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

**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.

**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.

**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.

**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.

Visit our website at www.taborelec.com
No. of Channels: 1/2, semi-independent

STANDARD WAVFORMS

<table>
<thead>
<tr>
<th>Waveform</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sine, Triangle, Square, Pulse, Ramp, Sine(x)/x, Gaussian, Exponential, Repetitive, Noise, DC.</td>
<td></td>
</tr>
</tbody>
</table>

Frequency Range:
- Sine: 100µHz to 50MHz
- Square, Pulse: 100µHz to 30MHz
- All others: 100µHz to 15MHz

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 Pulse Delay:
- 10ns to 1000s
- Amplitude Window: 10mVp-p to 10Vp-p
- Deviation Range: 1M to 4M
- Modulation Source: Internal FM, Arbitrary FM, Sweep
- Deviation Range: 1MHz to 100kHz
- Modulating SCLK: 100mS/s to 50MS/s
- Modulation Depth: 0% to 100%

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.

Advance Source:
- External (TRIG IN), Internal or software

MODULATION

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 +5V (5Vp-p)
- Modulation Depth: 0% to 100%

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).

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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: 1bits/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
- Validators: 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

AMPLITUDE
- Range: 10mV to 10Vp-p, into 50Ω;
- Resolution: 4 digits
- Accuracy: ±1% + 5mV

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

FILTERS
- Type: 25MHz / 50MHz Elliptic

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

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

SYSTEM 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

INPUTS
- TRIGGER INPUT
  - Connector: Rear panel BNC
  - Impedance: 10kΩ
  - Polarity: Positive or negative
  - Threshold Level: TTL
  - Min. Pulse Width: 20ns

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

INTER-CHANNEL 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

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## MODELS WW1071/2

100MS/s Single/Dual Channel Arbitrary Waveform Generators

### Specification

#### PHASE OFFSET (LEADING EDGE)

<table>
<thead>
<tr>
<th>Range</th>
<th>0 to 1M points (2M/4M optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution/Accuracy</td>
<td>1 point, or 1 SCLK of CH. 2</td>
</tr>
<tr>
<td>Initial Skew</td>
<td>&lt;±2ns, with sclk divider = 1;</td>
</tr>
<tr>
<td></td>
<td>&lt;±3ns, with sclk divider &gt; 1</td>
</tr>
</tbody>
</table>

#### CHANNEL 2 SAMPLE CLOCK DIVIDER

<table>
<thead>
<tr>
<th>Range</th>
<th>1 to 65,535 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>1 point</td>
</tr>
</tbody>
</table>

#### MULTI-INSTRUMENT SYNCHRONIZATION

#### PHASE OFFSET (LEADING EDGE)

<table>
<thead>
<tr>
<th>Range</th>
<th>0 to 1M points (2M/4M optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>4 point</td>
</tr>
<tr>
<td>Initial Skew</td>
<td>&lt;±15ns, depending on cable length and quality, typically with 0.5 meter coax cables</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WW1071</td>
<td>100MS/s Single Channel Arbitrary Waveform Generator</td>
</tr>
<tr>
<td>WW1072</td>
<td>100MS/s Dual Channel Arbitrary Waveform Generator</td>
</tr>
</tbody>
</table>

### 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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