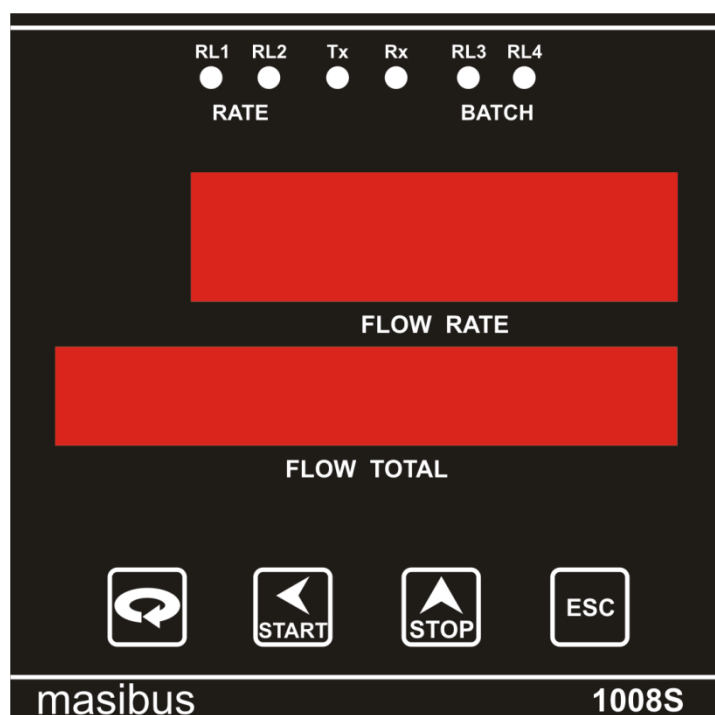


User's Manual

FLOW INDICATOR TOTALISER 1008S



Masibus Automation & Instrumentation Pvt. Ltd.

B/30, GIDC Electronics Estate,
Sector-25, Gandhinagar-382044, Gujarat, India

☎ +91 79 23287275-79 📠 +91 79 23287281-82

Email: support@masibus.com

Web: www.masibus.com

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1. INTRODUCTION

Foreword

Thank you for purchasing **FLOW INDICATOR TOTALISER 1008S**. This manual describes the basic functions and operation methods of 1008S. Please read through this user's manual carefully before using the product.

Overview

This is a microcontroller based Indicator - Totaliser unit, with very high performance to price ratio. It is highly versatile, accurate and different from the conventional indicators.

The instrument is made in 96 x 96 x 110 mm size with DIN standard panel cutout of 92 x 92 mm.

Front is sealed membrane type to withstand dusty environment. On back plate detachable terminals are provided for easy connection.

The programming, calibration and operation of the instrument are by four simple keys and with two independent displays groups: one for flow rate and one for batch total.

Operation of the instrument is menu driven with user understandable prompts. For protecting programmed data password protection facility is provided. Integrated total, batch total and roll count are cleared by special password.

The product is made to accept current (4-20 mA, 0-20mA), Voltage (1-5Volt, 0-5 Volt) input, pulse input & Digital input. It is available as a single input version only. The instrument is providing with the five-point calibration. The unit can be calibrated in installed condition itself by front panel keys at predefined points.

The set Parameters and integrated total are stored in serial NVRAM. No battery back up is required.

Notice

The contents of this manual are subject to change without notice as a result of continuing improvements to the instrument's performance and functions.

Every effort has been made to ensure accuracy in the preparation of this manual. Should any errors or omissions come to your attention, however, please inform MASIBUS Sales office or sales representative. Under no circumstances may the contents of this manual, in part or in whole, be transcribed or copied without our permission.

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Checking the Contents of the Package

Unpack the box and check the contents before using the product. If the product is different from that which you have ordered, if any parts or accessories are missing, or if the product appears to be damaged, contact your sales representative.

Product Ordering Code:

The FLOW INDICATOR TOTALISER 1008S unit has a nameplate affixed to the one side of the enclosure. Check the model and suffix codes inscribed on the nameplate to confirm that the product received is that which was ordered.

| ORDERING CODE | | | | | | | | | | | | | | | | |
|---------------|-------------|----------|---------------|------|--------------|------------|---------------|-------|-------|----------|--------------------|------|----------|--------------------|-----------------------|----------------------|
| Model | Input Types | | Digital Input | | Power Supply | | Communication | | Relay | | Retransmission O/P | | Mounting | | Mass Flow Measurement | |
| 1008S | X | | X | | XX | | X | | X | | X | | XX | | X | |
| | C | 4-20mA | N | None | A1 | 85-265V AC | N | None | N | NONE | N | None | P0 | Panel | N | None |
| | D | 0-20mA | Y | Yes | A3 | 24V DC | 2 | RS485 | 2 | 2 Relays | Y | Yes | W1 | Wall-IP55 | PT | PT Compensation |
| | E | 1-5V DC | | | | | | | 4 | 4 Relays | | | FP | Wall-FLP | SS | Saturated Steam Flow |
| | F | 0-5V DC | | | | | | | | | | | SH | Super Heated Steam | | |
| | G | 0-10V DC | | | | | | | | | | | | | | |
| | N | 0-10 KHz | | | | | | | | | | | | | | |
| | S | SPECIAL* | | | | | | | | | | | | | | |

X - Specify from table

*Consult Factory

2. SAFETY AND WARNING PRECAUTIONS

2.1 Safety Precautions

- ⚠ Before installation or beginning of any troubleshooting procedures power to all equipments must be switched off and isolated. Units suspected of being faulty must be disconnected and removed first and brought to a properly equipped workshop for testing and repair. Component replacement and interval adjustments must be done by a Masibus authorized or trained person only.

2.2 Warning Precautions

- It is recommended that power of these units to be protected by fuses, circuit breakers or external over current rated at the minimum value possible.
- All wiring must confirm to appropriate standards of good practice and local codes and regulations. Wiring must be suitable for voltage, current, and temperature rating of the system.
- Unused control terminals should not be used as jumper points as they may be internally connected, causing damage to the unit.
- Verify the ratings of the output devices and the inputs are as specified.
- Provide Power from a single-phase instrument power supply. If there is a lot of noise in the power line, insert an insulating transformer into the primary side of the line and use a line filter on the secondary side. As counter measures against noise, do not place the primary and secondary power cables close to each other.

Note:

- Information in this manual is subject to change without prior notice or permission due to continuous improvement.



CAUTION:

High voltage transients may occur when switching inductive loads such as some contactors or solenoid valves. Through the internal contacts, these transients may introduce disturbances which could affect the performance of the instrument.

For this type of load it is highly recommended that a “snubber” is connected across the normally open contact of the relay switching though load. The snubber recommended consists of a series connected resistor/capacitor (typically **15nF/100 Ohms**). A snubber will also prolong the life of the relay contacts. A snubber should also be connected across the output of a trip output to prevent false triggering under line transient conditions.

3. SPECIFICATIONS

3.1 Measured input signal

| | | | | | |
|------------------------------------|---|-------|---------------|---------|--------------|
| NUMBER OF INPUTS | 1(one) with Optional 2 & 3 | | | | |
| INPUT TYPE | DC Input | | Current Input | | *Pulse Input |
| | 0-5 V | 1-5 V | 0-20 mA | 4-20 mA | |
| MEASURING RANGE | 0-30000 Range | | | | 0 - 99999999 |
| ACCURACY | $\pm 0.025\%$ of full scale ± 1 Count | | | | **0.45 % |
| BURN OUT DETECTION | Available for 1 to 5VDC, 4 to 20 mA, 0 to 10 KHz. | | | | |
| INPUT RESISTANCE | <ul style="list-style-type: none"> 250 Ohms Internal for current Input 320K Ohms for Voltage Input | | | | |
| ALLOWABLE SIGNAL SOURCE RESISTANCE | DC input voltage: 1K Ω or less . Effect from allowable signal source Resistance: 0.031 % / 100 Ω or less | | | | |
| ALLOWABLE INPUT VOLTAGE | DC voltage: ± 20 V DC | | | | |
| NOISE REJECTION RATIO | Common Mode: > 100db Normal mode: > 40db | | | | |
| RESPONSE TIME | Input to relay o/p: < 1 second. Input to Analog o/p: < 1 second or less, 63 % (10 - 90%) (Time required for o/p to reach 63% of the maximum excursion when PV changes from 10% to 90%) | | | | |
| RESOLUTION | 16 bit | | | | |
| POLARITY PROTECTION | Not provided | | | | |
| MEMORY BACKUP | EEPROM | | | | |

Note:

- Input type is factory set.
- * Max. Pulse level ≤ 24 V , Min. pulse level > 1.0V
- ** $\pm(0.45\%$ of Reading + 1 Digit)

3.2 Loop Power Supply Specification

| | |
|-------------------|------------------------|
| LOOP POWER SUPPLY | 24VDC $\pm 5\%$ @ 50mA |
|-------------------|------------------------|

3.3 Retransmission Output

| | |
|-------------------------|-------------------------------------|
| NUMBER OF OUTPUT POINTS | 1 |
| OUTPUT SIGNAL | 4 to 20 mA DC |
| ON LOAD RESISTANCE | 500 Ω or less |
| OUTPUT ACCURACY | $\pm 0.25\%$ of full scale +1 count |
| RESOLUTION | 12 bits (5 μ A) |

3.4 Contact Input (Digital input)

| | |
|------------------|--|
| NUMBER OF INPUTS | 4 |
| USAGE | Input 1 : Stop Batch Input 2 : Integration total zero(Therefore Batch total and roll count will be zero) Input 3 : Start Batch Input 4 : Batch total zero |

| | |
|--|---|
| INPUT TYPE | Non- voltage contact input or transistor open collector input |
| INPUT CONTACT CAPACITY | 12VDC,10mA or more (for non – voltage contact input) |
| ON/ OFF DETERMINATION | <ul style="list-style-type: none"> • For non-voltage contact input ON = contact resistance of 1KΩ or less, OFF = contact resistance of 20KΩ or more • For transistor contact input ON = 2V or less OFF = leak current of 100μA or less |
| MINIMUM RETENTION TIME FOR STATUS DETECTION | About 1 Second |

3.5 Contact Output

| | |
|--|---|
| USAGE | Flow alarm and batch |
| NUMBER OF RELAY CONTACT OUTPUTS | 4 (2 Flow alarm relays, 2 Batch relays) |
| RELAY CONTACT RATING | 250VAC/5Amps |
| RELAY CONTACT TERMINAL | 3(Common, NO, NC) |

3.6 Display Unit Specification

| | |
|---------------------------------|--------------------------------------|
| PROCESS VALUE DISPLAY | 0.56" 5 digit 7- segment red display |
| INTEGRATED TOTAL DISPLAY | 0.40" 8 digit 7- segment red display |
| PARAMETER DISPLAY | Same integrated total display |
| STATUS INDICATING LAMP | Red LED's |

3.7 Electrical Specification

| | |
|-----------------------------|---|
| POWER SUPPLY | 85 to 265 VAC, 50Hz ; 24VDC(optional) |
| POWER CONSUMPTION | <10Va |
| WITHSTANDING VOLTAGE | <ul style="list-style-type: none"> • Between primary terminal and secondary terminal : 1500VAC(For 1 min) • Between primary terminal and ground terminal : 500VDC(for 1 min) • Between ground terminal and Secondary terminal : 500V AC (for 1 minute). • (Primary terminal: Power supply, relay output) (Secondary terminal: Analog input/output signal terminals, contact input terminal) |

3.8 Isolation specification

| | |
|---------------------------------------|---|
| ISOLATION RESISTANCE | Between power supply terminal and ground terminal: 500 VDC, 50M Ω |
| MEASURED INPUT TERMINAL | Isolated from other input/output terminals. Not isolated from 24Vdc supply (Transmitter power supply) and internal circuit. |
| 24V DC SUPPLY FOR TRANSMITTER | Not isolated from the measured input terminal & internal circuit, isolated from other input/output terminals. |
| RETRANSMISSION OUTPUT TERMINAL | Isolated from other input/output terminals and internal circuit. |
| CONTACT INPUT TERMINAL | Isolated from other input/output terminals and internal circuit. |
| RELAY CONTACT O/P | Isolated from other input /output terminals and internal |

| | |
|--------------------------------------|--|
| TERMINAL (DIGITAL INPUT) | circuit. |
| RS-485 COMMUNICATION TERMINAL | Isolated from other input/output terminals and internal circuit. |
| POWER SUPPLY TERMINAL | Isolated from other input / output terminals and internal circuit. |
| GROUND TERMINAL | Isolated from other input/ output terminals and internal circuit. |

3.9 Environmental Specification

| | |
|--------------------------------------|--|
| OPERATING TEMPERATURE | 0 to 55°C |
| STORAGE TEMPERATURE | 0 to 70°C |
| HUMIDITY | 30 to 90% RH (non-condensing) |
| WARM UP TIME | >10 Minute |
| EFFECT OF AMBIENT TEMPERATURE | For Voltage Input: $\pm 0.005\%$ of FS/ °C or less For analog output: $\pm 0.010\%$ of FS/ °C or less |

3.10 Alarm Specification

| | |
|--|--|
| ALARM TYPES | Flow high limit, Flow low limit |
| BATCHING ALARM | Pre warn and set point |
| SETTING RANGES FOR PROCESS VALUE ALARMS | Flow (PV) Alarms: Min = Zero of individual I/P type Max = Span of individual I/P type |

3.11 Display Specification

| | |
|--------------------------|---|
| PV DISPLAY | 5 digit red 7 segment display for flow rate |
| INTEGRATED TOTAL | 8 digit red 7 segment display for integrated total |
| PARAMETER DISPLAY | Same 8 digit red 7 segment display integrated total |
| STATUS DISPLAY | Red LEDs (for alarm & Batch) |

3.12 Communication

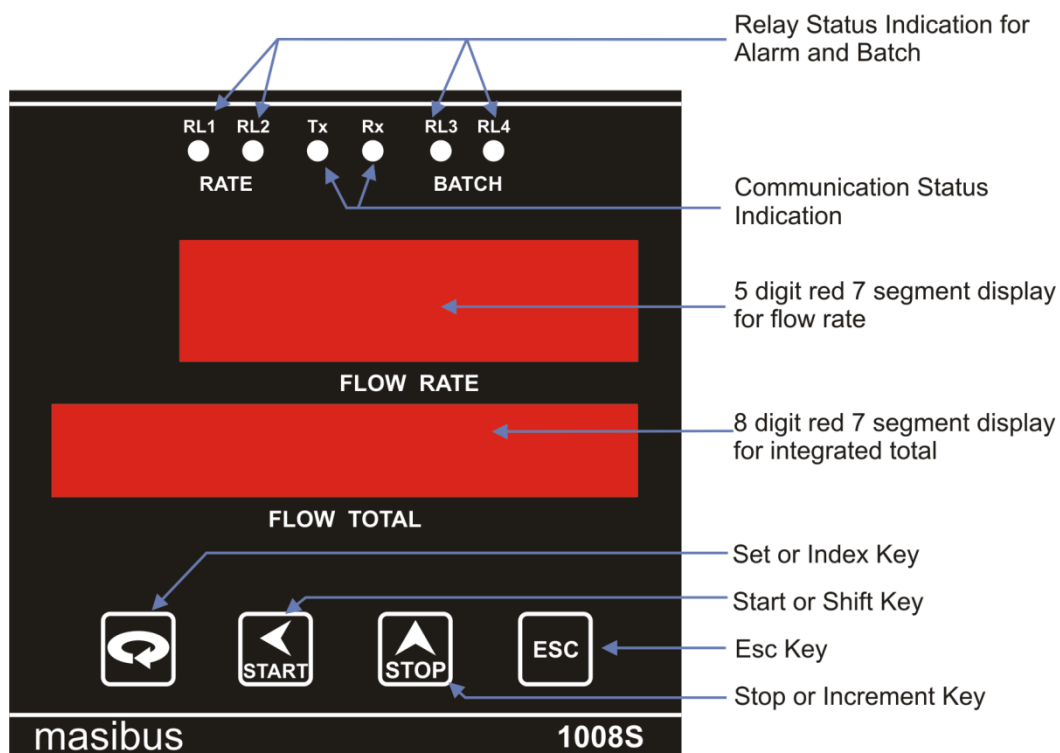
| | |
|--|----------------------------------|
| PROTOCOL | Modbus RTU serial |
| STANDARD | EIA RS-485 |
| MAX. COMMUNICATION DISTANCE | 1200 mtrs. (For 9600 bps RS 485) |
| COMMUNICATION METHOD | 2 wire half duplex (RS 485) |
| DATA FRAME | N, 8, 1 |
| COMMUNICATION RATE | 9600, 19200 bps |
| MAX. CONNECTABLE CONTROLLERS/ INDICATOR | 32 |
| ADDRESS RANGE | 1 to 99 |

3.13 Other Specification

| | |
|---------------------------------|--|
| SQUARE ROOT EXTRACTION | Applicable |
| DIGITAL FILTER | Applicable |
| TIME BASE UNIT | Second, minute, hour, day |
| CONVERSION FACTOR | 0.00 to 99.99 |
| FIVE POINT LINEARIZATION | Applicable |
| PULSE OUT PUT | Maximum pulse: 20 pulses/Sec. Excitation Voltage: <24Vdc with maximum 10 mAdc |
| LOW FLOW CUT OFF | Applicable |

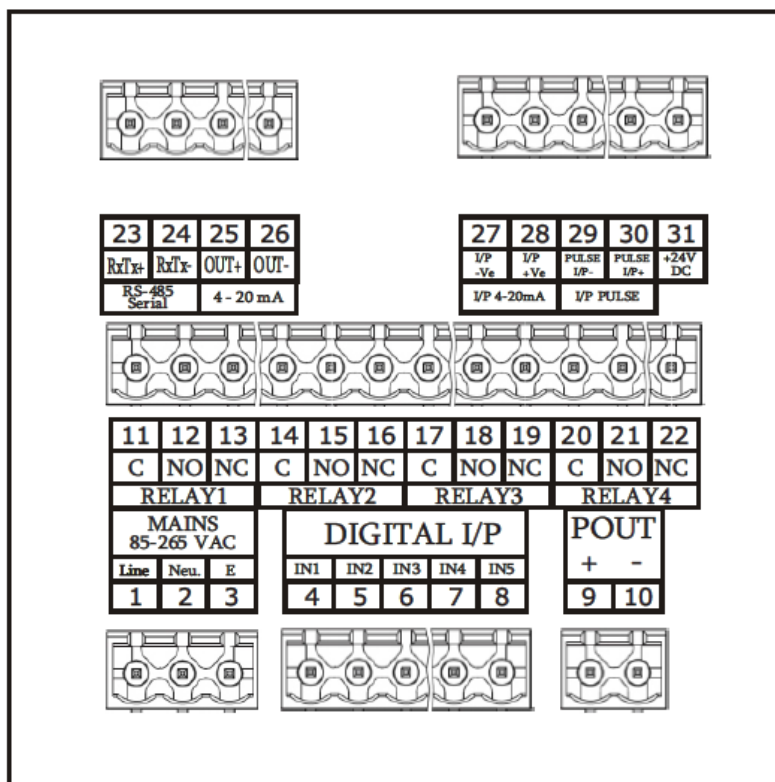
4. FRONT AND REAR PANEL DESCRIPTION

4.1 Front Panel Description

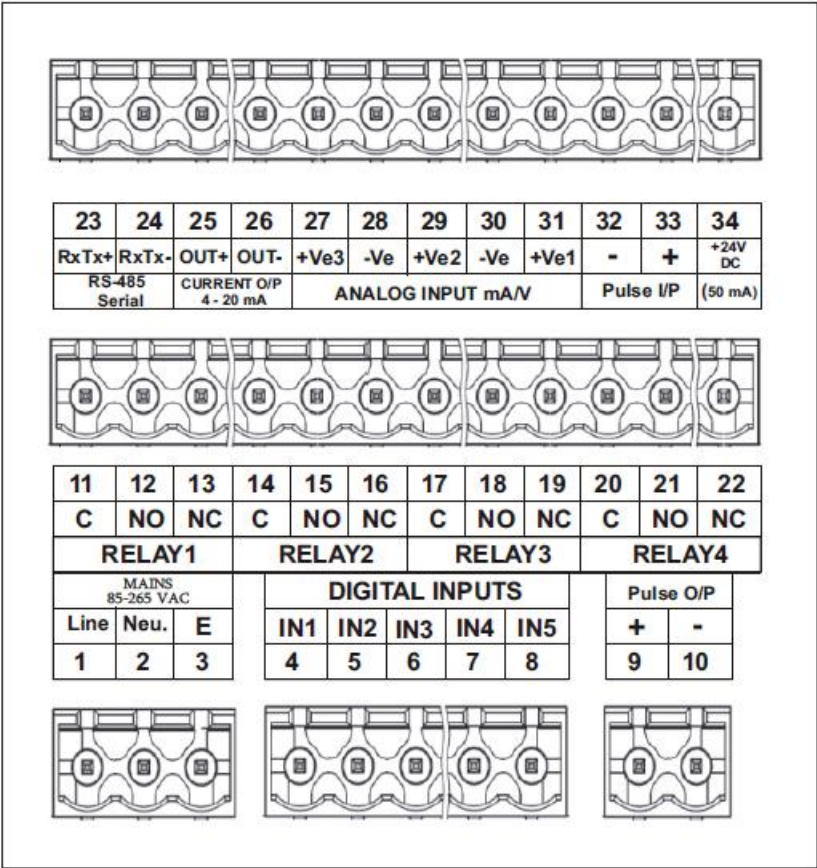


4.2 Rear Panel Diagram

4.2.1 Rear Panel Diagram Of 1008S Standard



4.2.2 Rear Panel Diagram Of 1008S With Mass Flow



5. MECHANICAL GUIDELINES

5.1 Mounting Details

- **Structure:** Front fascia IP54 complied(not certified), Enclosure GP (IP20)
- **Body construction:** Polycarbonate plastic.
- **Case color:** Dark grey
- **Weight:** 0.45Kg
- **Instrument Dimension:** 96 W* 96H*125D max behind panel with terminal (all in mm)
- **Mounting Method:** Panel mounting
- **Panel cut-out:** 92W* 92H (all in mm)
- **Wiring:** 2.5sq.mm
- **Standard Accessories:** 2 mounting clamp

5.2 Mounting Steps

Following steps should be followed for proper installation of the instrument.

- Mount the instrument in the panel cutout of 92mm x 92mm.
- Fix the instrument with the panel using two side brackets.
- All the electrical connections to be done at back panel on screw type terminals
- Make sure that no wire is connected loosely to avoid generation of spark and RFI. Before connecting the mains, check the mains configuration on the back panel.
- Ensure that the instrument is properly earthed.
- Check voltage between earth and neutral terminal. It should be less than 2 volts AC. If this voltage is greater then it results in unstable reading. In such a case use ISOLATION TRANSFORMER to provide mains to the instrument.

6. TERMINAL CONNECTION DETAILS

6.1 Terminal Connection Details Of 1008S Standard

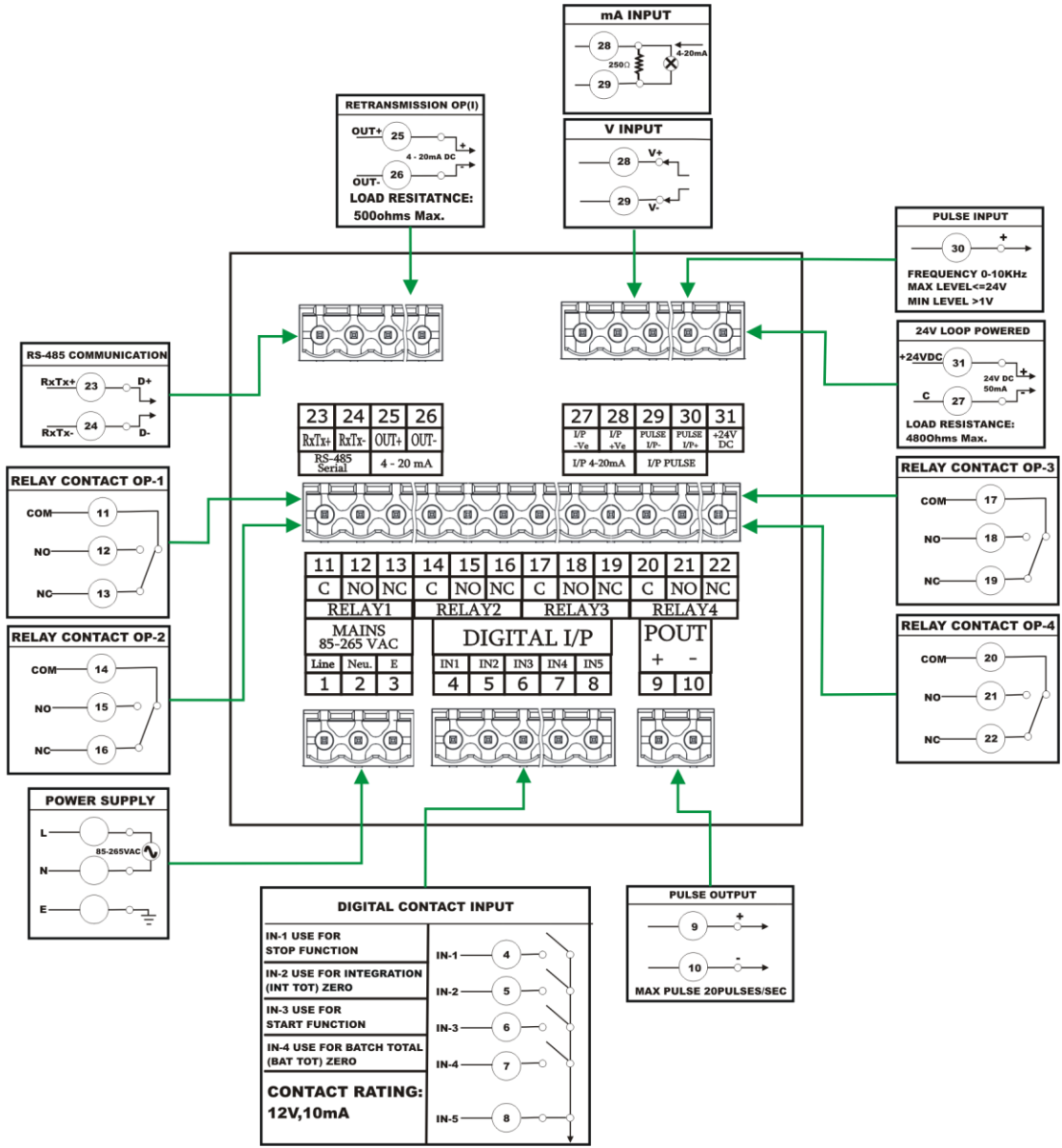
| | | | | | | | | |
|----|----------|------------------------|----|-------|------------------------|------|----------------|--------------------------|
| 1 | Line | MAINS 85-265 VAC | 11 | COM 1 | Low Alarm Relay | 23 | RxTx+ | RS 485 Serial |
| 2 | Neutral | | 12 | NO 1 | | 24 | RxTx- | |
| 3 | Earth | | 13 | NC 1 | | 25 | OUT+ | |
| 4 | DIN1 +Ve | Digital Inputs | 14 | COM 2 | High Alarm Relay | 26 | OUT- | CURRENT O/P : 4-20 mA |
| 5 | DIN2 +Ve | | 15 | NO 2 | | 27 | I/P -Ve | |
| 6 | DIN3 +Ve | | 16 | NC 2 | | 28 | I/P +Ve | |
| 7 | DIN4 +Ve | | 17 | COM 3 | WP | 29 | Pulse I/P- | I/P PULSE |
| 8 | DIN -Ve | | | 18 | | NO 3 | 30 | |
| 9 | POUT +Ve | Pulse o/p | 19 | NC 3 | EP Relay | 31 | +24V DC (50mA) | |
| 10 | POUT -Ve | | 20 | COM 4 | | | | |
| | | | 21 | NO 4 | | | | |
| | | | 22 | NC 4 | | | | |

6.2 Terminal Connection Detail Of 1008S With Mass Flow

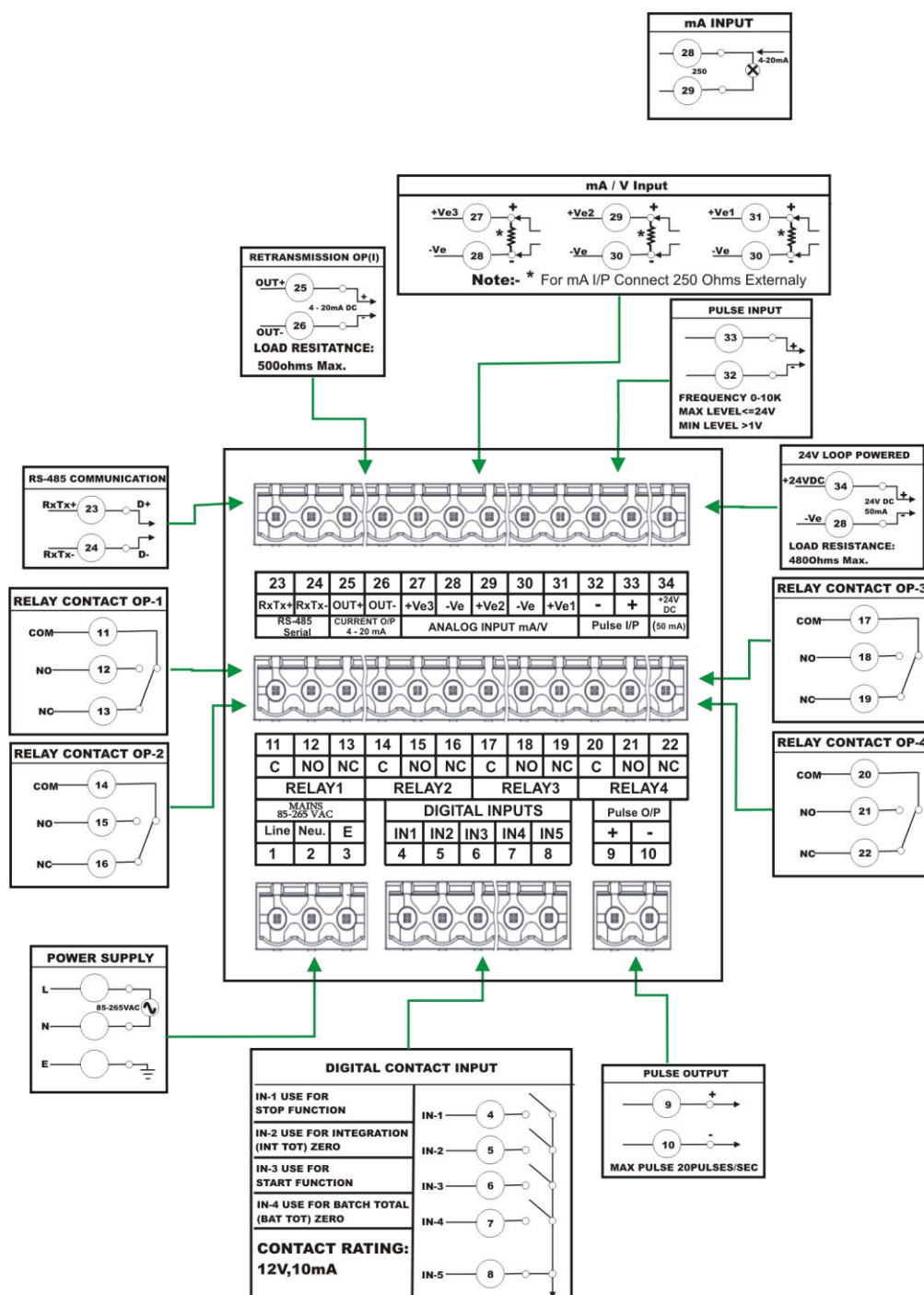
| | | | | | | | | |
|----|----------|------------------------|----|-------|------------------------|----|----------------|--------------------|
| 1 | Line | MAINS 85-265 VAC | 11 | COM 1 | Low Alarm Relay | 23 | RxTx+ | RS 485 Serial |
| 2 | Neutral | | 12 | NO 1 | | 24 | RxTx- | |
| 3 | Earth | | 13 | NC 1 | | 25 | OUT+ | |
| 4 | DIN1 +Ve | Digital Inputs | 14 | COM 2 | High Alarm Relay | 26 | OUT- | ANALOG I/P Ma/V |
| 5 | DIN2 +Ve | | 15 | NO 2 | | 27 | I/P3 +Ve | |
| 6 | DIN3 +Ve | | 16 | NC 2 | | 28 | -Ve | |
| 7 | DIN4 +Ve | | 17 | COM 3 | WP | 29 | I/P2 +Ve | |
| 8 | DIN -Ve | | 18 | NO 3 | | 30 | -Ve | |
| 9 | POUT +Ve | Pulse o/p | 19 | NC 3 | EP Relay | 31 | I/P1 +Ve | Pulse i/p |
| 10 | POUT -Ve | | 20 | COM 4 | | 32 | PIN –Ve | |
| | | | 21 | NO 4 | | 33 | PIN +Ve | |
| | | | 22 | NC 4 | | 34 | +24V DC (50mA) | |

7. WIRING DIAGRAM

7.1 Wiring Diagram Of 1008S Standard



7.2 Wiring Diagram Of 1008S With Mass Flow



8. OPERATING DETAILS

The following paragraphs give detailed description of how to operate the unit.
 Before using the instrument, make sure to study and understand this section.





8.1 Display Section:

The unit has two windows/groups of display:

- **Upper:**
 Five digits 7-segment, 0.56" Red LED display:
 It displays Flow rate/Process variable.
- **Lower:**
 Eight digits 7-segment 0.40" Red LED display:
 In normal mode of operation, Batch total/Integration Total is displayed. While in EDIT mode, parameters are displayed in this window.

8.2 Keyboard Section

Unit has 4 key membrane keypad organized as 4 x 1 matrix.
 Following Table explain the Operation of the Keys used for configuration.

| | | |
|--------------------------|---|---|
| SET OR INDEX |  | 1. It will allow user to enter in EDIT mode, when instrument is in RUN mode. 2. It will scroll menu and submenu when it is enabled 3. It will save edited data. |
| START OR SHIFT |  | 1. It will enter into the submenu, when main menu is enabled and shows submenu's value. 2. It will select the digit to modify, when value is edited. 3. It will start batch, if pressed, when IT & BT are being displayed |
| STOP OR INCREMENT |  | 1. It will increment value of digit selected or constant selected. 2. It will stop batch, if pressed, when BT/IT are being displayed. 3. For Pause batch press stop key for 1 second. 4. If we press stop key for 3 second then batch becomes zero. |
| ESCAPE |  | 1. It will escape to previous status, with reference to its current status. Sequence of status: IT MENU SUB-MENU Parameter's Value Escape sequence When Esc key is pressed in Menu, the instrument will come in RUN Mode. If user wants to go in EDIT mode, he will have to enter the correct password again. 2. When Esc key is pressed in RUN Mode, it will directly enter in to the set point menu. This function is only applicable when type of instrument is totaliser. |

8.3 Run Mode

Whenever mains is switched on to the unit,

- Engineering value proportional to the input signal will be displayed as Process variable.
 Decimal point is displayed at selected position.
- Last saved batch total/integration total will be displayed on the lower window.

8.3.1 Run Mode Parameters Details

| No. | Name | Description | Max digits | Limits | |
|-----|------------------|---|------------|--------------|-----------------------------|
| 1 | Batch Total | This parameter displays the Total flow since batch is started ('BT') | Max. 8 | 0 - 99999999 | For Standard Model |
| 2 | Integrated Total | This parameter displays the Total flow since Last Reset. ('IT') | Max. 8 | 0 - 99999999 | |
| 3 | Roll Count | This parameter displays the roll over count of the Integrated Total from '99999999' to '0' ('Rc') | Max. 4 | 0 - 9999 | |
| 4 | P1* | Show first ch. flow | Max. 4 | 0 - 9999 | *For Mass Flow Model |
| 5 | P2* | Show second ch. flow | Max. 4 | 00.00-99.99 | |
| 6 | P3* | Show third ch. flow | Max. 4 | 0.000-9.999 | |

- Batch total:**
 This is an eight digit totalized value, displayed as Batch total. As per the selected time base, Zero and Full-scale settings, this total is updated continuously, proportional to input. When New Batch Starts or Integration total is reset this value also gets initialized to 0.
- Integration total:**
 This is an eight digit totalized value, displayed as integrated total. As per the selected time base, Zero and Full-scale settings, this total is updated continuously, proportional to input.
- Rollover Count (RC):**
 This is a two-digit value, displayed as the rollover that takes place when integrated total gets higher than higher limit. When the integrated total crosses high limit, this count is incremented by one.

So the total integration will be equal to
 (Rollover Count) x (hi limit + 1) + Integrated Total (It)

Integrated total, batch total and roll count are cleared by special password.
 On power fail detection, current value of Batch total, integrated total and rollover count are stored in NVRAM.

Mass Flow Parameter Description(Optional)

- P1:** This is a 4-digit value of flow rate value. It is proportional to flow input. (1st channel)
- P2:** This is a 4-digit value of Pressure. It is proportional to pressure input. (2nd channel)
- P3:** This is a 4-digit value of Temperature. It is proportional to temperature input. (3rd channel)

Next section will describe the different Item of individual submenu.

➤ **Start & Stop function:(In Run Mode)**

☞ **START key:**

- ✓ If this key pressed batching relays (WP/EP) gets ON & BATCH TOTAL = 0. It means a new batch is started. If START key is pressed again and again, it will not start the batch until WP/EP relays gets OFF.
- ✓ Relays get OFF by two ways:

1. STOP key
2. BATCH TOTAL crosses the value of SETPOINT.

☞ **STOP key:**

- ✓ If user presses **STOP** key in running batch, batching relays (WP/EP) gets off. If again **STOP** key is pressed again and again only batching relays gets ON/OFF (only if BATCH TOTAL < (WP/EP) values. No new batch will be started by **STOP** key.
- ✓ When batch total value crosses the WP/EP value, relays gets OFF and batch is over.
- ✓ Again if START key is pressed then a new batch will start making BATCH TOTAL = 0. Batching relays gets ON.

8.4 Edit Mode

In this mode user can verify or modify, various parameters.
 To enter the EDIT mode, correct password is to be entered.

- **Password Protection**

When INDEX key is pressed, following prompt will be displayed at lower panel 7-segment display.

“bAt tot” , then
 “Int tot” , then
 “roL Cnt “ , then
 “PASSUord” .

User Can select the Parameter –any of the above prompt to display corresponding value by pressing INDEX key and then pressing “START KEY”(It is digit select key for editing the parameters),

At the selection of password, value “0000” is displayed.

Enter the correct password value with the help of START (digit select key) and STOP key (Incr key) and press INDEX KEY (INDEX key is used as ENTER key)

If correct password is entered & INDEX key is pressed, it will show the first mode PROG MOD. If wrong password is entered, then “0000” MSG will be displayed again at lower display window.

- **Parameter Description**

There are total three Menu Items:

| | |
|----|--------------------|
| 1. | Program Mode |
| 2. | Configuration Mode |
| 3. | Calibration Mode |

Three parameters are displayed after entering correct password.

These parameters related with totaliser are mentioned in the following table.

8.4.1 Program mode

Programming menu provides facility to configure the relay for different function.

8.4.1.1 Program Mode parameters Details

| N o. | Name | Description | No of digit | Lo limit | Hi limit |
|------|-----------------|---------------------------------|-------------|----------|----------|
| 1 | High Alarm | Alarm conditions for flow rate. | 5 | 0 | 30000 |
| 2 | Low Alarm | | 5 | 0 | 30000 |
| 3 | Pre warn Alarm | Batch control values. | 6 | 0 | 999999 |
| 4 | Set Point Alarm | | 6 | 0 | 999999 |
| 5 | Lo Alarm Relay | Low alarm relay | - | Yes/No | |
| 6 | Hi Alarm Relay | High alarm Relay | - | Yes/No | |
| 7 | Pre-warn Relay | Pre-warn Relay | - | Yes/No | |
| 8 | Set Point Relay | Set Point Relay | - | Yes/No | |
| 9 | Filter number | | 2 | 1 | 25 |

- **Low alarm and high alarm:**
Value of Low alarm should be lower than that of high alarm. If user tries to set value of Low alarm **greater** than high alarm Value, error message will be displayed. Similarly, if user set value of High alarm **lower** than low alarm Value, error message will be displayed. Alarms value cannot be set greater than Full-scale Value (FS).

- **Comparison with Zero and full-scale:**
Low Alarm value should be greater then Zero value. If user tries to set value of Low alarm less than Zero Value, error message will be displayed.
If (Low Alarm < Zero value), "error" message appears.

High-Alarm value should be greater than Full-scale value. . If user tries to set value of High-alarm greater than Full-scale value, error message will be displayed.
If (High Alarm > full-scale value), "error" message appears.

- **Set point and pre-warn:**
Error message will be displayed if, set point value is lower than pre-warn and vice versa.

When we press



key in RUN Mode we can directly enter in to Set point

and pre-warn menu. This function is only applicable when type of instrument is totaliser.

- **Alarm ON-OFF :(submenu no 5 to 8):**
Using these settings, user can set alarm/relay availability. If particular relay is set as 'yes', that particular alarm indication will be present over the display card and relay action will come into effect.

8.4.2 Configuration mode

Configuration mode provides facility to configure type of mode, type of input, baud rate for communication, etc. Every parameter are explained in the next section.

8.4.2.1 Configuration Mode Parameters Of 1008S Standard

| Sr. No. | Name | Description | No Of Digit | Lo Limit | Hi Limit |
|---------|--------------------|--|-------------|---|----------|
| 1 | Batch Mode | Type Of Mode, For Flow Control | - | Normal, Counter | |
| 2 | Input Type | Type Of Input | - | 0-5V, 1-5V, 0-20mA, 4-20mA , Pulse | |
| 3 | Type Of Instrument | Type Of Instrument, Which You Want To Use. | - | Indicator/ Totaliser | |
| 4 | Square Root | Mode Of Linearization | - | Yes/No | |
| 5 | Digital Input | To Be Used To Reset Batch Total, Integration total & to start batch and tostop batch | - | Yes/No | |
| 6 | Digital Filter | If Yes Than In Programming Mode It Will Show Filter No. | - | Yes/No | |
| 7 | Time Base | For Calculation/Display Of Flow Rate | - | Sec, Min, Hour, Day | |
| 8 | ZR1 | Zero Value | 5 | 00000 | 30000 |
| 9 | FS1 | Full Scale Value | 5 | 00000 | 30000 |
| 10 | No Of Batches | | 2 | 00 | 99 |
| 11 | Batch Count | Counter Will Count How Much Batches Has Been Taken | 2 | 00 | 99 |
| 12 | Relay Mode | Two Type Of Mode | - | Normal, Failsafe | |
| 13 | Cut Off | | 3 | 000 | 100 |
| 14 | DP | Decimal Point | - | 0,0.1,0.01,0.001 | |
| 15 | SF1 | Full Scale For Segment 1 | 6 | 00000 | 30000 |
| 16 | FL1 | % Age Of Full Scale (Segment 1) | - | 10,20,30,40,50,60,70,80,90,100 | |
| 17 | SF2 | Full Scale For Segment 2 | 6 | 00000 | 30000 |
| 18 | FL2 | % Age Of Full Scale (Segment 2) | - | 10,20,30,40,50,60,70,80,90,100 | |
| 19 | SF3 | Full Scale For Segment 3 | 6 | 00000 | 30000 |
| 20 | FL3 | % Age Of Full Scale (Segment 3) | - | 10,20,30,40,50,60,70,80,90,100 | |
| 21 | SF4 | Full Scale For Segment 4 | 6 | 00000 | 30000 |
| 22 | FL4 | % Age Of Full Scale (Segment 4) | - | 10,20,30,40,50,60,70,80,90,100 | |
| 23 | SF5 | Full Scale For Segment 5 | 6 | 00000 | 30000 |
| 24 | FL5 | % Age Of Full Scale (Segment 5) | - | 10,20,30,40,50,60,70,80,90,100 | |
| 25 | Baud Rate | | - | 9600,19200 | |
| 26 | Serial No | | 2 | 01 TO 99 | |
| 27 | Pout | | 4 | 0001 TO 9999 | |
| 28 | Default Display | | - | Batch Total/Integration Total (Bat Tot/Int Tot) | |
| 29 | Pass | | 4 | 0000-9999 | |
| 30 | Conversion Factor | | 4 | 00.00-99.99 | |
| 31 | K-FAC | K-FACTOR (Optional) | 8 | 00000.00-99999.99 | |
| 32 | Clear Total | To Clear Integration /Batch Total And Roll Count | 4 | 3210 | |
| 32 | Rounding | | 2 | 1,2,5,10 | |

| | | | | |
|----|---------------------|--|---|-----------|
| 33 | Over Range | If Yes then integration total will be running according to process value corresponding to 20ma and if No then integration total will stop after over limit is reached. | - | Yes/No |
| 34 | Pulse time | For averaging of input pulse. | 2 | 0 To 20 |
| 35 | Frequency Selection | For Frequency Lower than 300Hz select frequency type low. | - | Low, High |
| 36 | Pulse width | To set width of input pulse in low frequency mode. | 2 | 0 To 50 |

8.4.2.2 Configuration Mode Parameters Of 1008S With Mass Flow

| Sr. No. | Name | Description | No Of Digit | Lo Limit | Hi Limit |
|---------|--------------------|---|-------------|---|----------|
| 1 | Batch Mode | Type Of Mode, For Flow Control | - | Normal, Counter | |
| 2 | Input Type | Type Of Input | - | 0-5V, 1-5V, 0-20mA, 4-20mA , Pulse | |
| 3 | Type Of Instrument | Type Of Instrument, Which You Want To Use. | - | Indicator/ Totaliser | |
| 4 | Square Root | Mode Of Linearization | - | Yes/No | |
| 5 | Digital Input | To Be Used To Reset Batch Total, Integration total & to start batch and to stop batch | - | Yes/No | |
| 6 | Digital Filter | If Yes Than In Programming Mode It Will Show Filter No. | - | Yes/No | |
| 7 | Time Base | For Calculation/Display Of Flow Rate | - | Sec, Min, Hour, Day | |
| 8 | Chnl1 ZR | Zero Value | 5 | 00000 | 99999 |
| 9 | Chnl1 FS | Full Scale Value | 5 | 00000 | 99999 |
| 10 | No Of Batches | | 2 | 00 | 99 |
| 11 | Batch Count | Counter Will Count How Much Batches Has Been Taken | 2 | 00 | 99 |
| 12 | Relay Mode | Two Type Of Mode | - | Normal, Failsafe | |
| 13 | Cut Off | | 3 | 000 | 100 |
| 14 | DP | Decimal Point | - | 0,0.1,0.01,0.001 | |
| 15 | SF1 | Full Scale For Channel 1 | 4 | 0000 | 9999 |
| 16 | SF2 | Full Scale For Channel 2 | 6 | 00.00 | 99.99 |
| 17 | SF3 | Full Scale For Channel 3 | 6 | 000.0 | 999.9 |
| 18 | Pcns | Pressure constant | 5 | 000.00 | 999.99 |
| 19 | tcns | Temperature constant | 5 | 00000 | 99999 |
| 20 | F2E | Channel #2 Linearization mode | - | Sqrt / No sqrt | |
| 21 | ConE | Channel #3 Linearization mode | - | Sqrt / No sqrt | |
| 22 | Zp | Zero setting for Channel-2 | 5 | 000.00 | 999.99 |
| 23 | Zt | Zero setting for Channel-3 | 5 | 0000.0 | 9999.9 |
| 24 | F1E | Channel #1 Linearization mode | - | Sqrt / No sqrt | |
| 25 | Baud Rate | | - | 9600,19200 | |
| 26 | Serial No | | 2 | 01 TO 99 | |
| 27 | Pout | | 4 | 0001 TO 9999 | |
| 28 | Default Display | | - | Batch Total/Integration Total (Bat Tot/Int Tot) | |
| 29 | Pass | | 4 | 0000-9999 | |
| 30 | Conversion Factor | | 4 | 00.00-99.99 | |
| 31 | Clear Total | To Clear Integration /Batch Total And Roll Count | 4 | "PASS" & 0000-9999 | |

| | | | | |
|----|---------------|--|---|-------------|
| 32 | Rounding | | 2 | 1,2,5,10 |
| 33 | Over Range | If Yes then integration total will be running according to process value corresponding to 20ma and if No then integration total will stop after over limit is reached. | - | Yes/No |
| 34 | No of Channel | To convert 3 channel Mass flow unit to 1 channel unit. | - | 1-CH , 3-CH |

- Batch Mode:**
 If 'Batch Mode' (Batch mod) is selected to 'Counter', then two parameters "Batch count" (Bat cnt) and "No of Batches" (No_of_batch) will be displayed in Configuration mode.
 If 'Batch Mode' is selected to 'Normal', then two parameters will not be displayed.
- Input Type:**
 Based on requirement, user can select input type. It will be either Voltage or Current or Pulse.
- Instrument Type:**
 If "instrument type" is set as indicator, then **Pre warn** and **Set point** parameter will not be displayed in Program mode.
- Square root:**
 If user selects this mode as 'yes', flow rate will calculated using square root algorithm. Alternatively linear calculation will be done.
- Digital Input:**
 If *Digital input* is selected as 'yes' than only digital inputs will work. Four digital inputs are there.

DIN1+: Stop Function

DIN2+: Integration (Int tot) Zero (since IT is initialize to 0, therefore batch total/roll count are also initialized to 0)

DIN3+: Start Function

DIN4+: Batch total (bat tot) Zero

DIN-: GND (12V GND)

When any of these inputs is connected to DIN-, it will perform its specific function.

- Digital Filter:**
 If *Digital filter* is selected as 'yes' than in programming mode user can see 'filter no' parameter. If selected 'no' then 'filter no' will no be displayed.
- Time base:** Time base is used for calculation & display of flow rate.

Time base Setting details

| Select | Time base | Divisor |
|--------|-----------|---------------------|
| 0 | Second | 1 |
| 1 | Minute | 60 (1 x 60) |
| 2 | Hour | 3600(60 x 60) |
| 3 | Day | 86400(24 x 60 x 60) |

Value of Integrated total for time period of t (in seconds) will be

Integration total= (flow rate * time 't' in seconds)/divisor

- **Batch counter and no of batches:**
These parameters will be displayed only if the 'Batch mode' is selected to Counter type.
- **No of batches:** Set the parameter according to the requirement. It decides how much batches are to be taken
- **Batch counter:** It will be incremented by 1 whenever a new batch is started by START key in run mode. When batch counter value becomes equals to 'no of batches' value, then it will not *start* new batch.

Note: To reset batch counter, Enter in batch count (bat cnt) parameter in configuration mode. Press "Start" key to see its value. Now if user presses "Stop" key Batch counter value will be cleared to 0.

- **Relay-mode:**
In '*Relay-mode*' (relay nod), if set to '*normal*' mode then alarm relays and LEDs will work according to alarm values.
i.e. Relays on, LEDs on
Relays off, LEDs off

But if set to '*Failsafe*' Mode then alarm relays and LEDs will operate reversibly.
i.e. Relays on, LEDs off
Relays off, LEDs on

- **Cut off: (Low flow cut-off)**
Cut off could be set to 0000 to 0100.
Cut off will display the % value.

Cutoff value = Cutoff parameter (in %)*Full scale value

If full scale value is 10000 and cut off is 5%

Then cut off value will be calculated as

$$= (5/100)*10000 = 500.$$

So, if the displayed flow rate (displayed at upper window) is less then 500, it will not be added in integration.

- **Decimal Point Selection:**
Decimal point selection will be given from the configuration mode.

| Select | Decimal position |
|--------|------------------|
| 0 | No decimal |
| 0.1 | One decimal |
| 0.01 | Two decimals |
| 0.001 | Three decimals |

- **Five point Linearization:**
This instrument has feature of five-point linearization. User can define up-to five different segments of the full-scale input (in percentage) with Full-scale engineering value for each segment. We have to program the value of flow rate at different inputs.

Here we are defining five scale factors for the current input 4 mA to 20mA.
Let's have one example to understand this concept.

For Example:

ZR = 00000 and FS = 10000, Let us assume the Unit is current input mode.

- **Five Point Linearization**

| N o. | Flow rate | Value | Parameter | Display Value | Input Current mA |
|------|-----------|-------|-----------|---------------|------------------|
| 1 | FL1 | 10% | SF1 | 2000 | 5.6 |
| 2 | FL2 | 50% | SF2 | 4000 | 12.0 |
| 3 | FL3 | 60% | SF3 | 4500 | 13.6 |
| 4 | FL4 | 80% | SF4 | 7500 | 16.8 |
| 5 | FL5 | 100% | SF5 | 10000 | 20 |

In above
Flow rate on
between:

- 0 – 2000 for input of 0 % – 10%
- 2000 – 4000 for input of 10% – 50%
- 4000 – 4500 for input of 50 % – 60%
- 4500 – 7500 for input of 60 % – 80%
- 7500– 10000 for input of 80 % – 100%

example
Display varies

If user wants a flow to be linear throughout the span than configure this parameter as:
SF1 = FS1, FL1 = 100 %.

User is not required to initialize SF2, SF3, SF4, SF5, FL2, FL3, FL4 and FL5.

- **Pout Selection:**

Pout value decides the pulse Output.

There will be a pulse at pulse output pins (PIN NO.9, PIN NO 10), whenever a integrated total value is greater than by POUT by previous IT value [where last pulse is registered], it will be added to the integration total value.

i.e.

Current IT value \geq (Pout + previous IT value).

Example:

1. If Flow rate = 1000, Pout = 1000, Time base = second,

Every second, 1000 is added in integration total. Since pout is 1000, 1 times of pout value is added to integration-total every sec. Therefore we will have 1 pulse/sec.

2. Flow rate = 1000, Pout = 100,

Time base = second,

Every second, 1000 is added in integration total. Since pout is 100, 10 times of pout value is added to integration-total every sec. Therefore we will have 10 pulses/sec. It could not be observed on CRO. For this use a pulse counters for testing.

3. Flow rate = 600, Pout = 10,

Time base = min,

Every second, 10(600/60) is added in integration total. Since pout is 10, 1 times of pout value is added to integration-total every sec. Therefore we will have 1 pulse/sec or 60 pulses/min.

4. Flow rate = 600, Pout = 100,

Time base = min,

Every second, 10(600/60) is added in integration total. Since pout is 100, 1/10 times of pout value is added to integration-total every sec. Therefore we will have 1 pulse/10 sec or 6 pulses/min.

- **Default Display:** This parameter will select the parameter to be displayed in run mode. If Int tot / Bat tot is selected then in run mode 'Integration total' / 'Batch total' will be displayed on lower panel accordingly.

If "instrument type" parameter is set as indicator, then this parameter will not be displayed in Configuration mode and Integration total will be displayed in run mode.

- **Password:** A 'PASS' parameter is added in configuration mode. But it will always show '0000'. User has to remember the password. If user needs to change password, then go in 'pass' parameter, enter the required password and press Enter key.
For eg: If user enters '1234' in '**pass**' parameter, then, to enter in EDIT mode, a password '1234' is to be entered.

- **Conversion Factor (Conv-F):**

It is a constant, which simply divides process value by the factor set. Usually, it is set as 1.00

For example, if process value is 100 liters/minute & conversion factor is 1 then it will simply integrate process value as it is.

If we change conversion factor = 2, then it will divide process value by that factor i.e. $100/2 = 50$ & it integrates that value (in both integral and batch total) but on the display it shows original process value.

- **K Factor (K-FA): (OPTIONAL)**

Formula for K-FACTOR:

FLOW: - [(Pulse count per second * Time base) / (K-FACT)]

Where, Time Base value =

| Select | Time base | Divisor |
|--------|-----------|----------------------|
| 0 | Second | 1 |
| 1 | Minute | 60 (1 x 60) |
| 2 | Hour | 3600 (60 x 60) |
| 3 | Day | 86400 (24 x 60 x 60) |

For example: - if we want to set FLOW value equals to 250.00 and remaining parameter at: -

- For Flow per minute:

Time base = 2 = 60
Pulse count = 10000
Then FLOW = $[(10000 * 60) / 2400]$
FLOW = 250 per minute.

- For Flow per Hour:

Time base = 3 = 3600
Pulse count = 10000
Then FLOW = $[(10000 * 3600) / 144000]$
FLOW = 250 per Hour.

Note: - K-factor works linearly at 60/minute.

For Retransmission Output, "F.S" parameter is provided.

- **Clear total:**

Parameter to reset IT, BT, and RC.

If user enters the correct password, IT, BT and Roll over count gets cleared (initialized to Zero). And 'cleared' message is displayed on the lower window of display. By pressing ESC key, menu goes back to the clear total. If wrong password is entered, 'cleared' message will not appear.

- **Rounding:**

This parameter will round the figure of flow rate. It will increase/decrease the flow rate in multiple of rounding value. E.g. if rounding = 5 selected then flow rate will increase/decrease by 5, 10, 15....

- **Over Range:**
 If this parameter is yes then integration total will be adding according to process value corresponding to 20ma and if this parameter is no then integration total will stop adding after over limit is reached.
- **Pulse Time:**
 This parameter is used for averaging of input pulse in low frequency mode (Frequency < 300 Hz).
- **Frequency Selection:**
 For frequency below 300Hz select frequency type low.
- **Pulse Width:**
 This parameter is used for set the input pulse width in low frequency mode (Frequency < 300 Hz).
- **No of Channel:**
 This parameter is used to convert mass flow unit to single channel unit. When we convert mass flow unit to single channel value of P2 = 0 and P3 = 20 set, and P1 = single channel flow. Value of P2 and P3 are not changeable.

8.4.3 Calibration mode

8.4.3.1 Calibration Mode Parameters Details This menu allows user to perform calibration of analog input & output.

| No | Setting | Description | No of digit | Lo limit | Hi limit |
|----|-------------|---|-------------|----------|----------|
| 1 | Cal Zero | Zero Cal. Count | 4 | | |
| 2 | Cal Span | Span Cal. Count | 5 | | |
| 3 | Out Zero | Zero Cal. Count for Output | 4 | 0000 | 4095 |
| 4 | Out Span | Span Cal Count for Output | 5 | 0000 | 4095 |
| 5 | Default Out | If user selects 'yes', then Out zero = 800 and Out span (4000) is selected. | Yes/No | | |

➤ INDICATION:

For conversion in engineering value, the input is scaled between Zero and Full scale set values as per following formula (for linear mode):
 For any type of input:

$$\text{Indication (Engineering Value)} = \frac{X}{(\text{CALS} - \text{CALZ})} + \text{Zero}$$

$X = (\text{Input signal} - \text{CALZ}) * (\text{Full scale} - \text{Zero})$
 CALZ = Value of input applied during zero calibration

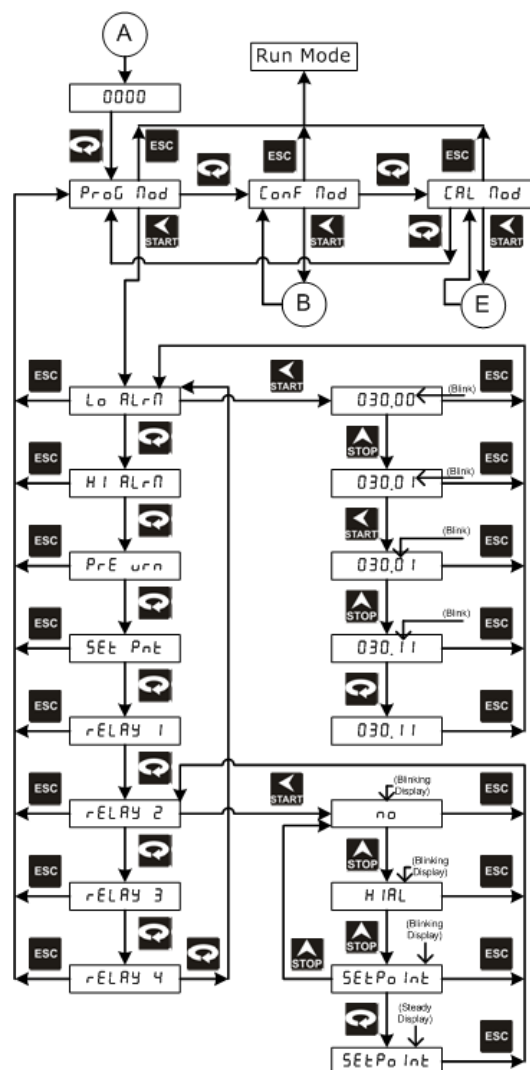
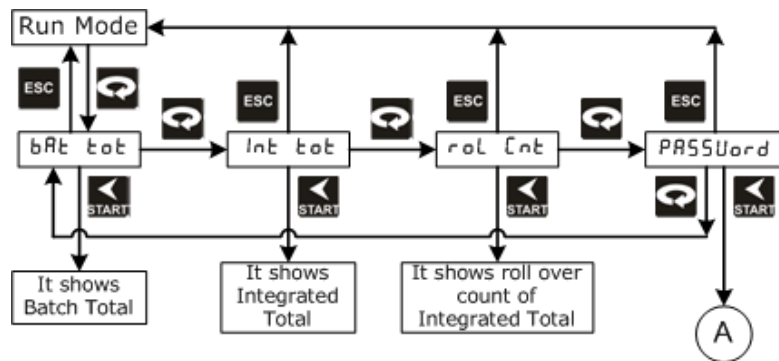
CALS = Value of input applied during Span calibration

If input signal is outside the set Zero and Full-scale limit, all the four digits of the Process variable starts flashing. Only when input signal comes back into the allowed range, display becomes steady.

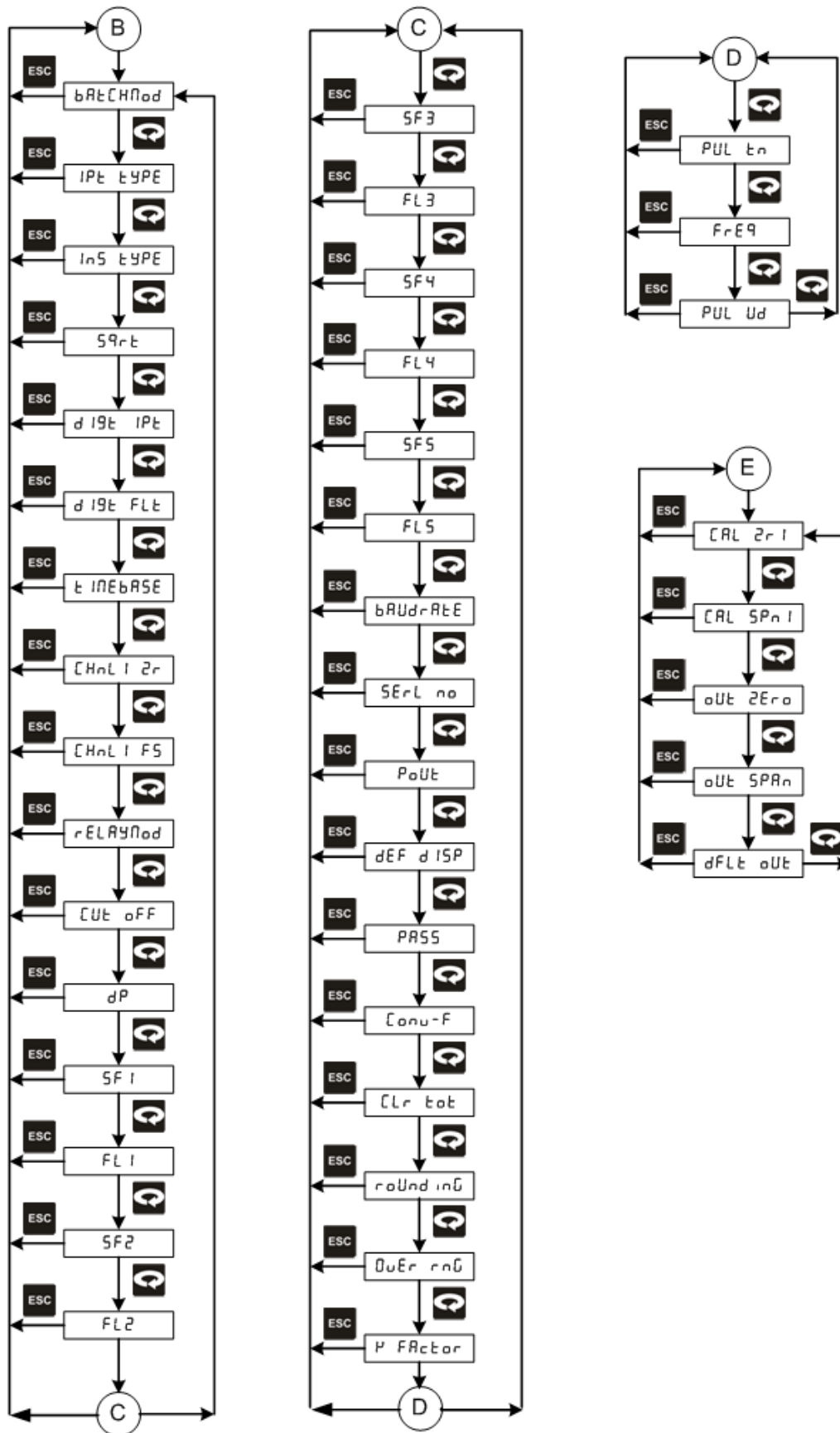
NOTE:

- ## 8.5 Parameter Flow

How to operate menu is shown below in the form of flow diagram

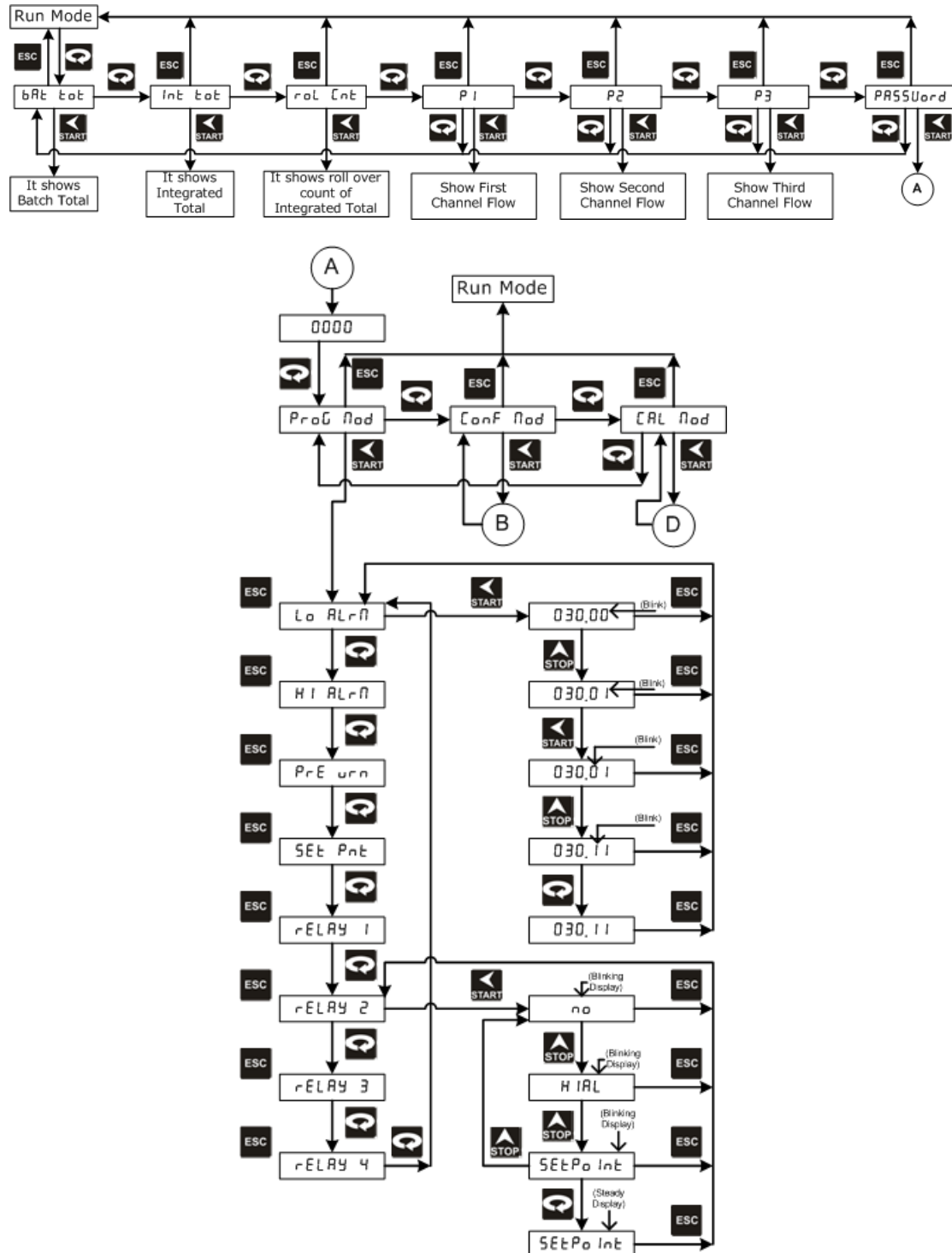


Note : 1) For all settings which have text as setting parameter, kindly refer `DELAY` setting
2) For all settings which have number as setting parameter, kindly refer `Lo ALLEN` setting

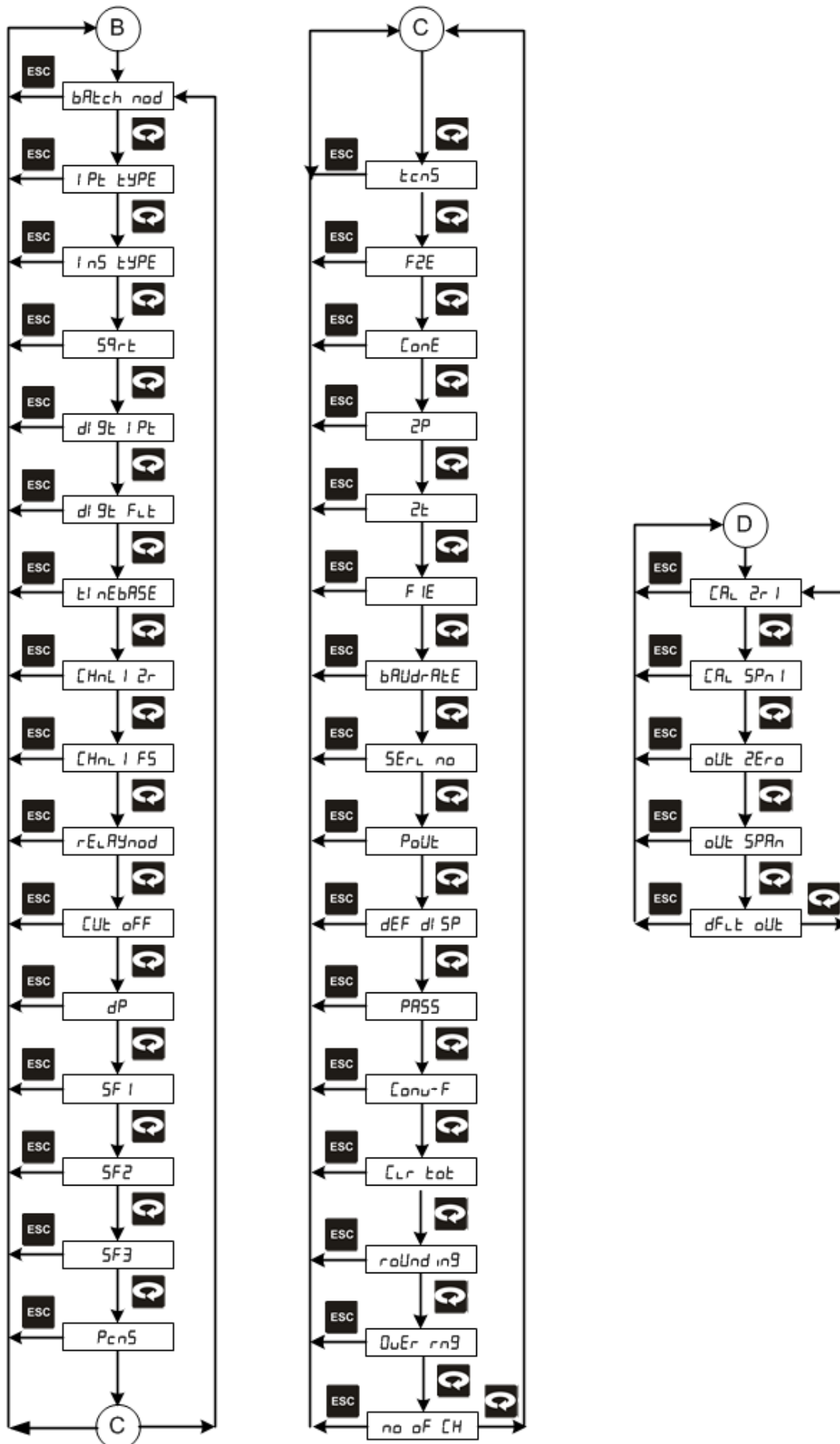


8.5.2 Parameter Flow Of 1008S With Mass Flow

How to operate menu is shown below in the form of flow diagram



Note : 1) For all settings which have text as setting parameter, kindly refer **rELAY 2** setting
2) For all settings which have number as setting parameter, kindly refer **Lo ALrn** setting



9. CALIBRATION PROCEDURE

9.1 Input Calibration

As explained earlier, One can do calibration thro' the keyboard itself, Zero and Full-scale values are stored in NVRAM.

1. Switch on the instrument and allow 15 minutes of warm up time before starting calibration.
2. Take a standard source. Set it's output at desired Zero value. Apply output of the source to the input terminals of connector pin according to input select.
3. In calibration mode, Press shift /start key to calibrate zero. This will show prompt - "CAL Zr1". To enter in "CAL Zr1" mode press shift /start key
4. Lower window displays a count. This is raw count proportional to analog input. Wait till counts are stable, save this count by pressing 'Index' key twice.
5. Press ESC key to come out from "CAL Zr1".
6. Now apply input equal to Full scale/Span (CALS):
7. Set output of the source at desired full-scale value. Apply output of the source to the input terminals
8. Press index key to go to calibration span. This will show prompt -"CAL SPn1". To enter in "CAL SPn1" mode press shift /start key.
9. Lower window displays raw counts count proportional to analog input.
10. Allow the reading to settle and Press 'Index' Key twice to save the count.
11. This reading will be stored as Span Now the instrument is calibrated.
12. Press ESC key to come out from "CAL SPn1".

9.2 Output Calibration

For output calibration, measuring instrument should be at least 3 times accurate.

9.2.1 Out zero and Out span

These two parameter are used for the calibration of re-transmission output. Users have to change the value of out zero and out span for the zero setting (for 4mA) and span setting (20 mA) respectively for re-transmission output.

1. In calibration mode, go to out zero calibration mode by pressing index key. This will show "oUT ZERo" prompt. To enter in "oUT ZERo" mode press shift /start key
2. Lower window displays a count. Using shift /start or inc/stop key to set reading (zero output) of connected ampere meter at output, exactly at 4.000mA and press index key to store the calibration value.
3. Press ESC key to come out from "oUT Zero".
4. Press index key to go to out span calibration. This will show prompt- "oUT SPAn". To enter in "oUT SPAn" mode press shift /start key
5. Lower window displays a count. Using shift /start or inc/stop key to set reading (span output) of connected ampere meter at output, exactly at 20.000mA and press index key to store the calibration value.
6. Press ESC key to come out from "oUT SPAn".
This reading will be stored. Now the instrument is calibrated.

If user enters values greater than 4095 "error" message will appear.

It user enters **out zero value > out span** value then also "error" message will appear.

Accuracy of retransmission O/p - 0.25% of Full span.

10. COMMUNICATION GUIDELINES

10.1 Introduction

The unit can be connected in RS-485 communication data link either in multi drop or repeat mode. Each unit must have unique Serial Number. Entire range of addresses (1 to 247) may be used. Before starting any communication, choose a baud rate compatible to the host computer. The serial protocol used is MODBUS RTU.

10.2 Function Code for Modbus

| CODE | NAME | Function |
|------|------------------------|---|
| 01 | Read coil status | Use to read Relay and Digital output status |
| 03 | Read Holding registers | Use to read PV, Control, RSP output etc |
| 05 | Write input registers | Use to write digital parameter value. |
| 06 | Preset Single register | Use to write programmable register |

The error checking field contains a 16-bit value implemented as two eight-bit bytes. The error check value is the result of a Cyclical Redundancy Check (CRC) calculation performed on the message contents.

Note:

- **For Analog Read:**
 FLx (FL1, FL2, FL3, FL4, and FL5) consists of 9 selectable values from 10 to 100.
 For 10 it will read.... 0
 For 20 it will read.... 1
 If FL1 =100, Hex address 0x0024 will show 9.
- **For Digital Read/Write:** Cmd Action = 1;
 Reg. Address = 0x0001 to 0x0004.
 1. Relays will read 0- OFF (relay) 1 – ON
 2. For start /stop function
 Cmd Action = 5
 Reg Address = 0x0005
 For Start – write 1
 For Stop – write 0

10.3 Modbus RTU protocol addresses for RS 485 Communication

10.3.1 Addresses Of 1008S Standard

| Sr. No. | Reg. No. | Parameter Name | Length in bytes (Words) | Read/Write |
|---------|----------|----------------|-------------------------|-----------------------------------|
| 1 | 40001 | High alarm | 2(1) | R/W |
| 2 | 40002 | Low alarm | 2(1) | R/W |
| 3 | 40003 | Set point | 2(1) | R/W |
| 4 | 40004 | Setpoint+2 | 2(1) | R/W |
| 5 | 40005 | Pre-warn | 2(1) | R/W |
| 6 | 40006 | Prewarn+2 | 2(1) | R/W |
| 7 | 40007 | Conv-Factor | 2(1) | R/W (00.00-99.99) |
| 8 | 40008 | Filter no | 2(1) | R/W (1 to 25) |
| 9 | 40009 | Batch mode | 2(1) | R/W (0 for Normal, 1 for Counter) |

| | | | | |
|----|-------|---------------------|------|---|
| 10 | 40010 | Type of input | 2(1) | R/W (0 for 0-5V, 1 for 1-5V, 2 for 0-20mA, 3 for 4-20mA, 4 for pulse) |
| 11 | 40011 | Type of Inst | 2(1) | R/W (0 for indicator, 1 for Totaliser) |
| 12 | 40012 | Sqrt mode | 2(1) | R/W (0 for Yes, 1 for No) |
| 13 | 40013 | Digital input | 2(1) | R/W (0 for Yes, 1 for No) |
| 14 | 40014 | Digital filter | 2(1) | R/W (0 for Yes, 1 for No) |
| 15 | 40015 | Time base | 2(1) | R/W (0 for SECOND, 1 for MINUTE, 2 for HOUR, 3 for DAY) |
| 16 | 40016 | ZR | 2(1) | R/W |
| 17 | 40017 | FS | 2(1) | R/W |
| 18 | 40018 | No of batches | 2(1) | R/W |
| 19 | 40019 | Batch counter | 2(1) | Read only |
| 20 | 40020 | Relay mode | 2(1) | R/W (0 for normal, 1 for failsafe) |
| 21 | 40021 | Cut-off | 2(1) | R/W (000.0 to 100.0) |
| 22 | 40022 | Dp | 2(1) | R/W (0 for 0, 1 for 0.1, 2 for 0.01, 3 for 0.001) |
| 23 | 40023 | SF1 | 2(1) | R/W (0-20000) |
| 24 | 40024 | FL1 | 2(1) | R/W (0-9)* |
| 25 | 40025 | SF2 | 2(1) | R/W (0-20000) |
| 26 | 40026 | FL2 | 2(1) | R/W (0-9)* |
| 27 | 40027 | SF3 | 2(1) | R/W (0-20000) |
| 28 | 40028 | FL3 | 2(1) | R/W (0-9)* |
| 29 | 40029 | SF4 | 2(1) | R/W (0-20000) |
| 30 | 40030 | FL4 | 2(1) | R/W (0-9)* |
| 31 | 40031 | SF5 | 2(1) | R/W (0-20000) |
| 32 | 40032 | FL5 | 2(1) | R (9) |
| 33 | 40033 | Baud rate | 2(1) | R/W (0 for 9600, 1 for 19200) |
| 34 | 40034 | Serial no | 2(1) | R/W (01 - 99) |
| 35 | 40035 | Pout | 2(1) | R/W (0000-9999) |
| 36 | 40036 | Default display | 2(1) | R/W (0 for batch total, 1 for integration total) |
| 37 | 40037 | Out zero | 2(1) | R/W (0000-4095) |
| 38 | 40038 | Out span | 2(1) | R/W (0000-4095) |
| 39 | 40039 | Default out | 2(1) | R/W (0 for yes, 1 for no) |
| 40 | 40040 | Int total | 2(1) | Read only |
| 41 | 40041 | Int total+2 | 2(1) | Read only |
| 42 | 40042 | Batch total | 2(1) | Read only |
| 43 | 40043 | Batch total+2 | 2(1) | Read only |
| 44 | 40044 | Roll count | 2(1) | Read only |
| 45 | 40045 | Flow rate | 2(1) | Read only |
| 46 | 40046 | Rounding | 2(1) | R/W |
| 47 | 40047 | Over Range | 2(1) | R/W(0 for Yes, 1 for No) |
| 48 | 40048 | K-factor | 2(1) | R/W |
| 49 | 40049 | K-factor + 2 | 2(1) | R/W |
| 50 | 40050 | Pulse Time | 2(1) | R/W (00-20) |
| 51 | 40051 | Frequency Selection | 2(1) | R/W (0 for Low Freq.($< 300\text{Hz}$), 1 for High Freq.) |

| | | | | |
|----|-------|--|------|-----------------------------|
| 52 | 40052 | Pulse Width | 2(1) | R/W (00-50) |
| 53 | 1 | Low alarm Relay Status | 1 | R, digital |
| 54 | 2 | High alarm Relay Status | 1 | R, digital |
| 55 | 3 | Set point Relay Status | 1 | R, digital |
| 56 | 4 | Pre warm Point Relay Status | 1 | R, digital |
| 57 | 5 | Start/Pause batch | | W(0 for Pause, 1 for Start) |
| 58 | 6 | To Clear Batch Total | 1 | W, digital(1 for Clear) |
| 59 | 7 | To Clear Integration Total and Batch Total | 1 | W, digital(1 for Clear) |

*** For FL1 to FL4:**

To write these parameters:

0 for 10, 5 for 60,

1 for 20, 6 for 70,

2 for 30, 7 for 80,

3 for 40, 8 for 90,

4 for 50, 9 for 100

10.3.2 Addresses Of 1008S With Mass Flow

| Sr. No. | Reg. No. | Parameter Name | Length in bytes (Words) | Read/Write |
|---------|----------|----------------|-------------------------|---|
| 1 | 40001 | High alarm | 2(1) | R/W |
| 2 | 40002 | High alarm + 2 | 2(1) | R/W |
| 3 | 40003 | Low alarm | 2(1) | R/W |
| 4 | 40004 | Low alarm + 2 | 2(1) | R/W |
| 5 | 40005 | Set point | 2(1) | R/W |
| 6 | 40006 | Setpoint+2 | 2(1) | R/W |
| 7 | 40007 | Pre-warn | 2(1) | R/W |
| 8 | 40008 | Prewarn+2 | 2(1) | R/W |
| 9 | 40009 | Conv-Factor | 2(1) | R/W (00.00-99.99) |
| 10 | 40010 | Filter no | 2(1) | R/W (1 to 25) |
| 11 | 40011 | Batch mode | 2(1) | R/W (0 for Normal, 1 for Counter) |
| 12 | 40012 | Type of input | 2(1) | R/W (0 for 0-5V, 1 for 1-5V, 2 for 0-20mA, 3 for 4-20mA, 4 for pulse) |
| 13 | 40013 | Type of Inst | 2(1) | R/W (0 for indicator, 1 for Totaliser) |
| 14 | 40014 | Sqrt mode | 2(1) | R/W (0 for Yes, 1 for No) |
| 15 | 40015 | Digital input | 2(1) | R/W (0 for Yes, 1 for No) |
| 16 | 40016 | Digital filter | 2(1) | R/W (0 for Yes, 1 for No) |
| 17 | 40017 | Time base | 2(1) | R/W (0 for SECOND, 1 for MINUTE, 2 for HOUR, 3 for DAY) |
| 18 | 40018 | ZR+2 | 2(1) | R/W |

| | | | | |
|----|-------|-----------------|------|--|
| 19 | 40019 | ZR | 2(1) | R/W |
| 20 | 40020 | FS + 2 | 2(1) | R/W |
| 21 | 40021 | FS | 2(1) | R/W |
| 22 | 40022 | No of batches | 2(1) | R/W (0 to 99) |
| 23 | 40023 | Batch counter | 2(1) | Read only |
| 24 | 40024 | Relay mode | 2(1) | R/W (0 for normal, 1 for failsafe) |
| 25 | 40025 | Cut-off | 2(1) | R/W (000.0 to 100.0) |
| 26 | 40026 | Dp | 2(1) | R/W (0 for 0, 1 for 0.1, 2 for 0.01, 3 for 0.001) |
| 27 | 40027 | SF1 + 2 | 2(1) | R/W |
| 28 | 40028 | SF1 | 2(1) | R/W |
| 29 | 40029 | SF2 + 2 | 2(1) | R/W |
| 30 | 40030 | SF2 | 2(1) | R/W |
| 31 | 40031 | SF3 + 2 | 2(1) | R/W |
| 32 | 40032 | SF3 | 2(1) | R/W |
| 33 | 40033 | PCNS + 2 | 2(1) | R/W |
| 34 | 40034 | PCNS | 2(1) | R/W |
| 35 | 40035 | TCSN + 2 | 2(1) | R/W |
| 36 | 40036 | TCSN | 2(1) | R/W |
| 37 | 40037 | F2E | 2(1) | R/W (0-sq,1-nosq) |
| 38 | 40038 | CONE | 2(1) | R/W (0-sq,1-nosq) |
| 39 | 40039 | ZP | 2(1) | R/W (0-9999) |
| 40 | 40040 | ZT | 2(1) | R/W (0-9999) |
| 41 | 40041 | F1E | 2(1) | R/W (0-sq,1-nosq) |
| 42 | 40042 | Baud rate | 2(1) | R/W (0 for 9600, 1 for 19200) |
| 43 | 40043 | Serial no | 2(1) | R/W (01 - 99) |
| 44 | 40044 | Pout | 2(1) | R/W (0000-9999) |
| 45 | 40045 | Default display | 2(1) | R/W (0 for batch total, 1 for integration total) |
| 46 | 40046 | Out zero | 2(1) | R/W (0000-4094) |
| 47 | 40047 | Out span | 2(1) | R/W (0000-4095) |
| 48 | 40048 | Default out | 2(1) | R/W (0 for yes, 1 for no) |
| 49 | 40049 | Int total + 2 | 2(1) | Read only |
| 50 | 40050 | Int total | 2(1) | Read only |
| 51 | 40051 | Batch total + 2 | 2(1) | Read only |
| 52 | 40052 | Batch total | 2(1) | Read only |
| 53 | 40053 | Roll count | 2(1) | Read only |
| 54 | 40054 | Mass Flow (MSB) | 2(1) | Read only |
| 55 | 40055 | Mass Flow (LSB) | 2(1) | Read only |
| 56 | 40056 | P1 (MSB) | 2(1) | Read only |
| 57 | 40057 | P1 (LSB) | 2(1) | Read only |
| 58 | 40058 | P2 (MSB) | 2(1) | Read only |
| 59 | 40059 | P2 (LSB) | 2(1) | Read only |
| 60 | 40060 | P3 (MSB) | 2(1) | Read only |
| 61 | 40061 | P3 (LSB) | 2(1) | Read only |
| 62 | 40062 | Flow Rate dp | 2(1) | Read only |

Flow Indicator Totaliser 1008S

REF NO: m18A/om/101

Issue No: 17



| | | | | |
|----|---|--|---|----------------------------------|
| 63 | 1 | Low alarm Relay Status | 1 | R, digital (1 for ON, 0 for OFF) |
| 64 | 2 | High alarm Relay Status | 1 | R, digital (1 for ON, 0 for OFF) |
| 65 | 3 | Pre warm Point Relay Status | 1 | R, digital (1 for ON, 0 for OFF) |
| 66 | 4 | Set point Relay Status | 1 | R, digital (1 for ON, 0 for OFF) |
| 67 | 5 | Start/Pause batch | | W(0 for Pause, 1 for Start) |
| 68 | 6 | To Clear Batch Total | 1 | W, digital(1 for Clear) |
| 69 | 7 | To Clear Integration Total and Batch Total | 1 | W, digital(1 for Clear) |

11. MISCELLANEOUS

RETRANSMISSION OUTPUT TABLE FOR OPEN /OVER /UNDER CONDITION:

- For 4-20mA:-

| INPUT FEED (mA) | DISPLAY | | RX O/P (mA) | |
|-----------------|-----------|-------------|-------------|-------------|
| | LINEAR | SQUARE ROOT | LINEAR | SQUARE ROOT |
| I/P <1.60 | OPEN | OPEN | 4.00 | 4.00 |
| 1.60<I/P<3.20 | UNDER | UNDER | 4.00 | 4.00 |
| 3.20<I/P<4.00 | Flow Rate | Flow Rate | 4.00 | 4.00 |
| 20.00>I/P>20.80 | Flow Rate | Flow Rate | 20.00 | 20.00 |
| 20.80>I/P>22.40 | OVER | OVER | 20.00 | 20.00 |
| 22.40>I/P | OPEN | OPEN | 20.00 | 20.00 |

NOTE:- For OPEN Sensor Condition Pre-warn and batch total (Set Point) Relays are in OFF State.

- For 0-20mA:-

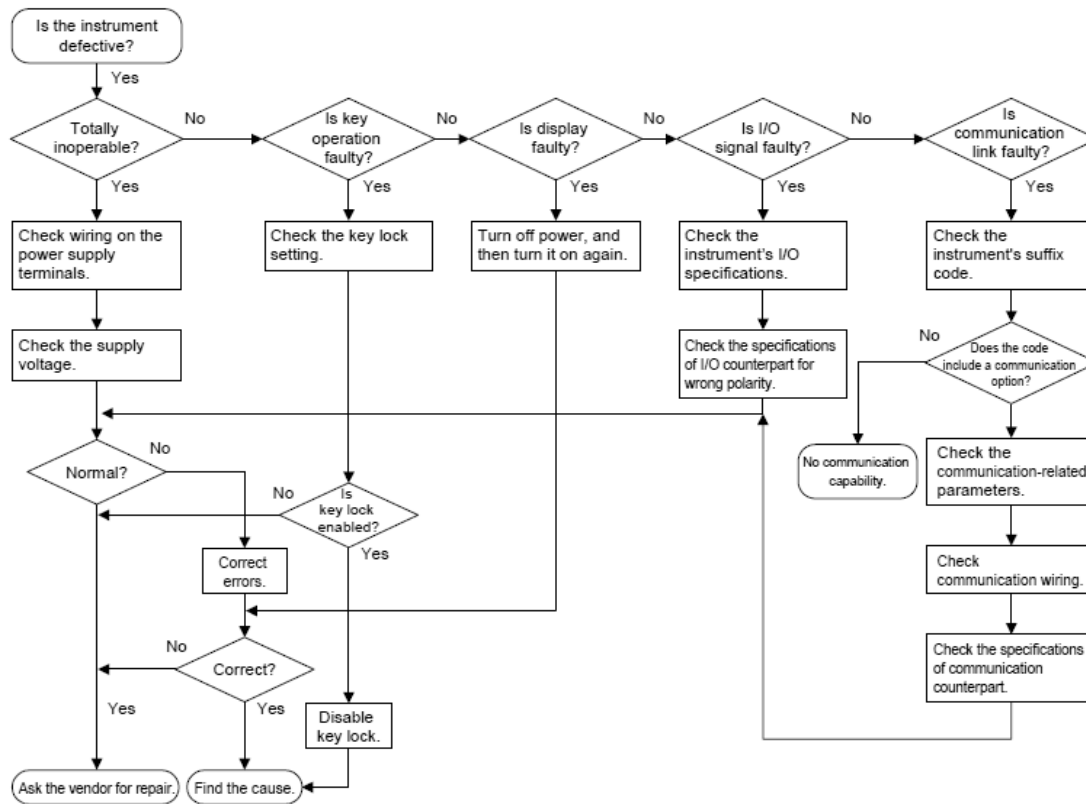
| INPUT FEED (mA) | DISPLAY | | RX O/P (mA) | |
|-----------------|-----------|-------------|-------------|-------------|
| | LINEAR | SQUARE ROOT | LINEAR | SQUARE ROOT |
| 0.00<I/P | ZERO | ZERO | 0.00 | 0.00 |
| 20.00>I/P>20.80 | Flow Rate | Flow Rate | 20.00 | 20.00 |
| 20.80>I/P>22.40 | OVER | OVER | 20.00 | 20.00 |
| 22.40>I/P | OPEN | OPEN | 20.00 | 20.00 |

NOTE:- For OPEN Sensor Condition Pre-warn and batch total (Set Point) Relays are not affected because during open sensor flow rate will be zero.

12. TROUBLESHOOTING

If the operating display does not appear after turning on the controller's power, follow the measures in the procedure below.

If a problem appears complicated, contact our sales representative.



Masibus Automation & Instrumentation Pvt. Ltd.

Customer Support Division

B/30, GIDC Electronics Estate,
 Sector-25, Gandhinagar-382044, Gujarat, India

Ph: 91-079-23287275/23287276/23287277

Fax: 91-079-23287281

Email: support@masibus.com

Web: www.masibus.com