

# M3302A/M3300A

## PXle Arbitrary Waveform Generator and Digitizer Combos with Optional Real-Time Sequencing and FPGA Programming

500 MSa/s, 16 Bits, 2 Channel AWG + 500 MSa/s, 14 Bits,  
2 Channel Digitizer

500 MSa/s, 16 Bits, 2/4 Channel AWG + 100 MSa/s, 14 Bits,  
4/8 Channel Digitizer



# Fast, Flexible, High-Performance Control, Testing and Prototyping

The M3302A/M3300A combine high-performance arbitrary waveform generator channels and digitizer channels in the same module providing the ideal tool for testing and prototyping in control or communications applications. Performance meets simplicity thanks to easy-to-use programming libraries, real-time sequencing technology (Hard Virtual Instrumentation or HVI), and graphical FPGA programming technology.

## Features

### Output options (AWGs)

- 500 MSa/s, 16 Bits, 2/4 Channels

### Input options (digitizers)

- 500 MSa/s, 14 Bits, 2 Channels
- 100 MSa/s, 14 Bits, 4/8 Channels

### Output features

- AWGs, function generators, AM/FM/PM modulators
- Advanced triggering and marking functionalities

### Input features

- Powerful data acquisition system (DAQ)
- Advanced triggering and marking functionalities

### Less than 400 ns input to output latency

### Optional HW programming for high-performance applications

- Real-time sequencing (HVI technology)
- FPGA programming
  - Xilinx Kintex-7 325T or 410T FPGA

### Up to 2 GB of onboard RAM (~ 1 Gsamples)

### Mechanical/interface

- 2 slots 3U (PXIe)
- Up to 1.6 GB/s transfer BW with P2P capabilities (PCIe Gen 2)
- Independent DMA channels for fast and efficient data transfer

## Applications

General purpose AWGs and digitizers

High-performance control

Communications: BB or IF SDR, channel emulation, transceiver testing

Aerospace and defense (A/D): RADAR, electronic warfare (EW)

Hardware-in-the-loop (HIL), automated test equipment (ATE)

Scientific research

## Programming technology and software tools

### Software programming

- Easy-to-use native programming libraries for most common languages: C, C++, Visual Studio, LabVIEW, MATLAB, Python, and more

### Hardware programming (optional)

- Real-time sequencing (Hard Virtual Instrumentation or HVI technology)
  - Graphical flowchart-style M3601A design environment (-HV1 option required on HW)
  - Ultra-fast, fully-parallelized, hard real-time execution
  - Ultra-fast, time-deterministic decision-making
  - Off-the-shelf inter-module synchronization and data exchange
- FPGA programming
  - Graphical M3602A FPGA design environment (-FP1 option required on HW)
  - No FPGA know-how required
  - Include high-level to low-level design elements: off-the-shelf DSP blocks, MATLAB/Simulink designs, Xilinx CORE Generator IP cores, Xilinx VIVADO/ISE projects, VHDL or Verilog code
  - Ultra-fast, one-click compiling and on-the-fly programming

### No programming

- Ready-to-use SD1 SPF (software front panels)

## M31XX/M32XX/M33XX family product table

Product	Type	Outputs (AWGs)				Inputs (Digitizers)			
		Speed (MSa/s)	Bits	Ch	BW (MHz)	Speed (MSa/s)	Bits	Ch	BW (MHz)
M3202A	AWG	1000	14	4	DC-400				
M3201A	AWG	500	16	4	DC-200				
M3102A	Digitizer					500	14	4	DC-200
M3100A	Digitizer					100	14	4/8	DC-100
M3302A	Combo	500	16	2	DC-200	500	14	2	DC-200
M3300A	Combo	500	16	4	DC-200	100	14	4/8	DC-100

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