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NIVAM INSTRUMENTS PVT. LTD.

INSTRUCTION MANUAL FOR

µCN-2401-Ex

MICROCONTROLLER BASED PROCESS INDICATOR

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General Description:

The NIVAM'S uCN 2401-Ex Process indicator is a process monitoring and controlling device. It accepts Electrical input mA (4-20 mA, 0-20mA) Voltage (1-5V, 0-5V, 2-10V, 0-10 V). & RTD (PT100) as input. It has 1" 4-digit display for process variable and 2 LED's to indicate the alarm status & 2 LED's to indicate communication status. uCN 2401-Ex is fully configurable and programmable through front keypad. Every care is taken to avoid programming by unauthorized persons by protecting each mode by password.

Installation:

Before connecting the I/P's, O/P's and electrical power, it is recommended to carefully study wiring data on the back side of instrument.

While connecting the I/P, O/P the polarities must be respected.

For looping the Transmitter µCN 2401-Ex provides 24 V DC at 30-mA power supply.

Technical Specifications:

Model	**: uCN-2401-Ex**
Input (selectable)	**: Electrical mA (4-20 mA, 0-20mA)** **Voltage (1-5V, 0-5V, 2-10V, 0-10 V)** **RTD PT-100**
Input impedance	**: 92 Ohms. (For 4 to 20 mA input)**
Output	**: 4 to 20 mA DC – isolated**
Transmitter power supply	**: 24 V DC @30 mA for powering one two Wire Transmitter.**
Range	**: Programmable (-999 to 9999)**
Accuracy	**: Better than ± 0.25% of FSD**
Alarms	**: 2 Nos. (Programmable)**
Relay rating	**: 1A @230 VAC resistive load**
Keyboard	**: 4 Nos. of keys (Optional).**
Indication	**: 4-digit 7 segment 1" RED display for PV**
Supply voltage	**: 95-265 V AC , 50 Hz, single phase**
Power required	**: 6 to 8 Watts**
Operating temp.	**: 5 –50 ^{o}C**
Humidity	**: 90% max. Non- condensing**
Mounting	**: Pipe Mounting.**

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FRONT STICKER DESCRIPTION:

The front sticker consists of 4-digit display window and 5 LEDs.

Two LED'S for displaying the alarm status.

1. The 4 digit display window indicates the process value, the message, and configuration variables.

2. The two LED's marked as sp1 and sp2 indicate the alarm corresponding to setpoint1 and setpoint2

If the SP1 alarm is operated, corresponding LED will glow.

Two LEDs for transmit and Receive indication.

One red LED is provided for Mode key, which indicates dual function of keys.

KEY BOARD DESCRIPTION:

µCN- 2401-Ex Consists of four keys (optional) and one LED to indicate the dual function keys.

1. MODE / FUNCTION KEY

It has dual function

a. Displays various programming modes.

b. Assign second function to other keys indicated by LED.

2. INC / DEC KEY

It has dual function.

a. Increments the numerical value or counts or choices if mode key LED is not glowing.

b. Decrements the counts or choices if mode key LED is glowing.

Note: For negative value first set your value and by using SHIFT key go to first digit, and decrement the first digit until you get negative sign then press Enter.

3. SHIFT LEFT / RIGHT KEY

It has dual function.

a. It shifts right the blinking display while setting numerical values if mode key LED is not glowing.

b. It shifts left the blinking display while setting numerical values if mode key LED is glowing.

4. ENTER / ESCAPE KEY

a. If mode key LED is not glowing the unit will accept the entered value/choice.

b. If mode key LED is glowing the unit will discard the entered value/choice and ESC from value/choice.

CONNECTION TERMINALS:

Back terminal plate consists of 3 double row terminals suitable for 2.5-mm^2 wire.

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PROGRAMMING MODES:

uCN-2401-Ex provides three programming modes for configuring the instrument.

All programming modes are password protected

1. USER mode : This mode permits the user to set Alarm related parameters i. e. Hysteresis , Alarm Type, Set Points and Fail Safe.

2. CONFIGURE mode : This mode permits the user to select the input type and configure range span and range zero.

3. CALIBRATION mode : This mode provides the user a user friendly way of calibrating the instrument under the control of software.

4. COMMUNICATIN mode : This mode provide the user to set baud rate & tag id of instrument.

PROGRAMMING / CONFIGURING DETAILS:

The programming of instrument is always starts with the

Mode / function key.

Step 1 : Pressing the mode key will display first mode. i. e. user mode.
Then by using increment/decrement key one can
Scroll through the programming modes.

Step 2 : Once the required mode is seen on the display,
Press Enter key to go in to the mode.
When ever user see a prompt for password.
Feed appropriate password.

Step 3 : Numerical values are feed by shifting and
Incrementing the blinking digit to required Value.
If mode key LED is glowing, increment Key will
Act as decrement key and left shift Key will act as right shift key.

Step 4 : If the changed value is to be accepted the user
Should press Enter and however he should make
Sure that the mode key LED is not glowing,
otherwise it would mean discard the entered value
and restore old value.

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Calibration procedure:

µCN 2401-Ex module is calibrated and then dispatched from the factory so that at site the Site engineer need not recalibrate the instrument.

But if you change the input you have to calibrate instrument before installing at site.

The procedure for calibration is as follows:

Before calibrating the instrument first set the all parameters related to input such as input type, decimal point and range of the input. Also set the parameters such as Hysterisis, Alarm type, fail safe and set points.

1) Press the MODE key. Now user will see USER
2) Press INC (increment) key and go to CAL mode and press ENT (Enter) key. Enter appropriate password then press Enter.
3) Now user will see INZR. Feed minimum of the range and press Enter. The user will see ADC counts on display. Press Enter
4) Now again user will see INZR press INC key, now user will see INSP. Feed maximum of the range and press Enter. The user will see ADC counts on display. Press Enter

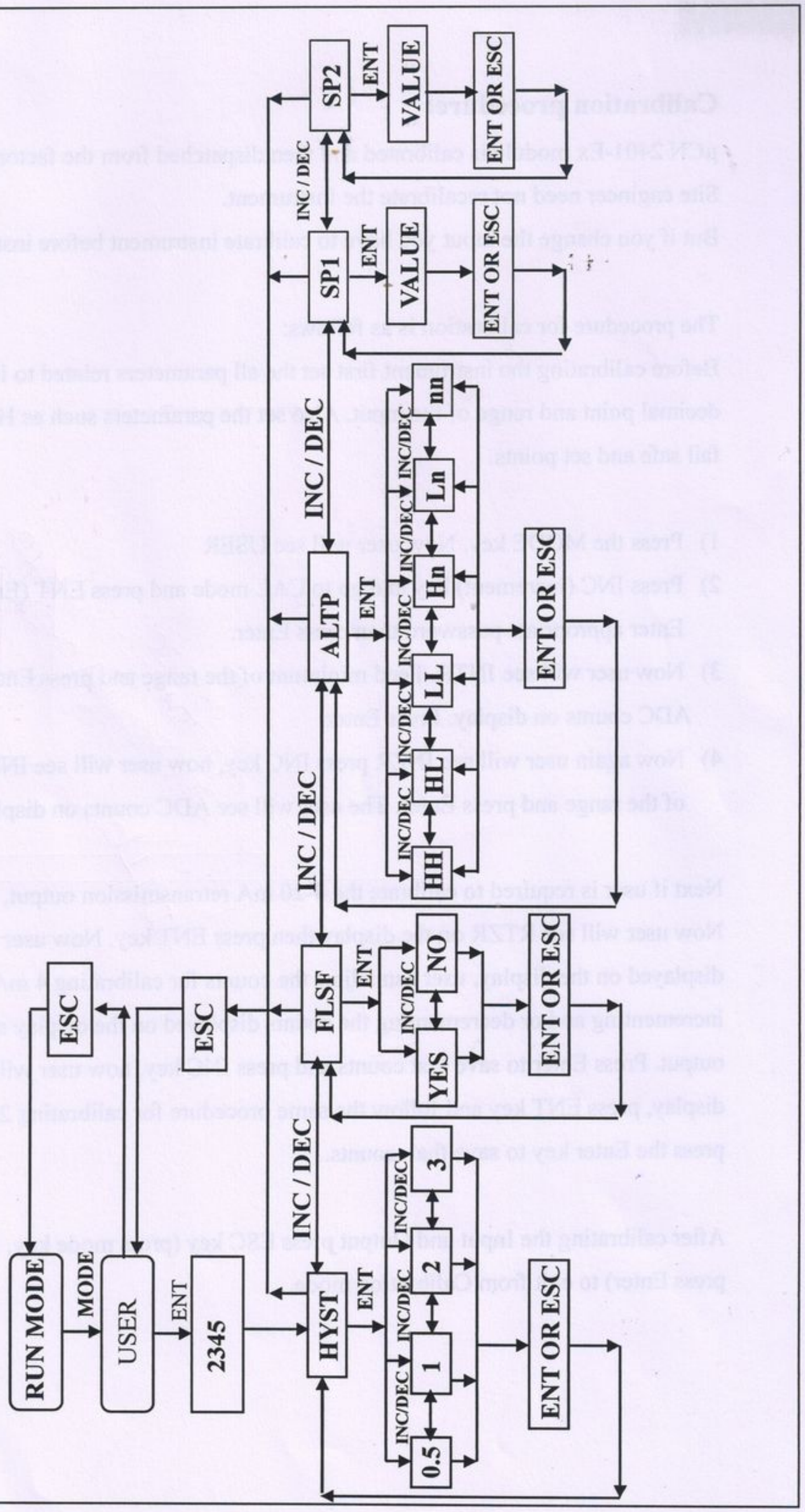
Next if user is required to calibrate the 4-20 mA retransmission output, press the INC key. Now user will see RTZR on the display then press ENT key. Now user will see a fixed count displayed on the display, user can adjust the counts for calibrating 4 mA output by incrementing and or decrementing the counts displayed on the display simultaneously monitor output. Press Enter to save that counts and press INC key, now user will see RTSP on the display, press ENT key and follow the same procedure for calibrating 20-mA output then press the Enter key to save that counts..

After calibrating the Input and Output press ESC key (press mode key, led will be ON and press Enter) to exit from Calibration mode.

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USER MODE

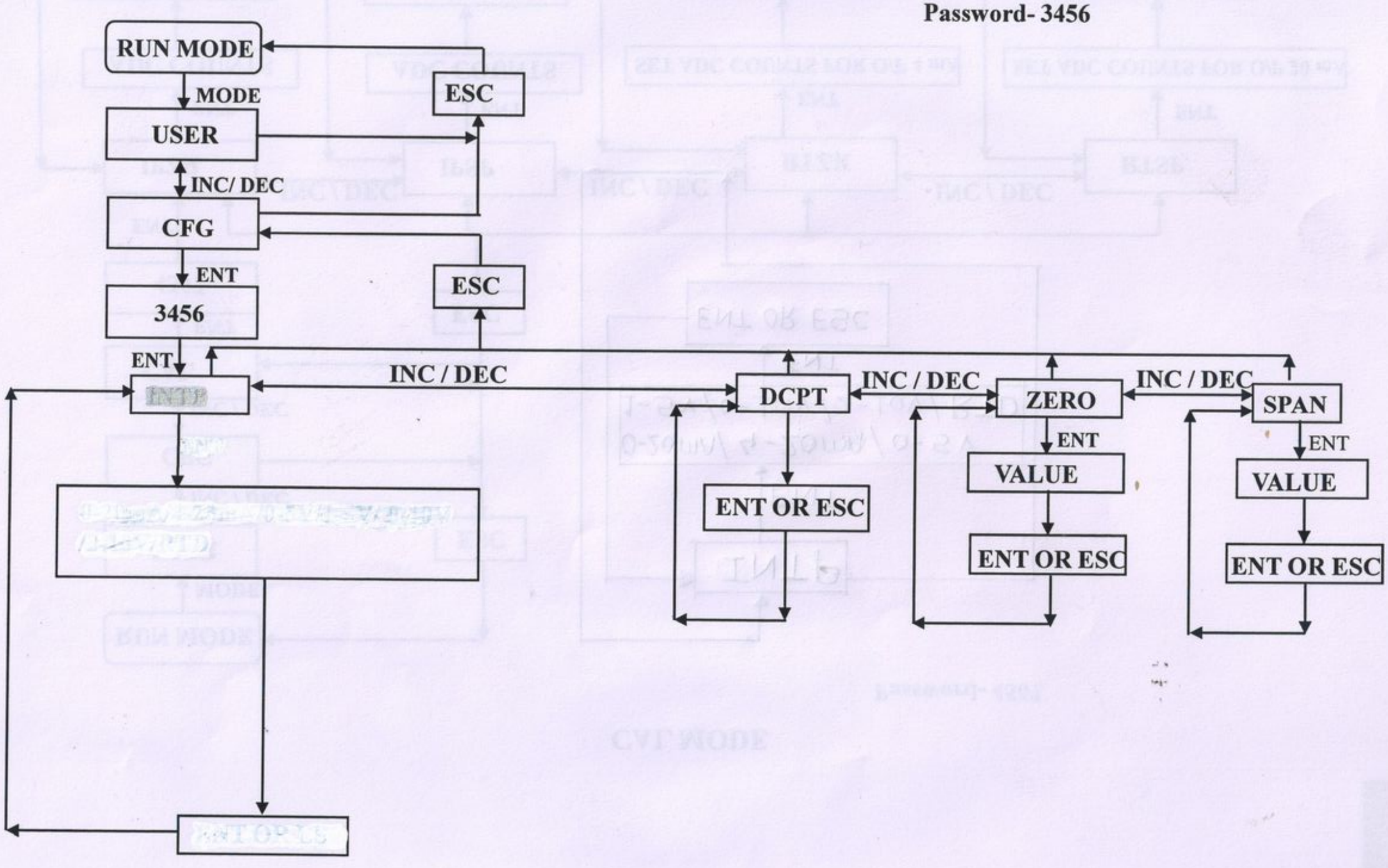
Password- 2345



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CFG MODE

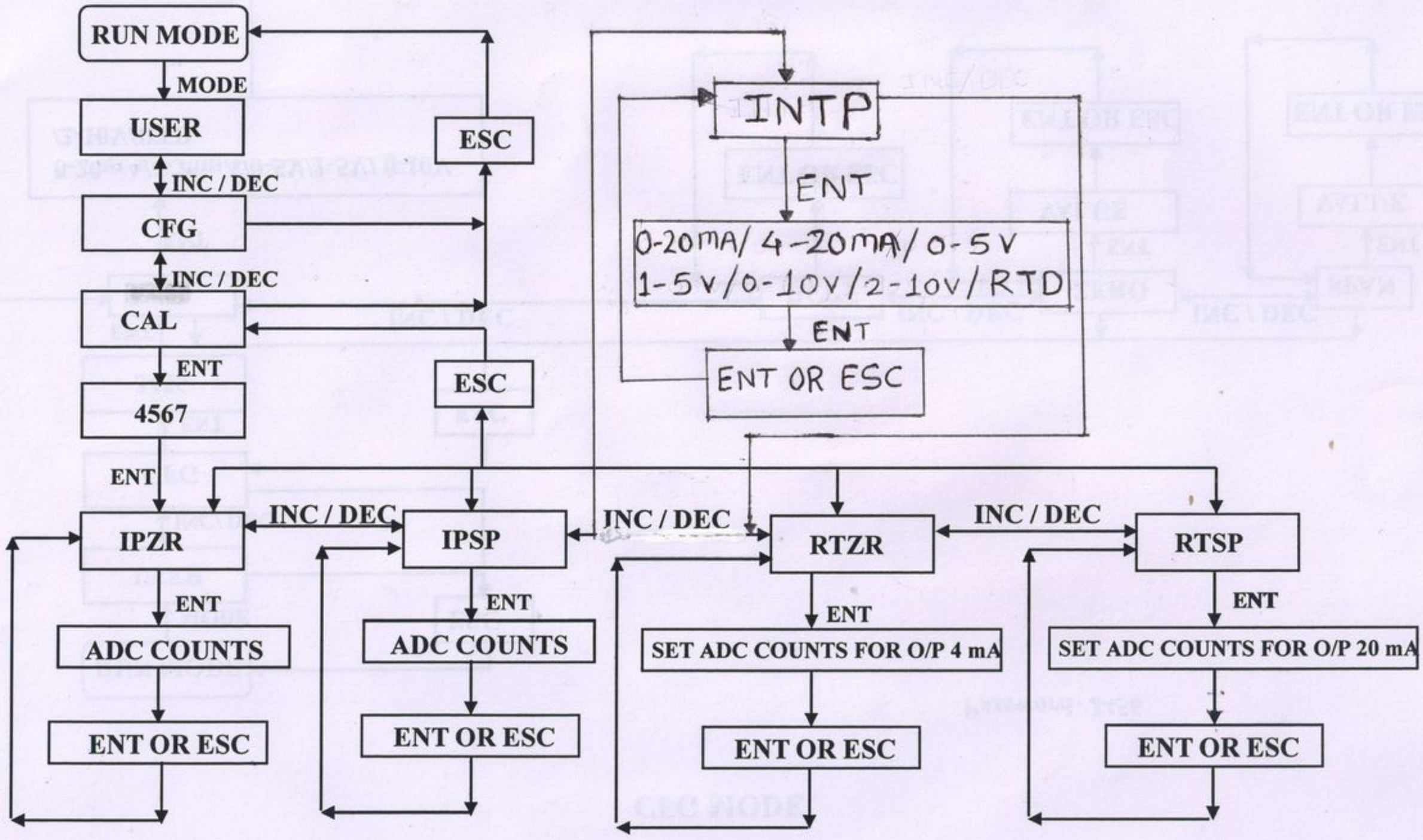
Password- 3456



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CAL MODE

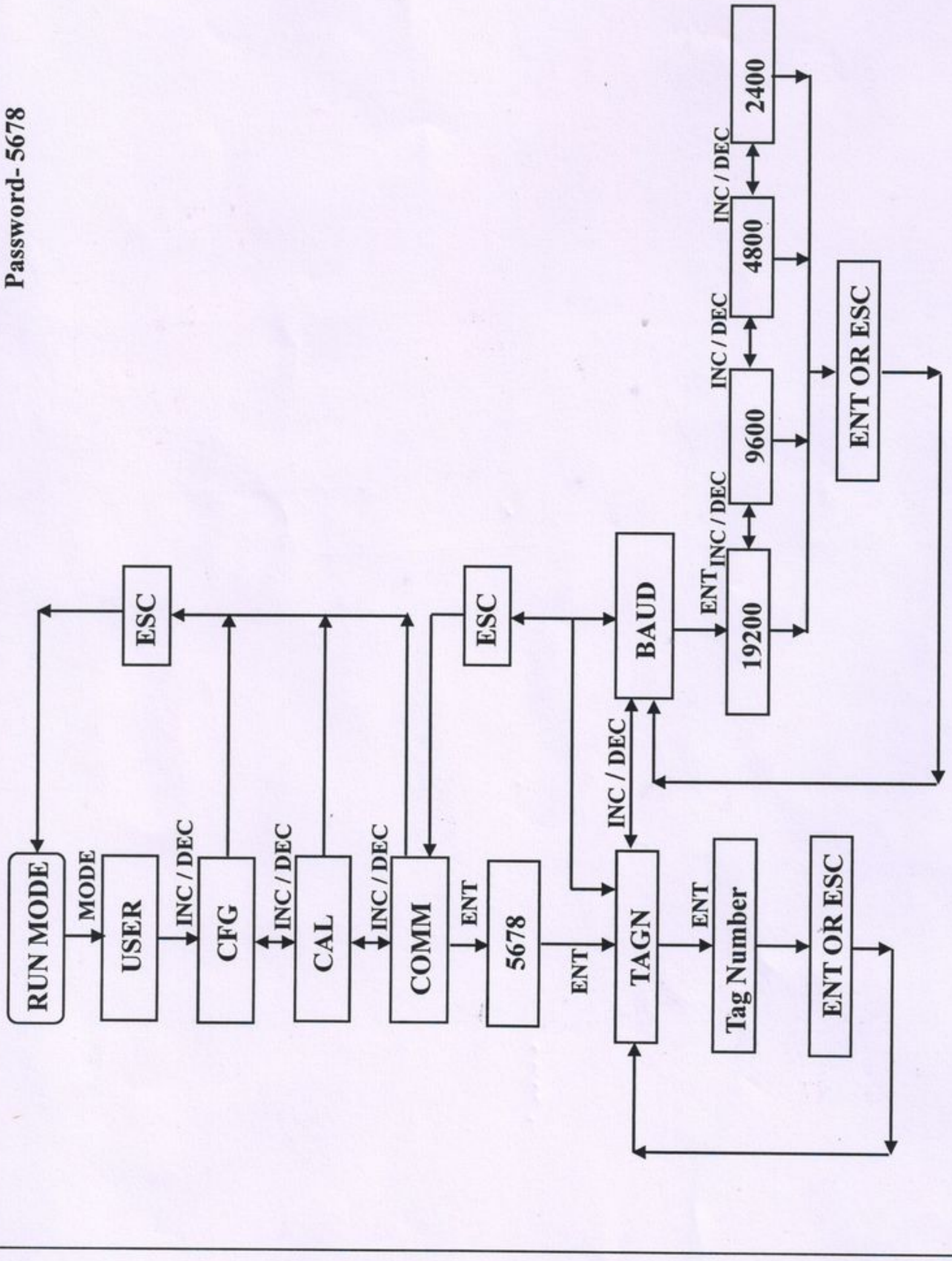
Password- 4567



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COMM MODE

Password- 5678



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Doc. Id. : Ver 1 / T_Procedure

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CALIBRATION PROCEDURE

1. Input Selection Switch Setting (SW1) :

Input Type	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
Current Input	ON	ON	ON	OFF	OFF	OFF	OFF	ON
0/1-5V Input	ON	OFF	OFF	ON	OFF	OFF	OFF	ON
0/2-10V Input	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
RTD Input	ON	ON	OFF	OFF	OFF	ON	ON	ON
THC Input	ON	ON	OFF	OFF	ON	OFF	OFF	ON

2. Gain Selection Switch Setting (SW2) :

Input Type	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7	SW2-8
E THC	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
J THC	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
K THC	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
N THC	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
R,TTHC	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
S,B THC	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
RTD	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
OTHER	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON

for 0to10v off off off off off off off off

3. Retransmission Output Selection Jumpers :

OFF ON

Output Type	JP1	JP2	JP3	JP4	JP5	JP6	JP7
0/4 – 20mA Source	ON	OFF	ON	OFF	OFF	OFF	ON
0/4 – 20 mA Sink	OFF	ON	OFF	OFF	ON	OFF	ON
0 – 5 V	OFF	OFF	OFF	ON	ON	OFF	OFF
1 – 5 V	OFF	OFF	OFF	ON	ON	OFF	ON
0 – 10V	OFF	OFF	OFF	ON	ON	ON	OFF
2 – 10V	OFF	OFF	OFF	ON	ON	ON	ON

4. Set Input Selection Switch(SW1) , Gain Selection Switch (SW2) , Retransmission Output Selection Jumpers . as per requirement.
5. For Electrical Input , connect Input Positive to Pin 1 of CN-IN & Input Negative to Pin 2 of CN-IN. Check ADC input voltage to Pin1 of U3 & Analog ground (Emitter of Q1). Must be 1.8V for Input Span.
6. For RTD Input , connect RTD 1 , 2 , 3 to Pin1 , 2 , 3 of CN-IN respectively. Check ADC input voltage to Pin1 of U3 & Analog ground (Emitter of Q1), for -50 degree = 0.3 ± 0.1V , for 600 degree = 1.70 ± 0.1V.

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13.07.2015	**13.07.2015**	**13.07.2015**