# VM3640A

## 50 MSa/s Arbitrary Waveform/Function Generator (VMIP™)

## Features

- Up to 50 MSa/s Sampling with 12-bit Resolution
- Programmable Output Filters
- Designed for Multi-channel Applications
- Up to Three Independent Channels per C-size Card
- SCPI and VXI*plug&play* Compatible
- Built-in Functions: Sine, Square, Ramp, Triangle, Noise Waveforms, Cardiac, plus more
- External Modulation (Amplitude, FSK, PSK)
- Sleep Mode for Portable Applications

## Overview

The VM3640A is a high-performance VXIbus arbitrary waveform generator that is ideal for applications requiring standard function generator capability, or the need to generate custom-defined waveforms. Direct digital synthesis is used to provide outstanding functionality, with standard sine and square waves available to 20 MHz.

A powerful feature of the VM3640A is that it is part of the VMIP™ family of VXIbus products. This gives the user the added flexibility of combining the VM3640A with two additional VM3640As, providing a multi-channel arbitrary waveform generator. The VM3640A can also be combined with other instruments, such as digital multimeters, digitizers or counters, to create a multi-function, C-size card.

## Performance

Standard built-in waveforms are provided that include sine, square, triangle, ramp, noise, pulse, sine(x)/x, exponential rise/fall, and cardiac and up to 120 k points of memory is available per unit for user-defined waveforms. The VM3640A is designed for multiple channel applications and three VM3640As can be internally locked for synchronous operation. If a high-stability clock source is required, this can be fed into the VXIbus chassis through the Slot 0 controller, or front panel input, allowing the VM3640As to be locked to this.

Any of the VXIbus TTL trigger lines or a front panel trigger can be used to trigger the VM3640A, allowing it to loop through the waveform memory.

## Programming

The VM3640A is programmed using message-based word serial protocol. The commands are SCPI and IEEE-488.2 compatible. VXI*plug&play* drivers are also provided to further ease programming. For faster data access, the VM3640A also supports pseudo-register access.

## Calibration

The calibration constants used to correct the data values are stored in nonvolatile memory, and are password protected for security. These constants are determined when the instrument is calibrated and can be changed as necessary (such as during routine calibration cycles). The constants may also be queried at any time via a word serial query and altered via a word serial command (if the password is known). All calibration is done using calibration DACs to adjust the gain and offset of each channel. This eliminates the need for removing covers from the unit and allows for automated calibration.

# 50 MSa/s Arbitrary Waveform/Function Generator (VMIP™)

## Specifications

### Waveforms

| | |
|---|---|
| **Standard Functions:** | Sine, square, triangle, noise, pulse, sinc, cardiac, dc, positive and negative ramp, exponential rise and fall |
| **Length (standard patterns):** | 4 k (4096) samples |
| **Length (user patterns):** | 8 to 122,880 samples. (Up to sixteen user defined patterns may be stored, depending on the amount of pattern RAM) |
| **Resolution:** | 12 bits (including sign) |
| **Sample Rate:** | 50 MSa/s |

### Frequency

| | |
|---|---|
| **Sine:** | 0.1 Hz to 20 MHz. Total harmonic distortion on sinewave no greater than 0.5%. |
| **Square:** | 0.1 Hz to 20 MHz. Rise/Fall time of square wave no greater than 20 ns with maximum aberrations less than 5% |
| **All other Waveforms:** | 0.1 Hz to 1 MHz |
| **Resolution:** | 8 digits limited by 0.1 Hz for sine and square waves. 5 digits for all other waveforms. |
| **Accuracy:** | Same as VXI CLK10 (±0.01% typical); can be improved by using an external reference. |

### Amplitude

**Range:**

| | |
|---|---|
| Volts dc: | -6 V to +6 V into 50 Ω<br>-10 V to +10 V into >200 Ω |
| Pulsed dc: | -6 Vp to +6 Vp into 50 Ω |
| Sine/Square: | 10 Vp into 50 Ω |
| All Other Waveforms: | 10 Vp into 50 Ω |
| **Output Impedance:** | 50 Ω |
| **Resolution:** | 3.5 digits |
| **Accuracy:** | ±1% |

**Output Offset Range:**

| | |
|---|---|
| Volts dc: | -3 V to +3 V, Offset + Amplitude cannot exceed ±6 V |
| Pulsed dc: | -3 V to +3 V, Offset + (Amplitude/2) cannot exceed ±3.5 V |
| Sine/Square: | -3 V to +3 V, Offset + Amplitude cannot exceed 6 V |
| All Other Waveforms: | -3 V to +3 V, Offset + Amplitude cannot exceed 6 V |

## Ordering Information

VM3640A

| | |
|---|---|
| **VM3640A** | Single-channel 50 MSa/s AWG (must be configured with a VM9000 host module) |