Motion Control – Solution Note

Background

A motion control system is used to regulate the position or velocity of a mechanical object. The main components of a motion control system (see the block diagram in Figure 1 below) include:

♦ **Application hardware or software**, which provides the rules for guiding motion

♦ A **motion controller**, which receives instructions, and outputs a voltage-based waveform to an amplifier

♦ An **amplifier**, which boosts the signals to the level required by the actuator

♦ An **actuator** (such as a motor), which provides the physical motion

♦ A **feedback device**, which provides positional or velocity information.
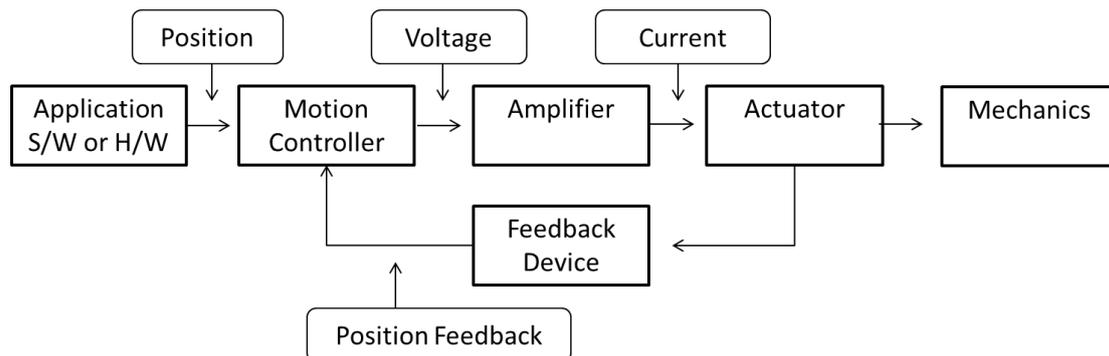
♦ The **mechanical object** to be controlled.

Figure 1: Motion Control Block Diagram

Requirement

You can use the **Tabor *Wonder Wave* AWG** to validate the automated optical inspection system used to test flat panel displays. In this system, the actuator is an electric motor, whose functionality, responsiveness, and limitations must be tested before incorporating it into the inspection system.

The motor has two inputs:

♦ A **frequency sweep** that drives the motor

♦ A **DC level** that determines the motor's direction.

The frequency sweep is represented as a square carrier wave with a 50% duty cycle (see Figure 2 below).

♦ In section A, the motor accelerates by changing the frequency from DC to 100KHz in 50mSec.

- In section B, the motor maintains a steady speed by keeping the frequency unchanged for a period of time.

- In section C, the motor gradually decelerates by changing the frequency from 100KHz to DC.

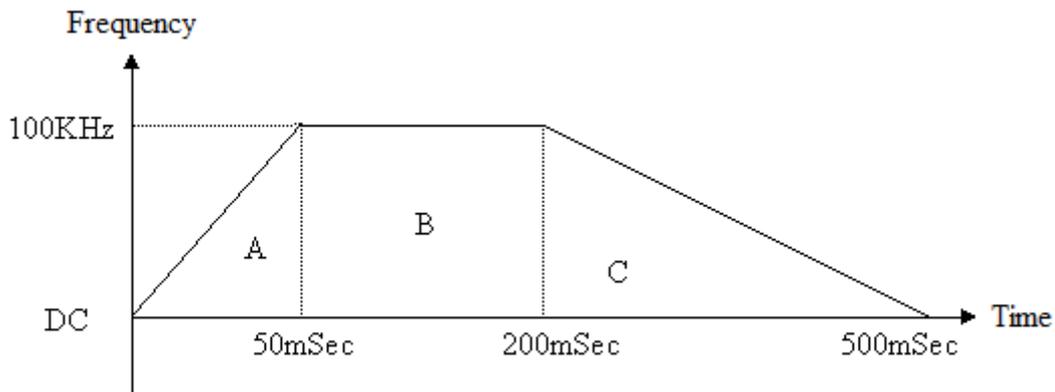

Figure 2: Control Signal Diagram

Solution

Tabor Electronics' *Wonder Wave* family of Arbitrary Waveform Generators (AWGs) serves as an excellent platform for the testing of Motion Control systems. Tabor's AWG allows you to provide sophisticated motion control *without requiring the use of an external modulator*.

Wonder Wave is supplied with *ArbConnection* – Tabor's comprehensive software tool that controls instrument operation, and provides unsurpassed programming and waveform creation capabilities. The *ArbConnection* suite includes:

- *Pulse Composer* – for generation of pulses and pulse trains
- *FM Composer* – for designing complex modulation schemes.

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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