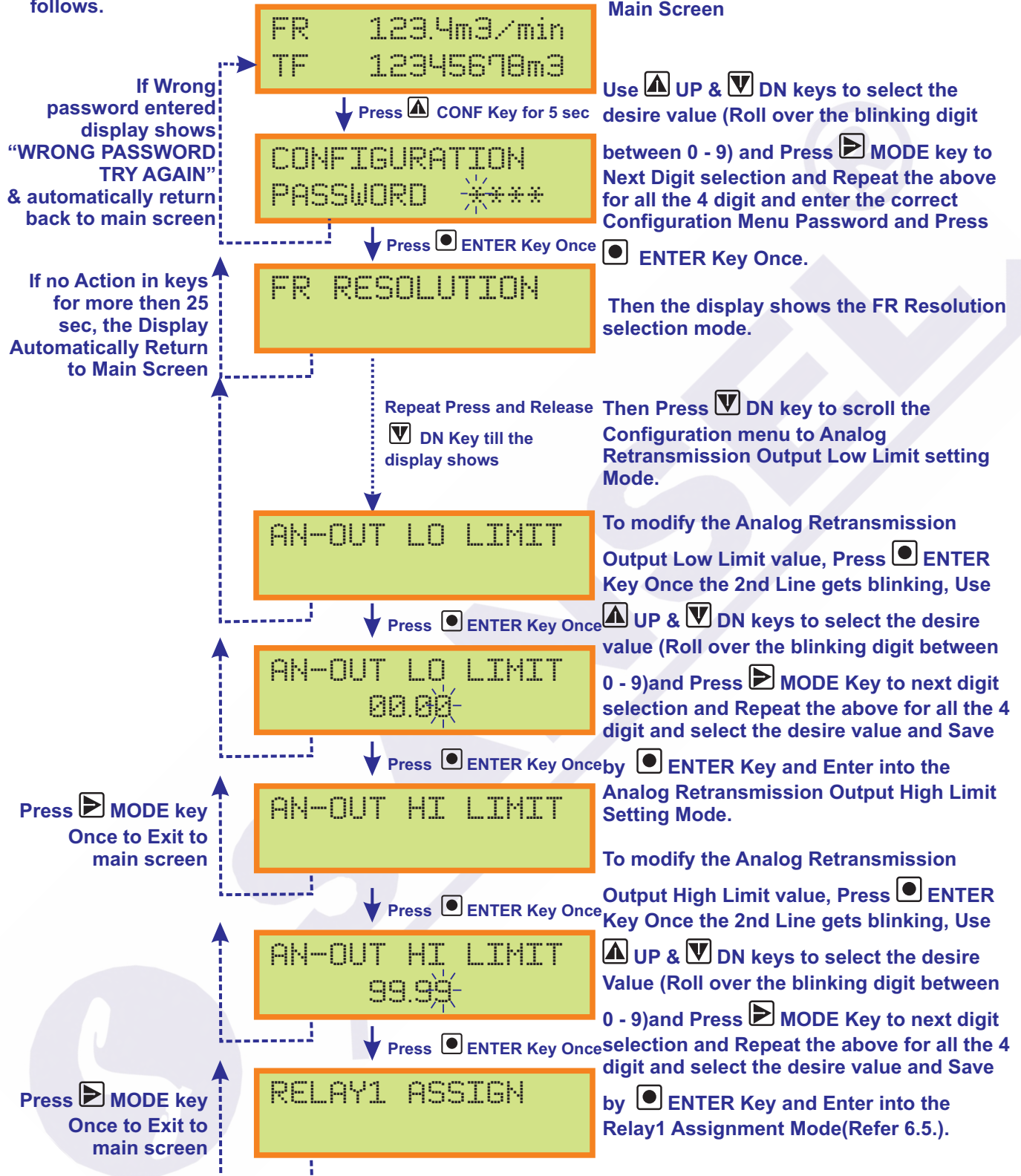
6.3. TF FRONT DELETE SELECTION

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



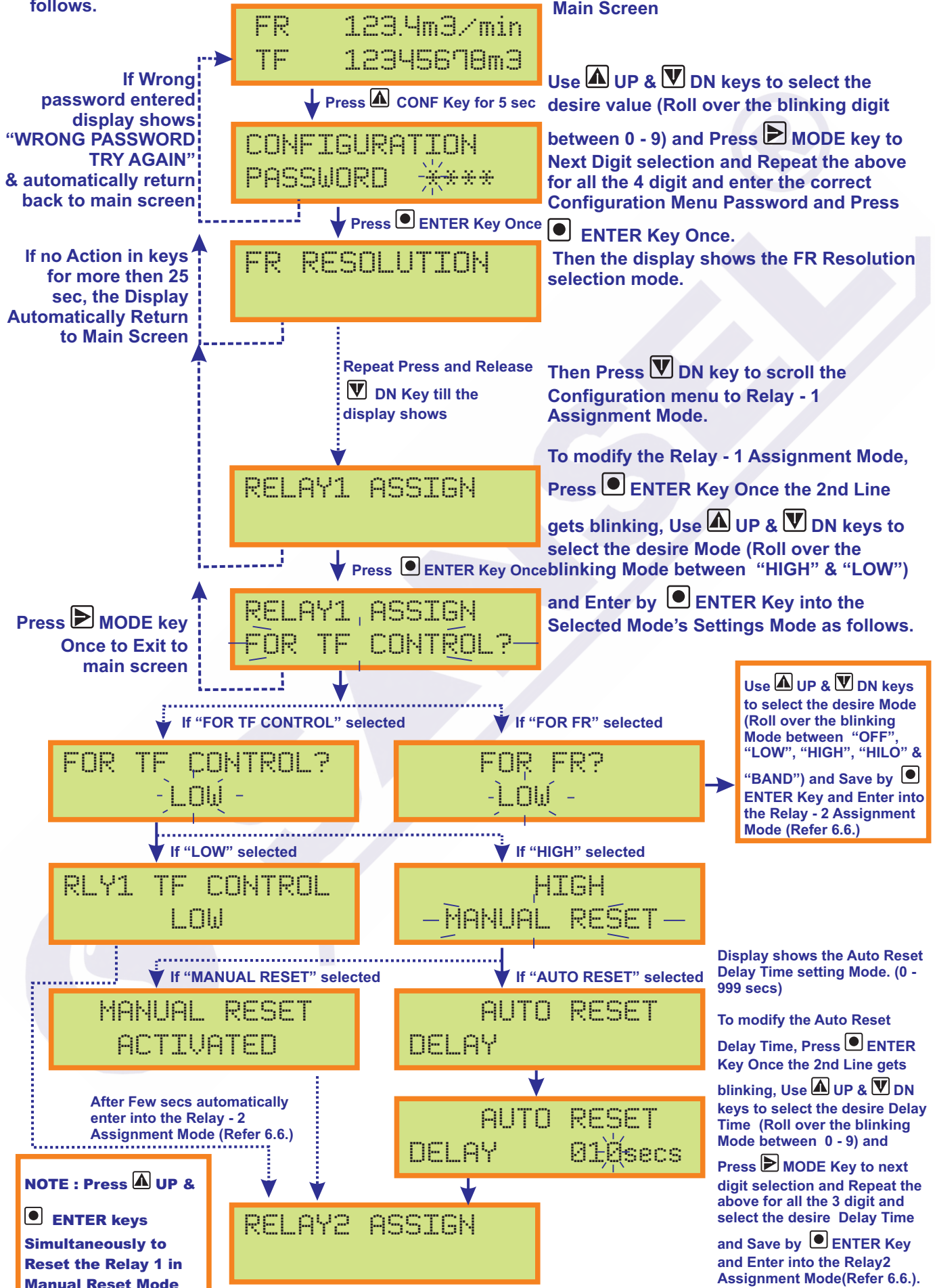
6.4. FR ANALOG RETRANSMISSION OUTPUT LIMIT SETTING(0 to 9999)

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



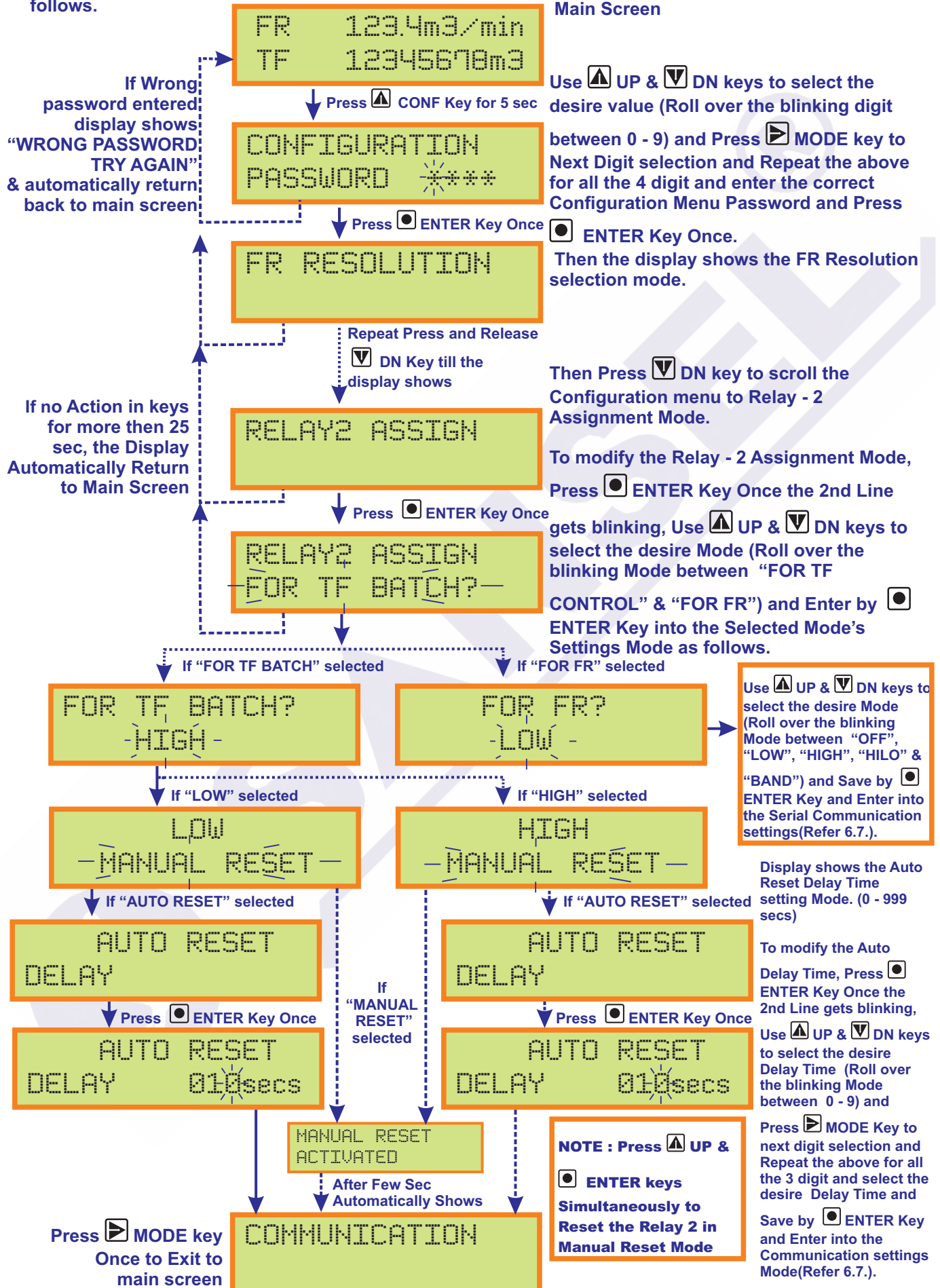
6.5. RELAY - 1 ASSIGNMENT

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



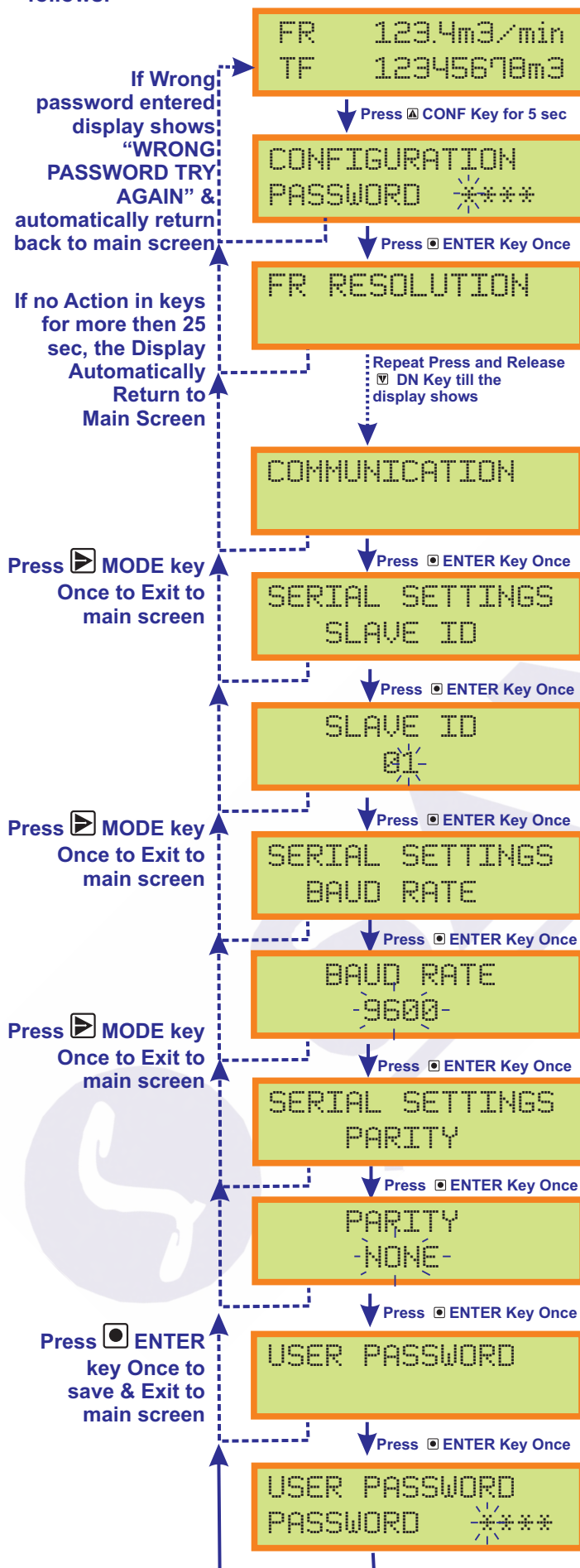
6.6. RELAY - 2 ASSIGNMENT

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



6.7. 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 FR Resolution 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 Slave ID Setting 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 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") and Save by ENTER Key & Enter into the Parity Settings Mode.

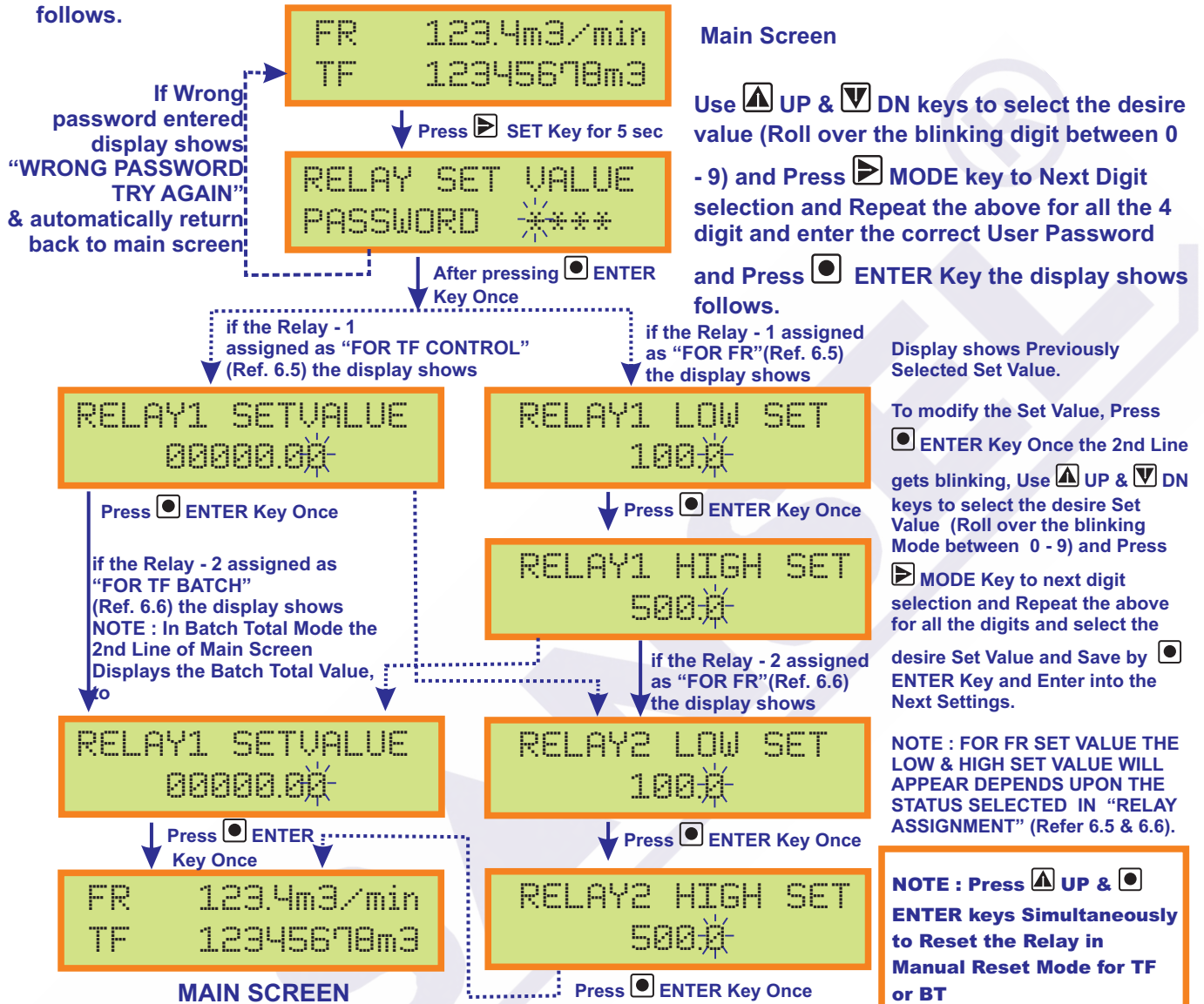
To modify the Parity, Press ENTER Key Once the display shows the Previously selected Parity, Use UP & DN keys to select the desire Value (Roll over the blinking Mode between "NONE", "EVEN" & "ODD") and Save by ENTER Key & Enter into the User password Settings Mode.

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)

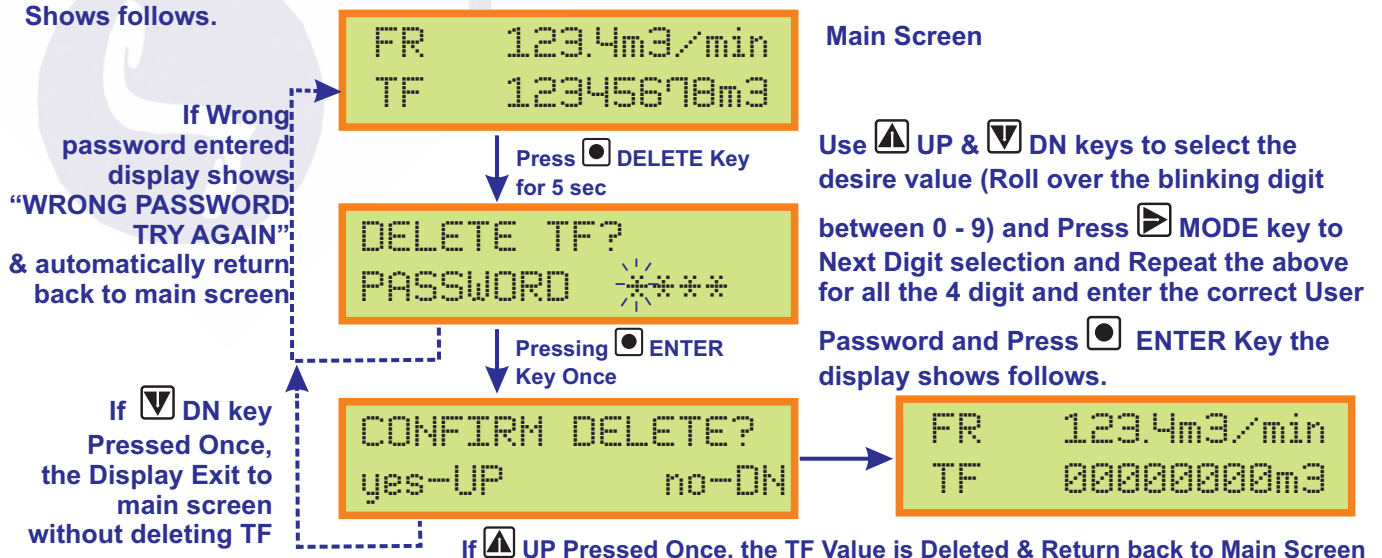
NOTE : During the Flow Process, Don't Configure Set Value, it may cause, Error in Total Flow(TF) Value & loss of PC Logging Data.

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)

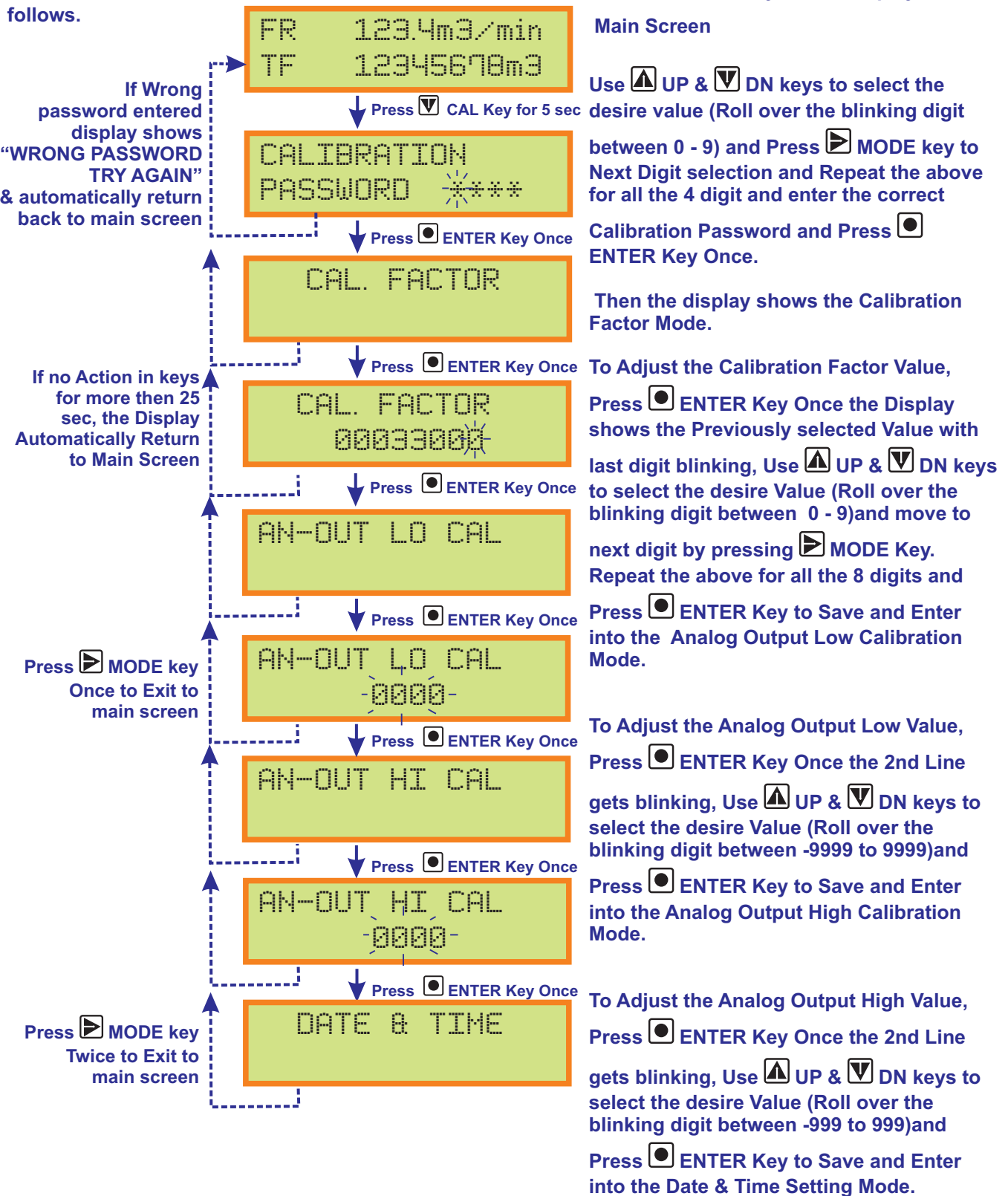
In Main Screen, Enter into the "Delete Total Flow" Mode, Press DELETE Key till the Display Shows follows.



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.

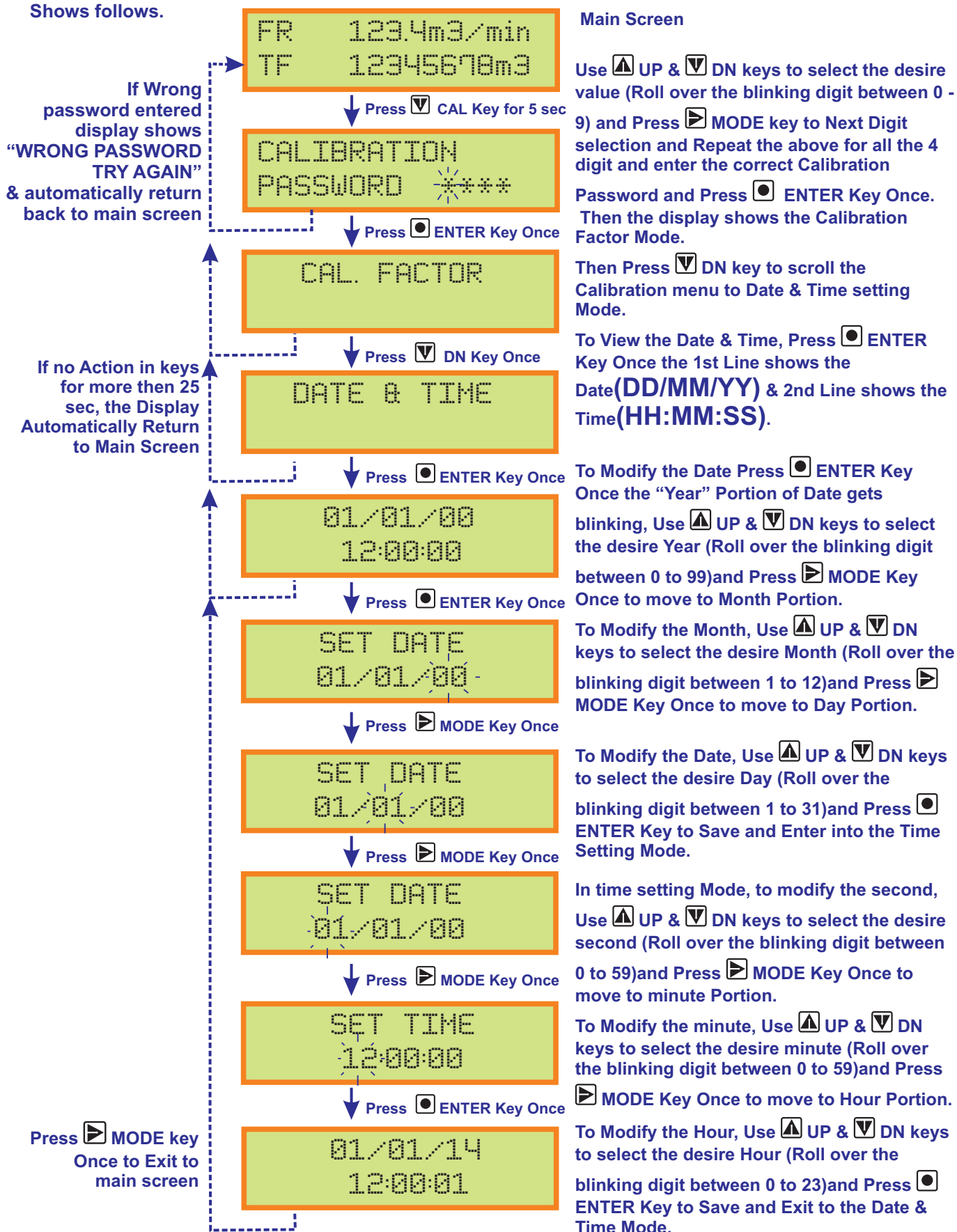
In Main Screen, Enter into the "User Calibration" Mode, Press  CAL Key till the Display Shows follows.



10.DATE and TIME SETTINGS(PASSWORD = 9753)(for future use)

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. MODBUS RTU PROTOCOL

FI 593 supports the RTU Mode in MODBUS communications. This device acts like a slave device in the MODBUS network. The default slave address with which the unit is shipped is 1 (decimal) . FI 593 supports functions 03 of the MODBUS protocol.

COMMUNICATION PARAMETERS:

Baud Rate	: 9600 or 19200 (selectable Ref. 6.7)
Flow Control	: NONE
No of data bits	: 8
Parity	: NONE or EVEN or ODD (selectable Ref. 6.7)
No of Stop Bits	: 1

register address		Parameters	Data format	function	range
lower word	higher word				
40001	40002	Flow rate	long integer	read	0 - 9999
40003	40004	Total Flow	long integer	read	0-99999999
40005	40006	Batch flow	long integer	read	0-99999999
40007	40008	TF setvalue 1	long integer	read	0-99999999
40009	40010	TF setvalue 2	long integer	read	0-99999999
40011	40012	FR low setvalue1	long integer	read/write	0-99999999
40013	40014	FR low setvalue2	long integer	read/write	0-99999999
40015	40016	FR high setvalue1	long integer	read/write	0-99999999
40017	40018	FR high setvalue2	long integer	read/write	0-99999999
40019		Unit for flow	integer	read	0-m3,1-lt,2-gl
40020		FR time	integer	read	0-sec,1-min,2-hr
40021		FR resolution	integer	read	0-0.01,1-0.1,2-1
40022		TF resolution	integer	read	0-0.001,1-0.01, 2-0.1,3-1

12. ORDERING INFORMATION

FI 594 - 0 0 4 2

Model No.

FI 594- Pulse Input
FI 593- Analog Input

sensor Supply

1 = 5V DC / 100mA Max. Load

2 = 10V DC / 100mA Max. Load

PC Communication

0 = Not Required

4 = RS 485(2 wire)

Retransmission Output

0 = Not Required

A = 4 - 20mA DC Opto isolated

V = 0 - 10V DC Opto isolated

Relay Output

0 = Not Required

1 = 1 Relay (5A Rated)

2 = 2 Relay (5A Rated)

13. WARRANTY

The FI 594 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 594 at our opinion. Data subject to change without notice.

Supplier Name & Address :

Customer Name & Address :

Serial No. : _____

Date of Delivery or Despatch : _____

14. CONTACT US

SANSEL INSTRUMENTS AND CONTROLS

No.1/46, GANGA NAGAR, MMDA COLONY, MADURAVOYAL,
NEAR METTUKUPPAM, CHENNAI - 600 095, TN

PH : 91 44 23783951, 65340391 CELL : 98401 49941

EMAIL : enquiry@sansel.net, info@sansel.net website : www.sansel.net