The WW1071/2 represents a new dimension in arbitrary waveform generator design. With an unprecedented combination of arbitrary generator and synthesizer, versatility, high resolution and wide frequency range, and outstanding performance-to-price ratio, the WW1071/2 delivers diverse benefits that will facilitate tasks in many fields.

**100MS/s Sample Rate**

New technology requirements are driving communications systems to use increasingly narrow channel widths. A high sample rate of 100MS/s makes the WW1071/2 an ideal modulation source for troubleshooting new encoding schemes. The WW1071/2 also provides high-speed waveforms to simulate signal distortion, video signals, component failures, and power supply line cycle dropouts and transients.

**High Performance**

Each channel of the WW1071/2 delivers precise waveforms with 14 bits of amplitude resolution and up to 14 digits of frequency resolution from remote with extremely low phase noise. Exceptional electrical performance includes up to 10Vp-p into 50Ω over the full frequency range. Selectable filters ensure clean stimulus waveforms enabling the generator to simulate modulation waveforms.

**14 Bit Resolution**

The 14-bit resolution provides 16,384 output levels. This means that even audio waveforms can be generated with excellent fidelity. It also allows video-and other complex waveforms-to be generated with small details superimposed on large signals, in order to test the response of receiving systems.

**Function Generator**

When used as a simple function generator the instrument offers ten basic waveforms with adjustable parameters all of which are accessible from the front panel. These are sine, triangle, square, pulse, ramp, sinc, Gaussian, exponential (up and down), noise, as well as DC. Sine and square waves can be generated at up to 50MHz.

**Up to 4M Waveform Memory**

The WW1071/2 offers 1M word memory standard and 2M or 4M word optional for arbitrary waveforms. In addition, the memory can be divided into as many as 2048 segments, which can be looped and linked in many different ways. Using 4M word at 100MS/s to generate a video signal, for example, the duration is 0.04 seconds, 25Hz, even without any looping of repetitive elements.

**Sequence Generator**

When the sequencing facilities are employed, the WW1071/2’s uniqueness is obvious. The memory segments can be linked and repeated in any combination both manually and under programmed control. This allows test software to switch between many different waveforms rapidly without the need to download multiple times, enhancing test throughput in a way that is unmatched by competing products. The sequence generator has four advanced modes: automatic, stepped, single and mixed, which make it even a more powerful tool.
High-Quality Modulation Signal Source
One of the many attractive features of the WW1071/2 is the sample clock modulation function. In ordinary arbitrary waveform generators, to make a frequency modulated sine wave you have to enter the complete mathematical function. Not so with the WW1071/2: all that is necessary is generating the carrier signal, and then modulating the clock to obtain the required result. The sample clock modulation can be done using internal waveforms such as sine, square, triangle, and ramp or using downloaded arbitrary modulating waveforms. This allows you to generate signals that would be difficult or impossible to define using an equation. AM, Linear and Logarithmic Sweeps, FSK and Ramped FSK are available as well.

Triggering Facilities
However versatile the waveform generation systems are made, the need for external control of generation is vital. The triggering facilities of the WW1071/2 match the generation functions in versatility. In the simplest mode, signals are output continuously. The WW1071/2 also offers the triggered mode, gated mode, external burst mode, and internal burst mode, all of which can use an external trigger signal or an internal trigger. The use of external sources to prompt the switching of segments has already been mentioned.

Inter-Channel Phase Control (WW1072)
In the WW1072, both channels share a common sample clock, and both channels are triggered from the same source assuring tightly synchronized channel-to-channel timing. Precise control over channel-to-channel phase offset is achieved by allowing control over channel start phase with a resolution down to as small as 1 waveform point. This enables extremely accurate timing or phase dependencies to be studied, such as those found in high speed digital communication systems.

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 waveform generator.

High Speed Access
Access speed is an increasingly important requirement for test systems. Included with the instrument is a variety of interfaces: LAN, USB and GPIB so one may select the interface most compatible to individual requirements. Using any of the external interfaces, controlling instrument functions and features as well as downloading waveforms and sequences is 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.

Multiple Environments to Write Your Code
Model WW1071/2 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.

Multi-Instrument Synchronization
Multiple WW1071/2s can be synchronized using a Master-Slave arrangement allowing users to benefit from the same high quality performance in their multi-channels needs.

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.
**MODELS WW1071/2**

100MS/s Single/Dual Channel
Arbitrary Waveform Generators

### Specification

<table>
<thead>
<tr>
<th>CHANNELS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Channels: 1/2, semi-independent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STANDARD WAVEFORMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waveforms: Sine, Triangle, Square, Pulse, Ramp, Sine(x)/x, Gaussian, Exponential, Repetitive Noise, DC.</td>
</tr>
<tr>
<td>Frequency Range:</td>
</tr>
<tr>
<td>Sine: 100µHz to 50MHz</td>
</tr>
<tr>
<td>Square, Pulse: 100µHz to 30MHz</td>
</tr>
<tr>
<td>All others: 100µHz to 15MHz</td>
</tr>
</tbody>
</table>

| Waveforms: |
| SINE |
| Start Phase: 0 to 360° |
| Phase Resolution: 0.1° |
| Harmonics Distortion, 3Vp-p (typ.): |
| DC to 2.5MHz: <-55dBc |
| 2.5MHz to 25MHz: <-60dBc |
| 25MHz to 40MHz: <-65dBc |
| 40MHz to 50MHz: <-70dBc |
| Non-Harmonic Distortion (typ.): |
| DC to 15MHz: <-70dBc |
| 15MHz to 50MHz: <-80dBc |

| Total Harmonic Distortion: DC to 100kHz: 0.1% |

| DC |
| Range: -5V to 5V |

| DIGITAL PULSE GENERATOR OPTION |
| Pulse Mode: Single or double, programmable |
| Polarity: Normal, inverted, complement |
| Period: 40ns to 1000s |
| Resolution: 10ns |
| Pulse Width: 20ns to 1000s |
| Rise/Fall Time: Fast <6ns (typ.), Linear 10ns to 1000s |
| High Time, Delay & Double Pulsed Delay: 10ns to 1000s |
| Amplitude Window: 10mVp-p to 10Vp-p(1) |
| Low Level: -5V to +4.995V(1) |
| High Level: -4.995V to +5V(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 1,000,000 to 1. With the 2M option, the ratio is extended to 2,000,000 to 1, hence the specifications below 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: 100mS/s to 100MS/s |
| Vertical Resolution: 14 Bits |
| Waveform Memory: 1M points standard, 2M/4M option (per channel) |
| Min. Segment Size: 16 points |
| Resolution: 4 points |
| No. of Segments: 1 to 2k |

| SEQUENCED ARBITRARY WAVEFORMS |
| Operation: Permits division of the memory bank into smaller segments. Segments may be linked, and repeated in user-selectable fashion to generate extremely long waveforms. |
| Sequencer steps: 1 to 2k |
| Min. Seg. Duration: 1µs |
| Segment loops: 1 to 1M |

| ADVANCE MODES |
| Automatic: No triggers required to step from one segment to the next. Sequence is repeated continuously through a pre-programmed sequence table. |
| Stepped: Current segment is sampled continuously, external trigger advances to next programmed segment. |
| Single: Current segment is sampled to the end of the segment including repeats and idles there. Next trigger advances to next segment. |
| Mixed: Each step of a sequence can be programmed to advance either: a) automatic (Automatic mode), or b) with a trigger (Stepped mode) |
| Advance Source: External (TRIG IN), Internal or software |

| COMMON CHARACTERISTICS |
| Carrier Waveform: Sine, Triangle, Square, Pulse, Ramp, Sine(x)/x, Gaussian, Exponential, Repetitive Noise, DC and Arb |
| Carrier SCLK: 100mS/s to 100MS/s |
| Carrier Frequency: Waveform dependent |
| Resolution: 12 digits, limited by 1µHz |
| Accuracy: 0.1% |
| Freq. Distortion: <0.1% |
| Modulation Source: Internal FM, Arbitrary FM, Sweep, External AM, FSK |

| FM |
| Modulating Shape: Sine, Square, Triangle / Ramp |
| Modulation Freq.: 1mHz to 100kHz |
| Deviation Range: 100mS/s to 50MS/s |

| ARBITRARY FM |
| Modulating Shape: Arbitrary waveform, 10 to 20000 waveform points |
| Modulating SCLK: 1mS/s to 2MS/s |
| Deviation Range: 100mS/s to 50MS/s |

| AM |
| Envelope Freq.: 1µHz to 500kHz |
| Sensitivity: 0V to +6V (5Vp-p) |
| Modulation Depth: 0% to 100% |

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MODELS WW1071/2
100MS/s Single/Dual Channel
Arbitrary Waveform Generators

Specification

FSK
Type: Hop or Ramp
Low level: Carrier sample clock
High level: Hop frequency
Baud Rate Range: 1 bits/sec to 10Mbits/sec
Min. FSK Delay: 1 waveform cycle + 50ns
Ramp FSK: Time 10µs to 1s
Resolution 3 digits

SYNC/MARKER OUTPUT
Connector: Front panel BNC
Impedance: 50Ω, ±1%
Level: >2V into 50Ω, 4V into 10kΩ
Validity: BIT, LCOM
Protection: Protected against temporary short to case ground
Position: Point 0 to n
Width: 4 to 100000 points
Resolution: 4 points
Source: Channel 1

SAMPLE CLOCK OUTPUT
Connector: Rear panel SMB
Level: ECL
Impedance: 50Ω, terminated to –2V

SINEWAVE OUTPUT
Connector: Rear panel BNC
Impedance: 50Ω, ±1%
Level: 1V into 50Ω
Protection: Protected against temporary short to case ground
Source: Sample clock frequency
Frequency Range: 100mHz to 100MHz
Resolution: Same as Sample clock
THD: 0.05% to 100kHz
SFDR: <–30dBc to 100MHz

TRIGGER INPUT
Connector: Rear panel BNC
Input Impedance: 10kΩ, ±5%
Polarity: Positive or negative
Threshold Level: TTL
Min. Pulse Width: 20ns

TRIGGER CHARACTERISTICS
System Delay: 1 Sample Clock + 150ns
Trigger Start, Stop & Phase Control: 0 to 1M (2M/4M optional)
Resolution: 4 points
Breakpoint Error: ±4 points
Breakpoint Source: External, Manual, or command

EXTERNAL
Connector: Rear panel BNC
Level: TTL
Slope: Positive or negative
Frequency: DC to 2MHz
Impedance: 10kΩ, DC coupled

AM INPUT
Modulation Input: Rear panel BNC
Impedance: 1MΩ, ±5%
Max. Input Voltage: 12V

SAMPLE CLOCK INPUT
Connector: Rear panel SMB
Input Level: ECL
Impedance: 50Ω, terminated to –2V
Range: 100mHz to 100MHz
Min. Pulse Width: 4 ns

COMMON CHARACTERISTICS
Sweep Direction: Up or down
Sweep Step: Linear, Logarithmic or Arb
Sweep Time: 1ms to 1000s
Sweep Resolution: 3 digits

AMPLITUDE
Range: 10mV to 10Vp-p, into 50Ω; Double into open circuit
Resolution: 4 digits
Accuracy (1kHz): 100mV to 1Vp-p ±(1% + 5mV)
1Vp-p to 10Vp-p ±(1% + 25mV)

OFFSET
Range: 0 to ±4.5V
Resolution: 2.2 mV
Accuracy: 1%

FILTERS
Type: 25MHz / 50MHz Elliptic

SYNCHRONIZATION CONNECTOR
Connector: Rear panel 9-pin D-SUB
SYNC Cable: Optional, consult factory at the time of purchase

RUN MODES
Continuous: Free-run output of a waveform
Triggered: Upon trigger, outputs one waveform cycle. Last cycle always completed
Gated: External signal enables generator. First output cycle synchronous with the active slope of the triggering signal. Last cycle of output waveform always completed
Burst: Upon trigger, outputs a single or multiple pre-programmed number of waveform cycles from 1 through 1M

EXPERIMENTAL
Range: 100mHz to 2MHz
Resolution: 14 digits, limited by 1µHz
Accuracy: 0.1%

MANUAL
Source: Soft trigger command from the front panel or remote

INTER-CHANNELE DEPENDENCY (WW1072)
Separate controls: Output on/off, amplitude, AM, offset, standard waveforms, user waveforms, waveform size, sequence table, channel 2 clock divider, trigger start phase, breakpoints
Common Controls: SCLK, frequency, reference source, trigger and sequence advance mode, SYNC OUT, FM, FSK, sweep and arm

Visit our website at www.taborelec.com
MODELS WW1071/2
100MS/s Single/Dual Channel
Arbitrary Waveform Generators

Specification

PHASE OFFSET (LEADING EDGE)

Range: 0 to 1M points (2M/4M optional)
Resolution/Accuracy: 1 point, or 1 SCLK of CH. 2
Initial Skew: <±2ns, with sclk divider = 1;
<±3ns, with sclk divider > 1

CHANNEL 2 SAMPLE CLOCK DIVIDER

Range: 1 to 65,535 points
Resolution: 1 point

MULTI-INSTRUMENT SYNCHRONIZATION

PHASE OFFSET (LEADING EDGE)

Range: 0 to 1M points (2M/4M optional)
Resolution: 4 point
Initial Skew: <±15ns, depending on cable length and quality, typically with 0.5 meter coax cables

GENERAL

Voltage Range: 85 to 265V
Frequency Range: 48 to 63Hz
Power Consumption: 60W max
Display Type: Color LCD, back-lit
Size: 3.8” reflective
Resolution: 320 x 240 pixels
Interfaces:
- USB Device: 1 x rear, USB device, (A type)
- LAN: 100/10 BASE-T
- GPIB: IEEE 488.2 standard interface

Dimensions:
- With Feet: 212 x 102 x 415mm (WxHxD)
- Without Feet: 212 x 88 x 415mm (WxHxD)
Weight:
- Without Package: 3.5Kg
- Shipping Weight: 4Kg
Temperature:
- Operating: 0 - 50°C
- Storage: -40°C to + 70°C.
Humidity:
- 11°C to 30°C: 85%;
- 31°C to 50°C: 75%
Safety: EN61010-1, 2nd revision
Calibration: 1 year
Warranty (1): 5 years standard

ORDERING INFORMATION

MODEL  DESCRIPTION
WW1071 100MS/s Single Channel Arbitrary Waveform Generator
WW1072 100MS/s Dual Channel Arbitrary Waveform Generator

OPTIONS

Option 1: 2M Memory (per channel)
Option 2: 4M Memory (per channel)

ACCESSORIES

Sync Cable: Multi-instrument synchronization
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.

(1) Standard warranty in India is 1 year.

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