

# 1.2GS/s Single-Channel Arbitrary Waveform Generator

TABOR'S NEW  
**WW**  
WONDER WAVE  
SERIES

## MODEL WW1281



- Single-channel 1.2GS/s waveform generator
- Sine and Square wave to 400MHz
- 12-Bit amplitude resolution
- 8M waveform memory, 16M memory, optional
- Differential outputs to 8Vp-p
- Square wave transition times of less than 500ps
- Two serial bits to generate complex digital strings
- FM, Arbitrary FM, FSK, PSK, and Sweep modulations
- Powerful sequencer allowing efficient, long waveforms with multiple sequences, fast coherent segment switching and coded segment hop connector

- Multiple run modes including gated, triggered and bursts
- Trigger delay inhibits the start of the output waveform
- User friendly 3.5" color LCD display
- Multi-Instrument synchronization
- DDS technology for low phase noise and tone separation
- Ethernet 10/100, USB 2.0 and GPIB interfaces
- ArbConnection software for easy waveform creation & control

The 1281, Single Channel Frequency Agile Waveform Synthesizer, combines industry-leading 1.2GS/s sample clock performance, frequency agility and modulation capability in a stand-alone package. Capable of generating waveforms from 1Hz to 400MHz the 1281 supports test stimulus demands of the information age, applications requiring clear tone separation and less than 500ps transition time.

### High Speed Function Generator

The 1281 generates 10 standard waveforms such as sine, square and triangle waves. Sine and square waves can be generated at frequencies up to 400MHz, making the 1281 the fastest function generator available today. The internal reference oscillator provides 1 ppm accuracy and has excellent long-term stability. An external frequency reference can be used if greater accuracy or stability is required.

### 1.2GS/s Performance

As products, which use increased signal bandwidths evolve, test equipment and systems must keep pace with this trend. The 1281's

with its high sample rate generator assures that this test tool does not lag the outbreak of new technology. Combined with unsurpassed price tag, the 1281 is the logical choice for future test technologies.

### 16M Memory

The 1281 offers 8M words of waveform memory and 16M word as an option for generating extremely long arbitrary waveforms. In addition, the memory can be divided into as many as 16k segments, which can be looped and linked in many different ways. Harnessing such memory to the high speed performance of the 1281 provides breakthrough solution for many applications.

### Powerful Segmentation and Sequencing

Solving almost every complex application, powerful segmentation and sequencing produce a nearly endless variety of complex waveforms. The waveform memory can be divided into multiple waveform segments and sequenced in user-selectable fashion to create complex waveforms that have repeatable segments and thus saving precious memory space.

Five different advance modes are available for the 1281 to step through the sequence table, including stepped and mixed advance modes and thus increasing efficiency of the test system. In addition, a rear panel connector has 8-bit control of segment replay providing additional and extremely useful hardware tool to hop between segments.

### Two Serial Digital Output Bits

Standard with the 1281 are two digital outputs, placed on the rear panel and supporting applications that require simultaneous generation of analog waveforms and digital streams. The instrument's sample clock generator drives both front and rear outputs and therefore provides jitter-free simulation of analog signals combined with serial data streams. The serial data is generated from the digital outputs at baud rates up to 2.4GHz.



**TABOR ELECTRONICS Ltd.**

# 1.2GS/s Single-Channel Arbitrary Waveform Generator

## Model WW1281



### **Frequency Agility**

Decrypting radio transmission often employs frequency hopping. The 1281 provides breakthrough technology that allows simulation of 2-level decrypted code as easy as simply writing two frequencies. The frequency hop mode is fast, coherent and provides a great tool for simulating code transmission without losing speed and/or integrity.

### **Accurate Output**

As standard, the instrument is equipped with an internal frequency reference that has 1ppm accuracy and stability over a period of 1 year. A rear-panel input for an external frequency reference is available for applications requiring greater accuracy or stability. Using the external reference input and an external controlling host computer will enhance frequency setting resolution to an amazing 14 digits of resolution.

### **Modulation Capability**

Agility and modulation capabilities open the way for limitless array of applications. Not only that the 1281 can generate any shape and style of waveforms, but modulation such as FM, FSK, PSK, and Sweep are easily employed without sacrificing the power of the instrument control and output run modes.

### **Multi-Instrument Synchronization**

Multiple 1281 can be synchronized using a Master-Slave arrangement allowing users to benefit from the same high quality performance for their multi-channel needs. This arrangement can convert two 1281s into a two-channel system that is phase-coupled for applications such as I & Q and more.

### **Easy to use**

Large and user-friendly 3.5" 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 waveform generator.

### **High Speed Access**

Access speed is an increasingly important requirement for test systems. Included with the instrument is a variety of interfaces: Ethernet 10/100, USB 2.0 and GPIB so one may select the interface most compatible to individual requirements. Using any of the external interfaces, controlling instrument function and features as well as downloading waveforms and sequences are fast, time saving and easily tailored to every system regardless if it is just a laptop to instrument or full-featured ATE system. IVI drivers and factory support will speed up system integration thus minimizing time-to-market and reduce system development costs significantly.

### **Automated External Self-Calibration**

Usually, calibration cycles in the industry range from one to three years where instruments are sent to a service center, opened to allow access to trimmers, calibrated and certified for repeated usage. In contrast, the innovative advanced technology implemented in these systems allows calibration from any interface, USB, GPIB or LAN. Calibration factors are stored in a flash memory and thus eliminating the need to open instrument covers.

### **ArbConnection**

ArbConnection is a graphical tool that provides an unlimited source of Arbitrary Waveforms. With the ArbConnection software you can control instruments functions, modes and features. You can also create a virtually infinite amount of test waveforms. Freehand sketch allows you to draw your own custom waveform for quick analysis of analog signals. You can use the built-in equation editor to create your own exotic functions. Add or subtract components of a Fourier series to characterize digital or analog filters or inject random noise into a signal to test immunity to auxiliary noise.



**TABOR ELECTRONICS Ltd.**

# 1.2GS/s Single-Channel Arbitrary Waveform Generator

## Model WW1281



### Service and Support

Beyond providing precision Test & Measurement instruments, Tabor Electronics provides unparalleled service and support, and is continuously finding new ways to bring added value to its customers.

Our after-sales services are comprehensive. They include all types of repair and calibration, and a single point of contact that you can turn to whenever you need assistance. As part of our extensive support, we offer individualized, personal attention Help Desk, both online and offline, via e-mail, phone or fax.

Tabor Electronics maintains a complete repair and calibration lab as well as a standards laboratory in Israel and USA. Service is also available at regional authorized repair/calibration facilities.

Contact Tabor Electronics for the address of service facilities nearest you.

### Applications

For expert technical assistance with your specific needs and objectives, contact your local sales representative or our in-house applications engineers.

### Manuals, Drivers, and Software Support

Every instrument comes equipped with a dedicated manual, developer libraries, IVI drivers, and software. However, if your specific manual is lost or outdated, Tabor Electronics makes it possible to log-on to its Download Center and get the latest data "in a click".

### Product Demonstrations

If your application requires that you evaluate an instrument before you purchase it, a hands-on demonstration can be arranged by contacting your local Tabor Electronics representative or the Sales Department at our Corporate Headquarters.

### Five-year Warranty

Every instrument from the Woder Wave series comes with a five-year warranty. Each one has full test results, calibration certificate, and CD containing product's manual and complete software package. Our obligation under this warranty is to repair or replace any instrument or part thereof which, within five years after shipment, proves defective upon examination. To exercise this warranty, write or call your local Tabor representative, or contact Tabor Headquarters and you will be given prompt assistance and shipping instructions.

#### CORPORATE HEADQUARTERS

9 Hattiasia St. P.O.Box404,  
Tel Hanan, Israel 20302  
☎ +972 (4) 8213393  
☎ +972 (4) 8213388  
[www.taborelec.com](http://www.taborelec.com)

#### EUROPE

**Austria**  
UEI-Viena  
☎ +43 15451 588  
☎ +43 15451 464

**Benelux** (Belgium, The Netherlands and Luxembourg)  
BFI Optilas B.V.  
☎ +31 172 44 60 60  
☎ +31 172 44 34 14

**Bulgaria**  
New-Tek Ltd.  
☎ +359 296 25286  
☎ +359 268 7110

**Cyprus**  
Sprel Ltd.  
☎ +357 2237 7159  
☎ +357 2237 7284

**Czech Republic & Slovakia**  
Testovací Technika s.r.o.  
☎ +420 2 7478 2237  
☎ +420 2 7478 1285

**Denmark**  
Atimco AS  
☎ +45 8625 8899  
☎ +45 8625 5889

**France**  
Racal Instruments SAS  
☎ +33 1 3923 2205  
☎ +33 1 3923 2225

**Germany**  
CompulMess Elektronik GmbH  
☎ +49 89 321501-0  
☎ +49 89 321501-11

**Greece**  
American Technical Enterprises S.A.  
☎ +30 210 5240 740  
☎ +30 210 5249 995

**Hungary**  
ProMet Meresteknika  
☎ +36 24 521 240  
☎ +36 24 521 253

**Italy**  
LP Instruments srl  
☎ +39 2 4840 1713  
☎ +39 2 4840 1852

**Norway**  
Nortelco AS  
☎ +47 2257 6100  
☎ +47 2257 6130

**Poland**  
Helmar  
☎ +48 22 436 3106  
☎ +48 22 436 3110

**Romania**  
InterNET SRL  
☎ +40 21 312 1662  
☎ +40 21 312 1663

**Russia**  
CDIP  
☎ +7 0959 56 2022  
☎ +7 0959 56 2022

**Spain & Portugal**  
Instrumentos De Media SL  
☎ +34 91 300 0191  
☎ +34 91 388 5433

**Sweden & Finland**  
Ferner Elektronik AB  
☎ +46 8 760 8360  
☎ +46 8 760 8341

**Switzerland**  
Elstar Elektronik AG  
☎ +41 56 427 1888  
☎ +41 56 427 1976

**United Kingdom & Ireland**  
SEMATRON UK Ltd.  
☎ +44 1256 812222  
☎ +44 1256 812666

**Yugoslavia** (Bosnia, Croatia, Macedonia, Montenegro, Serbia, Slovenia)  
Mechanic & Electronic Measurement  
☎ +43 1943 4254  
☎ +43 1943 4251

#### ASIA PACIFIC & JAPAN

**Australia**  
Trio Test & Measurement Solutions  
☎ +61 8 8234 0504  
☎ +61 8 8234 0130

**India**  
AIMIL Ltd.  
☎ +91 11 2695 0001  
☎ +91 11 2695 0011

**Japan**  
TOYO Corporation  
☎ +81 3 3279 0771  
☎ +81 3 3246 0645

**Korea**  
ITB Corporation  
☎ +82 2 549 8501  
☎ +82 2 549 8502

**New Zealand**  
Electrotest Ltd.  
☎ +64 9 448 2600  
☎ +64 9 448 2611

**Philippines**  
Sunley Inc.  
☎ +63 2751 1216  
☎ +63 2815 0730

**Singapore, Thailand & Vietnam**  
Gold Lite Engineering Pte Ltd.  
☎ +65 6273 0487  
☎ +65 6273 5006

**Taiwan, China & Hong Kong**  
Precision International Corp.

**Taiwan**  
☎ +886 2 85124888  
☎ +886 2 85124900

**China & Hong Kong**  
☎ +86 21 64401300  
☎ +86 21 64400524

#### AFRICA

**South Africa**  
Channels Measurement  
☎ +27 11 254 8362  
☎ +27 11 254 8451

**MIDDLE EAST**  
**Israel**  
Dan-El Technologies Ltd.  
☎ +972 3 9271888  
☎ +972 3 9271666

**Turkey**  
Alfatek Test & Automation Ltd.  
☎ +90 216 474 7355  
☎ +90 216 474 7357

#### UNITED STATES US SALES & SUPPORT OFFICE

☎ +1 909 7970484  
☎ +1 909 7974955

**IL, IN, IA, KS, KY, MN, MO, NE, ND, SD, WI**  
Base Eight, Inc.  
☎ +1 847 670 1680  
☎ +1 847 670 1737

**AZ, CO, ID, MT, NM, TX, EI Paso, UT, WY**  
Berry Technical Sales Inc.  
☎ +1 303 665 9116  
☎ +1 303 833 1294

**AR, LA, OK, TX**  
Data Marketing Associates Inc.  
☎ +1-972 661 0300  
☎ +1 972 490 0836

**OH, WV, PA, MI**  
Dytec EAST  
☎ +1-330 405 8311  
☎ +1 330 405 8313

**DC, MD, VA**  
Eastern Instrumentation Corp.  
☎ +1 410 884 7303  
☎ +1 410 884 7306

**PA, NJ**  
El Philly  
☎ +1 856 231 0668  
☎ +1 856 231 9022

**HAW, NV, CA**  
Sierra Technical Sales  
☎ +1 510 713 9957  
☎ +1 510 713 9958

**NJ, NY**  
Tera Technologies Inc.  
☎ +1 888 921-TERA  
☎ +1 888 449 2799

**CT, ME, MA, NH, RI, VT**  
Test-Rep Associates, Inc.  
☎ +1 978 692 8000  
☎ +1 407 839 0337

**AL, FL, GA, MS, NC, SC, TN**  
W.A Brown Instruments  
☎ +1 407 648 9660  
☎ +1 407 839 0337

**CA, NV**  
W5 Inc.  
☎ +1 949 212 1199  
☎ +1 714 281 0767

**CANADA**  
Testforce Systems Inc.  
☎ +1 514 856 0970  
☎ +1 514 856 6983

**LATIN AMERICAS SALES & SUPPORT OFFICE**  
☎ +1 440 543 7710  
☎ +1 440 543 9681



**TABOR ELECTRONICS Ltd.**



# Specification 1.2GS/s Single-Channel Arbitrary Waveform Generator

## Model WW1281



### STANDARD WAVEFORMS

**Waveforms:** Sine, Triangle, Square, Pulse, Ramp, Sinc (Sine(x)/x), Gaussian Pulse, Exponential Fall, Rising Pulse, Noise, DC.

**Frequency Range:** Waveform dependent

**Source:** Internal synthesizer

#### SINE

**Frequency Range:** 50 Hz to 400 MHz, continuous;  
50 Hz to 125 MHz, triggerable.

**Start Phase Range:** 0 to 360°

#### Harmonics Distortion and Spurious at 1Vpp:

DC to 10MHz	-50dBc
10 to 50MHz	-45dBc
50 to 125MHz	-40dBc
125 to 300MHz	-30dBc
300 to 400MHz	-25dBc

#### Total Harmonic Distortion:

DC to 100kHz	0.5%
--------------	------

#### Flatness CW (1kHz):

DC to 200MHz	0.7dB
200MHz to 400MHz	4dB
or	
DC to 400MHz	1dB (with option 1)

#### Phase Noise - Internal SCLK

100Hz Offset	-83dBc/Hz
1kHz Offset	-85dBc/Hz
10kHz Offset	-85dBc/Hz
100kHz Offset	-112dBc/Hz
1MHz Offset	-132dBc/Hz

#### Phase Noise - External SCLK

100Hz Offset	-105dBc/Hz
1kHz Offset	-105dBc/Hz
10kHz Offset	-122dBc/Hz
100kHz Offset	-140dBc/Hz
1MHz Offset	-146dBc/Hz

#### TRIANGLE

**Frequency Range:** 50 Hz to 125 MHz

**Start Phase Range:** 0 to 360°

#### SQUARE

**Frequency Range:** 50 Hz to 400 MHz

**Duty cycle Range:** 1.0% to 99.0%

**Rise/Fall time:** <700 ps (typically <600 ps)

**Aberration:** <10%

### PULSE

**Frequency Range:** 50 Hz to 125 MHz

**Delay, Rise/Fall Time, High Time:** Adjustable with 1 ns resolution (each independently)

**Rise/Fall time:** <700 ps (typically <600 ps)

**Aberration:** <10%

#### RAMP

**Frequency Range:** 50 Hz to 125 MHz

**Delay, Rise/Fall Time:** Adjustable with 1 ns resolution (each independently)

#### SINC (Sine(x)/x)

**Frequency Range:** 50 Hz to 125 MHz

**"0 Crossings"** 4 to 100 cycles

#### GAUSSIAN

**Frequency Range:** 50 Hz to 125 MHz

**Time Constant** 10 to 200

#### EXPONENTIAL PULSE

**Frequency Range:** 50 Hz to 125 MHz

**Time Constant:** -100 to 100

#### NOISE

**Bandwidth:** 250MHz

#### DC

**Range:** -2V to +2V

### ARBITRARY WAVEFORMS

**Sample Rate:** 50 kS/s to 1.1 GS/s (typically 1.2 GS/s)

**Vertical Resolution:** 12 bits

**Waveform Memory:** 8 Meg points standard, 16 Meg points optional

### MEMORY SEGMENTATION

**No. of Segments:** 1 to 16k

**Min. Segment Size:** 64 points

**Resolution:** 16 points size increments from 16 to 8M points (16M optional)

### CODED SEGMENT HOPS

**Description:** Provides fast and coherent selection between segments. Output hops between segments

### Source:

9-pin connector. 8 pins are for code selection and 1 is for validating the code.

### Segment Hops:

8-bits, 256 maximum

### Hop Delay:

3 periods max

### Input Level:

TTL, high = true

### SEQUENCED ARBITRARY WAVEFORMS

#### Operation:

Segments may be linked and repeated in a user-selectable order to generate extremely long waveforms. Segments are advanced using either a command or a trigger

### ADVANCE MODES

#### Automatic Sequence

##### Advance:

No triggers required to step from one segment to the next. Sequence is repeated continuously through a pre-programmed sequence table

#### Stepped Sequence

##### Advance:

Current segment is sampled continuously, external trigger advances to next programmed segment. Control input is TRIG IN connector.

#### Single Sequence

##### Advance:

Current segment is sampled to the end of the segment including repeats and idles there. Next trigger advances to next segment. Control input is TRIG IN connector.

#### Multi Single

##### Sequence Advance:

Current segment is sampled to the end of the segment. If repeats are programmed, each trigger stimulates one repeat. At the end of the repeat count, the next trigger advances to next segment. Control input is TRIG IN connector.

#### Mixed Sequence

##### Advance:

Steps are marked with advance bit. Steps with "0" bit are stepped through automatically; Steps with "1" bit wait for a trigger to advance to the next step.

#### Advance Source:

##### Sequencer steps:

From 1 to 4096

##### Segment loops:

From 1 to 1 Meg

# Specification 1.2GS/s Single-Channel Arbitrary Waveform Generator

## Model WW1281



### Min. Segment

**Duration:** 400ns for more than one loop  
**Multi Sequence:** Selectable sequence from 1 to 10

### Minimum Segment

**Size in a Sequence:** 16 points

### DIGITAL OUTPUTS (B13/B14)

**Description:** Bits 13/14 (LVPECL level) are part of the arbitrary waveform, however, can be programmed separately without any effect on the main arbitrary waveform

**Update Frequency:** 50kpps to 1200Mpps

**Position and Width:** Programmable

### COMMON CHARACTERISTICS

#### FREQUENCY

**Resolution:** 9 digits  
**Accuracy and Stability:** Same as reference

#### 10MHz REFERENCE CLOCK

Internal	0.0001% (1 ppm TCXO) initial tolerance over a 19C to 29C temperature range; 1ppm/C below 19C and above 29C; 1ppm/year aging rate
External	10 MHz TTL, 50% 2% duty cycle

#### AMPLITUDE

##### Amplitude:

Single Ended	50 mV to 2 Vp-p, into 50Ω; Double into open circuit
Differential Outputs	100 mV to 4 Vp-p, into high Z; Double into open circuit

##### Resolution:

**Accuracy (1kHz):** ±(3% + 5 mV)

#### OFFSET

**Range:** 0 to ±1 V  
**Resolution:** 4 digits  
**Accuracy:** ±(3% + 50 mV)

#### FILTERS

**Type:** 50 MHz, 3-pole Bessel  
125 MHz, 3-pole Bessel

### OUTPUTS

#### MAIN OUTPUT

**Type:** Differential, Channel 1 normal and Channel 2 inverse  
**Connectors:** Two Front panel SMA's  
**Impedance:** 50Ω nominal, each output  
**Protection:** Protected against temporary short to case ground

#### SYNC / MARKER OUTPUT

**Connector:** Front panel SMA  
**Level:** >2 V into 50Ω, 3V nominal into high impedance  
**Protection:** Protected against temporary short to case ground  
**Type:** Generates sync pulse, which is synchronous with the output waveform in all functions and modes. In FM and sweep modes only, this output generates a marker at designated frequencies.

#### Validators:

BIT	Pulse width is 16-points wide;
SCOM	Pulse width is less than 16-points wide;
LCOM	Pulse starts at the beginning of the sequence and ends before the last step of the sequence;
	Point 0 to n, Programmable with 16-point resolution

#### Position:

#### SAMPLE CLOCK OUTPUT

**Connector:** Part of the Synchronization connector  
**Level:** 150mV rms

#### DIGITAL BIT OUTPUTS B13/B14

**Connectors:** Two rear-panel SMB's  
**Impedance:** 50Ω, ±1%  
**Level:** LVPECL into 50Ω, terminated to +1.3V  
**Protection:** Protected against temporary short to case ground

### INPUTS

#### TRIGGER INPUT

**Connector:** Front panel SMS  
**Impedance:** 50Ω, ±2%  
**Threshold Level:** From 0V to ±5V, programmable  
**Damage Level:** ±8V  
**Sensitivity:** 100mV  
**Min Pulse Width:** 20 ns  
**Slope:** Positive or negative going edge.

### EXTERNAL REFERENCE INPUT

**Connector:** Rear panel BNC  
**Impedance:** 10 kΩ, 5%  
**Threshold Level:** TTL  
**Duty Cycle:** 50%, 5%

#### SAMPLE CLOCK INPUT

**Connector:** Part of the Synchronization connector  
**Range:** 50 kHz to 1 GHz  
**Input Level:** 50mV rms  
**Impedance:** 50Ω  
**Damage Level:** 1V rms  
**Min. Pulse Width:** 0.5 ns

#### SEGMENT HOPS INPUT

**Connector:** 9-pin DSUB, female  
**Input Level:** TTL, high = true

### SYNCHRONIZATION CONNECTOR

**Connector Type:** (9W5)  
**Interconnecting Cable:** Optional, consult factory at the time of purchase

### MODULATION

**Carrier Waveform:** Sinewave  
**Run Modes:** Continuous, Triggered, Burst and Gated  
**Advance Source:** Automatic, triggered, burst, gated or software command  
**Trigger Parameters:** All trigger parameters such as level, slope, jitter, etc. apply

### FM

**Carrier Waveform:** Sine wave  
**Carrier Frequency:** 1 Hz to 400 MHz  
**Modulating Waveforms:** Sine, square, triangle and ramp  
**Modulation Source:** Internal  
**Modulating Frequency:** 1 mHz to 100 kHz  
**Modulating Frequency Resolution:** 5 digits  
**Accuracy:** 10 ppm  
**Deviation Range:** 100 mHz to 398 MHz  
**Marker:** Output and Level Same as SYNC output.  
Position Programmable for selected frequency

### ARBITRARY FM

**Carrier Waveform:** Sine wave  
**Carrier Frequency:** 1 Hz to 400 MHz  
**Modulating Waveform:** Arbitrary waveform 16 to 128k waveform points

# Specification 1.2GS/s Single-Channel Arbitrary Waveform Generator

## Model WW1281



### Modulation Source: Internal

#### Modulating Waveform

**Sample Clock:** 1 mS/s to 2.5 MS/s

**Resolution:** 7 digits

**Accuracy:** 10 ppm

#### Marker:

Output and Level Same as SYNC output.  
Position Programmable for selected frequency

### FSK

**Carrier Waveform:** Sine wave

**Carrier Frequency:** 1 Hz to 400 MHz

**Modulation Source:** External

**Baud Rate Range:** DC to 10Mbits/sec

### PSK

**Carrier Waveform:** Sine wave

**Carrier Frequency:** 1 Hz to 400 MHz

**Modulation Source:** External

**Resolution:** Frequency dependent.

**Carrier phase:** 0 to 360°

**Baud Rate Range:** DC to 10Mbits/sec

### SWEEP

**Carrier Waveform:** Sine wave

**Sweep Type:** Linear, log or Arb

**Sweep Direction:** Up or down

**Sweep Range:** 1 Hz to 400 MHz

**Sweep Time:** 1 ms to 1000 s,

**Resolution:** 7 digits,  $\pm 0.1\%$

#### Marker:

Output and Level Same as SYNC output.  
Position Programmable for selected frequency

### TRIGGER CHARACTERISTICS

**System Delay:** 1 Sample Clock+ (100 ns)

**Trigger Delay:** 0 to 16 Meg sample clocks

**Trigger Delay**

**Resolution:** 1 sample clock

**Trigger Jitter:** 1 sample clock

### EXTERNAL

**Input:** Front panel SMA

**Frequency:** DC to 10 MHz

**Threshold Level:** From 0V to  $\pm 5V$ , programmable

**Damage Level:**  $\pm 8V$

**Sensitivity:** 100mV

**Min Pulse Width:** 20 ns

**Slope:** Positive or negative going edge.

### INTERNAL

**Range:** 0.1 $\mu$ s to 100s

**Resolution:** 4 digits, limited by 0.1 $\mu$ s

**Accuracy:** 0.1%

**Software:** Soft trigger

### MANUAL

**Source:** Soft trigger command through the front panel or external interface

### GATED MODE

External signal enables generator. First output cyclesynchronous with the active slope of the triggering signal. Last cycle of output waveform always completed

### BURST

**Waveforms:** Sine, Triangle, Square, Pulse, Ramp, Sinc (Sine(x)/x), Gaussian Pulse, Exponential Fall, Rising Pulse, Noise, DC.

**Counted Burst Cycles:** 1 to 1Meg, programmable

**Source:** Manual, Internal or External

### MULTI-INSTRUMENT SYNCHRONIZATION

**Description:** Two instruments can be connected together and synchronized to provide dual-channel synchronization. Phase (leading edge) offset between master and slave units is programmable as well as trigger delay

### PHASE (LEADING EDGE) OFFSET

**Description:** Leading edge of master output trails the leading edge of the slave output by a programmable number of points.

**Range:** 0 to 8Meg waveform points (16Meg optional)

**Resolution and Accuracy:**

**Initial Skew:** 1 waveform point  $\leq \pm 5$  ns typically, with the supplied synchronization cable

### GENERAL

**Power Supply:** 85 to 265Vac, 47-63 Hz

**Power Consumption:** 60W

**Front Panel Display:** Color LCD, 3.5" reflective, 320 x 240 pixels, back-lit

**Operating temperature:** 0°C - 50°C

**Humidity**

**(non-condensing):** 11°C - 30°C 85%  
31°C - 40°C 75%  
41°C - 50°C 45%

**Storage temperature:** -40°C to + 70°C.

**Interface:** Ethernet 10/100, USB 2.0 and GPIB standard

**Language:** IEEE-488.2 - SCPI - 1993.0

**Dimensions:** 212 x 88 x 415 mm (WxHxD)

**Weight:** Approximately 7 lb

**Safety:** EN61010-1, 2nd revision

**EMC:** CE marked. Designed to meet VDE 0411/03.81 and UL 1244 MTBF per MIL-HDBK-217E, 25°C, Ground Benign

**Reliability:**

**Workmanship**

**Standards:** Conform to IPC-A-610D

**Supplied Accessories:** Power Cord, USB cable, CD containing Operating Manual, ArbConnection software and developer libraries.

**Warranty:** 5 years standard

### ORDERING INFORMATION

**MODEL** WW1281

1.2GS/s Single-Channel Arbitrary Waveform Generator

### OPTIONS

**16Meg:** 16 Meg Memory  
**1dB** 1dB Sine flatness filter

### 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.