VIKING
WE MAKE MACHINES

INDUSTRIAL SIGNAL GENERATOR

www.vikingmachinery.co.nz

Version 1.0 – March 2023

0.0 Safety Statement

All machinery, especially CNC machinery, has inherent dangers and risks. It is the responsibility of the system designer to ensure that any systems built using any Viking Machinery Ltd. products are safe for use. Any technical information is provided as a reference only, and does not constitute a recommendation as to the fitness of use in any particular application.

Viking Machinery Ltd. strongly urges customers to seek expert advice when dealing with potentially dangerous electrical voltages and sources of mechanical energy. Information contained in this document does not constitute a substitute for expert advice.

1.0 Product Overview

- Industrial Signal Generator
- Analog voltage and current output modes
- +/- 12V signal voltage range
- 0-24mA signal current range
- USB charging
- Function memory on power off
- User editable parameters for calibration & function
- Dimensions: 90mm x 70mm x 27mm

2.0 Scope of Document

This document is designed to give an overview of the operation and adjustment of the Industrial Signal Generation unit.

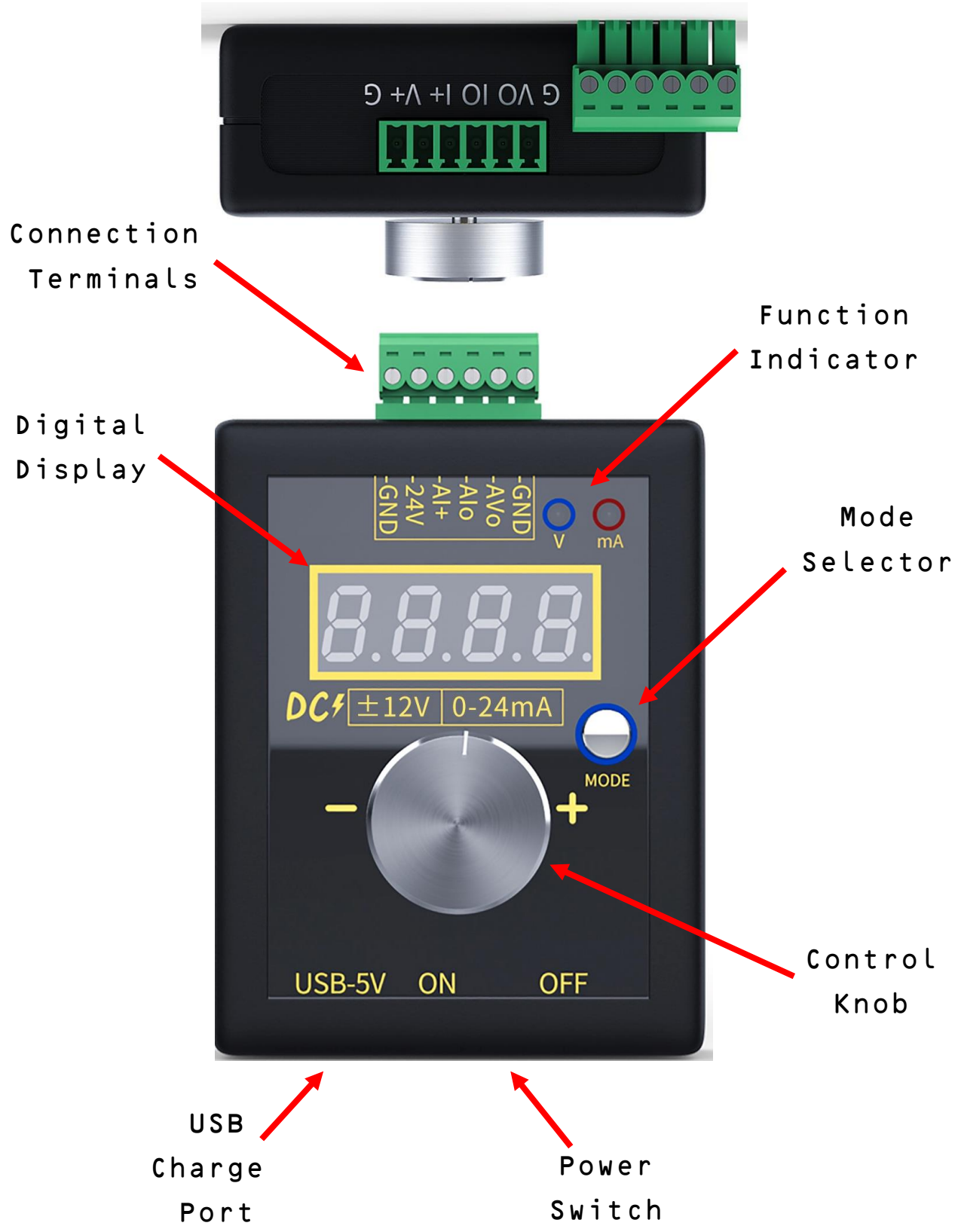
It is assumed that the user is familiar with electronics and electrical test equipment, and understands the safety precautions required to protect people and equipment from harm.

IMPORTANT:
When testing a4-20mA system, you might find either a passive or active circuit. Confirm by;

1. Disconnecting the two current loop wires from the PR module input terminal.
2. Using a voltmeter, measure for DC voltage present on the wires.
3. If no voltage is present, then your device is creating a passive current signal. This means a loop excitation source, (typically 12...24 VDC), must be used to power the current loop and measure the signal. Many PR modules have an input excitation source which powers a passive current loop, allowing our module to both measure and energize your device.
4. If you measure voltage on the wires, (typically 12...24 VDC), then the current signal created by your device is active.

3.0 Controls Overview

Below is a basic overview of the control features of this test unit.

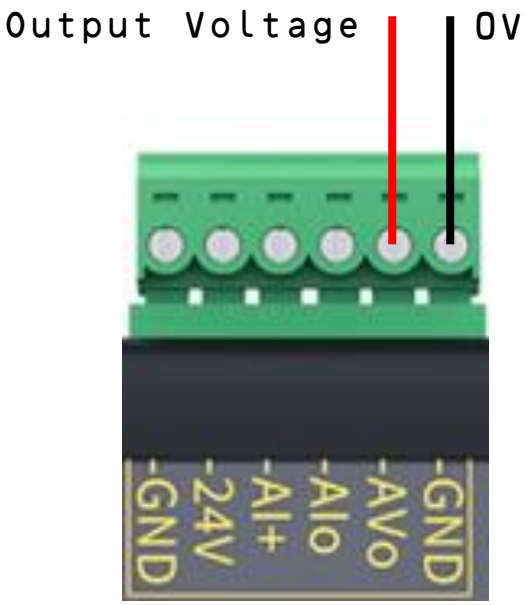


4.0 Conenctions

Below are the connections for different testing options:

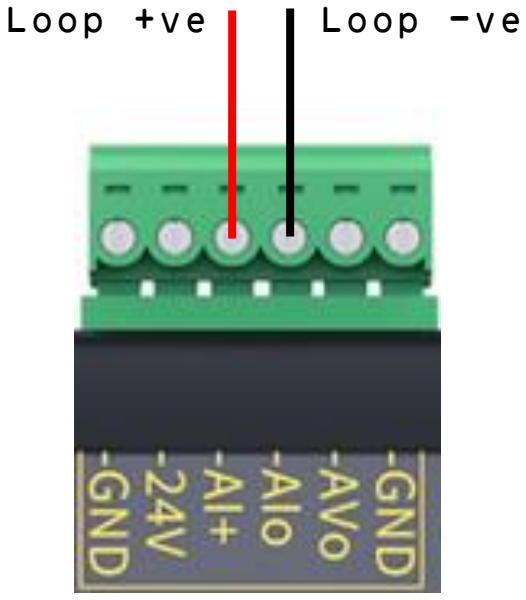
Voltage Output

For voltage output modes, simply connect the 0v and AVo terminals.



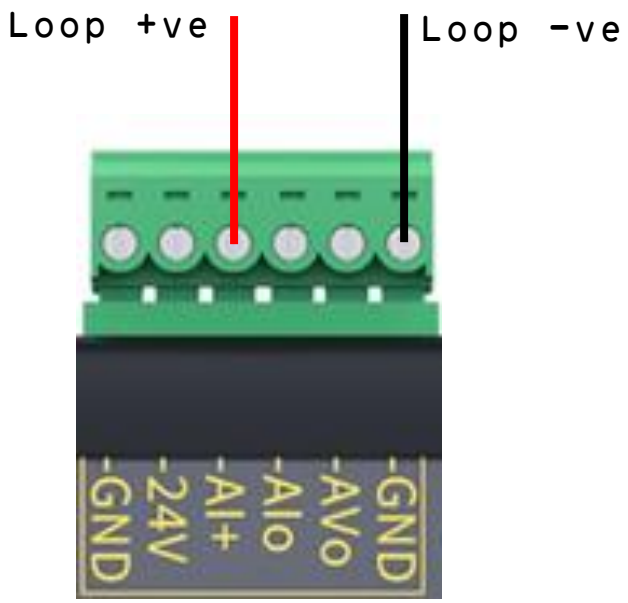
Current Output for Passive Systems

For passive systems, connect as shown,



Current Output for Active Systems

For active systems, connect as shown,



5.0 Checking the Battery

To check the internal battery voltage, press and hold the MODE button for ~2 seconds. The current battery voltage will flash, and then return to normal. 3.7V is fully charged.

The LED on the bottom of the unit will also display battery condition. The LED codes are;

- Flashing – battery charging
- Green – charge over 80%
- Yellow – charge between 40% and 80%
- Red – charge below 40%

6.0 Operator Interface

The unit has three control options. The mode button, which is used to select between voltage and current function, and the battery check function only.

The control knob is rotated to adjust variables, and clicked to ‘enter’ the variables. A long click is used to enter the menus. Clockwise clicks are generally a positive adjustment and counter clockwise is negative.

7.0 Saving Default Voltage / Current Setting

The unit allows you to save the default current/voltage that the unit will power on to. It will remember this every time you turn the unit on. To do this, select the voltage or current output using the MODE button, and then turn the knob to set the desired value. Once you are at the voltage that you need, click the center button once. The display will go blank, and then show three dots across the bottom. Now when you power the unit off and on again, it will remember this setting for power on.

8.0 Voltage Function Variables

In voltage mode, long press the centre wheel to enter the parameters menu. The functions available are listed below. To adjust values F002 onwards you will need to enter a password. This prevents accidental tampering with these settings. When you attempt to scroll beyond F001, you will be prompted to enter a password. The password is +--+., followed by a click of the knob. To set a +, rotate the knob one click clockwise, to set a -, rotate the knob 1 click counter clockwise.

F001 - Coarse or Fine Adjustment Mode

Default Value = 1

Changes the default behaviour of the knob. Set to 0, the unit is in coarse adjustment mode. Set to 1, the unit is in fine adjustment mode. Set to 2 is shortcut mode (see F100)

F002 - Output Range

Default Value = 0

Changes the limiting range of the voltage output. The available ranges are;
0: +/- 12V
1: +/- 5V
2: 0-10V
3: 2-10V
4: 0-5V
5: 1-5V
6: 0-3.3V
7: 0-2.5V
8: 0-1V
9: -10-0V

F003 - Display Voltage

Default Value = 0

0: Actual Voltage
1: Percentage from 0-100%
2: 2-50Hz
3: 0-1500

F004 - Coarse adjustment calibration

Default Value = 1

Range of 1 to 50. This adjusts how much the knob changes the displayed value per click.

F005 - Fine adjustment calibration

Default Value = 1

Range of 1 to 50. This adjusts how much the knob changes the displayed value per click.

F006 - Calibration for -10V point

Range of -999 to 999. Do not play with this unless you know what you are doing! Be sure to confirm the actual output with a separate test meter if you attempt this calibration.

F007 - Calibration for 0V point

Range of -999 to 999. Do not play with this unless you know what you are doing! Be sure to confirm the actual output with a separate test meter if you attempt this calibration.

F008 - Calibration for +10V point

Range of -999 to 999. Do not play with this unless you know what you are doing! Be sure to confirm the actual output with a separate test meter if you attempt this calibration.

F009 - Display brightness

Default Value = 1

Range of 1 to 8. Level 8 is the brightest, level 1 the dimmest.

F100 - Quick output points

Default Value = 0

0: No quick reference points used
2-9: Corresponds to the number of quick set points to be used.

F101 to F109 - Quick output values

Select the value point that corresponds to each of the points above.

9.0 Current Function Variables

In current mode, long press the centre wheel to enter the parameters menu. The functions available are listed below. To adjust values F002 onwards you will need to enter a password. This prevents accidental tampering with these settings. When you attempt to scroll beyond F001, you will be prompted to enter a password. The password is +--+., followed by a click of the knob. To set a +, rotate the knob one click clockwise, to set a -, rotate the knob 1 click counter clockwise.

F001 - Coarse or Fine Adjustment Mode

Default Value = 1

Changes the default behaviour of the knob. Set to 0, the unit is in coarse adjustment mode. Set to 1, the unit is in fine adjustment mode. Set to 2 is shortcut mode (see F100)

F002 - Output Range

Default Value = 0

Changes the limiting range of the current output. The available ranges are;
0: 0-20mA
1: 4-20mA
2: 0-24mA

F003 - Display Current

Default Value = 0

0: Actual Current
1: Percentage from 0-100%
2: 2-50Hz

F004 - Coarse adjustment calibration

Default Value = 1

Range of 1 to 50. This adjusts how much the knob changes the displayed value per click.

F005 - Fine adjustment calibration

Default Value = 1

Range of 1 to 50. This adjusts how much the knob changes the displayed value per click.

F006 - Calibration for 4mA point

Range of -999 to 999. Do not play with this unless you know what you are doing! Be sure to confirm the actual output with a separate test meter if you attempt this calibration.

F007 - Calibration for 12mA point

Range of -999 to 999. Do not play with this unless you know what you are doing! Be sure to confirm the actual output with a separate test meter if you attempt this calibration.

F008 - Calibration for 20mA point

Range of -999 to 999. Do not play with this unless you know what you are doing! Be sure to confirm the actual output with a separate test meter if you attempt this calibration.

F009 - Display brightness

Default Value = 1

Range of 1 to 8. Level 8 is the brightest, level 1 the dimmest.

F100 - Quick output points

Default Value = 0

0: No quick reference points used
2-9: Corresponds to the number of quick set points to be used.

F101 to F109 - Quick output values

Select the value point that corresponds to each of the points above.

10.0 Device Verification

You may wish to ensure that the device is working correctly, and is properly calibrated.

To do this with the voltage mode, simply use you multi meter to measure the output voltage.

To do this with the current mode, connect a known resistor across the AI and GND terminals. Measure the voltage drop across the resistor and use Ohm's law (V=IR) to calculate.

For example, with the device set to 20mA, connect a 120ohm resistor. The measured voltage should be 2.4V. (V = 0.20 X 120)

9.0 Reference Links

Viking Machinery - Home Page

www.vikingmachinery.co.nz

Viking Machinery - TradeMe Store

https://www.trademe.co.nz/Members/Listings.aspx?member=4906214

Viking Machinery - Email

Sales@vikingmachinery.co.nz

Viking Machinery - Social Media

https://www.instagram.com/vikingmachinery/

https://www.youtube.com/@vikingmachinery

https://www.cgtrader.com/viking-nz

https://cults3d.com/en/users/Viking_NZ/creations

https://www.thingiverse.com/VikingNZ/about

https://grabcad.com/james.hussey-3