



Screen Scope

Screenscope Integrated
Function Generator

User Guide

Ver 1.0

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The Function Generator option is an Integrated part of Screenscope. This safety information for the use of screenscope is reproduced here



Warning - risk of danger exists if the connections to these connectors is not made in accordance with the safety instructions. Refer to the section on Important Safety Information before using it.



Frame terminal. Electrically connects to unit case

Intended use and maximum input voltage range

The Screenscope is designed for measurement category I (CAT I) indoor electronics use only. Do not use Screenscope with measurement categories II, III or IV.

Probe ground lead connection precaution

Care must be taken to ensure the ground of the input, is not connected to a voltage other than ground. If there is any doubt, use a multimeter to check before connecting.

Failure to use the equipment according to the safety instructions may result in damage to the equipment, or personal injury to yourself or others.

Introduction

Screenscope Integrated Function Generator is a 10MHz Sine , Square, Triangular and pulse waveform generator. It is based on Direct Digital synthesis to produce accurate waveforms with sweep and burst capability.

Screenscope's unique external screen concept makes it possible to integrate this functionality in the same small low cost unit, since the graphical interface means you can accommodate the extra controls in a simple way. Other stand alone scopes would not be able to provide the extra controls without much extra knobs and buttons and with the inevitable use of dual use buttons which add to user difficulty.

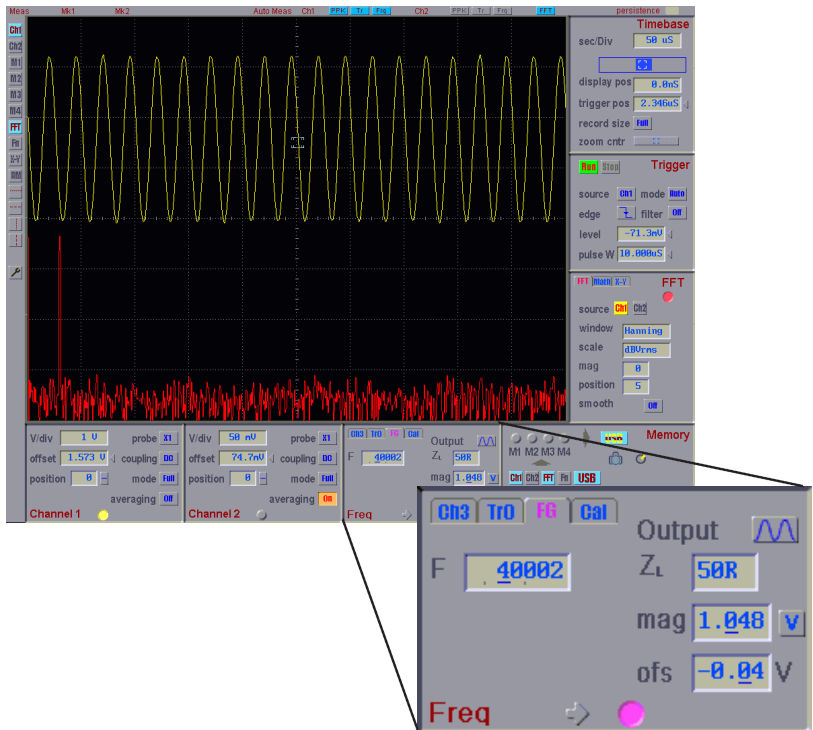
Combining a function generator in a stand alone scope gives versatile capability with applications ranging from R&D, production testing, education and hobby use.

Features

- 3 - 10 MHz Sine wave
- Continuous wave, Burst and Sweep modes
- 0.2dB gain flatness to 9MHz
- Variable output magnitudes to 7.5Vppk
- Output offset adjustment
- Magnitude reading in Vpp of dBm
- Output load setting
- Unique Quick Set Controls
- Easy to use with Quick Set controls

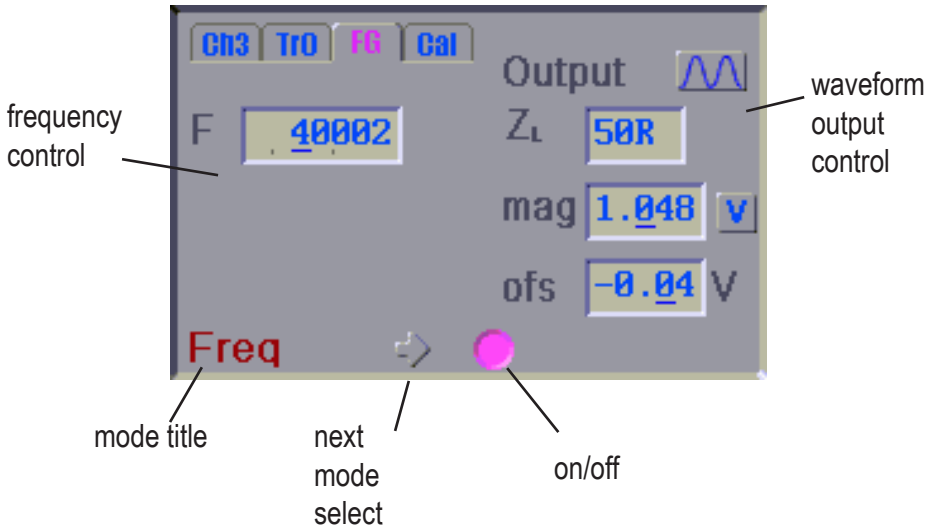
The AUX BNC connector on Screenscope's front panel can be used for a 1 bit Ch3 input, Trig Out, Function Generator out and Calibration Signal out.

Select the Function Generator panel by clicking the FG tab.



Main panel overview

The Function Generator panel will change its appearance to display the relevant controls for the selected frequency mode. Frequency modes available are: Continuous Wave, Burst or Sweep. These are selected with the arrow button to the right of the title.



Speed Setting

Adjusting variables is as simple as moving the mouse cursor over a variable box then using the wheel to scroll the value up or down.

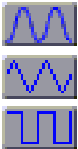
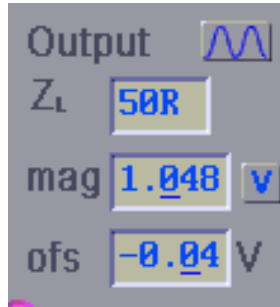
To make setting variables with many digits fast and easy, Screenscope's Function Generator uses a unique **speed setting** method. This is done by selecting the coarseness of the adjustment first within the variable box, then using the wheel in the usual way.

The coarseness is selected by right or left clicking over the variable. In response, an underscore cursor will move left/ right indicating at which digit the adjustment is to occur. In the above panel for example scrolling in the frequency setting will add or subtract in 10,000 Hz increments. If a decrement takes it below 10,000 it automatically reduces decrements to 1000 Hz lots and so on. This way it is possible to very quickly set any frequency for example, with minimum effort.

Speed Setting is available for all function generator variable settings..

Output Waveform Controls

The output controls provide selection of waveform type (sine, triangular, square) magnitude and offset. This section is common to all frequency modes.



Output Waveform Type

Clicking this buttons sets the output waveform type to the next option. It will rotate back to sine wave after the last.

Z_L 50R

External Load

Set this to 50R if there is a 50 Ohm load on the output, such as feeding into a 50 Ohm coaxial cable. This will allow correct readout of the output voltage and offset. The unloaded output magnitude is twice that with a 50 Ohm load since the output impedance is also 50 Ohm.

Output Magnitude and Offset

Scroll in their respective settings boxes to change the output values. The values for offset are in volts. Magnitude can be Vppk or dBm. The readouts are affected by selection of External load setting.



Mag readout dBm or Volt

Click this button to change magnitude readout between dBm or Vppk. For dBm, the load should be 50R and output type a sine wave.

Frequency resolution

The main frequency F or $F1$ in sweep mode, has a setting resolution of 2.86 Hz. When setting , it will automatically “click” to a value consistent with this.

Continuous Wave Output



Select **Freq** mode and click on/off to turn on if required.



Set freq as required. Outputs will change as they are set.

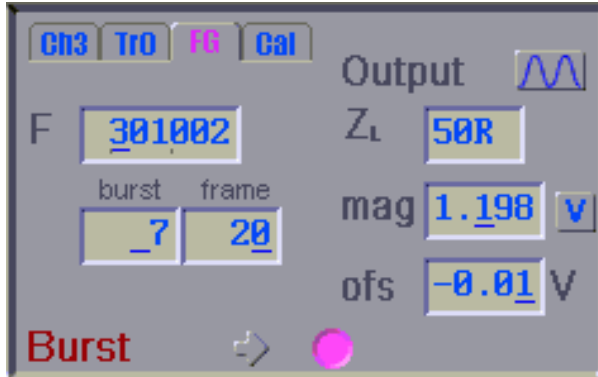


See section **Output Waveform Controls** on p5 for description.

Burst Mode



Select **Burst** mode and click on/off to turn on if required.



F

Set freq as required. Outputs will change as they are set.

burst

Set the number of cycles to burst

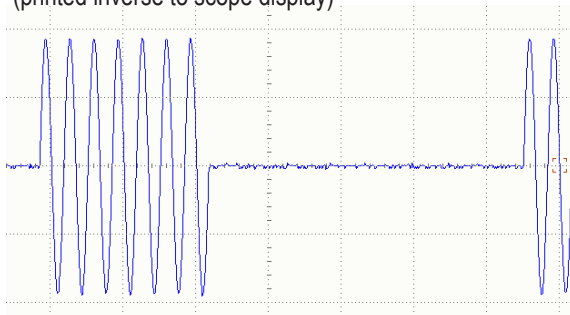
frame

Set the total time in cycles for frame = burst cycles + off cycles

Output

See section **Output Waveform Controls** on p5 for description.

This example as per above settings.
(printed inverse to scope display)



Sweep Mode



Select **Sweep** mode and click on/off to turn on if required.



F1 Starting frequency. Setting “clicks” to 3Hz resolution.

F2 Ending frequency. F2 should be higher than F1.

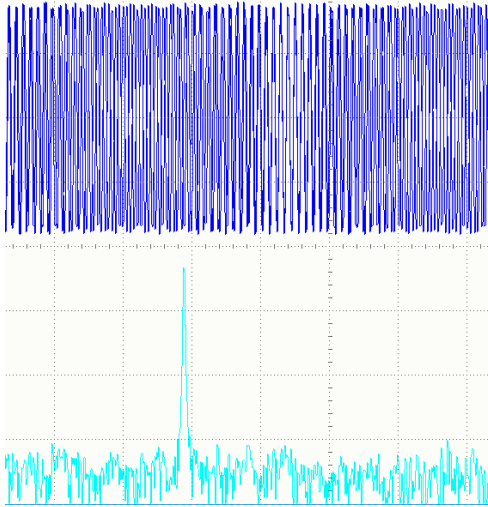
F2 can be set independently but actual values “click” to nearest possible value which also depends on **steps** setting. Change number of steps if F2 setting is not changing.

steps Number of frequency steps from F1 to F2. Range is 2 to 4095.

Changing number of steps will have an effect on F2 and directly alter the sweep time which is also recalculated and displayed.

time Displayed in seconds. This is total sweep time in seconds. Available range depends on frequency settings and number of steps.

Output See section **Output Waveform Controls** on p5 for description.



Sweep mode example. FFT peak tracks sweep.
(printed inverse to scope display)

Waveforms

	Sine
	Triangular
	Square
	Pulse (Available next firmware)

Modes

	Continuous Wave
	Sweep
	Burst

Output

Impedance		50 Ohm
Protection		Short Circuit Protected
Offset range		-2.20 to +2.20V
Sine	Feq Range	3 Hz - 10 MHz (-1.4dB at 10Mhz)
	Flatness	+/- 0.2dB to 9 MHz
	harmonics	HD2 HD3 < -55dB 0 to 900KHz
	Output Levels	0.10 - 7.4 V ppk open / 3.7V ppk into 50 Ohm
	Accuracy	+/-2%
Triangular	Feq Range	3 to 1MHz
	Output Levels	0.10 - 7.4 V ppk open / 3.7V ppk into 50 Ohm
	Accuracy	+/-2%
Square, Pulse	Feq Range	3 Hz - 7 MHz with sweep and burst capability
	Rise Time	<14nS (at 1V into 50 Ohm)
	Edge Jitter	1 MHz - 7 MHz < 1nS
	Edge jitter	< 100KHz 20nS
	Output Levels	0.14 - 4.2V ppk open / 2.1V ppk into 50 Ohm
	Accuracy	+/- 2%

Contact

Screenscope is manufactured by Diamond Systems Pty Ltd.

Street: **Diamond Systems**
145 Barreenong Rd
Cottles Bridge
Victoria 3099
Australia

Postal: **Diamond Systems**
PO Box 105
Hurstbridge
Victoria 3099
Australia

web: www.screenscopetraces.com

Support: support@screenscopetraces.com

Ph (03) 9714 8597

Int +613 9714 8597