45 YEARS OF INNOVATION

MODELS WS8101/2

100MHz Single/Dual Channel Arbitrary Function Generators

- Single / Dual Channel Arbitrary / Function Generators
- 100MHz sine and 62.5MHz square waves
- Triangle, ramp, sinc, gaussian, exponential, noise, pulse generation with variable edge, and DC waveforms
- 16Vp-p into 50Ω, 32Vp-p into open circuit
- 16 Bit, 250MS/s, 512Kpoint arbitrary waveforms

- Linear & logarithmic sweeps
- Continuous, triggered, gate and burst
- AM, FM, FSK, and PSK modulation
- High resolution 3.8" LCD, color display
- Ethernet, USB and GPIB interfaces
- ArbConnection software for easy waveform creation

The Tabor Wave Standard 8101/2 is a Single / Dual Channel Arbitrary / Function Generator with a 100MHz bandwidth and the functionality of a function generator, arbitrary generator and pulse generator all in one easy to use high performance unit. It is a compact stand alone bench top unit that will satisfy all of the industry and education standard testing needs for years to come.

Standard Waveforms
The WS8101/2 has 11 built in functions for quick and easy wave generation. Front panel operations allows for easy selection of wave form and editing of all wave parameters. All of the standard waves can reach up to 31.25MHz with Sine and Square going as high as 100MHz and 62.5MHz respectively.

User Defined Waveforms
For more advanced users the WS8101/2 with its 16-bit vertical resolution offers a standard 512kb memory depth and a 250MS/s sample clock for designing waveforms. With the ability to control and edit the value of each and every point any wave is possible. The memory can be divided into segments for storing all of the user defined waveforms.

Modulated Waveforms
Agility and modulation capabilities open the door to diverse applications. In addition to the capability of generating any shape and style of waveform with the arbitrary waveform generation power, the products can also do standard modulation schemes such as FM, AM, FSK, sweep and PSK without sacrificing the power of the instrument control and output run modes.

Accuracy and Stability
As standard, the instrument is equipped with an internal frequency reference that has 1ppm accuracy and stability over a period of 1 year. An external frequency reference is provided on the rear panel for applications requiring greater accuracy or stability, supported by the instrument's up to 14 digits resolution from remote.

Easy to Use
Large and user-friendly 3.8" back-lit color LCD display facilitates browsing through menus, updating parameters and displaying detailed and critical information for your waveform output. Combined with numeric keypad, cursor position control and a dial, the front panel controls simplify the often complex operation of an arbitrary function generator.

Remote Control
Model WS8101/2 comes standard with a variety of interfaces: LAN, USB and GPIB allowing the user to freely select the interface best suited to his individual requirements. The included ArbConnection software is a powerful editorial tool for designing waveforms and provides the user with full control of instrument functions, modes and features.

Multiple Environments to Write Your Code
Model WS8101/2 comes with a complete set of drivers, allowing you to write your application in various environments such as: Labview, CVI, C++, VB and MATLAB. You may also link the supplied dll to other Windows based API's or, use low level SCPI commands (Standard Commands for Programmable Instruments) to program the instrument, regardless if your application is written for Windows, Linux or Macintosh operating systems.

Automated External Self-Calibration
Leading-edge technology is implemented to allow calibration from any interface, USB, GPIB or LAN and calibration factors are stored in a flash memory thus eliminating the need to open instrument covers.

TABOR ELECTRONICS Inc.
Since 1971

Specification

CONFIGURATION

Output Channels	1 or 2, semi-independent

STANDARD WAVEFORMS

Waveforms:	Sine, Triangle, Square, Pulse, Ramp, Sine(x)/x, Gaussian, Exponential, Repetitive Noise, DC.
Frequency Range:	
Sine	1µHz to 100MHz
Square	1µHz to 62.5MHz
All Others	1µHz to 31.25MHz

SINE

Start Phase:	0-360°
Phase Resolution:	0.01°
Harmonics Distortion (1Vp-p):	
1MHz to 5MHz	<-60dBc
5MHz to 10MHz	<-57dBc
10MHz to 25MHz	<-55dBc
25MHz to 50MHz	<-50dBc
50MHz to 100MHz	<-45dBc
Non-Harmonic Distortion (1Vp-p):	
1MHz to 25MHz	<-70dBc
25MHz to 50MHz	<-65dBc
50MHz to 100MHz	<-60dBc
Total Harmonic Distortion:	
DC to 100kHz	0.1%
Flatness (1MHz, 1Vp-p):	
1MHz to 25MHz	<0.5dBc
25MHz to 50MHz	<1dB
50MHz to 100MHz	<2dB
SSB Phase Noise (10kHz offset):	
1MHz	<-115dBc
10MHz	<-100dBc
100MHz	<-80dBc

TRIANGLE

Start Phase:	0-360°
Phase Resolution:	0.01°

SQUARE

Duty Cycle Range:	0% to 99.9%
Resolution:	0.1%
Rise/Fall Time:	<5ns (<4ns typ.)
Overshoot (typ.):	<5%
Jitter (rms):	<100ps

RAMP

Timing Ranges:	0%-99.9% of period

SINC (Sine(x)/x)

"0 Crossings":	4-100

GAUSSIAN

Time Constant:	10-200

EXPONENTIAL PULSE

Type:	Rise or Decay, selectable
Time Constant:	-100 to 100

REPETITIVE NOISE

Type:	Repetitive
Bandwidth:	31.25MHz

DC

Range:	-8V to 8V

PULSE

Pulse Mode:	Single or double, programmable
Polarity:	Normal, inverted or complement
Period:	16ns to 1000s
Resolution:	4ns
Pulse Width:	8ns to 1000s
Resolution	4ns
Accuracy	<2% (typ.)
Rise/Fall Time:	
Fast	<4ns (typ.)
Linear	4ns to 1000s
High Time, Delay & Double Pulse Delay:	4ns to 1000s
Impedance:	50Ω
Amplitude Window:	16mVp-p to 16Vp-p[1]
Low Level	-8V to +7.992V [1]
High Level	-7.992V to +8V [1]

[1] Double into high impedance

NOTES:

1. All pulse parameters, except rise and fall times, may be freely programmed within the selected pulse period provided that the ratio between the period and the smallest incremental unit does not exceed the ratio of 512,000 to 1, hence the specifications above do not show maximum limit as each must be computed from the above relationship.
2. Rise and fall times, may be freely programmed provided that the ratio between the rise/fall time and the smallest incremental unit does not exceed the ratio of 100,000 to 1.
3. The sum of all pulse parameters must not exceed the pulse period setting.

ARBITRARY WAVEFORMS

Sample Rate:	1.5S/s to 250MS/s
Vertical Resolution:	16 bits
Waveform Memory:	512k points
Min. Segment Size:	16 points
Resolution:	4 points
No. of Segments:	1 to 1k
Waveform Granularity:	1 point

MODULATION

Carrier Waveform:	Sine wave
Carrier Frequency:	1µHz to 100MHz
Source:	Internal

AM

Envelope Waveform:	Sine, square, triangle, ramp
Envelope Freq.:	1mHz to 100kHz
Modulation Depth:	0% to 100%

FM

Modulating Shape:	Sine, square, triangle, ramp
Modulating Freq.:	1µHz to 100kHz
Peak Deviation:	Up to 100MHz

ASK / FSK / PSK

Baud Rate:	1bits/sec to 10Mbits/sec
Data Bits Length:	2 to 4,000

SWEEP

Sweep Step:	Linear or log
Sweep Direction:	Up or Down
Sweep Time:	1µs to 500s

COMMON CHARACTERISTICS

FREQUENCY

Resolution:	
Display	11 digits (limited by 1µHz)
Remote	14 digits (limited by 1µHz)
Accuracy/Stability:	Same as reference

ACCURACY REFERENCE CLOCK

Internal	0.0001% (1 ppm TCXO) 1ppm/year aging rate
External	10MHz TTL, 50% ±2% or 50Ω ±5% 0dBm

AMPLITUDE

Range:	10mV to 16Vp-p into 50Ω; Double into open circuit
Resolution:	4 digits
Accuracy (1kHz):	±(1% + 50mV)
Rise/Fall Time:	<4ns, typ.
Overshoot:	5%, typ.

OFFSET

Range:	0 to ±7.992V, into 50Ω
Resolution:	1mV
Accuracy:	±(1%+1% of Amplitude +5mV)

OUTPUTS

MAIN OUTPUT

Connector:	Front panel BNC
Type:	Single-ended
Impedance:	50Ω ±1%
Protection:	Short Circuit to Ground, 10s max

Specification

SYNC OUTPUT

Connector:	Front panel BNC
Source:	Common
Type:	Single ended
Waveform Type:	BIT (4 points wide)
Impedance:	50Ω
Amplitude:	TTL
Variable Position Control:	
Range	0 to segment length
Resolution	4 points

INPUTS

TRIGGER INPUT

Connector:	Rear panel BNC
Impedance:	10kΩ
Slope:	Positive / Negative (selectable)
Damage Level:	±12V
Input Frequency:	DC to 2.5MHz
Level:	-5V to 5V
Sensitivity:	100mV
Min. Pulse Width:	10ns

EXTERNAL REFERENCE INPUT

Connector:	Rear panel SMB
Input Frequency:	10MHz
Impedance & Level:	
Default	10kΩ ±2%, TTL, 50% ±2%
Option	50Ω ±5%, 0dBm Sinewave

FILTERS

Type:	25MHz, 50MHz, 60MHz, 120MHz

RUN MODES

Continuous:	Free-run output of a waveform.
Triggered:	Upon trigger, outputs one waveform cycle. Last cycle always completed.
Gated:	External signal transition enables or disables generator output. Last cycle always completed
Burst:	Upon trigger, outputs a Dual or multiple pre-programmed number of waveform cycles from 1 through 1M.

TRIGGER CHARACTERISTICS

Trigger Delay:	[(0; 200ns to 20s)+system delay]
Delay Resolution:	20ns
Delay Error:	6 SCLK + 150ns

EXTERNAL

Source:	Common
Source:	Rear panel BNC
Slope:	Positive/Negative, selectable
Damage Level:	±12V
Input Frequency:	DC to 2.5MHz

Trigger Level:	-5V to 5V
Resolution:	1mV
Sensitivity:	100mV
Min. Pulse Width:	10ns
System Delay:	6 SCLK + 150ns
Trigger Jitter:	±1 SCLK period

INTERNAL / TIMER

Range:	200ns to 20s
Resolution:	20ns
Error:	3 SCLK + 20ns

MANUAL

Source:	Soft trigger command from the front panel or remote

INTER-CHANNEL DEPENDENCY (WS8102)

Separate controls:	Output on/off, amplitude, offset, standard waveforms, user waveforms, user waveform size
Common Controls:	Sample clock (Arb), frequency (Std), period (Pulse) reference source, trigger modes, trigger advance source, SYNC OUT

LEADING EDGE OFFSET

Range:	0 to 512k
Resolution:	1 point
Initial Skew:	<1ns
Error	1 SCLK

GENERAL

Voltage Range:	85 to 265VAC, 48-63 Hz
Power Consumption:	60W
Display Type:	Reflective Color LCD, back-lit
Size	3.8"
Resolution	320 x 240 pixels
Interfaces:	
USB	1 x rear, USB device, (A type)
LAN	100/10 BASE-T
GPIB	IEEE-488.2 - SCPI – 1993.0
Dimensions:	
With Feet	212 x 102 x 415 mm (WxHxD)
Without Feet	212 x 88 x 415 mm (WxHxD)
Weight:	
Without Package	3.5 kg
Shipping Weight	4 kg
Temperature:	
Operating	0°C - 50°C
Storage	-40°C to + 70°C.
Humidity:	
11°C - 30°C	85%
31°C - 40°C	75%
41°C - 50°C	45%
Safety:	CE Marked, IEC61010-1
Calibration:	1 year
Warranty [1]**:**	3 years standard

[1] Standard warranty in India is 1 year.

ORDERING INFORMATION

MODEL	DESCRIPTION
WS8101	100MHz Single Channel Arbitrary Function Generator
WS8102	100MHz Dual Channel Arbitrary Function Generator

ACCESSORIES

S-Rack Mount:	19" Single Rack Mounting Kit
D-Rack Mount:	19" Dual Rack Mounting Kit
Case Kit:	Professional Carrying Bag
Note:	Options and Accessories must be specified at the time of your purchase.