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1.Usage And Features

This product is used for debugging industrial PLC and process instruments, and adjusting valves. It is small in size, easy to carry. It has advantages of high precision and powerful functions. Signals can be input and output at the same time. The output is programmable and the input can be real time displayed as curves. With powerful functions at the same time, it is easy to use due to a windows form menu is available for operating this instrument.

2.Product Parameters

2.1 Model to distinguish

Model	CURRENT	VOLTAGE	PASSIVE (XMT)	24V LOOP	Millivolt	Frequency	CURRENT INPUT	VOLTAGE INPUT
MR1.9E	✓	✓	✓				✓	✓
MR1.9P	✓	✓	✓	✓	✓		✓	✓
MR1.9Pro	✓	✓	✓	✓	✓	✓	✓	✓

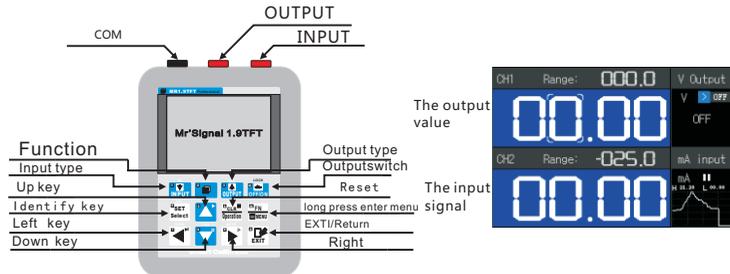
2.2 Current/voltage signal parameters:

SIGNAL TYPE	Range	PRECISION	INTERNAL IMPEDANCE	MAX LOAD
CURRENT	0-24mA	0.1%	100Ω	750Ω
VOLTAGE	0-12V	0.1%	500KΩ	30mA
PASSIVE(XMT)	0-24mA	0.1%	100Ω	30V
24V LOOP	0-24mA	0.1%	100Ω	24mA
CURRENT INPUT	0-24mA	0.1%	100Ω	30V/24mA
VOLTAGE INPUT	0-30V	0.2%	2MΩ	30V

2.4 Other Parameters

Size : 90*70*28mm
Weight: ≈500g
Working temperature: 0-50°C
Lithium battery: 2000mA
USB charging: 5V 1A
Up to 20 hours on 20mA loading

3.Panel And Screen



4.Basic Operations

4-1.How To Generate Output:

<p>1 Press OUTPUT to Change Type of Signal</p> <p>The output type flag will be changed</p> <ul style="list-style-type: none"> mA Output V Output XMT Output Hz Output mV Output 24V Loop 	<p>2 Adjust Numbers</p> <p>Through the keyboard to adjust the Numbers</p>	<p>3 Press OPEN to start generating</p> <p>If output started and the circuit is close, the output state flag will be</p> <p>OPEN</p>	<p>4 If output flag display Open Circuit</p> <p>The circuit is open or no testing subject connected.</p>
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4-2.How To Meter

Input:

1 Press INPUT to Change Type of Signal

The Input type flag will be changed

V input
mA input

4-3. Input Pause!

Press and hold **OFF/ON** for 2 sec, a pause mark will be displayed, then input will be stopped. Press and hold **EXIT** to resume.

4-4. Enter Menu!

A) Quick Menu of Input: Press and hold **INPUT** to enter, press **EXIT** to quit.

B) Quick Menu of Output: Press and hold **OUTPUT** to enter, press **EXIT** to quit.

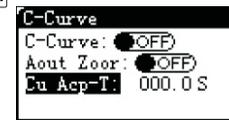
C) Instrument Menu: Press and hold **FN** to enter, press **EXIT** to quit.

4-5. Basic Operations Of Menu!

Press **▲** **▼** to select an item, press **SET Select** to edit or enter next menu, press **EXIT** to return.

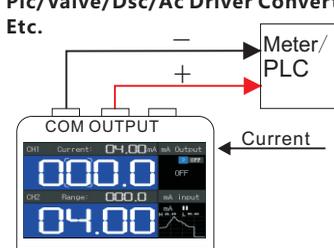
As graphic 4.1, choose an item like 'Mode', press **SET Select** to change options. As graphic 4.2, choose an item like 'Cu Acp-T', press **SET Select** to start adjusting value.

After finish changing value, press **SET Select** to save.



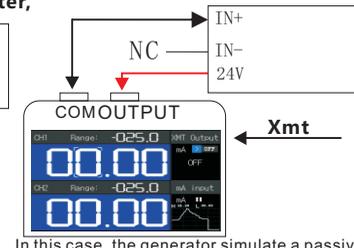
5. Use Case

5-1.Current/Voltage Output To Meter/Plc/Valve/Dsc/Ac Driver Converter, Etc.



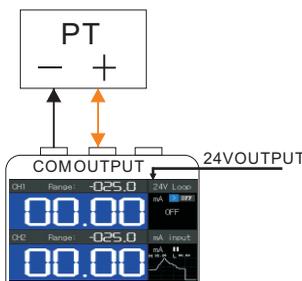
Current/voltage output is the most widely use.

5-2.Simulate A Passive Transmitter(Xmt)



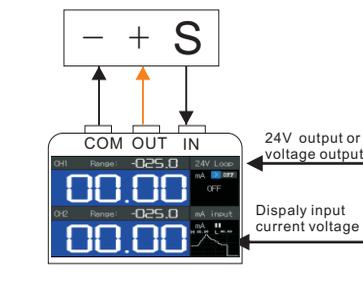
In this case, the generator simulate a passive transmitter, which change the current in the loop as a potentiometer.

5-3.Testing A Passive Transmitters



The generator provide 24V power supply, which is necessary while testing a passive transmitter, and meter the current on the loop at the same time.

5-4.Testing A Transmitter /Sensor.

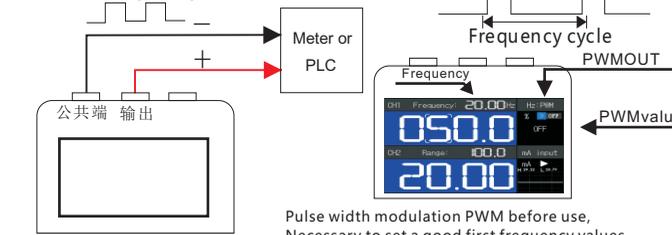


In this case, the generator, which supply 24V or 0-12V according to the testing object demand, is used as a power supply and meter the input signal at the same time.

5-5.Frequency output

5-5.2 : pulse width modulation out put

5-5.1 : Frequency



Pulse width modulation PWM before use, Necessary to set a good first frequency values, Can enter the switching frequency quick Menu.

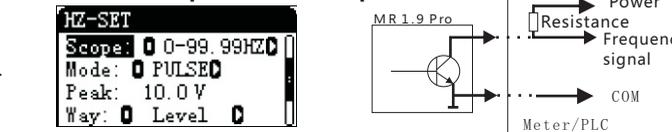
Mode 1: frequency output.

Mode 2: frequency PWM (pulse width modulation output).

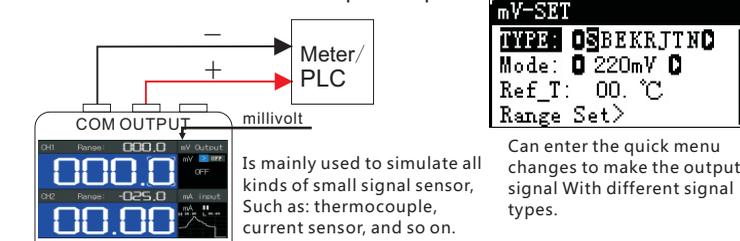
Way 1: the level of output, can modify the peak voltage output.

way 2: open collector output, is used to simulate OC gate, need outside power supply.

5-5.3 NPN open circuit output



5-6.Millivolt and thermocouple output



Is mainly used to simulate all kinds of small signal sensor, Such as: thermocouple, current sensor, and so on.

Can enter the quick menu changes to make the output signal With different signal types.

Advanced Functions

Profile

1. Actual Value Convert To Range:

For example, the measurement range of a temperature sensor is from 0 to 100 value of output is 4-20mA. Once you set the max/min range value and max/min actual value, the input and output value can be displayed as actual value or range according to your wish. The generator will convert actual value to range automatically, you don't need to do the calculation.!

2. Programmable Output.

You just need to 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.

3. Quick Output.

You may need only several fixed value of output in your daily work. The product has 6 presetting value for you to quick output. Meanwhile the product allow you to customize the presetting value.

4. Display Input As Curve.

The input value can be displayed as curve. You can monitor the change of input graphically.

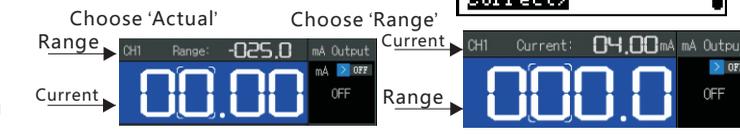
5. Instrument Adjustment.

We provided you for a friendly windows form menu which allows you to adjust the instrument to make you work efficiently.

6. Quick Menu

Every type of signal has its own kind of quick menu. Here we talk about quick menu of current output. Other menus are alike.

6-1.Mode



6-2.En-Program:Learn more from section 8.

6-3.Signal: Select an option to restrict output to a range. There is four options you can choose, which are 0-24mA, 4-20mA, 0-10mA and USER. When you choose "User" option, you need to set a customized range according to Section 7.

6-4.Looping-Vol:Change the voltage when the circuit is open. The lower it is, the longer battery life will be.

6-5.Range Set: Learn more from Section 7.

6-6.Program Out: Learn more from Section 8.

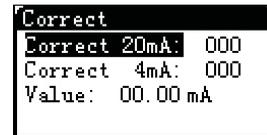
6-7.Presetting: Learn more from Section 9.

6-8.Correct:

Correct the errors of output: the menu is like graphic 6.1, choose a certain value of signal to correct, output to a high precision meter, adjust number until the meter display the certain value



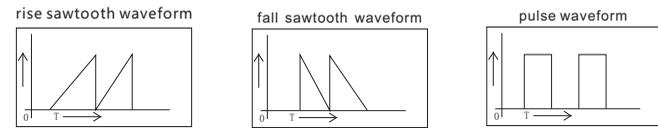
Graphic 6.1



Graphic 6.2

Correct the errors of input: the menu is like graphic 6.2, choose a certain value of input to correct, input a high precision source of signal, adjust number until Value item in this menu display the certain value.

8-3.Set Parameters To Output Other Waveforms



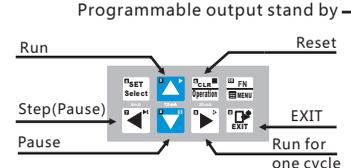
Rise sawtooth waveform: Set Down Step as Stop Val minus Start Val. When output has been increased to Stop Val, it will be decreased to Start val in one step.

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

8-4.How To Start Programmable Output

- 1. Enable programmable output:**Go to Quick Menu->En-Program, press INPUT, the programmable output will be stand-by.
- 2. Control programmable output:** Press keys in operation zone to control programmable output.



8-5.Quick Start Programmable Output

When you output manually, you often need to switch to programmable output. In this case,adjust the instrument as below:

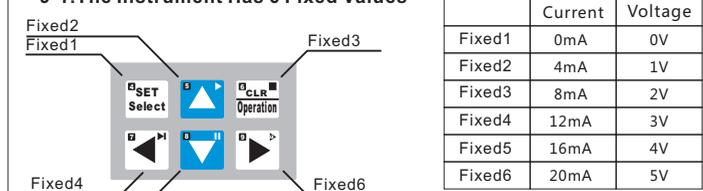
- Go to Instrument menu->General->FN,choose 'Program Out' .
- Go to Instrument menu->General->Default,choose 'Adjust' .
- The operation zone is to adjust numbers in default.
- Quick Switch to programmable output:**Press FN, and the operation zone will be able to control programmable output.

Assume you often use programmable output,sometimes need to output a certain value. In this case, adjust the instrument as below:

- Go to Instrument menu->General->FN, choose 'Program Out'.
- Go to Instrument menu->General-> Default,choose 'Function'.
- The operation zone is to control programmable output in default.
- Generate a certain value:** Press FN,end the operation zone will be able to adjust the value of output.

9. Presetting For Quick Output

9-1.The Instrument Has 6 Fixed Values



9-2.How To Quick Output Fixed Value.

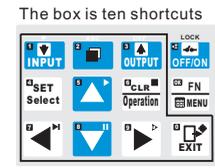
- Go to Instrument menu->General->FN, choose 'FixedValue'.
- Press FN while generating signal, a mark will be displayed on the screen, as graphic 10.1
- Press Keys in operation zone the corresponding fixed value will be generated.



Graphic 10.1

9-3.If the Presetting Fixed Value Dose Not Meet Your Needs, You Can Set 10 Values For Quick Output.

- Go to Instrument menu->General->FN, choose 'Presetting'.
- Go to Quick menu->Presetting, you can set 10 values at the most
- Press FN while generating signal, a mark will be displayed on the screen, as graphic 10. 1.
- Press Keys in operation zone the corresponding fixed value will be generated.



10. Instrument Menu

10-1.General



FN: Program Out/Presetting/Fixed Value While generating signal the operation zone is for adjusting value of output in default. The operation zone will be change to control functions if you press FN. This option determine which function it will be after pressing FN.



Default: Function/Adjust If choose 'Adjust', the operation zone is to adjust numbers in default. If choose 'Function', the operation zone is to control functions in default. Press FN, the effect of operation zone will be altered.

SigSW: the UI will be different when change type of output!

Backlight: Adjust Backlight.

Beep: Turn on/off beep.

Save value: the value of output is saved when turn off the instrument.

Save State: the state of output(OFF or OUT) is saved when turn off the instrument.

10-2.Function

If firmware updated, there may be some new functions which will put into this menu.

10-3.Output/Input Settings: Same as Quick Menu.

10-4.Output Switch

You can turn off some type of signal which you do not need to use. Then the signals will not appear when you change input/output type.

10-5.Language: Change Language.

11. Curves

Display input in curves for you to monitor the change of input. Every input can be display as curve in real time. If you use 24V output, the current in the loop can be display as curves as well.

11-1.How To Display Curve

- Go to Quick menu of input->C-Curve->C-Curve, turn on.The input display as curve like graphic 11. 1.
- When Output 24V, go to Quick menu of output->Curve->C-Curve, turn on. The current in the loop display as curve like graphic 11. 2
- Press the [F] [V] to pause/resume capture input signal. When output 24V, the way to pause/resume is different. Press the keys in the operation zone to pause/resume as below.



11-2.Auto Zoom

If the change rate of input is small, the rise and fall of the curve is not obvious. Go to Quick menu->C-Curve->Auto Zoom, turn on. Then the change will be zoom in graphically.

11-3.Capture Period

Go to Quick menu->C-Curve->Cu Acp-T, adjust number. This parameter represent a period in which instrument capture input once and add it to the curve. The instrument can display 128 point

12. Attention

12-1.Charging And Power Supply

The instrument can use embedded battery or connect to usb as long term power supply. Please charge the instrument with a charger which output more than 1A.

12-2.Extend Battery Life

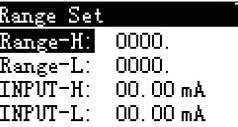
If you are going to leave the instrument unused for a long time. Do not keep it with an empty battery. Please fully charge the battery before keep it. Discharge and charge at least one time in every 3 month to keep the battery active.

12-3.Self-Check

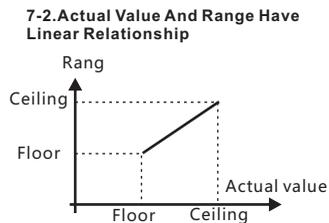
If you suspect that the instrument does not work. As the instrument allows input and output at the same time, you can do a self-Check this way. Output a signal, and connect the output to the input terminal. The instrument can meter the signal generated by itself.

7. Range

7-1.Every Input/Output Signal Has Its Own Settings
Go to Quick Menu->Range Set,change the ceiling and floor of the range and actual value

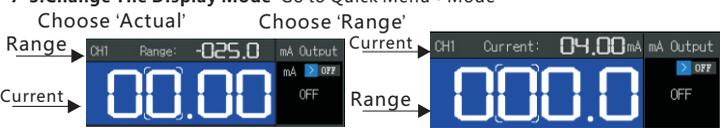


Tips: Press FN to change the position of decimal point when adjusting 'Range-H' and 'Range-L'.



7-2.Actual Value And Range Have Linear Relationship

7-3.Change The Display Mode Go to Quick Menu->Mode



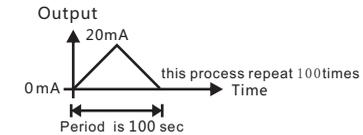
8. Programmable Output

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.

8-1.Set Four Parameters For Quick Programmable Output

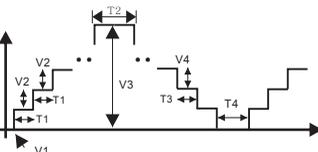
Go to Quick Menu->Program Out, adjust four parameters as below:

Parameter	Effect	Example
NumberOT	Number of loops	100
Start Val	The floor of output	0.00
Stop Val	The ceiling of output	20.00
Cycle	The period of one cycle	100



8-2.Set Eight Parameters To Programmable Output

Go to Quick Menu->Advanced:
Mode choose Cycle: programmable output will work according to parameters in preview menu.
Mode choose Custom: 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