VALVELink
All your process control needs

ISEN

Portable Signal Generator

ISEN50

Preface

◆Thank you for purchasing and using our company's signal generator. This manual provides a detailed introduction to the functions, wiring, and operating instructions of the signal generator. To ensure proper use of the signal generator, please read this manual carefully before use.
◆Please verify whether the product packaging and accompanying accessories are consistent with the order.
◆To prevent instrument failure or malfunction, unauthorized disassembly and assembly of instruments is strictly prohibited.

Product Packaging

1.Signal generator host *1
2.Signal cable *3
3.USB cable *1
4.Charging plug *1
5.Tool kit *1
6.Positive probe *1
7.Negative probe *1
8.Product manual *1

Overview

It has multiple signal measurement and output functions, including voltage, current, thermocouple, thermal resistance, and resistance. It adopts a high-definition LCD screen and functional silicone buttons, with simple operation, long standby time, high accuracy, and programmable output function.Widely used in the debugging of PLCs, process instruments, electric valves, etc. in laboratories and industrial sites.

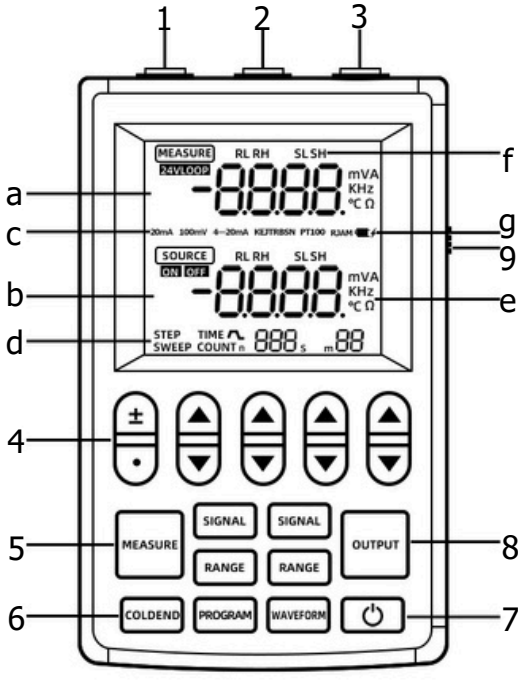
Major function:
-Voltage signal: 0-30V, 0-25mV, 0-100mV output and measurement.
-Current signal: active and passive 0-25mA, 4-20mA output and measurement.
-Thermocouples: K, E, J, T, R, B, S, N outputs and measurements.
-Thermistor: PT100 output and measurement.
-Resistance: The output and measurement of resistance signals.

●Working temperature and humidity: -10℃-55℃, 20-80%RH(without condensation)
●Storage temperature: -20℃-70℃
●External dimensions: 115mm*70mm*26mm
●Reverse connection and process protection: 30V

1. Parameter

Signal	Type	Range	Accuracy	Resolution Ratio	Notes
DC Voltage	20mV	0.00-24.00mV	±0.1%	0.01mV	
	100mV	0.0-100.0mV	±0.1%	0.1mV	
	V	Output:0.00-15.00V	±0.1%	0.01mV	Output:Maximum current 30mA, Measurement: Input impedance 1.2MΩ
		Measure 0.00-30.00V	±0.1%	0.01mV	
DC Current	mA	0.00-24.00mA	±0.1%	0.01mA	Output: Maximum load 750Ω Measurement: Input impedance 100Ω
	4-20mA	4/8/12/16/20mA	±0.1%	0.01mA	
Passive Current	mA	0.00-24.00mA	±0.1%	0.01mA	Output: External power supply 16V-30V
Power Distribution Output	24VLOOP	24V/16V	10%	0.1V	Drive current 24mA
TC	K	-270-1372℃	±1%	1℃	Output: The range starts from the cold end temperature and cannot output temperatures below the cold end.
	E	-270-1000℃	±1%	1℃	
	J	-210-1200℃	±1%	1℃	
	T	-270-400℃	±1%	1℃	
	R	-50-1768℃	±1%	1℃	
	B	250-1820℃	±1%	1℃	
	S	-50-1768℃	±1%	1℃	
	N	-270-1300℃	±1%	1℃	
RTD	PT100	-200-850℃	±0.5%	0.1℃	Accuracy does not include lead resistance excitation current range: constant 0.1mA-2.3mA
Resistance	Ω	20-400Ω	±0.5%	0.1Ω	

2.Keys & Functions



Wiring Terminal:
1: COM(black)
2: Output(yellow)
3: Measurement terminal(red)

4.Numeric Modifier Keys:

Switch between positive and negative values.

Switching Numeric Decimal Points.

Increase numerical value.
Reduce numerical value.

5.Measurement function button (blue):
MEASURE: Turning measurement on/off.
SIGNAL: Switching the measurement signal type.
RANGE: Switching of the measuring range.

6.Cold End and Programming Functions:
COLDEND: Displays/modifies the cold end (valid for thermocouple measurements only).
PROGRAM: Enabling Programming Functions.
WAVEFORM: Switches programmable output waveforms (linear output/stepping output).

7.Power Button

Turn on and off the power

8.Output function key (yellow):

SIGNAL: Switching output signal type.
RANGE: Switches the output range.
OUTPUT: Turn on/off signal output.

9.DIP switch (default OFF):

1.Auto power off: 10 minutes without key operation, auto power off.
2.Manual cold end: set the cold end value manually when measuring thermocouple.
3.Passive output: output passive current signal for analog transmitter.
4.Low load mode: output 16V to supply power to the transmitter when there is no passive current input, which is used to reduce power consumption and prolong the usage time.

Liquid Crystal Display:

a.Measured value display: 4 bits 8 bytes with unit.
b.Output signal value: 4 bits 8 bytes with unit.
c.Signal and cold end mode: 20mV/100mV/4-20mA/K/E/J/T/R/B/S/N/PT100. RJA is auto cold end, M is manual cold end.
d.Programming function: n/m for split output, output value = (main set value) × (n/m), SWEEP for linear output, linear output signal according to the user-set time. STEP for step output, step output signal according to the user-set step. TIME for the output time of each step, 0-999s can be grouped. COUNT for the number of output cycles, 0-999 times can be grouped. COUNT is the number of output cycles, 0-999 times can be grouped.
e.Unit: mA/mV/V/°C/Ω.
f.Range conversion function: RL is the lower limit of display range, RH is the upper limit of display range, SL is the lower limit of signal, SH is the upper limit of signal.
g.Battery power and charging sign: Charging type, the sign flashes. Fully charged, the sign is always on.

3.Signal Output

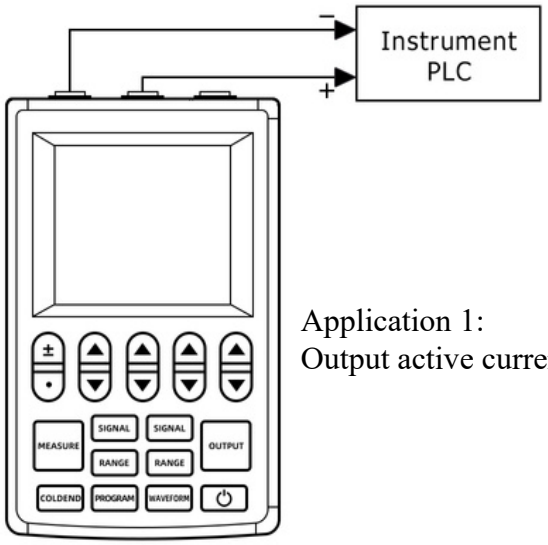
The generator can output voltage, active current, passive current, RTD, TC and resistance signals.

3.1Voltage,Active current output

①Connect the black signal cable to the COM terminal and the yellow signal cable to the output terminal.
②Press the yellow "SIGNAL" key to switch the signal type.
③Press " ,to adjust the size of the output value.
④Press the yellow "OUTPUT" key, "SOURCE" in the LCD screen will change from "OFF" to "ON" to start the output.

3.2 4-20mA Output

The 4-20mA signal is incremented/decremented 4mA at a time.
①Signal type selection is 4-20mA.
②Use the " ,key corresponding to 4-20 to set the output value in a stepwise manner, incrementing or decrementing 4mA at a time, in the order of 4->8->12->16->20. you can also use the regular " ," key to set a small value for fine-tuning.
③Press the yellow "OUTPUT" key, "SOURCE" in the LCD screen will change from "OFF" to "ON" to start output.



Application 1:
Output active current/voltage to meter or PLC.

3.3 Thermocouple Output

Outputs the thermocouple temperature minus the voltage value corresponding to the cold end temperature.
①Press the yellow "SIGNAL" key to switch the signal type to K/E/J/T/R/B/S/N.
②Press the " ▲, ▼ " key to adjust the size of the output temperature value.
③Press the yellow "OUTPUT" key, "SOURCE" in the LCD screen will change from "OFF" to "ON" to start output.

3.4 RTD Output

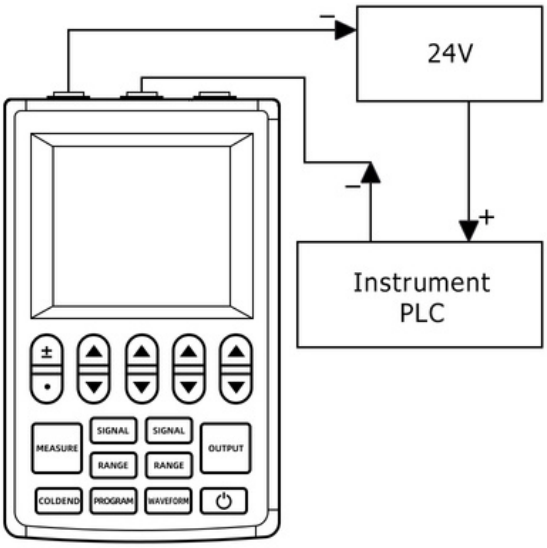
Outputs the resistance value corresponding to the RTD temperature.
①Press the yellow "SIGNAL" key to switch the signal type to PT100.
②Press the " ▲, ▼ " key to adjust the size of the output temperature value.
③Press the yellow "OUTPUT" key, "SOURCE" in the LCD screen will change from "OFF" to "ON" to start output.

3.5 Resistance Output

①Press the yellow "SIGNAL" key to switch the signal type to Ω.
②Press the " ▲, ▼ " key to adjust the size of the output resistance value.
③Press the yellow "OUTPUT" key, "SOURCE" in the LCD screen will change from "OFF" to "ON" to start output.

3.6 Passive Current Output

①Press the yellow "SIGNAL" key to switch the signal type to mA.
②Turn the dip switch to [Passive Output] ON side to activate the passive current output function.
③Press the " ▲, ▼ " key to adjust the output value size.
④Press the yellow "OUTPUT" key, "SOURCE" in the LCD screen will change from "OFF" to "ON" to start output.



Application 2
Two wire transmitter simulator

3.7 Output or measure voltage and current signals according to the displayed range
(Excluding range conversion, firmware versions3.3 and aboveare valid)
①Valid when the signal type is voltage or current signal.
②Press the "RANGE" key to switch between displaying the lower range RL → upper range RH → lower signal SL → upper signal SH → none.
③When the range is displayed as RL, press the " , " key to set the corresponding value. Press the " " key to switch to RL decimal point.
④Set the values of RL, RH, SL, and SH in sequence.

When outputting:
⑤Press the "RANGE" key again to exit the range setting, press the " " key to switch between output by range or signal output, and there will be no unit display when outputting by range.
⑥Press the " , " key to adjust the output value size.
⑦Press the yellow "OUTPUT" key, "SOURCE" in the LCD screen will change from "OFF" to "ON" to start output.

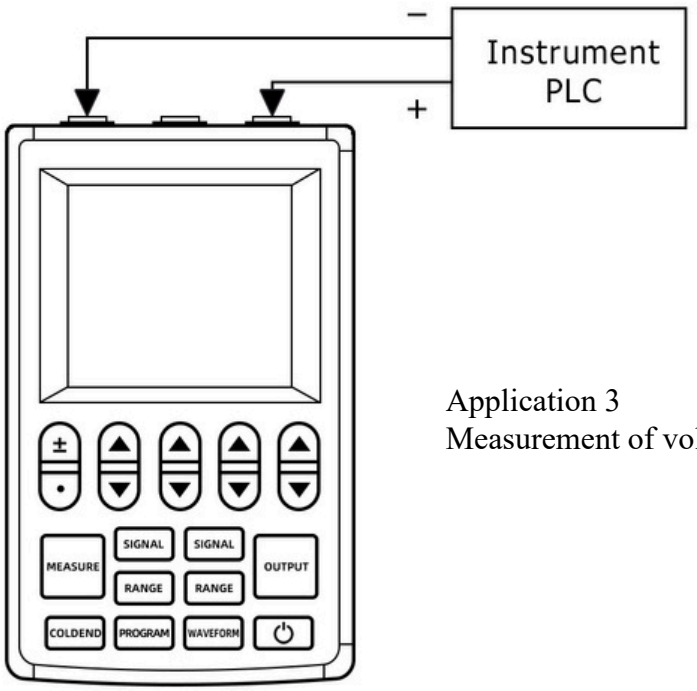
When measuring:
⑤Press the "RANGE" button again to exit the range setting, and press the " " button to switch between range measurement display or signal value display. There is no unit display when measuring the range.
⑥In the measurement area, the actual measurement value can be displayed or converted according to the range.

4.Signal Measurement

The signal generator can measure voltage, active current, passive current, thermal resistance, thermocouple, and resistance signals. The update cycle is 1 second. When not performing the measurement function, press the blue "MEASURE" button to turn off the measurement mode in order to save power.

4.1 Voltage and Active Current Measurement

① ②③④Connect theblacksignalcableto COM terminal and the red signal cable to the measurement terminal.
Press the blue "MEASURE" key to open the measurement function.
Press the blue "MEASURE" key to switch the signal type.
Display the actual measured value in the LCD measurement display area.



Application 3
Measurement of voltage, active current signals.

4.2 Passive Current Measurement

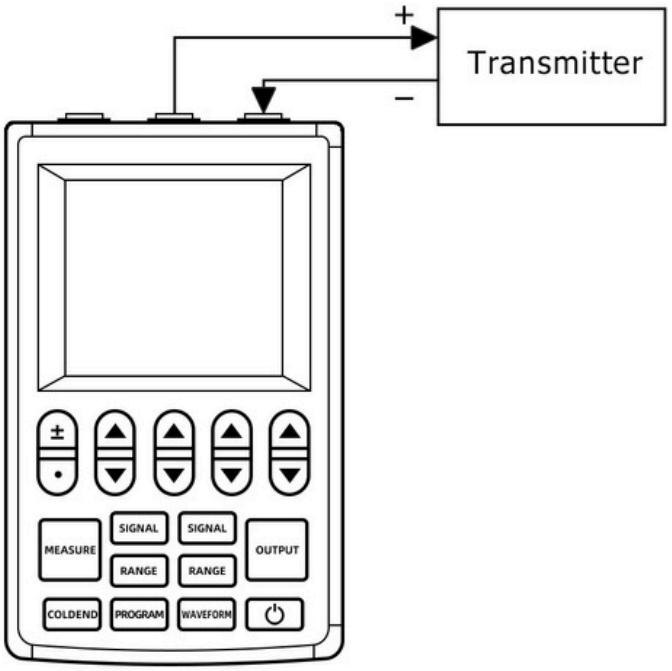
For2,3-wire transmittermeasurements

①Connect the signal cable according to the 2-wire or 3-wire connection method.

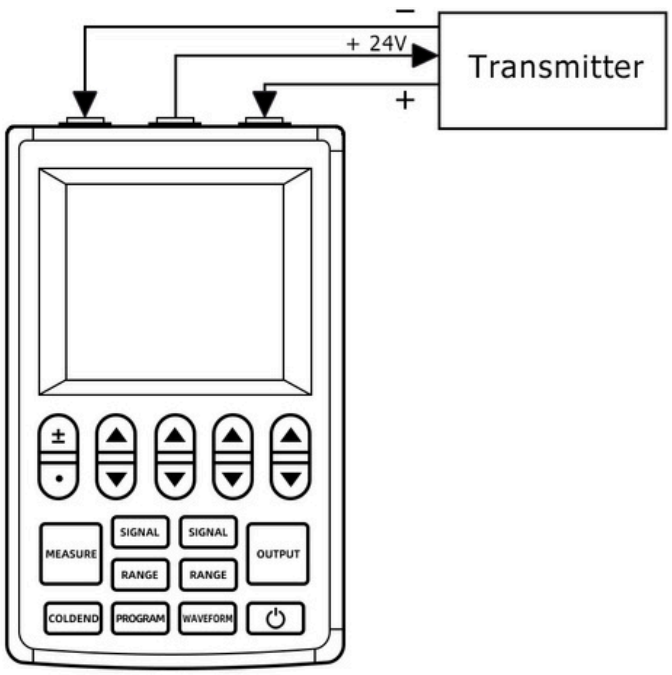
②Press the blue "SIGNAL" key to switch the signal type to 24VLOOP.

③At this time, the output terminal is fixed to output 24V or 16V (16V is output when the dip switch is ON in [Low Load Mode]).

④The actual measured value is displayed in the LCD measurement value display area, and the output display area is fixed at 25mA.



Application 4：Measuring 2-wire transmitters



Application 5：Measuring 3-wire transmitters

4.2 Thermocouple Measurement

Formeasuring thermocouple temperature values with automatic or manual cold end compensation.

①Connect the black signal cable to the COM terminal and the red signal cable to the measurement terminal.

②Press the blue "SIGNAL" key to switch the signal type to K/E/J/T/R/B/S/N.

③The actual measured value is displayed in the LCD measured value display area.

To view or adjust the cold end temperature, proceed as follows:

①Press the "COLDEND" key, the LCD display output value will switch to the cold end temperature display.

②LCD display shows RJA, which means the current cold end is the cold end temperature collected by the internal sensor of the generator and cannot be modified.

③If the dip switch is set to the manual cold end position, the LCD display will show "M", at this time, the "▲, ▼ " key can be used to set the cold end value manually.

4.4 RTD Measurements

Formeasuring the temperature value of PT100 RTDs.

①Connect the black signal cable to the COM terminal and the red signal cable to the measurement terminal. (PT100 uses 2-wire connection)

②Press the blue "SIGNAL" key to switch the signal type to PT100.

③Display the actual measured value in the LCD measured value display area.

4.5 Resistance Measurement

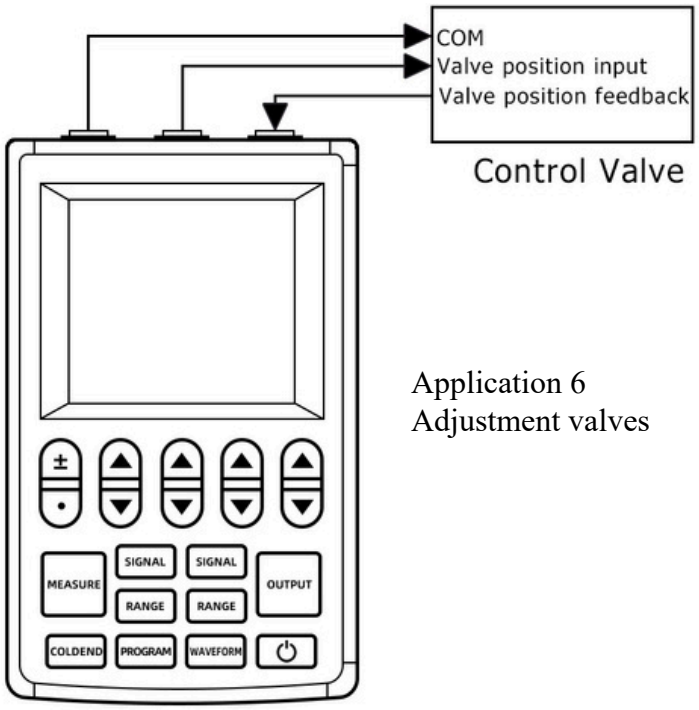
① Connect the black signal cable to the COM terminal and the red signal cable to the measurement terminal.

② Press the blue "SIGNAL" key to switch the signal type to Ω.

③ Display the actual measured value in the LCD measured value display area.

4.6 Adjustment Valve

Outputs active voltage/current to the valve and measures the feedback signal to adjust the valve.
①Connect the signal cable according to application 6 wiring.
②Press the blue "SIGNAL" key to switch the measurement signal type to voltage/current.
③Press the yellow "SIGNAL" key to switch the output signal type to voltage/current.
④Press the yellow "OUTPUT" key, "SOURCE" in the LCD will change from "OFF" to "ON" to start output.
⑤The feedback measurement value of the actual valve is displayed in the LCD measurement value display area.



Application 6
Adjustment valves

5.Programmable Output

5.1 Split output function (n/m)

Thevoltage, current, andthermocouple signals can be split into n/m times output by splitting the output.
Output value = (main setting value) x (n/m)

n 2 m 5

①Press the " ▲, ▼" key to set the output master setting value.
②When there is no waveform, press "PROGRAM" to enter the split output mode and display the n/m menu.
③Press the "PROGRAM" key to set the "m" value, which can be set in the range of 1-20.
④Press " ▲, ▼ " to set the "n" value, according to the "n" value you can get the n/m output value. The range of "n" can be set to 0-m.
⑤Press the yellow "OUTPUT" key, "SOURCE" in the LCD screen changes from "OFF" to "ON", and the output is started.
⑥Press the yellow "OUTPUT" key again to turn off the output.
⑦Press the "PROGRAM " key to exit the split output mode.

5.2 Linear Output Functions

Thesignal value can be output linearly at a time set by the user.

①Press the " ▲, ▼ " key to set the output master setting value.

②Press the "WAVEFORM" button and "SWEEP" is displayed in the LCD screen to enable the linear output mode.

③Press the "PROGRAM" key to set the linear output time parameter TIME, there are 4 end time can be set, respectively, the rise time, the upper limit hold time, the fall time, the lower limit hold time. Press " ▲ , ▼ " key to modify the time value, the range 0-999s can be set.

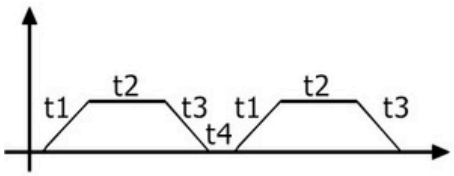
④Press the "PROGRAM" key again to set the number of linear output times COUNT, the range of 0-999 times can be set, 0 times for the infinite number of times.

⑤Press the yellow "OUTPUT" key, "SOURCE" in the LCD screen changes from "OFF" to "ON", and the output is started. "The LCD screen displays the current output steps.

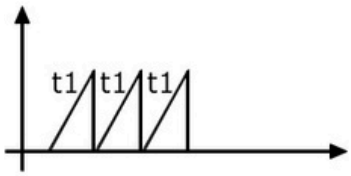
⑥Press the yellow "OUTPUT" key again to turn off the output.

⑦Press the "PROGRAM" key to exitLinearOutputMode.

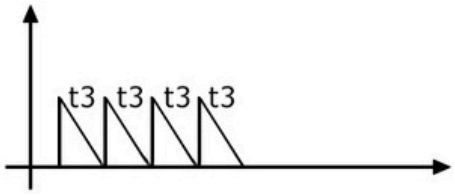
TIME	
SWEEPCOUNT n	052s



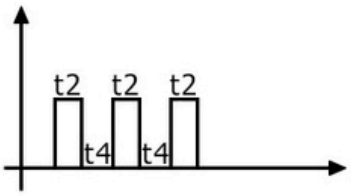
Linear Output Waveform 1
Normal Timing



Linear Output Waveform 2
Rising sawtooth waveform t2=t3=t4=0s



Linear Output Waveform 3
Falling sawtooth waveform t1=t2=t4=0s



Linear Output Waveform 4
Square waveform t1=t3=0s

5.3 Auto-stepping Function

Thesignal value can be output in steps of the value set by the user.

①Press the " ▲ ,▼ " key to set the output master set value

②Press the "WAVEFORM" key and the LCD screen displays STEP to enable the step output mode.

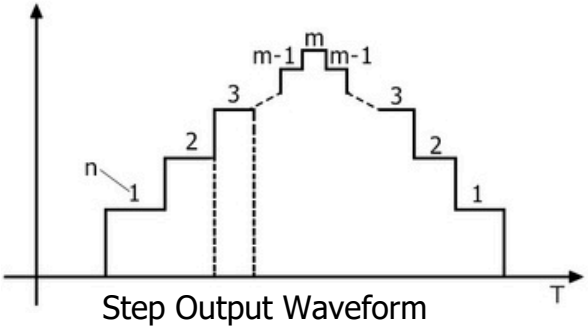
③Press the "PROGRAM" key to set the linear output time parameter TIME, Press " ▲ ,▼ " to modify the time value, range 0-999s can be set.

④Press the "PROGRAM" key once to set the initial value of n/m for the step output. When stepping output, n=1->2->m-1->m-1->2->1 changes.

⑤Press the yellow "OUTPUT" key, "SOURCE" in LCD screen changes from "OFF" to "ON", start output. "The LCD screen displays the current output steps.

⑥Press the yellow "OUTPUT" key again to turn off the output.

⑦Press the "PROGRAM" key to exit Linear Output Mode.



Step Output Waveform

6.Troubleshooting and Instrument Maintenance

6.1 Troubleshooting

①Press the power button, no display on the LCD screen:
a.Make sure there is no power. b. Make sure the AC adapter output current is 1000mA.
②No measured value display: Press the blue "MEASURE" key to confirm that the measurement is on.
③Abnormalities in the output or measured values:
a.Verify that the signal wires are properly connected.
b.Verify that the signal type is correct.
④The measured value flashes at a fixed frequency (1 time/s): indicates that the input signal is below the lower or above the upper range limit.
a.Confirm that the signal cable is connected correctly.
b.Confirm that the signal type is correct.
c.Switch to the appropriate range or adjust the input signal size.

6.2 Instrumentation Maintenance

Thismeter is poweredby 3.7V rechargeable lithium battery, when using it for a long time, please use AC adapter for power supply to prolong the battery life. If charging with cell phone charger, please make sure the output current of the charger is 1000mA.This instrument is not waterproof, please do not use it in high humidity environment.

All your process control needs

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