Warranty Certificate

This instrument is warranted against any manufacturing defects for a period of twelve months from the date of installation, or eighteen months from the date of supply, which ever is early.

Kindly note that:

1. *The warranty is limited to repairing the instrument and no responsibility is taken for any other damage resulted*
2. *The warranty will be void if the instrument is opened or tampered in any way*
3. *The faulty instrument has to be returned to our factory, carriage prepaid & duly insured.*

Product Category : Programmable Process Controller

Model No. : Sleek 901

Serial number : _____

Date of despatch : _____

Authorized signatory : _____

Company seal

The Inside Stuff

As You Unpack	.....	**2**
Introduction	.....	**3**
Principle Of Operation	.....	**4**
Features	.....	**4**
Specifications	.....	**5**
Illustrations	.....	**6**
Operation	.....	**7**
Modes of Operation	.....	**8**
Installation Procedure	.....	**9**
Programming Flow Chart	.....	**10**
Calibration Procedure	.....	**13**
Warranty Certificate	.....	**16**

Kindly forward this product manual to the end user. The user is requested to read the manual thoroughly before operating the instrument.

As you unpack

Congratulations
on buying a
Programmable Process Indicator!

As you unpack kindly ensure that
1. The material received is in good condition
2. You have received the following material:
   a) Programmable Process Controller as per your order
   b) Mounting bracket pair
   d) This manual along with Warranty certificate

In case of any discrepancies contact our customer support department immediately.

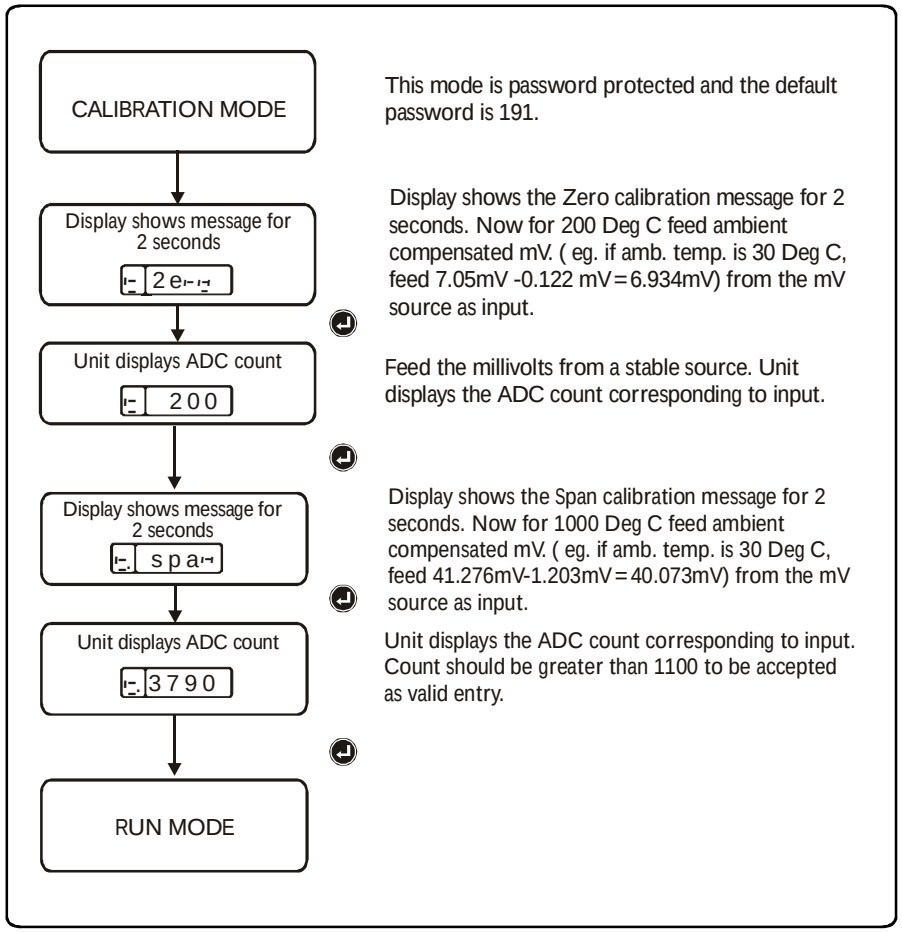
We are sure you will get long and trouble free service from our system.

We need your feedback :

Every attempt is made to make this manual clear and easy to understand, so that the user can install, take care of and feel confident in using our product. We welcome your valued suggestions to help us improve this product as well as the document and make it more user friendly.

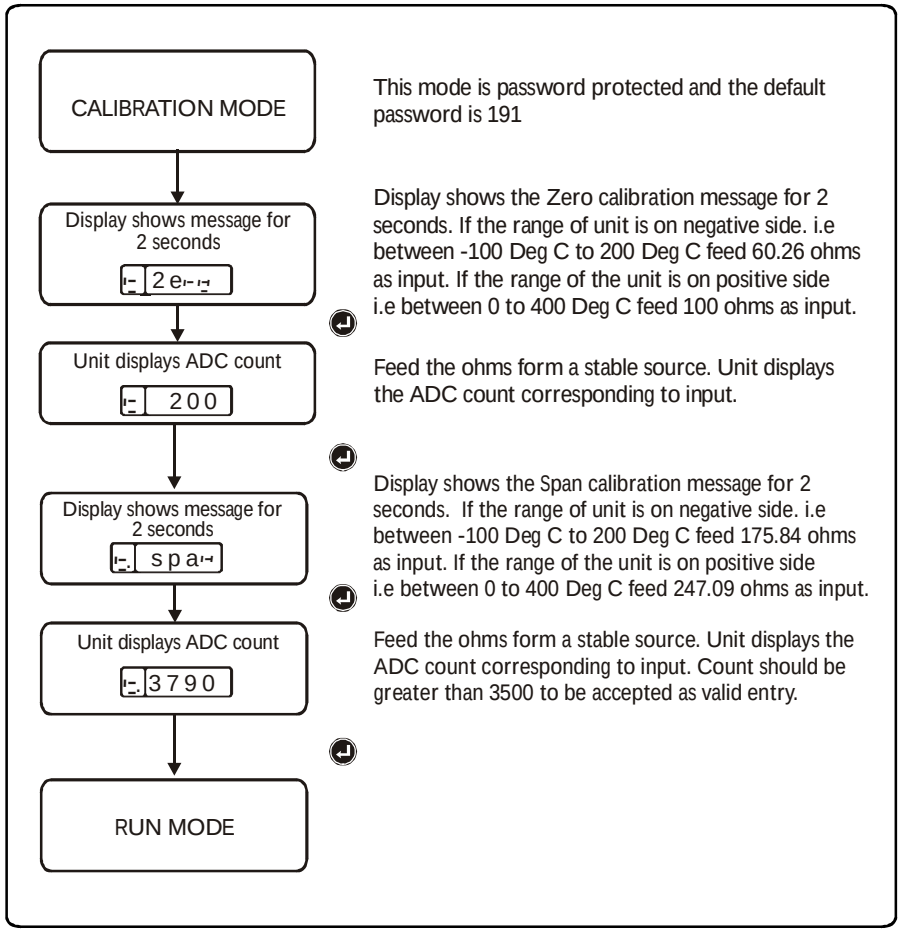
Calibration procedure

For CR-AL type input



Calibration procedure

For PT-100 input



Introduction

Process Indicators and Controllers play an mportant part in any process industry. Quick and accurate measurement and control of a process value will improve the final product quality, reliability and reduce rejection.

Process indication and control is therefore one of the prime considerations in any process industry

The Sleek 90 series is a Microcontroller based Process Indicator cum Controller with user friendly programming facility. The Sleek 90 has been designed for fast and accurate measurement and control of process value. Linearisation of signals provides high accuracy even for most nonlinear sensors. The instrument is designed using highly reliable electronic components. Process value is displayed directly in digits, giving better resolution.

The Sleek 90 accepts 4 - 20 mA as input. Wide ranges of measurements are available depending on the sensor used.

The instrument is immune to mechanical vibrations. Even the mounting position will not affect the measurement accuracy.

Use of highly reliable electronic components with low tempearature coefficient ensures long and trouble free service.The instrument is tested for its performance under various climatic conditions.

Principle of Operation :

The Sleek 90 series is based on the principle high input impedance amplifier feeding an analog to digital convertor. The input signal generated by the transducer is fed to a signal conditioning amplifier, output of which is digitised by the ADC. This digital signal is linearised by software, displayed and compared to the set value by the microcontroller which initiates the programmed relay action. The linearisation, display and relays are controlled by the microcontroller by virtue of the system software.

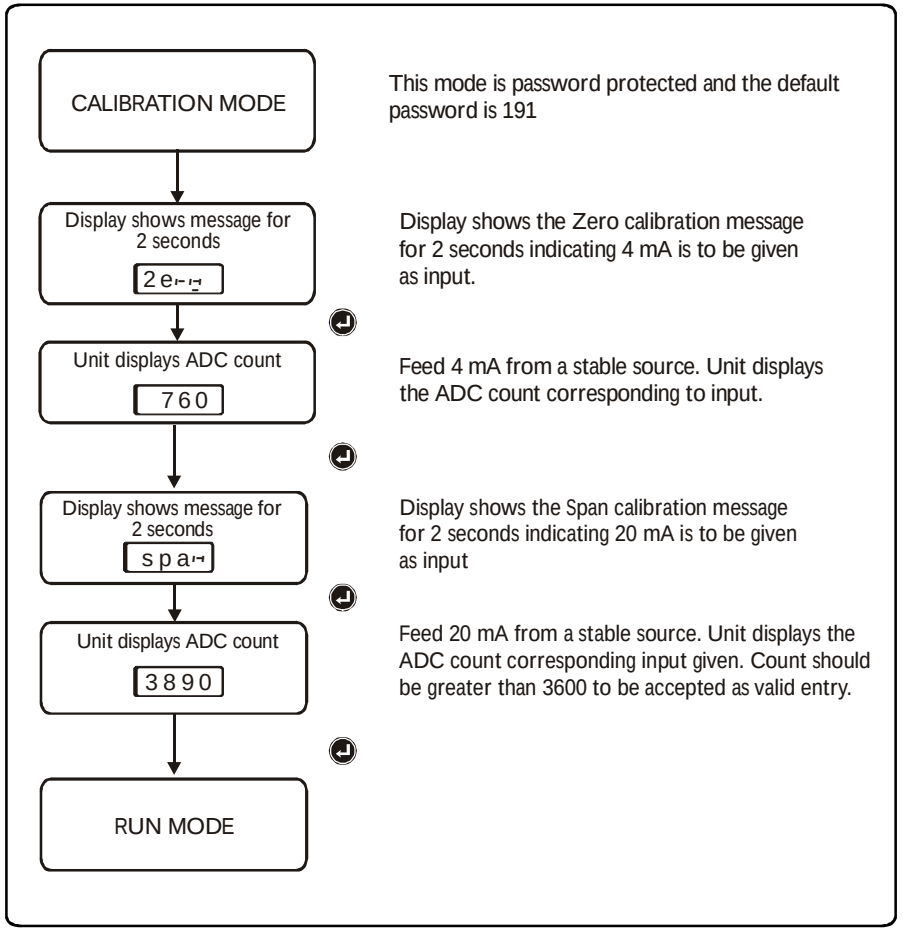
Features :

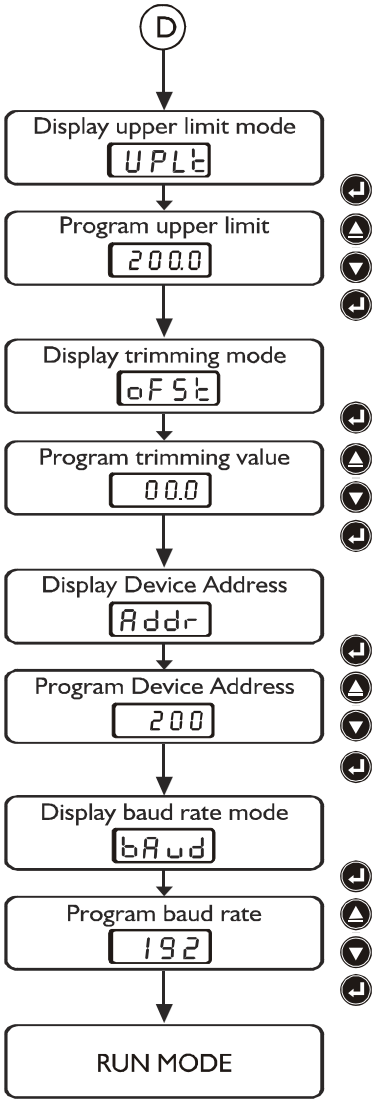
- Microcontroller based logic
- Linearisation of controlled variable achieved through software giving high accuracy
- Highly compact
- Dust and vermin proof enclosure with epoxy powder coating.
- User selectable Control Logic
- Programming through tactile membrane keys
- NVRAM enables data storage even in events of prolonged power failure
- Fast response time
- RS 232 Modbus protocol supported
- Maximum MTBF and minimum MTTR

Calibration procedure

Warning : This procedure is to be carried out strictly by technically qualified personnel only.

The instrument is calibrated at the factory using 0.05 % accurate calibrating instruments. No calibration should be required in normal case, however if the instrument requires re-calibration, the procedure to be followed is given below. **For 4 - 20 mA input type**





Indicates that upper limit of the range of 4-20mA output is being programmed

By inc & dec keys lower limit corresponding to 20 mA can be programmed

Indicates offset value, to be added or subtracted from process value.

By inc & dec keys offset value can be programmed between -200 to +200.

Indicates that device address used communication is being programmed .

By inc & dec keys device address can be set between 1 to 247

Indicates that baud rate for communication is being programmed .

By inc & dec keys baud rate in kbps is selectable between 012 = 1200, 024 = 2400, 048 = 4800, 096 = 9600 or 192 = 19200

Specifications

Model	: Sleek 901A / Sleek 901B / Sleek 901C Sleek 901D / Sleek 901E
Range	: Programmable from -999 to 9999
Input	: 4 - 20 mA
Indication accuracy	: +/- 0.2 % of FS +/- 1 digit
Accuracy deviation due to	
a) Temperature change	: +/- 0.02 % / °C , ref at 25 °C
b) Supply Variation	: +/- 0.01 % /V
Outputs	: 24 V DC, +/- 1 V, @ 30 mA supply
Display	: 4 digit Seven segment Red LED
Display size	: 25 mm / 50 mm / 100 mm / 150 mm / 200 mm
Power supply	: 230 V AC, +/- 10 % , 50 Hz
Ambient Temp. range	: 0 to 55 °C
Sensor break indication	: Up scale [OPEn]
Relative Humidity	: 90 % Non Condensing
Power consumption	: 6 VA
Weight	: 900 grams
Mounting	: Flush panel mounting / Hanging type
Dimensions	: As per chart given below
Programming protection	: Password protected. Default password is 134.

Model	Display height (mm)	Facia (W x H)	Cutout (w x h)	Depth ■ (D)
Sleek 901A	25	196 x 96	186 x 92	80
Sleek 901B	50	288 x 144	282 x 138	120
Sleek 901C	100	432 x 192	424 x 186	100
Sleek 901D	150	480 x 240	--	120
Sleek 901E	200	672 x 336	--	120

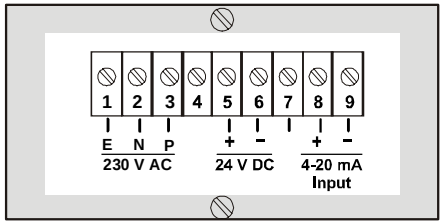
■ Add 25 for terminals

Illustrations

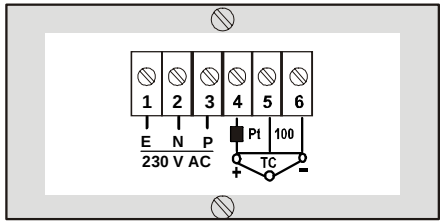
A) Front view

B) Rear View

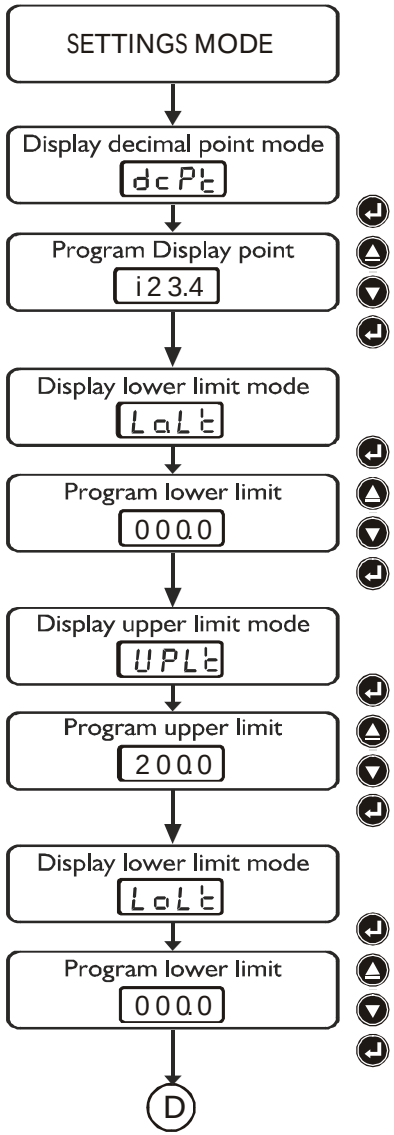
For 4 - 20 mA



For PT 100 or Thermocouple type



SETTINGS MODE



Indicates that decimal point position of the unit is being programmed

By inc & dec keys decimal position can be selected. Current position is flashing and will be common to all the parameters..

Indicates that lower limit of the range of input is being programmed

By inc & dec keys lower limit corresponding to 4 mA can be programmed

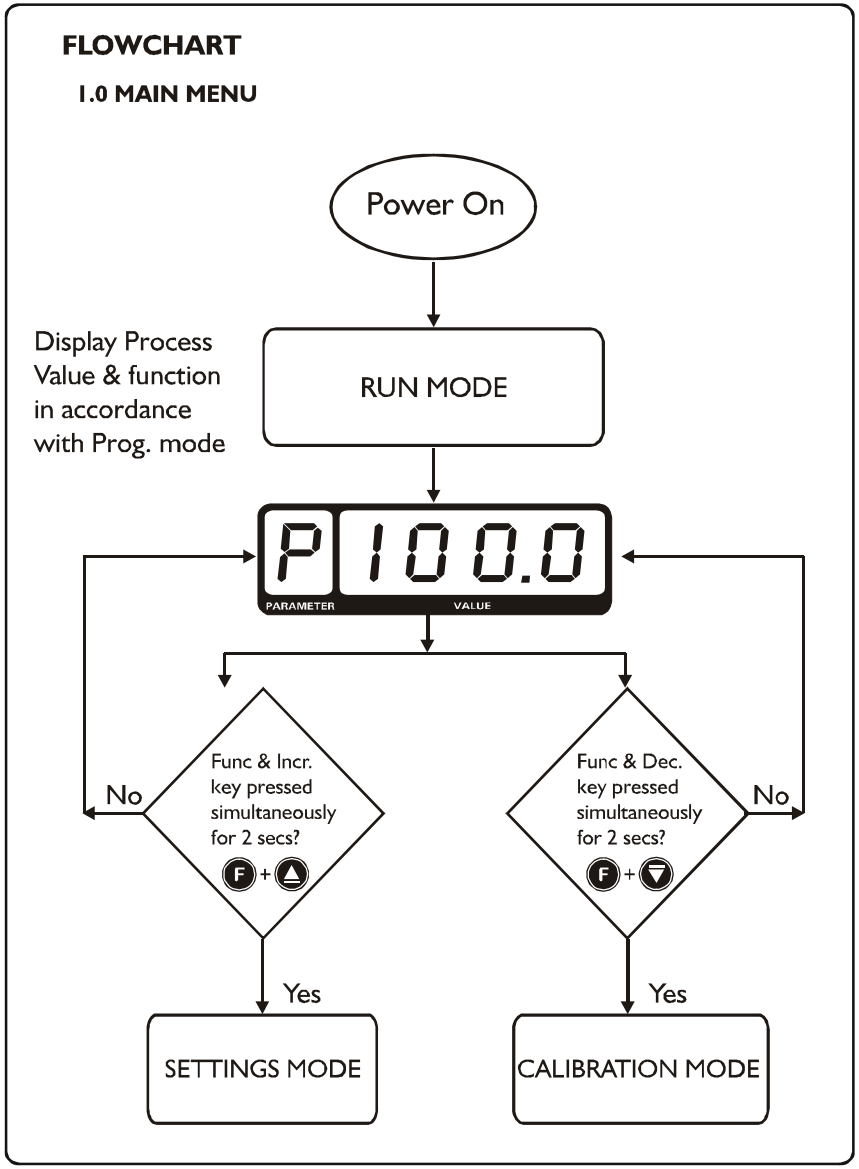
Indicates that upper limit of the range is of input being programmed

By inc & dec keys lower limit corresponding to 20 mA can be programmed

Indicates that lower limit of the range of 4-20mA output is being programmed

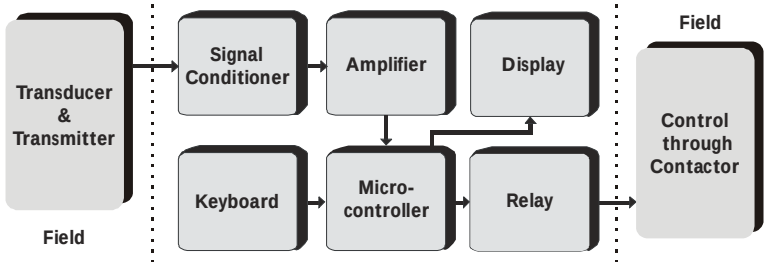
By inc & dec keys lower limit corresponding to 4 mA can be programmed

Program Flow Chart



Operation

Block Diagram



1. **Transducer :** This is externally connected to the instrument. Types available are Pt - 100, Thermocouple, 4-20 / 0-20 mA current signal
2. **Signal conditioner:** This circuit accepts the process signal from the sensor performs the necessary compensation (Ambient compensation for T/C and lead wire compensation for PT- 100) and converts it into suitable signal level for ADC.
3. **ADC:** This is a 12 bit Successive Approximation type ADC inbuilt the microcontroller. It accepts the analog input signal, converts it into digital data and feeds it to the processor for further action.
4. **Microcontroller**: This is the heart of the unit and is inter faced to all other peripherals. The transducers, membrane keypad, display, memory and output relays function under the command of the microcontroller.
5. **Memory :** There are two memory elements provided in the circuit. One is the EPROM for monitor (main) program storage and the other is the NVRAM for storage of various user

programmed parameters and process variables (even in events of prolonged power failure).

6. **Keypad :** Feather touch membrane keys are provided on the front panel for user programming. These keys have features like long life, negligible contact bounce, ease of operation.
7. **Display :** The front panel carries all the indications. These are controlled by the CPU. There are five digits on the front panel for indicating various messages and parameter values.

Modes of Operations :

1. **Program Mode :**
   In this mode the user can program all the setpoints, control action etc.

2. **Run Mode :**
   In this mode the display shows the process value.

For programming sequence please refer program flow chart.

Installation procedure :

Also observe **"Precautions"** as given in this manual

The instrument should be mounted in a place where it is clearly visible and accessible.

1. Insert the instrument in a suitable cut out and fix it using the bracket pair provided on the sides.
2. Make the connections as shown in Rear View diagram.
3. All connections should be firm.
4. Connect the positive of the transmitter to ' + ' terminal and negative of power supply to ' - ' terminal. i.e Connet the terminals in series with the transmitter.
5. Ensure proper earthing to the instrument.