PROTEUS

Infinite possibilities

Benchtop Platform

Introducing Tabor's all new Proteus series, the world's first Arbitrary Waveform Transceiver. In its benchtop platform, with a 9" touch display and on-board PC the system integrates the ability to transmit, receive and perform digital signal processing all in a single instrument. The fully standalone operated system, offers industry leading performance, various configuration options, an innovative task oriented programming, and user programmable FPGA. So whether it is for high-en aerospace and defense, telecommunications, automotive, medical or d physics applications Proteus opens the door to a world of infinite possibilities.

Leading Features:

Dual, four, eight or twelve channel 1.25GS/s & 2.5 GS/s 16 bit, or dual, four or six channel 9GS/s 8 bit, AWG & AWT configurations

Integrated NCO for digital up-converting to microwave frequencies

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

8GHz bandwidth, 5.4GS/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

Excellent phase noise and spurious performance

User Customizable DSP block for real time processing and application specific functionality

Standalone 4U, 19" wide benchtop platform, with 9" touch display, USB 3.0, 10G Ethernet and Thunderbolt high speed interfaces

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

PROTEUS
Infinite possibilities

Standalone and easy to use

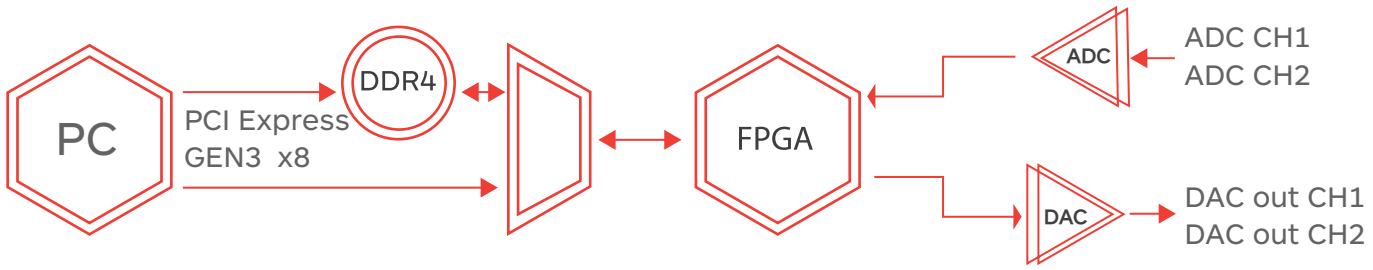
The benchtop version of the Proteus series offers up to 12 channels in a 4U, 19" benchtop box. With a 9" touch display and on-board PC the benchtop platform enables users to program the instrument without the need of an external PC. Users can program the instrument from the on-board PC using various programming environments such as MATLAB, LabView, Python and more. So for synchronized, phase coherent, multi-channel applications such as quantum physics and radar applications the Proteus arbitrary waveform transceiver is an ideal, high performance and cost effective solution.

Ultra-fast data transfer rates

Spending more time setting up your generated scenario than actually running it? The Proteus Benchtop platform utilizes PCI express Gen 3 x4 lanes connection that enables up to 32Gb/s of data transfer speed. This enable 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 3GS/s. So no matter whether your scenario is extremely complex, infinite or even dynamic you can generate it with the Proteus series model.

CHANNELS CHARACTERISTICS	P9082/4/6B	P2582/4/8/12B	P1282/4/8/12B
NUMBER OF CHANNELS	2/4/6	2/4/8/12	2/4/8/12
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	P9082/4/6B	P2582/4/8/12B	P1282/4/8/12B
MAX. SAMPLE RATE	9GS/s	2.5GS/s	1.25GS/s
RESOLUTION	8-bit	16-bit	
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

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	3GS/s
MINIMUM PC REQUIREMENTS	
CPU	i7
MEMORY	32GB
OPERATING SYSTEM	WINDOWS 10 IoT
SOURCE	Internal / Rear panel interfaces

SIGNAL PURITY	DC OUTPUT	DIRECT OUTPUT
HARMONIC DISTORTION [2]		
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 [3]		
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] Max input data rate is 2.5GS/s. Max. interpolating sample rate is 9GS/s
[2] SCLK=Max sample rate, amplitude = 400mVpp, Direct mode, measured using balun
[3] SCLK=Max sample rate, amplitude = 400mVpp, excluding SCLK/2-fout, measured using balun

PROTEUS

Infinite possibilities

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 P128xB | P258xB | P908xB	 625MHz | 1.25GHz | 4.5GHz
MAX. USABLE FREQUENCY P128xB | P258xB | P908xB	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	1mVpp to 550mVpp
AMPLITUDE RESOLUTION	1mV
AMPLITUDE ACCURACY	±(3% of amplitude ±2 mV)
RISE/FALL TIME (20% TO 80%)	< 60 ps (typ)
INSTANTANEOUS BANDWIDTH P128xB | P258xB | P908xB	 625MHz | 1.25GHz | 4.5GHz
MAX. USABLE FREQUENCY P128xB | P258xB | P908xB	2nd Nyquist 1.25GHz | 2.5GHz | 8GHz
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 P908xB P128xB, P258xB	 SCLK/32 SCLK/8

SYNC CLOCK OUTPUT (Continued)	
WAVEFORM	Square
RISE/FALL TIME (20% TO 80%)	<150ps
IMPEDANCE	LVCMOS
CONNECTOR	SMP

MARKER OUTPUTS	
NUMBER OF MARKERS P1282B, P1284B P1288,P2582,P2584, P9082B P12812B P2588B, P9084B P25812B, P9086B	 4 8 12 16 24
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 P128xB, P258xB P908xB	 2 pts 8 pts
MARKER DELAY	
COARSE DELAY	
RANGE	0 to 2048 points
RESOLUTION P128xB, P258xB P908xB	 8 points 32 points
FINE DELAY	
RANGE	0 to 1.2ns
RESOLUTION	1ps
ACCURACY	15ps
CONNECTOR TYPE	SMP

REFERENCE CLOCK OUTPUT	
SOURCE	Internal TCXO
WAVEFORM	Square
FREQUENCY	100MHz or REF IN
STABILITY	+/- 2.5 PPM
AGING	+/- 1 PPM @ +25°C (per year)
CONNECTOR	SMP

REFERENCE CLOCK INPUT	
INPUT FREQUENCIES	10MHz / 100MHz selectable
LOCK RANGE	± 1MHz
INPUT LEVEL	0.6 Vp-p to 1.7 Vp-p
IMPEDANCE	50Ω, AC coupled (nom)
CONNECTOR TYPE	SMP

SAMPLE CLOCK INPUT	
FREQUENCY RANGE	SCLK Range
INPUT POEVEL RANGE	0.4Vpp to 1.2Vpp
DAMAGE LEVEL	<-0.5V or >1.5V
INPUT IMPEDANCE	50Ω nom, AC coupled
CONNECTOR TYPE	SMA

TRIGGER INPUTS	
RANGE	–5 V to +5 V
THRESHOLD	±5 V
RESOLUTION	100 mV
SENSITIVITY	200 mV
JITTER Standard P128xB, P258xB P908xB Low Trigger Jitter Opt.	 8 SCLK periods 32 SCLK periods SQRT(SCLK period^2 + 150e-12^2)
LATENCY / SYSTEM DELAY P128xB, P258xB P908xB	 <900SCLK periods <2700 SCLK Periods
POLARITY	Pos or Neg
SOURCE	Selectable between channels
INPUT IMPEDANCE	10 kΩ or 50Ω (nom), DC coupled, factory configured
MAX TOGGLE FREQUENCY	10MHz (50MHz Optional)
MINIMUM PULSE WIDTH	50ns (5ns Optional)
CONNECTOR TYPE	SMP

FAST SEGMENT DYNAMIC CONTROL INPUT (OPTIONAL)	
INPUT SIGNALS	Data 6bit, Channel select 2 bit, Valid 1 bit
SEGMENTS / SEQUENCES	64 fast
DATA RATE	35MHz
MINIMUM LATENCY (Dynamic control input to direct out)	
FAST SEGMENT	<250ns
NORMAL SEGMENT	<1µ
INPUT LEVEL	LVTTL
CONNECTOR	D-SUB, 9 pin

DIGITIZER CHARACTERISTICS (AWT OPTION)	
NUMBER OF CHANNELS	1 or 2
INPUT VOLTAGE RANGE	500 mVpp (full scale)
INPUT VOLTAGE OFFSET	-2V to +2V
INPUT FREQUENCY RANGE	9GHz
RESOLUTION	12 bits
ACQUISITION MEMORY	up to 8GS
SAMPLE CLOCK SOURCES	Internal or external
INTERNAL CLOCK SOURCE	Internal, external reference
MAX SAMPLING RATE	5.4GS/s in Single channel mode 2.7Gs/s in Dual channel mode
MIN SAMPLING RATE	1GS/s
CLOCK ACCURACY	<2 ppm
IMPEDANCE	50Ω
COUPLING	DC or AC (factory configured)
CONNECTOR	SMA
TRIGGER SYSTEM	
TRIGGER MODES	Positive, negative edge
TRIGGER SOURCES	External, Software, Channel
COUPLING	DC
IMPEDANCE	50Ω (nominal)
LEVEL RANGE	>± 2.5 V (nominal)
FREQUENCY RANGE	DC to 65MHz
CONNECTOR	SMA

FPGA PROGRAMMING	
FPGA TYPE	Xilinx Kintex UltraScale XCKU060 upgradeable to XCKU115
MODES	
STANDARD	Tabor standard built-In functionality
DECISION BLOCKS	Built-in library of mathematical functions, modulation & digital Filters
SHELL	Open core providing all interfaces and configuration path to the user

DIGITAL UPCONVERTER	
MODES P258X ALL OTHERS MODELS	 NCO / Interpolation / IQModulation NCO only
SAMPLING RATE	1GS/s to Max sample rate
CARRIER FREQUENCY	
RANGE	0 to 40% of Sampling rate
RESOLUTION	48 bit
PHASE RANGE	0 to 360°
PHASE RESOLUTION	16 bit
INTERPOLATION FACTORS	x2, x4, x8
IQ FORMAT IQ PAIR PER CHANNEL MAX INPUT RATE NUMBER OF CHANNEL	x2 Mode 1 1,250MS/s 2
SFDR AND HARMONICS	Same as Arbitrary
MEMORY	Same as Arbitrary

PROTEUS

Infinite possibilities

GENERAL	
VOLTAGE RANGE:	100 VAC to 264 VAC
FREQUENCY RANGE:	47Hz to 63Hz
POWER CONSUMPTION:	550W max.
INTERFACE: USB Thunderbolt (Optional) LAN (BASE-T) SFP+ (Optional, Replaces RJ45) GPIB (Optional)	 1 x front panel USB host (type A) 2 x rear panel USB host, (type A) 1 x rear panel USB Device (type C) 1 x rear panel Thunderbolt3 1 x rear panel RJ45 1000/100/10 1 x rear panel SFP+ 10G Optical IEEE 488.2 – GPIB
STORAGE	120GB removable
WEIGHT Without Package Shipping Weight	 7.5 kg 9 kg
DIMENSIONS: With feet Without feet	 440 X 175 x 330 mm (W x H x D) 440 X 190 x 330 mm (W x H x D)
TEMPERATURE: Operating Storage Warm up time	 0°C to +40°C -40°C to +70°C 15 minutes
HUMIDITY:	85% RH, non-condensing
SAFETY:	CE Marked, EC61010-1:2010
EMC:	IEC 61326-1:2013
CALIBRATION:	2 years
WARRANTY*:	3 year standard * 1 year standard in India

ORDERING INFORMATION	
MODEL	**DESCRIPTION**
P1282B	1.25GS/s, 16Bit, AWG, 1GS Memory, 2CH, 4 Markers
P1284B	1.25GS/s, 16Bit, AWG, 1GS Memory, 4CH, 4 Markers
P1288B	1.25GS/s, 16Bit, 2GS Memory, 8CH 8 Markers
P12812B	1.25GS/s, 16Bit, 2GS Memory, 12CH 12 Markers
P2582B	2.5GS/s, 16Bit, 2GS Memory 2CH, 8 Markers
P2584B	2.5GS/s, 16Bit, 2GS Memory, 4CH, 8 Markers
P2588B	2.5GS/s, 16Bit, 2GS Memory, 8CH 16 Markers
P25812B	2.5GS/s, 16Bit, 2GS Memory, 12CH, 24 Markers
P9082B	9GS/s, 16Bit, 4GS Memory 2CH, 8 Markers
P9084B	9GS/s, 16Bit, 4GS Memory 4CH, 16 Markers
P9086B	9GS/s, 16Bit, 4GS Memory 6CH, 24 Markers

OPTIONS	
4M1	4GS Memory option for models P1282B & P2582B
4M2	4GS Memory option for models P1284B & P2584B
4M3	4GS Memory option for models P1288B, P2588B & P9084B
4M4	4GS Memory option for models P12812B, P25812B & P9086B
8M1	8GS Memory option for models P1282B & P2582B
8M2	8GS Memory option for models P1284B, P2584B & P9082B
8M3	8GS Memory option for models P1288B, P2588B & P9084B
8M4	8GS Memory option for models P12812B, P25812B & P9086B

OPTIONS (Continued)	
16M1	16GS Memory option for models P9082B
16M2	16GS Memory option for models P9084B
16M3	16GS Memory option for models P9086B
DO1	9GHz BW Direct Output option for models P1282B & P2582B
DO2	9GHz BW Direct Output option for models Pxx84B & P9082B
DO3	9GHz BW Direct Output option for models Pxx88B & P9084B
DO4	9GHz BW Direct Output option for models Pxx812B & P9086B
DJ1	Dynamic Jump Input option for models P1282B & P2582B
DJ2	Dynamic Jump Input option for P1284B, P2584B & P9082B
DJ3	Dynamic Jump Input option for P1288B, P2588B & P9084B
IM1	Interpolation Mode option for P258B (x2 and x4)
IM2	Interpolation Mode option for P908B (x2, x4 and x8)
MRK1	x8 Extra Markers option for models P1282B & P2582B
MRK2	x8 Extra Markers option for models P1284B, P2584B & P9082B
MRK3	x16 Extra Markers option for models P1288B, P2588B & P9084B
LTJ1	Ultra Low Trigger Jitter (200ps typ.) option for models P1282B & P2582B
LTJ2	Ultra Low Trigger Jitter (200ps typ.) option for models P1284B, P2584B & P9082B
LTJ3	Ultra Low Trigger Jitter (200ps typ.) option for models P1288B, P2588B & P9084B
LTJ4	Ultra Low Trigger Jitter (200ps typ.) option for models P12812B, P25812B & P9086B
G1	Low Waveform Granularity option for models P1282B & P2582B
G2	Low Waveform Granularity option for P1284B, P2584B & P9082B
G3	Low Waveform Granularity option for P1288B, P2588B & P9084B
G4	Low Waveform Granularity option for P12812B, P25812B & P9086B
AWT	5.4GS/s Single, 2.7GS/s Dual Channel 12 Bit Digitizer option for models P1284B, P1288B, P2584B, P2588B, P9082B & P9084B
STM	3GS/s Streaming option
DUC	Digital UpConverter for models P2582B, P2584B, P2588B & P25812B
SEC	Removable SSD option for security needs for all models
SSD	Extra Factory Duplicated Solid State Drive (SSD) for option SEC
TRG	Faster trigger input (50MHz instead of 10MHz)
PROG	High level FPGA programming capability through decision blocks of built-in Demodulation & digital Filters
Shell	Programmable FPGA with open core for user embedded IP
TBolt	Rear panel Thunderbolt3 USB (type C)
SFP+	Rear panel 10G optical SFP+ connectivity (replace the LAN)

绿测科技有限公司

广州总部：广州市番禺区陈边村金欧大道83号江潮创意园A栋208室
深圳分公司：深圳市龙华区龙华街道 油松社区东环一路1号耀丰通工业园1-2栋2栋607
南宁分公司：广西自由贸易试验区南宁片区五象大道401号五象航洋城1号楼3519号
广州分公司：广州市南沙区凤凰大道89号中国铁建·凤凰广场B栋1201房
电话：020-2204 2442
传真：020-8067 2851
邮箱：Sales@greentest.com.cn
官网：www.greentest.com.cn

微信视频号　绿测科技订阅号　绿测工场服务号