PROTEUS
Infinite possibilities

AWG&AWT Models

TABOR ELECTRONICS

Proteus AWG Models & Options Selection Guide

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Modular, scalable and compact

Based on PXI Express industry standard the modular architecture can easily scale to hundreds of channels, while keeping the required space to a minimum. The compact form size enables up to 4 generator output channels and 2 digitizer input channels to occupy only 3 PXI slots. So for synchronized, phase coherent, multi-channel applications such as quantum physics and radar applications the Proteus arbitrary waveform transceiver is an ideal, space efficient and cost effective solution.

Ultra-fast communication interface

Spending more time setting up your generated scenario than actually running it? The PCI Express Gen 3 x8 lanes connection enables up to 64Gb/s of data transfer speed. This enables the Proteus arbitrary waveform transceiver to offer the fastest waveform download available on the market today, saving you one of your most valuable resources, time.

Feedback control system

Many of today's applications, require conditional waveform generation depending on input signals from the environment. The Proteus arbitrary waveform transceiver flawlessly integrates both DAC and ADC in one system, controlled by a single FPGA for optimal synchronization and minimum latency. This high speed control system provides a feedback loop for fast decision making on the fly with minimum latency.
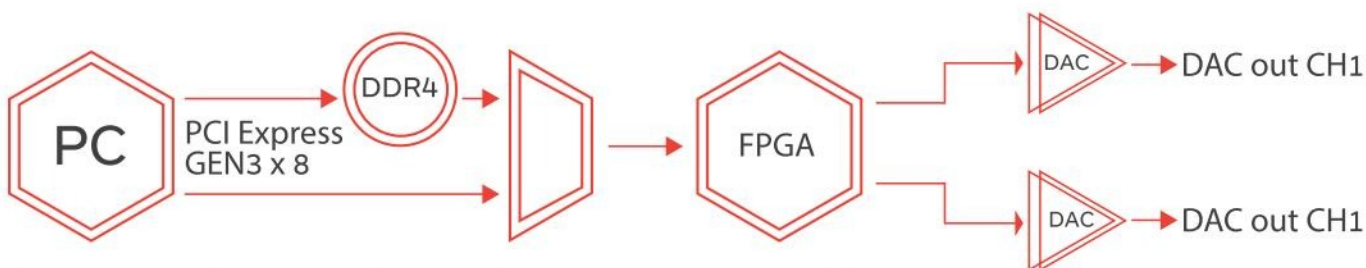
Generate any imaginable scenario

The new series offers an innovative task oriented sequence programming where user can change the full instrument set up at every line of the task table. In addition, not only can users of the Proteus series instruments generate and download waveforms simultaneously, they can stream data directly to the FPGA without the need to use the built in memory. This enables generating random, unique and infinitely long scenarios directly from the controlling PC at DAC speeds of up to 9GS/s. So no matter whether your scenario is extremely complex, infinite or even dynamic you can generate it with the Proteus series model

PROTEUS
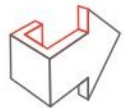Infinite possibilities

Module Platform

Based on a PXIe platform, the system integrates the ability to transmit, receive and perform digital signal processing all in a single instrument. The modular, compact and cost effective system offers industry leading performance, various configuration options, an innovative task oriented programming, and user programmable FPGA. So whether it is for aerospace and defense, telecommunications, automotive, medical or high-end physics applications Proteus opens the door to a world of infinite possibilities.

Leading Features:

Dual or Four channel 1.25GS/s & 2.5GS/s 16 bit, or Dual channel 9GS/s having 16 bit AWG & AWT configurations

Integrated NCO for digital upconverting to microwave frequencies

Real time data streaming directly to the FPGA for continuous and infinite waveform generation.

8GHz Bandwidth, 2.7GS/s 12 bit digitizer option for feedback control system and conditional waveform generation

Innovative task oriented sequence programming for maximum flexibility to generate any imaginable scenario

Up to 16GS/s waveform memory with the ability to simultaneously generate and download waveforms.

Excellent phase noise and spurious performance

User customizable FPGA for demodulation, digital filtering and application specific

High speed PCIe GEN3x8 lanes communication interface

Modular and space efficient PXI Express platform, easily scalable to hundreds of channels.

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CHANNELS CHARACTERISTICS		P9082M	P2582M | P2584M	P1282M | 1284M
NUMBER OF CHANNELS		2	2 | 4	2 | 4
INITIAL SKEW		<20ps		
FINE DELAY				
	RANGE	0 to 5 ns		
	RESOLUTION	5ps		
	ACCURACY	±5ps		
COARSE DELAY				
	RANGE	0 to wavelength		
	RESOLUTION	1 sample point		

ARBITRARY MODE	P9082M	P2582M | P2584M	P1282M | 1284M
MAX. SAMPLE RATE	9GS/s	2.5GS/s	1.25GS/s
RESOLUTION	Up to 16-bit (Depending on model and mode)		
MAX. MEMORY SIZE	Up to 16GS	Up to 8GS	
NUMBER OF SEGMENTS	64k		
MINIMUM SEGMENT LENGTH NORMAL FAST SEGMENT	2048 points 224 points	1024 points 64 points	
WAVEFORM GRANULARITY STANDARD OPTIONAL	64 points 32 points	32 points 16 points	32 points 16 points
INTERPOLATION MODES	x1	x1, x2 and x4	

TASK MODE	
TASK TABLE LENGTH	64K tasks per channel
TASK LOOPS	1M
SEQUENCE	A sequence is defined as a continuous and looped series of tasks
MAX. NUMBER OF SEQUENCES	32K sequences
SEQUENCE LOOPS	1M
SCENARIO	A scenario is defined as a continuous series of tasks/sequences
MAX. NUMBER OF SCENARIOS	1K scenarios

STREAMING (STM OPTION)	
MAX. STREAM RATE	6GS/s
MINIMUM PC REQUIREMENTS	
CPU	i7
MEMORY	32G
OPERATING SYSTEM	WINDOWS 10
SOURCE	PXI Express Bus

SIGNAL PURITY	DC OUTPUT	DIRECT OUTPUT
HARMONIC DISTORTION [1]		
fout = 10 MHz - 200 MHz, Measured @ DC to 2 GHz	<-70 dBc (typ.)	<-70 dBc (typ.)
fout = 200 MHz ... 1.5 GHz, Measured @ DC to 4.5 GHz	<-60 dBc (typ.)	<-60 dBc (typ.)
fout = 1.5 GHz ... 4.5 GHz, Measured @ DC to 4.5 GHz	<-50 dBc (typ.)	<-50 dBc (typ.)
SFDR [2]		
fout = 10 MHz...500 MHz, Measured @ DC to 1.5 GHz	-80 dBc (typ)	<-85 dBc (typ)
fout = 500 MHz...4.5 GHz , Measured @ DC to 4.5 GHz	-70 dBc (typ)	<-75 dBc (typ)
PHASE NOISE (@10kHz offset)		
fout = 140.625MHz	-134 dBc/Hz	
fout = 280.25MHz	-128 dBc/Hz	
fout = 562.5MHz	-122 dBc/Hz	
fout = 1.125GHz	-116 dBc/Hz	
fout = 2.25GHz	-110 dBc/Hz	
fout = 4.5GHz	-104 dBc/Hz	

[1] SCLK=Max sample rate, amplitude = 400mVpp, Direct mode, measured using balun
[2] SCLK=Max sample rate, amplitude = 400mVpp, excluding SCLK/2-fout, measured using balun

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DC OUTPUT

OUTPUT TYPE	Single-ended or differential, DC-coupled
IMPEDANCE	50Ω (nom)
AMPLITUDE	50 mVp-p to 1.3 Vp-p
AMPLITUDE RESOLUTION	1mV
DC AMPLITUDE ACCURACY	±(3% of amplitude ±2 mV)
VOLTAGE WINDOW	±1.15V
DC OFFSET	±0.5V
OFFSET RESOLUTION	10mV
DC OFFSET ACCURACY	±(3% of setting ±15 mV)
SKEW BETWEEN NORMAL AND COMPLEMENT OUTPUTS	0ps
RISE/FALL TIME (20% TO 80%)	< 130 ps (typ)
INSTANTANEOUS BANDWIDTH P128xM | P258xM | P9082M	625MHz | 2.25GHz | 4.5GHz
MAX. USABLE FREQUENCY P128xM | P258xM | P9082M	2nd Nyquist 1.25GHz | 2.5GHz | 4.5GHz
JITTER (PEAK-PEAK)	<15 ps (typ)
OVERSHOOT	<5% (typ)
CONNECTOR TYPE	SMA

DIRECT OUTPUT (OPTIONAL)

OUTPUT TYPE	Single-ended or differential, AC coupled
IMPEDANCE	50Ω (nom)
AMPLITUDE	600mVpp, single-ended into 50Ω
AMPLITUDE RESOLUTION	1mV
AMPLITUDE ACCURACY	±(3% of amplitude ±2 mV)
RISE/FALL TIME (20% TO 80%)	< 60 ps (typ)
INSTANTANEOUS BANDWIDTH P128xM | P258xM | P9082M	625MHz | 2.25GHz | 4.5GHz
MAX. USABLE FREQUENCY P128xM | P258xM | P9082M	2nd Nyquist 1.25GHz | 2.5GHz | 9GHz
CONNECTOR TYPE	SMA

SAMPLE CLOCK OUTPUT

SOURCE	Selectable, internal synthesizer or sample clock input
FREQUENCY RANGE	SCLK Range
OUTPUT AMPLITUDE	0.5V to 1V depending on SCLK
IMPEDANCE	50Ω (nom), AC coupled
CONNECTOR	SMA

SYNC CLOCK OUTPUT

AMPLITUDE	500mVpp, typ.
FREQUENCY P9082M P128xM, P258xM	SCLK/32 SCLK/8
WAVEFORM	Square
RISE/FALL TIME (20% TO 80%)	<150ps
IMPEDANCE	LVCMOS
CONNECTOR	SMP

MARKER OUTPUTS

NUMBER OF MARKERS P1282M, P1284M P2582M, P2584M, P9082M	4 (extra 8 Optional) 8 (extra 8 Optional)
OUTPUT TYPE	Single Ended
OUTPUT IMPEDANCE	50Ω (nom)
AMPLITUDE	
VOLTAGE WINDOW	±1.15V
LEVEL	32mVpp to 1.2Vpp (32 discrete levels)
RESOLUTION	10mVpp
ACCURACY	±7%
OFFSET	
RANGE	±0.5V
RESOLUTION	10mV
ACCURACY	±(3% of setting ±15 mV)
RISE/FALL TIME (20% TO 80%)	<200ps
RANGE	0 - waveform length
RESOLUTION P128xM, P258xM P9082M	2 pts 8 pts
MARKER DELAY	
COARSE DELAY	
RANGE	0 to 2048 points
RESOLUTION P128xM, P258xM P9082M	8 points 32 points
FINE DELAY	
RANGE	0 to 1.2ns
RESOLUTION	1ps
ACCURACY	15ps
CONNECTOR TYPE	SMP

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