Introduction to the use of an Arbitrary Function Generator

Vineesh V S

Department of Electrical Engineering, IIT Bombay

January 6, 2016

Abstract

In this document, a brief introduction to the use of an Arbitrary Function Generator is provided. The use of AFG to generate standard waveforms and some controls to change the parameters of those waveforms are also described. This document is a simpler version of AFG3000 series user manual

1 What is an Arbitrary/ Function generator?

Arbitrary/ Function generators are electronic instruments used to generate time-varying electrical waveforms. Unlike function generators which generate standard waveforms such as sine, square, ramp, triangle etc., AFGs can also generate arbitrarily shaped waveforms. Apart from this, it has AM/FM/PM modulation capabilities, sweep and burst modes. The waveform and its parameters are displayed in the graphic display.

2 The Tektronix AFG3000 series Arbitrary/ Function generator

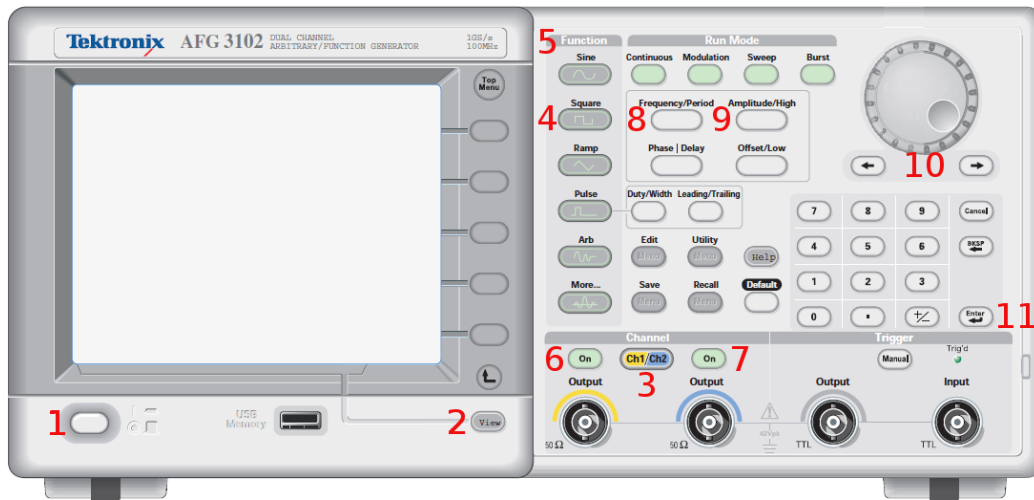A representation of the front panel of 3000 series AFG is shown in Figure 1.

Figure 1: Dual channel arbitrary function generator

3 Generating the waveforms

The steps given below will help you generate a sine wave at the channel1 and a square wave at channel2

- Power on the device ①. You will see a display as shown in Figure 2

- Press *View* button ② to toggle the view format.

There are three view formats for this AFG.

- Format1: Waveform parameter and graph (Figure 2)

- Format2: Graph comparison (Figure 3)

- Format3: Waveform parameter comparison (Figure 4)

You might have observed that both the channels are having sine waveforms. Let us select square wave for channel2

- Use *View* button to bring the display back to *View format 1*

- Press *CH1/CH2* button ③ to select CH2 (Channel 2)

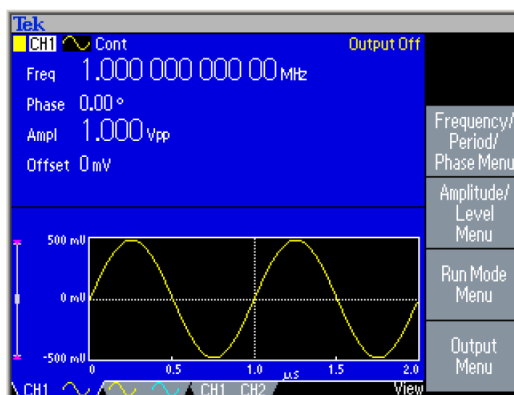- Press *Square* button ④ in the *Function* section ⑤ to set square waveform for channel2

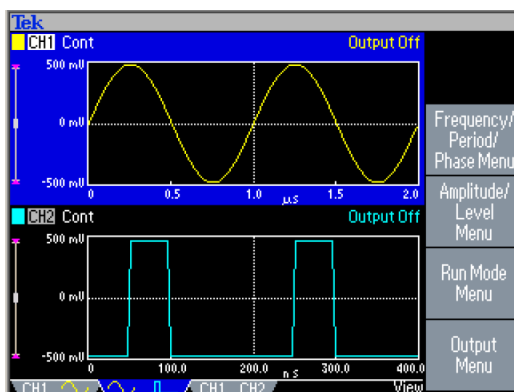Figure 2: View format 1: Waveform parameter and graph

Figure 3: View format 2: Graph comparison

- Press button ⑥ and button ⑦ to switch on the output channels 1 and 2 respectively

Now, one can use a DSO to observe the waveforms generated by the AFG.

4   Changing waveform parameters

This section will help in setting up the amplitude and frequency of the waveforms

- Use the *View* button to bring back the display to *View format 1*
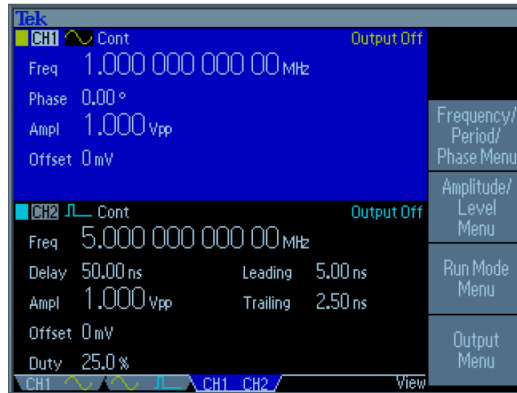
Figure 4: View format 3: Parameter comparison

- Press the *Frequency/ Period* button ⑧

- Use a combination of the right, left arrows and the knob ⑩ to set the frequency to the desired value

- One can also type a value of frequency using the numeric buttons given below the knob and press *Enter* button ⑪[1]

- Similarly change the amplitude of the waveform using *Amplitude/High* button ⑨

References

[1] http://mmrc.caltech.edu/Tektronics/AFG3021B/AFG3021B %20Programmer%20Manual.pdf (Accessed: 06-01-2016)

[2] Suggestions from: Ms. Madhumita Date, Mr. Mahesh Bhaganagare, WEL

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[1]This can be used if one wants to set the frequency to a specific value (Eg: 12.8989 kHz)