How to Simply Generate a PSK Modulation

Phase-Shift Keying (PSK) is a technique used to transmit data by modifying the phase of a sinusoid carrier wave. Tabor Arbitrary Waveform Generators (AWGs) supports PSK modulation according to the following variations: PSK, BPSK, QPSK, OQPSK, pi/4DQPSK, 8PSK, 16PSK, as well as user-defined variations. This document will quickly guide you through the definition process as shown on a WW2572A.
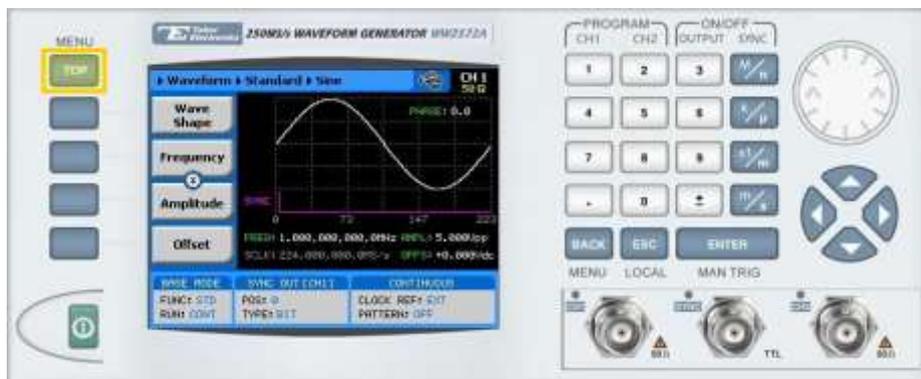

NOTE

You can also generate **Quadrature Amplitude Modulation (QAM)** by following steps similar to those described in this document. The (n)PSK and (n)QAM modulations are available in the WW2572A, WW5064/1074/2074, WS8102 and PM8572A models.

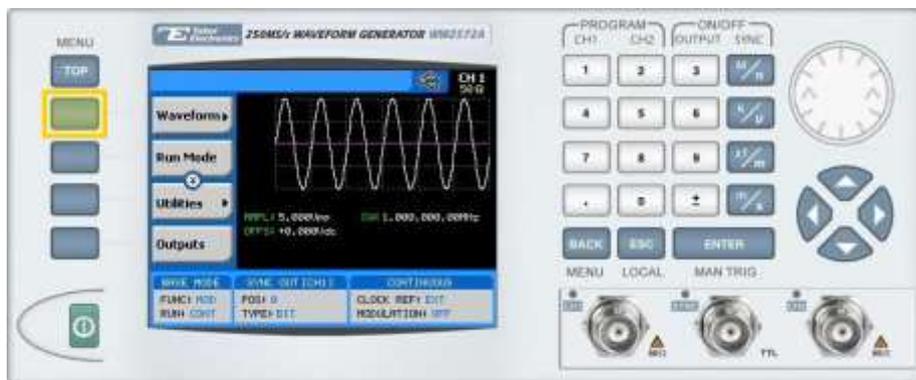The front panel of the AWG is depicted below.

➜ **To generate a PSK Modulation using the front panel:**
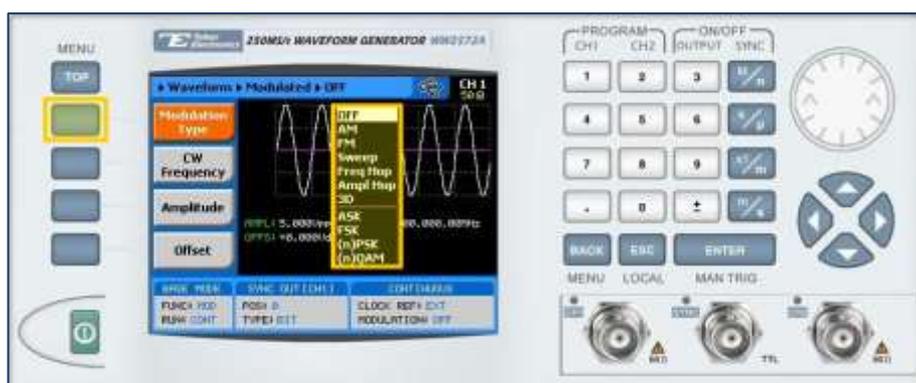
1. Press the **TOP** menu button.

2. Press the **Waveform** button.

3. Press the **Modulated** button.

4. Press the **Modulation Type** menu button. A list of modulation types appears on the screen. By default, the modulation type is set to "OFF".
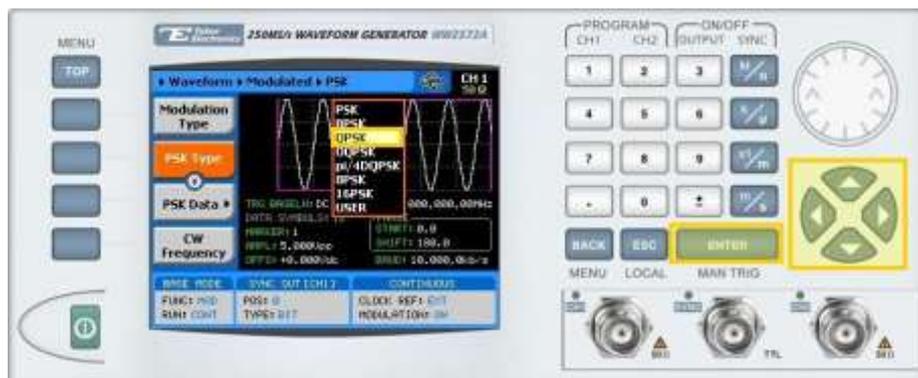
5. Select the **(n)PSK** modulation type from the list box using the arrow keys, and press **ENTER**.

6. Press the **PSK Type** menu button. A list of PSK varieties appears on the screen.

- PSK

- BPSK

- QPSK

- OQPSK

- pi/4DQPSK

- 8PSK

- 16PSK

- USER (user-defined)

7. Select the required PSK modulation from the list box using the arrow keys, and press **ENTER**.

8. Following your selection, you will be able to configure the characteristics of the modulation with the modulation-type specific menu buttons that appear on the left-hand side of the panel.

TIP

Whenever the ⬇ icon is displayed there are more attribute menu buttons to be shown below. Simply scroll down using the dial or cursor key.

9. Choose the menu buttons on the left-hand side of the screen to modify any of the following attributes:

   - **PSK Data**. A table used to program a sequence of phase changes, as shown in step 10.

   - **CW Control**. Used to turn the carrier waveform **CW OFF** or **CW ON**.

   - **CW Frequency**. The frequency of the sinusoid carrier waveform.

   - **Symbol Rate.** The rate at which the symbols step through. The rate can be programmed within the range of 1 S/s to 1 MS/s (when the length of the symbol is a single bit).

   - **Marker**. Defines an index point in the PSK sequence at which the Sync Output generates a marker pulse.

   - **Amplitude**. The amplitude of the carrier wave (in Volts peak-to-peak).

   - **Offset**. The amplitude (in VDC) offset with reference to zero-level amplitude.

10. Press the **PSK Data** menu button to program a sequence of phase changes, as shown below.
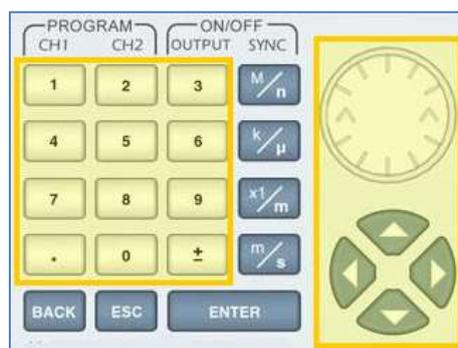
Each row in the table includes the following parameters:

- **Line.** The index number of the row.

- **Symbol.** The PSK data symbol. Each symbol defines a specified phase shift.
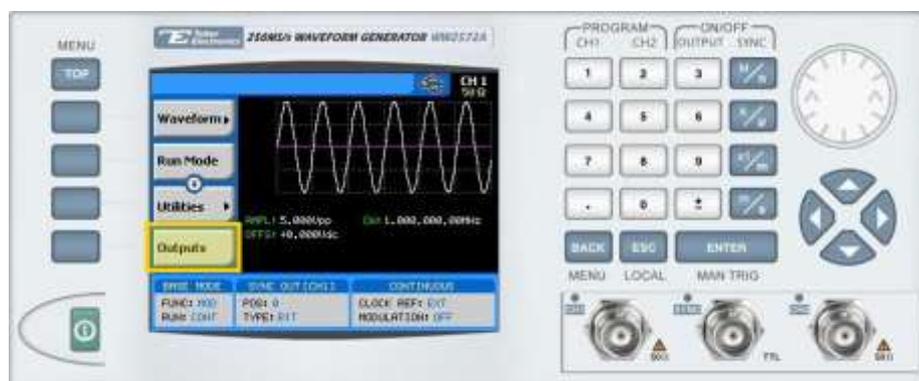
The following operations can be performed on the table:

- **Edit Line.** To edit an existing row.

- **Insert Line.** To add a new row to the table.

- **Delete Line.** To delete an existing row from the table.

- **Load DEMO Table.** To restore the factory-set demo values to the table.

- **Delete Table.** To delete the entire table.

- **Apply Changes.** Applies all the changes made to the table.

11. When selecting a numeric attribute for modification, modify the displayed value either by using the dial or the cursor keys, or by entering the value using the numeric keypad. Press **ENTER** to save the modified parameter value.

12. Press the **TOP** menu button to return to the main menu.

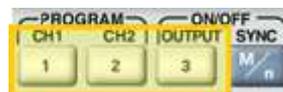13. Press the **Outputs** button to configure the output settings.

14. Define the channels in the **Outputs** section as being **ON** or **OFF**, modifying the settings using the dial or the cursor keys:

- To scroll between the fields, use the cursor keys.

- To edit a field, select the field, and press **ENTER. Use** the keypad to enter the chosen value.

- To toggle between **ON** and **OFF**, select the field and press **ENTER**. Use the cursor keys to choose the selected option.

- Press **ENTER** again to exit the edit mode, and save the value.

TIP

You can quickly modify the output settings by selecting **CH1** or **CH2** on the keypad, and toggling the **OUTPUT** key to turn the channel on or off.

For More Information

To learn more about Tabor's solutions or to schedule a demo, please contact your local Tabor representative or email your request to info@tabor.co.il. More information can be found at our website at www.taborelec.com

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