SMART Signal generator

User Manual

SMART

User Guide

Dear User， thank you for choosing calibrator, Mr.Signal Smart, which is designed by Shanghai Lanyi Electronic Technology Co., Ltd.
Quick master the operation of Smart you need to learn the next four point.

1. Read "Instrument Brief Introduction" and "Technical Parameters" to know the main functions and signal types of the Smart.

2. Basic operation: how to choose signal type and signal mode. For example, If choose to output millivolt which is one of the signal types, and TC is one kind of millivolt, then millivolt and all kinds of TC is the signal mode.

3. Basic operation: Enter menu.

4. Basic operation: Set parameters of image controls of the menu.

Directory :

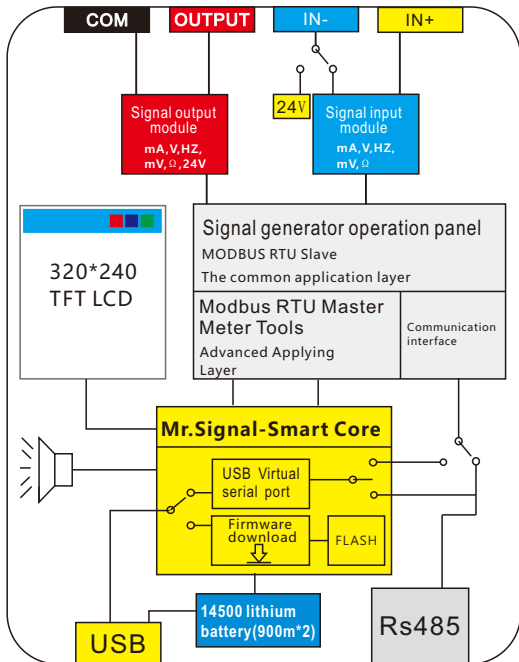# Smart -Signal generator

1. Instrument Brief Introduction

1.1 Smart has powerful performance for it has a high-speed ARM CPU and is easy to get start for it has friendly UI. The following is the structure chart of Smart.

1.2 Introduction of Software functions

Programmed Output:

You can make Mr. Signal Smart to do auto increased/decreased output. There has two modes.

Mode One:

Set a period and start/end value of output. The output will be automatically linear increased from start value to end value and linear decreased from end value to start value in a period. The auto increased/decrease output will be repeated as many times as you want.

Mode Two:

Advanced setting, the changing of output is determined by more parameters.

Type One:

After setting the starting point, ending and cycles the equipment can start working.

Preset Values:

You may need only several fixed value of output in your daily work. The product allow you to customize 9 presetting value for you to quick output.

Converting Signal: Input can be converted into another kind of output. For example, Input Hz signal, then convert them into current output.

Real-time Curve:

The input/output changing can be displayed as curves. You can set the capture period and zoom in the curves according to the max and min.

Display as Range/Actual Value:

Input and output value can be displayed as actual value or range according to your wish. Actual value corresponds to range linearly. For example, 4-20mA corresponds to 0-100, then 4mA corresponds to 0, 12mA corresponds to 50, 20mA corresponds to 100. You can vary correspondence between actual value and range.

Modbus RTU Remote Control:

Mr. Signal Smart will be able to communicate with PLC or configuration software via RS485 to online change output and monitor input.

Modbus RTU Master Station:

To do communication test on, change parameters of, copy parameters of and monitor Slave devices with RS485 Modbus interface.

Extend Function:

We may provide more function, such as PID controller, recorder etc. For further information, visit our company website.

USB Firmware Update:

The device can get bug fixed and new function through firmware update via usb. You can download DFU package from our website.

USB to Rs485:

The device can be use as a USB virtual RS485 serial port. A driver will be needed in os before Win10.

2.Technical Parameters

Output signal					
Type	Range	Precision	Resolution	Coefficient	Internal Impedance
Current(mA)	0~24mA	0.05%	0.001mA	+25PPM	100Ω
voltage (V)	0~12V	0.05%	0.001V	+25PPM	500k
passive current (XMT)	0~24mA	0.1%	0.001mA	+25PPM	100Ω
24V Loop	0~24mA	0.1%	0.01mA	+25PPM	100Ω
frequency(Hz)	0~9999Hz	0.03%	5bit	+10PPM	1Mk
millivolt (mV)	-10~110mV	0.05%	0.01mV	+25PPM	2K
TC-S	0-1760℃	0.2%	1℃	+25PPM	2K
TC-B	0-1810℃	0.5%	1℃	+25PPM	2K
TC-E	0-990℃	0.2%	1℃	+25PPM	2K
TC-K	0-1320℃	0.2%	1℃	+25PPM	2K
TC-R	0-1760℃	0.3%	1℃	+25PPM	2K
TC-J	0-1190℃	0.3%	1℃	+25PPM	2K
TC-T	0-390℃	0.2%	1℃	+25PPM	2K
TC-N	0-1290℃	0.2%	1℃	+25PPM	2K
Pt100	-200~650℃	0.5%	1℃	+50PPM	- - -
Cu50	-20~150℃	0.5%	1℃	+50PPM	- - -

Input signal					
Type	Range	Precision	Resolution	Coefficient	Internal Impedance
Current(mA)	0~24mA	0.1%	0.01mA	+25PPM	100Ω
voltage (V)	0~12V	0.1%	0.001V	+25PPM	500k
frequency(Hz)	0~9999Hz	0.1%	5bit	+10PPM	1Mk
millivolt (mV)	-10~110mV	0.1%	0.01mV	+25PPM	2Mk
TC-S	0-1760℃	0.2%	1℃	+25PPM	2Mk
TC-B	0-1810℃	0.5%	1℃	+25PPM	2Mk
TC-E	0-990℃	0.2%	1℃	+25PPM	2Mk
TC-K	0-1320℃	0.2%	1℃	+25PPM	2Mk
TC-R	0-1760℃	0.2%	1℃	+50PPM	2Mk
TC-J	0-1190℃	0.2%	1℃	+25PPM	2Mk

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TC-T	0-390℃	0.2%	1℃	+25PPM	2Mk
TC-N	0-1290℃	0.2%	1℃	+50PPM	2Mk
Pt100	-200~650℃	0.1%	0.1℃	+50PPM	2.5k
Cu50	-20~150℃	0.1%	0.1℃	+50PPM	2.5k
Resistor	0 - 400Ω	0.1%	0.01Ω	+50PPM	2.5k

3.Basic Operation

3.1 Appearance

OUT+
OUT-

IN - /(24V)
IN+

USB Port

Charging State

ON/OFF

Rs485 Interface
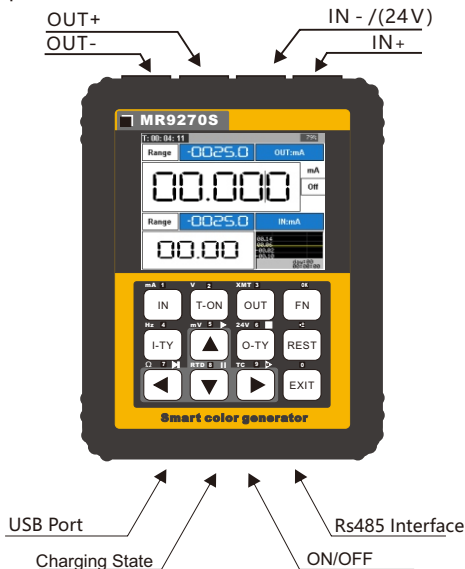
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3.2 Keyboard

Out ON/OFF
Input type

Output type
Function Menu

Input mode

Output mode
Reset
Menu EXIT

I-TY
This key has a second function, in the settings, the key is to modify and confirm.

Direction key: alter the cursor position to choose the item which is going to be changed.

3.3 Screen

State bar

Output value

Input value

curve
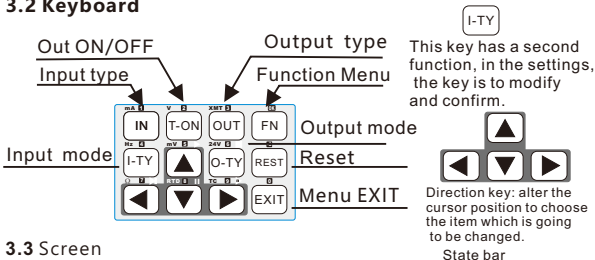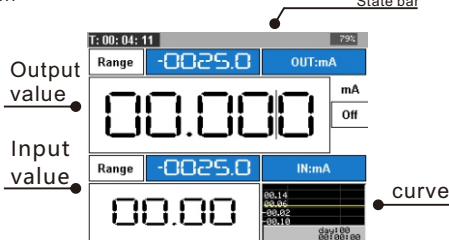
3.4. Choose Signal Type:

Press [OUT] to pop up output signal type choose menu, press the corresponding number key to choose a signal type.
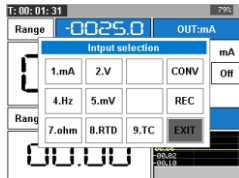
Press [IN] to pop up input signal type choose menu, press the corresponding number key to choose a signal type.

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3.5.Start Output :

Press left and right arrow keys to choose a digit, press up and down arrow key to vary the digit.
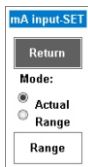
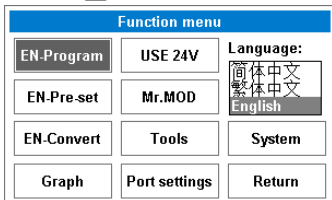T-ON You must press this key to turn on output sinal.
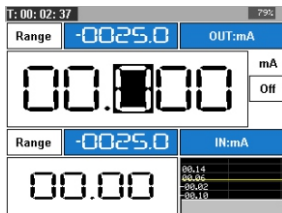
3.6.Enter Settings :

3.6.1Press and hold OUT for 2 seconds to pop up output settings widgets. The following graphic is the settings when output type is current.
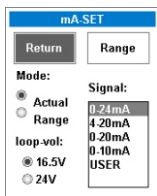
3.6.2 Press and hold IN for 2 seconds to pop up input settings widgets. The following graphic is the settings when input type is current.

mA-SET	
Return	Range

Mode:
○ Actual
○ Range

Signal:
0-24mA
4-20mA
0-20mA
0-10mA
USER

loop-vol:
◉ 16.5V
○ 24V

mA input-SET
Return

Mode:
◉ Actual
○ Range

Return

3.6.3 Press FN to pop up system settings widgets.

Function menu		
EN-Program	USE 24V	Language:
EN-Pre-set	Mr.MOD	简体中文 / 繁体中文 / English
EN-Convert	Tools	System
Graph	Port settings	Return

3.7.Settings Widgets Operation:

Press ▲ ▼ to choose an item, Press I-TY to modify an confirm, press EXIT to quit or return.

3.7.1 Vary numerical value :

Choose an item, press I-TY , then the item can be modified. Then press direction key to vary the number. Finally press I-TY to save.

Range-H: 0100.0

3.7.2 Adjust Slider ：

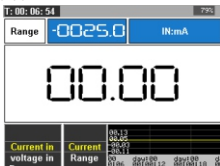Choose a slider, press I-TY , then the slider move left side. Press O-TY, the slider move right side. The changing will be save automatically every time.

3.8Change Display Mode

Press and hold EXIT for 2 seconds, The Display will be changed into 5 modes. The following is the other 4 modes besides the main screen.
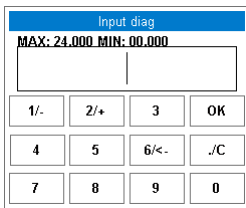
Output Display Mode

Input Display Mode
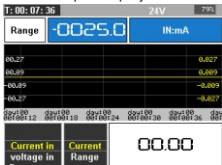
Input Curve Mode
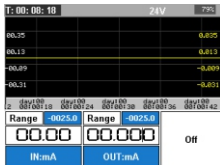
Input&Output Curve Mode

3.9The use of digital keyboard window

Press $\boxed{\text{EXIT}}$ to pup up numeric keyboard widget, the 12 keys in the widget correspond to the 12 hardware key on the device. The widget is for varying output value quickly. There may have a second function If Press and hold a key. For example , press and hold Digit '1' input minus sign.
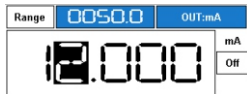
Input diag			
MAX: 24.000 MIN: 00.000			
1/-	2/+	3	OK
4	5	6/<-	./C
7	8	9	0

number pad

4.Signal operation

4.1 Current output

4.1.1Switch display mode : Press $\boxed{\text{O-TY}}$ to change mode

Range	0050.0	OUT:mA

12.000

mA
Off

Actual Value Display

Current	12.000	OUT:mA

0050.0

Off

Range Display

4.1.2 Current circuit open testing: Press $\boxed{\text{T-ON}}$ to start output. If a "OC/ON" flag flash on the screen, The circuit is open or no testing subject connected.
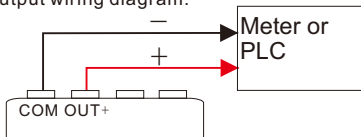
4.1.3 Current Output Settings: Press and hold $\boxed{\text{OUT}}$ for 2 second to open settings widgets.

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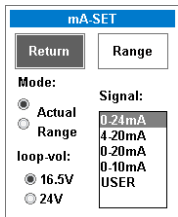
Mode: choose display mode.
Loop-vol: Change the voltage on the circuit. Default option is 16.5v for longer battery life. Some device need a 24V drive capability.
Range: Learn more from section 1.2 Display as Range/Actual Value.
Signal: Select an option to restrict output to a range. When you choose "User" option, you need to set a customized range according what you determine in "Range" widget.

4.1.4 Current output wiring diagram.

4.2   Voltage Output

4.2.1 Switch display mode Press $\boxed{\text{O-TY}}$ to change mode.

Actual Value Display   Range Display

4.2.2 **Voltage Output Settings**: Press and hold $\boxed{\text{OUT}}$ for 2 second to open settings widgets.
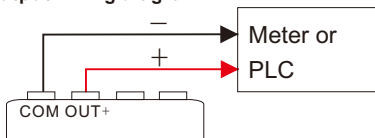
Smart -Signal generator
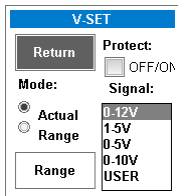
Mode: choose display mode.
Range: Learn more from section 1.2 Display as Range/Actual Value.
Protect: If there is a short in output circuit for 2 seconds, output will be turned off automatically.
Signal: Select an option to restrict output to a range. When you choose "User" option, you need to set a customized range according what you determine in "Range" widget.

4.2.3 Voltage output wiring diagram.

4.3 XMT Output Simulate a transmitter

4.3.1 Switch display mode Press $\boxed{\text{O-TY}}$ to change mode

Actual Value Display

Range Display

4.3. 2 Current Output Settings: Press and hold $\boxed{\text{OUT}}$ for 2 second to open settings widgets.

Smart -Signal generator
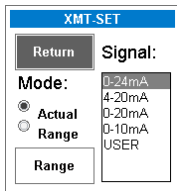
Mode: choose display mode.
Range: Learn more from section 1.2
Display as Range/Actual Value
Signal: Select an option to restrict output to a range. When you choose "User" option, you need to set a customized range according what you determine in "Range" widget

4.3.3 **XMT output wiring diagram.**

```
                    IN+
                          Meter or PLC
        NC          IN-

                    24V

   ┌──┐ ┌──┐ ┌──┐
   COM OUT+
```
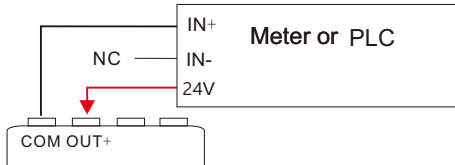
4.4 Pulse output

4.4.1 There are four type of Pulse mode Press and hold
[O-TY] **for 2 seconds to change mode**

Frequency output

PWM Duty ratio output

Speed frequency output

Quantitative output pulse

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Pulse Output Settings: Press and hold [OUT] for 2 second to open settings widgets.
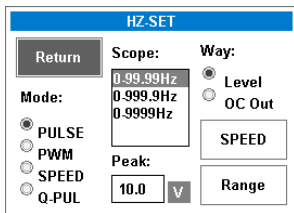
Mode: choose pulse mode

Out range: the frequency range of output.

Peak: peak of wave form, max is 24V.

Way: letrical level output(PNP) or OC switch output(NPN).

Speed: Enter speed settings.

**Range:** Learn more from section 1.2 Display as Range /Actual Value. Only work in pulse mose.

4.4.3 Pulse output-Frequency mode

Pulse is the most widely used mode. It has four kinds of range, which can be changed in output settings or by pressing [O-TY].
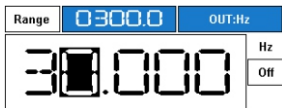
4.4.4 Pulse output-PWM mode。

PMW is short for Pulse-Width Modulation. Pulse is modulated according the percentage of keep electrical level high in a cycle. Two parameters need to be set, which are percentage and frequency. Press [O-TY] to alter from frequency setting and percentage setting.
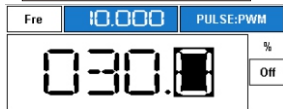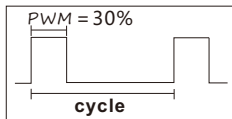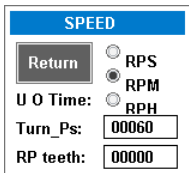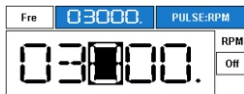
The main usage of PWM:

   pulse heat system, adjustment of Motor speed, Light Brightness, brake strength, etc. PMW is widely used, especially in linear drive.

4.4.5 Pulse output-Speed mode.

The best method to Calculate rotating speed of motor or gear is by pulse. For example, a motor generate a pulse for every rotation, if speed is 3000 rotations per minute, then 50 pulse will be generated for every second.

Frequency=RPS(rotations per second)* the number of pulse generated every rotation.

RPM=RPS*60
RPM(per minute)=RPS*60
RPH=RPS*3600
RPH(per hour)=RPS*3600

RP teeth In a practical application, the gear of moter may have some missing teeth. For example, a gear of a motor must have 60 teeth but deliberately have one loss. The rotating speed is calculated by the missing tooth.

SPEED

Return ○ RPS
● RPM
U O Time: ○ RPH
Turn_Ps: 00060
RP teeth: 00000

4.4.6 Frequency output- Qualitative pulse mode

This function is to simulate flow sensor. For example, a liter of water flood over a turbine, sensor generated 100 pulses. The device generate pulses as a flow sensor will be.

The period of pulse. The unit is millisecond, min is 0.1ms.

The number or qualitative pulse

The rest period for the next pulse

Percentage of the rest pulses

Time of the rest pulses 99 : 99 : 99

Work state

-13-
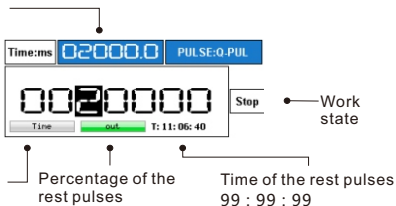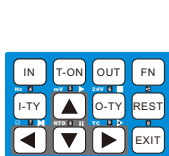
Quantitative instructions:

Quantitative models and working condition
Stop: the generation is stopped. The number of qualitative pulse can be modified.
Pause: the generation is suspended.
Run: the pulses are generating.

| Key	Description
T-ON	The work state is from stop to pause.
▲	Press when work state is pause, pulse start generation.
▼	Press when work state is run, the generation is suspended.
►	Press when work state is run, one pulse will be generated.
REST	Press when work state is run, the generation stop and reset.
O-TY	Press on any work state to modify the period.

4.4.7 Frequency output wiring diagram.
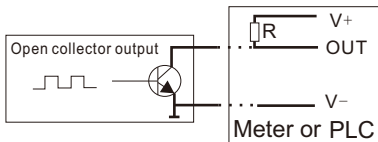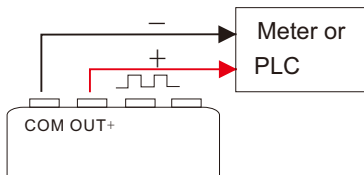
4.5 Millivolt/thermocouple Output

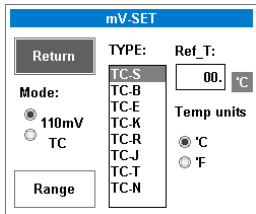### 4.5.1 Switch mode Press ⟨O-TY⟩ to change mode

Millivolt output

Thermocoupule output

4.5.2 Current Output Settings: Press and hold ⟨OUT⟩ for 2 second to open settings widgets.

Mode: choose display mode.
Range: Learn more from section 1.2 Display as Range/Actual Value.
Type: Choose the type of thermocouple.
**Colt-T:** The temperature of cold junction.
Temp Unit: set unit to be Celsius degree or Fahrenheit

Why need a cold junction compensation? Thermocouple work in testing spot and instrumentation in monitor room. The temperature is quite different between these two places. The signal of TC base on 0 degree. And to avoid the signal is too faint to transfer to instrumentation, a circuit used for cold junction compensation is a must.If find out the temperature measured by instrumentation is higher than it should be, when device simulate TC, you should set the temperature of cold junction.

4.5.3 Millivolt output wiring diagram.
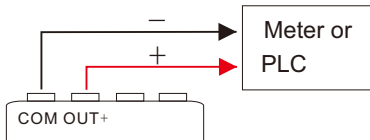
4.6 Resistance Output
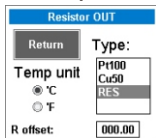
4.6.1 Switch mode Press O-TY to change mode

Resistance Value Output

Thermocouple Output

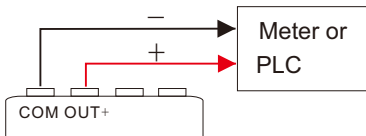### 4.6.2 Resistance Output Settings: Press and hold [OUT] for 2 second to open settings widgets.

Temp Unit: set unit to be Celsius degree or Fahrenheit
Type: type of RTD
Resistance offset: correct the resistance ouput.

4.6.3 Resistande output wiring diagram.

Use attention：

RTD is a special signal, which is not a electronic signal. So the device has some requirement to generate resistance output. Instrumentation supply a voltage for RTD to vary current and voltage as the temperature changed. The Voltage of instrument should be lower than 10V or the device will be fail to simulate a RTD. You can make device generate RTD signal and measure by itself to check if the RTD output is work.
Usually the voltage of instrumentation is lower than 5V, current is lower than 1mA, or the lifetime of RTD will be reduced.

4.7 **24V loop detection (transmitter power supply and detection of current and output ports)**
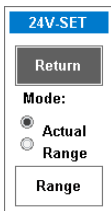
4.7.1 Switch mode Press [O-TY] to change mode

Range	-0025.0	24V Loop

00.00 mA Off

Actual Value Display

Current	00.000	24V Loop

--0025.0 Off

Range Display

4.7.2 Current Output Settings: Press and hold [OUT] for 2 second to open settings widgets.

24V-SET
Return
Mode:
○ Actual
○ Range
Range

Mode: choose display mode.
Range: Learn more from section 1.2
Display as Range/Actual Value.

4.7.3 24V loop output wiring diagram.

Passive transmitter
— +

COM OUT+
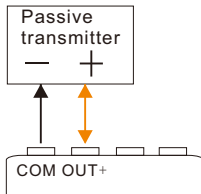
There are many kinds of transmitter, for example: pressure transmitter, temperature transmitter, pneumatic valve feedback transmitter, etc.. Test equipment supply current can not be more than 24mA.

4.8 Independent 24V

4.8.1Recognition of independent 24V

Input (-) can be switched to an independent 24V function, which is a single output 24V. 24V terminals and input (+) with the use of the transmitter can be tested. Its main purpose is to test the pneumatic control valve or two wire transmitter.
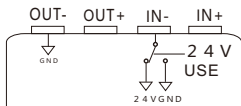
Tip: 24V loop detection and independent 24V difference is, 24V loop detection using output signal port power supply and measurement feedback current, independent 24V port and the output (-) port composition 24V power supply, also can be input and (+) composed of transmitter power supply and measuring transducer feedback current.
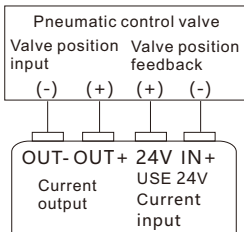
4.8.2 USE 24V

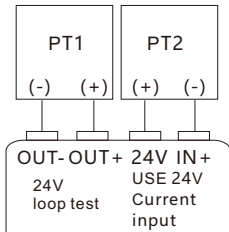Enter the function menu select "24V USE", the status bar will appear 24V prompt and flashing

USE 24V : Enable independent 24V start output.

Used to keep : Enable the 24V status after each boot to keep the state in the last boot. Conversely, each boot 24V need to manually open.

4.8.3 wiring diagram:
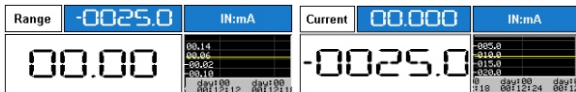

Pneumatic control valve test

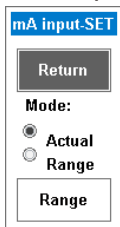Simultaneous testing of two two wire transmitter.

4.9 Current input

4.9.1 Switch display mode Press I-TY to change mode.
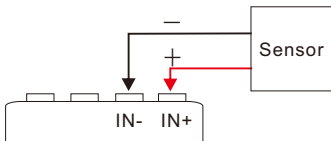

Actual Value Display

Range Display

4.9.2 Current input Settings: Press and hold IN for 2 second to open settings widgets.

Mode: choose display mode.
Range: Learn more from section 1.2 Display as Range/Actual Value.

4.9.3 wiring diagram:

Signal < =24mA/<30V

4.**10 Voltage input**

4.10.1 Switch display mode Pres $\boxed{\text{I-TY}}$ to change mode.

Actual Value Display

Range Display

4.10.2 Voltage input Settings: Press and hold $\boxed{\text{IN}}$ for 2 second to open settings widgets.

Mode: choose display mode.
Range: Learn more from section 1.2 Display as Range/Actual Value.
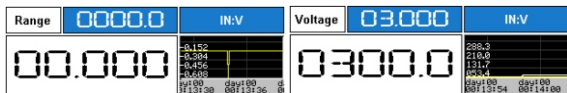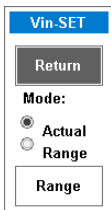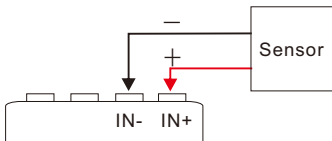
4.10.3 wiring diagram:

Signal = - 4V~30V

4.11 Pluse input

4.11.1 Switch display mode Press [I-TY] to change mode

Range	0000.0	IN:Hz

0.0000

Frequency input mode

Fre	0000.0	PULSE:PWM

0.0000

PWM input

Fre	0000.0	PULSE:RPM

00.000

Frequency speed mode

Fre	0000.0	PULSE:Count

00996055

Pluse counting

4.11.2 Pluse input Settings: Press and hold [IN] for 2 second to open settings widgets.

HZinput-SET

Return

Way:
- ● Level in
- ○ OC in

Mode:
- ● Pulse
- ○ PWM
- ○ Speed
- ○ Count

Count way:
- ○ Rising
- ○ Falling
- ○ R/F

SPEED   Range

MODE: Pluse on work mode.

Speed : Working principle of pulse output is the same.
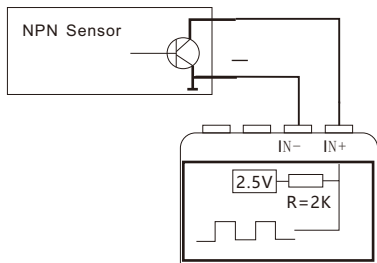
Way: input way。

Count way: Rising edge representation level from 0V to rise to the peak of the pulse, the counter plus 1, down along the said input level down to 0V counter plus 1, jump is input level as long as the upper and lower jump, the counter is incremented by 1, reset the counter, please press the [REST]
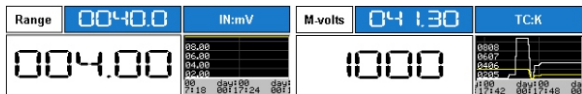
4.11.3 wiring diagram
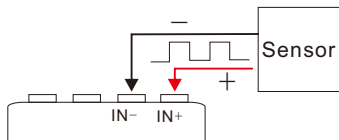
The frequency of the input range is 0-9999HZ

4.12 Millivolt/thermocouple Intput
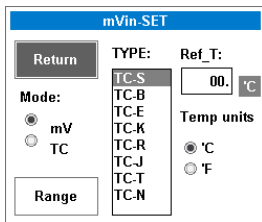
4.12.1 Switch display mode Press I-TY to change mode

Actual Value Display   Temperature display

4.12. 2 Millivolt intput Settings: Press and hold [IN] for 2 second to open settings widgets.
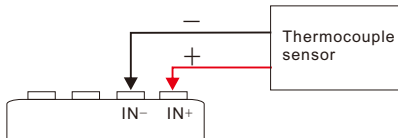

Mode: choose display mode.
Range: Learn more from section 1.2 Display as Range/Actual Value.
Type: Choose the type of thermocouple.
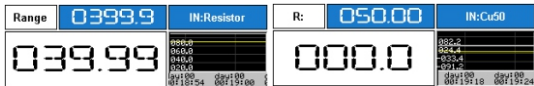**Colt-T:** The temperature of cold junction.
Temp Unit: set unit to be Celsius

4.12.3 wiring diagram

4.13 Resistance/Pt100/Cu50

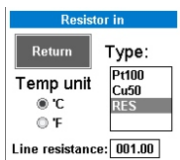## 4.13.1 Switch display mode Press [I-TY] to change mode

Actual Value Display

Temperature display

4.**12**. **2 Resistance intput Settings: Press and hold** $\boxed{\text{IN}}$ **for 2 second to open settings widgets.**

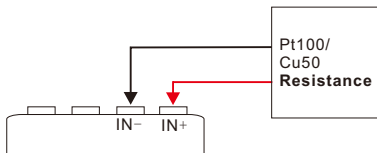**Temp Unit:** set unit to be Celsius degree or Fahrenheit
Type: type of RTD
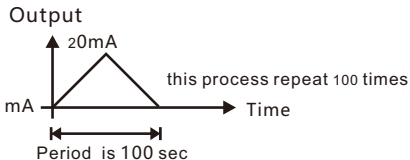**R offset:** correct the resistance ouput.

4.13.3 wiring diagram

5.**Programmable Output**

According to the parameters you set, the output will be automatically increased and decreased as many times as you want. It is use for the aging test of valve, PLC debugging, etc.

5.1.Set Four Parameters For Quick Programmable Output

Smart -Signal generator

5.2 Start programming output

Press [FN] , enter the function menu to select the "EN-Program".
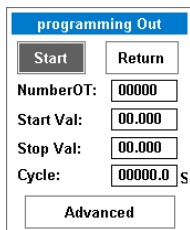
Programming output window selection starts, will automatically return to the main interface, waiting for the user to start running.

Status icon

Signal progress　Timing progress　Residual frequency

RUN　　　　　　　　　　STOP

STEP　　　　　　　　　　EXIT

PAUSE　　　　　　　　　Run for one cycle

不同状态的指示

STOP	◼
RUN	▶
PAUSE	⏸
Run for one cycle	1

5.3 Advanced

Cycle: programmable output will work according to parameters in preview menu.
USER: programmable output will work according to parameters in current menu plus parameters in previous menu.
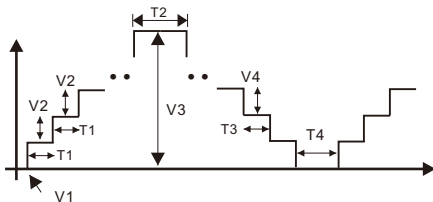
V1:Start Val(Previous Menu) : The floor of output
V2:Up Step: Increase amount of every step
T1:Step Time: Increase every step time
T2:Stop Time: Idle time on the ceiling
V3:Stop Val(Previous Menu): The ceiling of output
V4:Down Step: Decrease amount of every step
T3:Step Time(Second One): Decrease every step time
T4:Stop Time(Second One): Idle time on the floor

Tip: the use of custom mode and set the 6 parameters, return to the programming output window, the increase or decrease of the cycle will be displayed with the custom to re calculate the cycle.

5.4.**Set Parameters To Output Other Waveforms**

rise sawtooth waveform
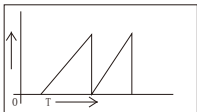
Set Down Step as Stop Val minus Start Val.When output has been increased to Stop Val, it will be decreased to Start val in one step.

fall sawtooth waveform
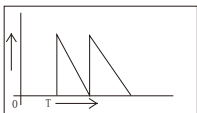
Set Up Step as Stop Val minus Start Val.When output has been decreased to Start Val, it will be increased to Stop val in one step.

Pulse waveform
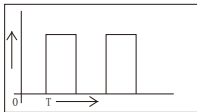
Extend Stop Time

6.Preset

6.1 Press $\boxed{\text{FN}}$ enter the function menu to select the "EN-Pre-set".
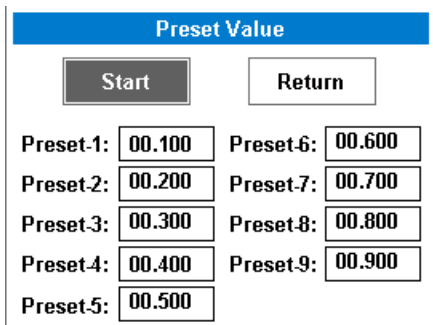
6.2 Pre setting operation

Enable the pre setting, the keyboard of the left three keys into a pre occupied, the right to continue to use, press the $\boxed{\text{EXIT}}$ button to exit the pre set function.
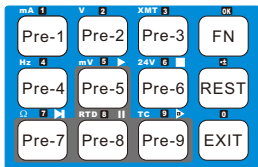
7.Signal conversion

Users in the test process, if you need to use the signal conversion, such as the frequency of 0 - 100Hz converted to 4 - 20mA, then you can use the signal conversion function.

Press $\boxed{FN}$ enter the function menu to select the "EN-Convert".

Signal Convert	
Start	Return
Input-H:	0010.000
Input-L:	0000.000
Output-H:	0010.000
Output-L:	0000.000
Overrange:	☑ Yes/No
Auto RUN:	☐ Yes/No

Input H/Input L:Signal range of input signal.

Output H/Output L:Signal range of output signal.

Overrange: For example, 1-5V converted into 4-20mA, if the user check this, when the input is 0V, the output will follow to 0mA, if the user does not check, then the output is 4mA, the output is locked in the range of settings.

Auto RUN : Check this option, the next boot will automatically start the signal conversion, when the switch to work in the press of the $\boxed{EXIT}$, the signal conversion will exit and disable RUN Auto check.

8.Real time curve

Used to analyze the changing trends of signals.

8.1 Hold down the $\boxed{EXIT}$ key for 2 seconds, you can switch to the big curve screen.

Smart -Signal generator

Auxiliary timer →

Signal value scale →

→ Time scale
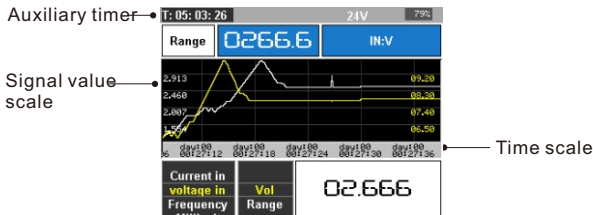
Input signal curve interface
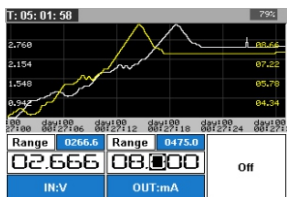
Input signal output signal at the same time working curve interface.

8.2 Real time curve operation

Real time curve of pause refresh: by leaning on [T-ON] for 2 seconds, the real-time curve box will appear pause and flashing, then the real curve of pause refresh, continue to press this button for 2 seconds, real-time curve began to refresh.

Auxiliary timer is cleared: the auxiliary timer shows the time of the machine running, hold down the [REST] 2 seconds timer cleared. Please use this function with clear and flexible.

8.3 Enter the real-time curve setting window: press the [FN] to display the function menu to select the real time curve.

Graph

Return

C-Curve:

Auto Zoom:

Cu Acp-T: 000.1 S

Auto Zoom:

Cu Acp-T: 000.1 S
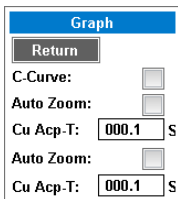
Output Graph: open the output signal to follow the curve (yellow line).
Auto Zoom: automatic adjustment of the output signal scale range, the maximum value of the minimum curve to automatically adjust the Y axis scale range.
Cu-Acp-T: the refresh interval time of the output curve.
Auto Zoom: the scale of the

input signal is automatically changed.
Cu-Acp-T: the time of the refresh interval of the input signal.

9.System setting

9.1Enter system setup window

Press [FN] enter the function menu to select the "System"

System setting

Sig SW: Function m   Theme:
                        Classic
○ Turn
◉ Fast   Save Value: ✓   Boot:
Screen: Save State: ☐   Prog run
in/out   Beep: ✓
output   Fast ADC: ☐   Calibration
input
in-Graph USB &ON: ☐   Return
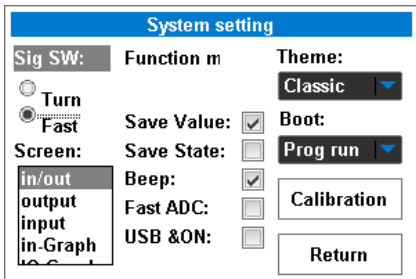
Sig SW: the way of signal selection
Screen: select the working interface.
Backlight: adjusting backlight brightness.
Save Value: save the output value before the shutdown.
Save State: the output signal of the switch state to maintain, (if
the signal is open every time the signal can be set
up, usually with the signal conversion work).
Beep: Beep switch.
Fast ADC: to improve the speed of signal input and refresh.
USB &ON: plug in the USB power supply, the instrument
automatically enter the working state, no check, the
instrument on the electric reserve at the charging
interface. If the instrument is inserted in the USB PC
port, and the driver is normal, the instrument will
automatically boot.
Theme: change the color scheme of the instrument.
Fn function: hold down the ⟨FN⟩ key for 2 seconds, can quickly
start the program function。
Calibration: the fine tuning window into the signal.

10.Modbus RTU Slave

Using the standard RTU Modbus protocol, can use the
configuration software or PLC for remote control and monitoring.
10.1 Press ⟨FN⟩ enter the function menu to select the
"Port setting".

ComPort Setting	
Mode:	USB RS485 ▼
Baud:	19200 ▼
Parity:	NONE ▼
StopBit:	1 ▼
Slave address:	001
Return	

Smart -Signal generator

1 0.2 Instrument register address and description

Name	Addr	Data type	R/W	Explain
ID	40001	ushort	R	Instrument type
Key	40002	ushort	R/W	The instrument pressed key
Mode	40003	ushort	R/W	Ydoxh @3 v| vlap ghidxow vwlw/ @4 hqdedn program output, =2 for signal conversion
BTV	40004	ushort	R	Instrument battery voltage
Retain	40005	ushort	R	
Input select	40006	ushort	R/W	@3 p D lq/@4Y lq/@5 Sxovh lq/@6 p y in,=4 R in
input mode	40007	ushort	R/W	mA in : =0 current display,=1 range display,R in:=0 pt100 in,=1 Cu50 in ,=2 R in.
lqsxw mode2	40008	ushort	R/W	=0,pulse way =Level in, mV in.=1,Pulse way=OC in,mV in =TC.
input value	40009	long	R	Large font display signal value

-33-

Smart -Signal generator

| input value2	40011	long	R	Frequency signal in PWM mode, the value of the frequency value, the MV input, in the thermocouple input, the MV of input values, input resistance and MV input function the same
input ramge	40013	long	R	The range of the input signal is converted.
input value	40015	float	R	Floating point representation
input value2	40017	float	R	Floating point representation
input ramge	40019	float	R	Floating point representation
Output on/off	40021	uhosrt	R/W	Output signal switch
Output select	40022	ushort	R/W	=0:mA out,=1:V out,=2:XMT out,=3:pulse out,=4:mV out,=5:R out,=6:24V out
output mode	40023	ushort	R/W	mA in : =0 current display,=1 range display,R in:=0 pt100 in,=1 Cu50 in ,=2 R in.

Output mode2	40024	ushort	R/W	=0 mA in,=1V in,=2 Pulse in,=3 mv in,=4 R in
output value	40025	long	R/W	Output signal value for large font display
output value2	40027	long	R	Frequency signal in PWM mode, the values of frequency value, millivolt output. In the thermocouple output and the value for the MV output value, output resistance and MV output function the same
output range	40029	long	R	E| f rqyhuwlqj wkh rxwsxwvljqdoudqj h
output value	40031	float	R/W	Floating point representation
output value2	40033	float	R	Floating point representation
output range	40035	float	R	Floating point representation

11. Modbus Master - Mr.MOD

Modbus main function of the main functions of this product, will be updated regularly, this note only shows the basic operation, such as the update staff will be released in the website, please pay attention to! Modbus master station is mainly used to modify the instrument parameters, parameter replication monitoring, test communication is normal. Communication mode to use the RS485 interface, the interior has a three pole protection, can prevent more than 100V of static electricity, and short circuit protection, PTC self recovery insurance.

11.1 Modbus master has 5 configurations for users to test different devices.
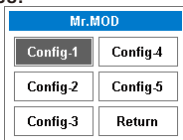
11.2 Modbus master interface

Communication count

Error count

Number of registers

Master tag

Baud rate information

Register label

Online instruction

Device address

Value

Register address

data type

Corresponding to the keyboard.The first row of keys

11.3 Modbus master parameter settings

Press FN to enter the main station parameter setting。

There are two modes operation:
Auto: the user triggers the running button, the program starts polling from the station equipment variable, the real-time refresh variable, and the on-line modification variable.

Manual: read operations and write operations are performed manually, according to a write button, the program on a polling station equipment. To modify the parameters to modify a unified, according to the write button, the program will automatically change the variable in order to write.

11.4 Add a register

Press the "Add"

DRV Addr:range 0-255

CMD : Selection of instructions from the transmitting device, 03:40x. 03 said protection instructions operate on registers and 40x said MODBUS register address prefix, such as the address of a variable set 00001, then access the register address as 40001 and hexadecimal address 0000.

Add more: the number of variables to add, such as adding a number of 10, then the variable address will automatically increment.

Reg TYPE :

ushort : 16bit unsigned integer

short: 16bit integer

Byte-1: 8 bits in the first byte integer (Modbus the underlying protocol variables are 16 bits of data, if the user wants to take 8 integers, then the bytes are selected by the user)

Byte-2: Second 8bit byte integer

ulong: 32bit unsigned integer

long: 32bit integer

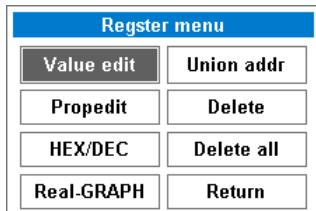**Float:** 32 bit single precision floating point number

Commonly used labels and Tags: Comments on the role of.

Data Order: MODBUS master read variables, the rearrangement. Such as: a floating point number is composed of four words, since MODBUS differs from the station equipment by the CPU, there may caused a four byte floating point in different rows, a 32-bit integer is similarly, so that read back data anomalies, can modify this setting.

Setup is completed, you can press the $\boxed{\text{OUT}}$ **key to confirm the addition, you can also select the OK key.**

11.5 Register operation :

In the Modbus master interface according to the $\boxed{\text{I-TY}}$ to display the register window.

Regster menu	
Value edit	Union addr
Propedit	Delete
HEX/DEC	Delete all
Real-GRAPH	Return

Value edit:Pop up digital keyboard to modify.

Propedit : Edit select register.

HEX/DEC:Decimal display and sixteen decimal display.

Real-GRAPH : Reserve.

Union addr : Set the device address of the other register to the same as the selected variable address.

Delete : Delete a register.

Delete all : Delete all register.

Fast modify register value: in the MODBUS main interface, press [0-TY] to pop up the digital keyboard.

Bit change: [0-TY] key on the main interface of the MODBUS

12. Attentions
12-1.Extend Battery Life
If you are going to leave the instrument unused for a long time. Do not keep it with an empty battery. Please fully charge the battery before keep it. Discharge and charge at least one time in every 3 month to keep the battery active.
12-2.The battery replacement
If the battery has bad need to change, be sure to use the battery manufacturer established parameters, or purchased from the manufacturer. Battery for: 14500 rechargeable lithium battery, voltage of 3.6 V, charging termination voltage of 4.2 V, normal manufacturer of battery capacity Is in commonly 800 ~ 900 ma, the weight of the battery in about 20 g, please normal manufacturer of battery, It is forbidden to use AAA batteries, battery types are different.
12-3.Self-Check
If you suspect that the instrument does not work. As the instrument allows input and output at the same time, you can do a self-Check this way. Output a signal, and connect the output to the input terminal. The instrument can meter the signal generated by itself.