The WX1284C, (1.25GS/s) and the WX2184C, (2.3GS/s) are four channel arbitrary waveform generators, which offer unrivaled performance, in unmatched case size and cost, without compromising bandwidth and signal integrity. Using the very same 12.5" width, 2U height box as the single and dual channel versions of the WX series, the four channel additions provide more channel density for high-speed AWG than ever revealed before in a benchtop, allowing customers to shrink, even further, their bench or system space.

Universal Waveform Source
Aside from its natural ability to generate arbitrary shapes with waveform granularity of 1 point, the WX series can also be used as a full-featured standard, modulation or pulse/ pattern generator to solve various applications. Equipped with up to 2.3GS/s, 14bit DAC and up to 32Mpoints memory, the WX series can generate literally any waveform, short or long, at frequencies up to 1GHz with 12 digits of resolution, resulting in the highest precision signal creation and regeneration without compromising signal fidelity or system integrity.

Signal Integrity and Purity
One of the most important requirements in today’s testing and measurement applications is high signal quality. With a typical SSB phase noise of <-115dBc at 100MHz, and <-100dBc at 1GHz, at 10 kHz carrier offset and with exceptionally good SFDR of <-60dBc at 1GHz carrier, Tabor’s WX series unique platform delivers one of the best quality signals available on the market today, answering the ever-growing demand for clear and precise signals.

Common or Separate Clocks
The new four channel architecture offers two SCLK sources, enabling users to choose between a common or separate SCLK feed. A common SCLK source allows for all outputs to be fully synchronized with 10ps of skew control for accurate and controlled phase between channels, ideal for many X-Y modes, I&Q output and even 4 channel MIMO link applications. Alternatively, users can select to work with two separate SCLK sources resulting in two separate channel couples (1&2 and 3&4) with each having the ability to be programmed to output different function shapes, frequency, amplitude levels and/or to operate in different run modes, in effect having two separate dual channel instruments in one box.

DC or HV Output Amplifiers
Have a requirement for different output paths in your lab? Great! The new four channels additions to the WX series offer two single or differential ended DC coupled output amplifiers: 2Vp-p into 50Ω with 700MHz bandwidth, for applications demanding optimized transitions and aberrations or 4Vp-p into 50Ω with 350MHz bandwidth, for applications demanding high voltage.
**Powerful Segmentation and Sequencing**
Solving almost every complex application, powerful segmentation and sequencing produces 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, jump and nest, saving you precious memory space. The WX series also allows you to generate up to 1000 sequence scenarios and sequence between them to generate an even higher level of flexibility in waveform creation.

**Dynamic Segment / Sequence Control**
Working in the real-time world and need fast waveform switching? The WX series has a rear panel control designed specifically for that. Having the dynamic control feature, in effect, can serve as replacement of the sequence table where the real-time application can decide when and for how long a waveform will be generated. For much more complex applications, this same input may serve as a dynamic switch for complete sequences, creating real-life scenarios for real-time applications.

**Smart Trigger**
Until now, you’ve been forced to trigger on a specific event. Tabor’s all-new SmarTrigger feature was designed to enhance the trigger capability and facilitate wider flexibility of a specific pulse event. It allows triggering on either a pulse having a larger pulse width than a programmed time value (<time), a pulse having a smaller pulse width than a programmed time value (>time), or even on a pulse having a pulse width between two limits (><time). In addition, the SmarTrigger has a hold-off function, in which the output is held idle after the first trigger and starts a waveform cycle only with the first valid trigger after a hold-off interval has lapsed, allowing you to solve endless «negotiation» scenarios.

**Pulse / Pattern Creation**
Generating complex pulse trains has never been easier. The Pulse Composer is a powerful built-in tool that converts the WX series to a very sophisticated Pulse/Pattern Generator, allowing to create literally any complex pulse train / pattern, whatever it's a single pulse, multi-level, linear-points, initialization or preamble pattern definition, user-defined or even standard random patterns with programmable resolution, so it doesn't matter if your application is radar communications, nanotechnology or serial bus testing, the pulse/pattern composer is the right tool for your application. Moreover, all the WX series' advanced trigger modes are applicable, hence one can choose to use the “step” mode to advance every bit independently or the “once” mode to advance a complete data block in one trigger event, enabling even more applications, such as trigger, clock and data protocols.

**Programmable Markers**
The four channel WX is equipped with one programmable differential marker for each output channel. Differential simply means outstanding signal integrity for high frequencies, whereas the programmability allows you to set position, width, delay and amplitude for any required peripheral triggering need. While bench usage enables setting only one marker position, you can set multiple markers and program different marker properties for each transition instance remotely, allowing various triggering profiles.

**Digital Outputs (Option D)**
In today’s world, many applications require multiple digital outputs or a parallel digital interpretation of the analog outputs. With the new digital option the WX now offers 32 programmable digital outputs, up to extra 16M of digital memory, up to 1.15Gb/s of data rate and controllable skew between outputs. Combined with Tabor’s dedicated digital signal amplifier, WXD1, the WX is, by far, the best mixed signal source on the market to meet all of today's requirements.

**8-Channel Capability**
Need more than four channels to drive your application? With two 4-Channel WX units you can reach 8 synchronized channels system using a Master-Slave arrangement, allowing users to benefit from the same high quality performance even for multi-channel needs.

**Easy to Use**
Large and user-friendly 4” backlit color LCD display facilitates browsing through menus, updating parameters and displaying detailed and critical information for your waveform output. Combined with numeric keypad, ten quick-link function & run mode buttons, cursor position control and a dial, the front panel controls simplify the often complex operation of an arbitrary waveform generator.

**Multiple Environments to Write Your Code**
The WX series 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.

**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 WX1284C/WX2184C
1.25GS/s or 2.3GS/s Four Channel
Arbitrary Waveform Generators

## Specification

### CONFIGURATION
Output Channels: 4, Synchronized/semi separated

### STANDARD WAVEFORMS

<table>
<thead>
<tr>
<th>Type</th>
<th>Frequency Range</th>
<th>Sine Waveform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WX1284C</td>
<td>10kHz to 500MHz</td>
<td></td>
</tr>
<tr>
<td>WX2184C</td>
<td>10kHz to 1GHz</td>
<td></td>
</tr>
<tr>
<td>Square, Pulse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WX1284C</td>
<td>10kHz to 250MHz</td>
<td></td>
</tr>
<tr>
<td>WX2184C</td>
<td>10kHz to 125MHz</td>
<td></td>
</tr>
<tr>
<td>WX1284C</td>
<td>10kHz to 350MHz</td>
<td></td>
</tr>
<tr>
<td>WX2184C</td>
<td>10kHz to 500MHz</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WX1284C</td>
<td>10kHz to 125MHz</td>
<td></td>
</tr>
<tr>
<td>WX2184C</td>
<td>10kHz to 250MHz</td>
<td></td>
</tr>
</tbody>
</table>

### SINE
Start Phase: 0 to 360°
Phase Resolution: 0.1°
SFDR (typ.): -60dBc
Harmonics Distortion (typ.): 1Vpp<sup>1</sup> 3Vpp<sup>1/2</sup>
5MHz to 200MHz: <44dBc
200MHz to 325MHz: <30dBc
325MHz to 425MHz: <60dBc
425MHz to 500MHz: <70dBc
500MHz to 700MHz: <32dBc
700MHz to 1GHz: <70dBc

<sup>1</sup> Measured with 500MHz lowpass filter
<sup>1/2</sup> Measured with 1GHz lowpass filter

### SSB Phase Noise (10kHz offset, typ.):
1MHz Carrier: <120dBc
10MHz Carrier: <118dBc
100MHz Carrier: <115dBc
250MHz Carrier: <110dBc
500MHz Carrier: <105dBc
1GHz Carrier: <100dBc

### PULSE
Pulse Mode: Single or double, programmable
Polarity: Normal, inverted or complement
Period:
WX1284C: 4ns to 5s
WX2184C: 2ns to 5s
Resolution:
WX1284C: 1ns
WX2184C: 500ps
Pulse Width:
WX1284C: 2ns to 5s
WX2184C: 1ns to 5s
Rise/Fall Time:
Fast: DC Path: 600ps (typical < 500ps)
        HV Path: 1ns (typical < 900ps)

### AMPLITUDE:
Delay, Double Pulse Delay:
WX1284C: 2ns to 1s
WX2184C: 1ns to 1s
Amplitude:
DC Path: 50mVp-p to 2Vp-p into 50Ω
HV Path: 100mVp-p to 4Vp-p into 50Ω

### LEVELS:
Low Level: -2V to +1.95V
High Level: -1.95V to +2V

### 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 16,000,000 to 1.
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 1,000,000 to 1.
3. The sum of all pulse parameters must not exceed the pulse period setting.

### PULSE / PATTERN COMPOSER
MULTI-LEVEL / LINEAR-POINTS
Number of Levels: 1 to 1000
Dwell Time:
WX1284C: 1ns to 1s
WX2184C: 500ps to 1s
Memory: 100k
Ampl. Resolution: 4 digits
Time Resolution: 1ns
Amp. Resolution: 4 digits

### SEQUENCED WAVEFORMS
Multi Sequence: 1 to 1,000 unique scenarios
Sequence Steps: 1 to 4k steps
Segment Loops: 1 to 16M cycles, each segment
Sequence Loops: 1 to 1M (“Once” mode only)
Step Advance Modes: Continuous, once and stopped

### SEQUENCED SEQUENCES
Sequence Scenarios: 1 Scenario
Dynamic Control: Software command or rear panel sequence control port
Table Length: 1 to 1k steps
Advance Control: Continuous, once and stopped
Sequence Loops: 1 to 1,000,000 cycles

### MODULATION
COMMON CHARACTERISTICS
Carrier Waveform: Sine
Carrier Frequency:
WX1284C: 10kHz to 500MHz
WX2184C: 10kHz to 1GHz
Modulation Source: Internal

### FM
Modulation Shape: Sine, square, triangle, ramp
Modulation Freq.: WX1284C: 100Hz to 500MHz
WX2184C: 100Hz to 100MHz
Deviations:
WX1284C: 10kHz to 250MHz
WX2184C: 10kHz to 500MHz

### SWEEP / CHIRP
Sweep Type: Linear or log
Sweep Direction: Up or down
Sweep Time: 1.4 μs to 10ms
Modulation Shape: Pulse
Pulse Repetition:
Range: 200ns to 20s
Resolution: 3 digits
Accuracy: 100ppm

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Visit our website at www.taborelec.com
MODELS WX1284C/WX2184C
1.25GS/s or 2.3GS/s Four Channel
Arbitrary Waveform Generators

Specification

FSK / FREQUENCY HOPPING

FSK Baud Rate:
WX1284C 10mbps to 250Mbps
WX2184C 10mbps to 500Mbps
Hop Table Size: 2 to 256
Hop Type: Fast or Linear
Dwell Time Mode: Fixed or programmable per step
Dwell Time:
WX1284C 4ns to 10s
WX2184C 2ns to 10s
Dwell Time Res.:
WX1284C 4ns
WX2184C 2ns

ASK / AMPLITUDE HOPPING

ASK Baud Rate:
WX1284C 10mbps to 250Mbps
WX2184C 10mbps to 500Mbps
Hop Table Size: 2 to 256
Hop Type: Fast or Linear
Dwell Time Mode: Fixed or programmable per step
Dwell Time:
WX1284C 4ns to 10s
WX2184C 2ns to 10s
Dwell Time Res.:
WX1284C 4ns
WX2184C 2ns

AM

Modulation Shape: Sine, square, triangle, ramp
Modulation Freq.: 100Hz to 1MHz
Modulation Depth: 0.1 to 200%

ASK / AMPLITUDE HOPPING

ASK Baud Rate:
WX1284C 10mbps to 250Mbps
WX2184C 10mbps to 500Mbps
Hop Table Size: 2 to 256
Hop Type: Fast or Linear
Dwell Time Mode: Fixed or programmable per step
Dwell Time:
WX1284C 4ns to 10s
WX2184C 2ns to 10s
Dwell Time Res.:
WX1284C 4ns
WX2184C 2ns

(n)PSK and (n)QAM

Modulation Type: PSK, BPSK, QPSK, OQPSK, Pi/4 DQPSK, 8PSK, 16PSK, 16QAM, 64QAM, 256QAM and User Defined
Symbol Rate Range: WX1284C 10mbps to 250Mbps
WX2184C 10mbps to 500Mbps
Symbol Accuracy: 1ppm
Symbol Table Size: 2 to 256

COMMON CHARACTERISTICS

FREQUENCY

Resolution: 12 digits
Accuracy/Stability: Same as reference

ACCURACY REFERENCE CLOCK

Internal 1 ppm from 19°C to 29°C; 1 ppm/°C below 19°C or above 29°C; 1 ppm/year aging rate
External Same as accuracy and stability of the external ref.

OUTPUTS

MAIN OUTPUTS

Coupling: DC-coupled
Connectors: Front panel SMAs
Impedance: 50Ω nominal, each output
Protection: Protected against temporary short to case ground

DC-COUPLED

Type: Single-ended or differential
Resolution: 4 digits
Accuracy: ±(2% +2 mV), offset = 0V
Overshoot: 5%, typical

HV PATH

Rise/Fall Time: 1ns (typical < 900ps)
Amplitude Range:
Single-ended 50mVp-p to 2Vp-p *
Differential 100mVp-p to 8Vp-p *
* Double into high impedance

OFFSET

Offset Range: -1V to + 1V into 50Ω
Offset Resolution: 4 digits
Offset Accuracy: ±2% + 15mV

MARKER OUTPUTS

Number of Markers: Four markers, one per channel
Type: Differential (+) and (-) outputs
Connectors: SMB
Skew Between Markers: 100ps, typical
Impedance: 50Ω
Amplitude Voltage:
Low level 0V
High level 0.5V to 1.2V, single-ended;
0V to 2.4V, differential
Resolution: 10mV
Accuracy: 10% of setting
Width control: 2 SCLK to segment length;
Position control:
Range 0 to segment length
Resolution 2 points
Initial delay: 4ns±½ clock (Output to marker)
Variable delay:
Control Separate for each channel
Range 0 to 3ns
Resolution 10ps
Accuracy ±(10% of setting +20ps)
Rise/Fall Time: <1ns, typical

DIGITAL OUTPUTS (OPTION D)

Number of Bits: 32 output channels
Type: Differential (+) and (-) outputs
Connectors: High speed I/O receptacle, 68-pin VRDPC
Skew Between Bits: 100ps, typical
Level: LVDS
Impedance: 100Ω
Max. Data Rate: WX1284C 625Mb/s
WX2184C 1.15Gb/s
Pattern Memory: Up to 16MWord
Source: Dedicated or parallel

SYNC OUTPUT

Connector: Rear panel BNC
Source: Channels 1/2 or channels 3/4
Type: Single ended
Waveform Type: Pulse 16 points width
WCOM Waveform complete
Impedance: 50Ω
Amplitude: 1V, doubles into high impedance
Variable Position Control:
Range 0 to segment length
Resolution 16 points
Rise/Fall Time: 2ns, typical

INPUTS

TRIGGER INPUT

Connector: Rear panel BNC
Input Impedance: 10kΩ or 50Ω, selectable
Polarity: Positive, negative or both
Damage Level: ±20Vdc
Frequency Range: 0 to 15MHz
Trigger Level Control:
Range -5V to 5V
Resolution 12 bit (2.5mV)
Accuracy ±(5% of setting + 2.5mV)
Sensitivity 0.2Vp-p
Min. Pulse Width: 10 ns

EVENT INPUT

Connector: Rear panel BNC
Input Impedance: 10kΩ or 50Ω, selectable
Polarity: Positive, negative or either
Damage Level: ±20Vdc
Frequency Range: 0 to 15MHz
Trigger Level Control:
Range -5V to 5V
Resolution 12 bit (2.5mV)
Accuracy ±(5% of setting + 2.5mV)
Sensitivity 0.2Vp-p minimum
Min. Pulse Width: 10 ns

YEARS OF INNOVATION

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Specification

**SEQUENCE/SEGMENT CONTROL INPUT**

| Connectors: | Rear panel D-sub, 8 bit lines |
| Input Impedance: | 10kΩ |
| Input Impedance: | TTL |

**EXTERNAL REFERENCE INPUT**

| Connector: | Rear panel BNC |
| Input Frequency: | 10, 20, 50 or 100MHz |
| Input Impedance: | 50Ω |
| Voltage Swing: | -5dBm to 5dBm |
| Damage Level: | 10dBm |

**EXTERNAL SAMPLE CLOCK INPUT**

| Connector: | Rear panel SMA |
| Input Impedance: | 50Ω |
| Voltage Swing: | -20dBm to 5dBm |
| Input Frequency: | WX1284C 75MHz to 1.25GHz |
| Input Frequency: | WX2184C 75MHz to 2.3GHz |
| Clock Divider: | 1/1, 1/2, 1/4, 1/8, 1/16 separate for channels 1/2 & 3/4 |
| Damage Level: | 15dBm |

**RUN MODES**

| Continuous: | A selected output function shape is output continuously. |
| Self Armed: | No start commands are required to generate waveforms. |
| Armed: | The output dwells on a DC level and waits for an enable command and then the output waveform is output continuously; An abort command turns off the waveform. |
| Trigged: | A trigger signal activates a single-shot or counted burst of output waveforms and then the instrument waits for the next trigger signal. |
| Normal Mode: | The first trigger signal activates the output; consecutive triggers are ignored for the duration of the output waveform. |
| Override Mode: | The first trigger signal activates the output; consecutive triggers restart the output waveform regardless if the current waveform has been completed or not. |
| Gated: | A waveform is output when a gate signal is asserted. The waveform is repeated until the gate signal is de-asserted. Last period is always completed. |
| Burst: | Upon trigger, outputs a Dual or multiple pre-programmed number of waveform cycles from 1 through 1M. |

**TRIGGER CHARACTERISTICS**

| Source: | Common or separate |
| Modes: | Waveform start to waveform start |
| Delayed: | Waveform stop to waveform stop |
| Timer: | Range 200ns to 2s |
| Resolution: | 3 digits |
| Accuracy: | 100ppm |

**CHANNELS 1/2 TO 3/4 OFFSET CONTROL**

| Initial skew: | 200ps |
| Control: | Range 0 to waveform-length points |
| Resolution: | 4 points |
| Accuracy: | Same as SCLK accuracy |

**TWO INSTRUMENTS SYNCHRONIZATION**

| Initial Skew: | 20ns + 0 to 8 SCLK |
| Offset Control: | 0 to Waveform length |
| Offset Resolution: | 4 SCLK increments |
| Skew Control: | -5ns to 5ns |
| Skew Resolution: | 10ps |

**GENERAL**

| Voltage Range: | 100VAC to 240VAC |
| Frequency Range: | 50Hz to 60Hz |
| Power Consumption: | 150VA |
| Display Type: | TFT LCD, 4", 320 x 240 pixels |
| Interfaces: | USB 1 x front, USB host, (A type); 1 x rear, USB device, (B type) |
| LAN: | 1000/100/10 BASE-T |
| GPIB: | IEEE 488.2 standard interface |
| Dimensions: | With Feet 315 x 102 x 395 mm (WxHxD) |
| Weight: | Without Package 4.5kg |
| Weight: | Shipping Weight 6kg |
| Storage: | -40°C to 70°C |
| Humidity: | 85% RH, non condensing |
| Safety: | CE Marked, IEC61010-1 |
| EMC: | IEC 61326-1:2006 |
| Calibration: | 2 years |
| Warranty: | 5 years standard |

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WX1284C</td>
<td>1.25GS/s Four Channel Arbitrary Waveform Generator</td>
</tr>
<tr>
<td>WX2184C</td>
<td>2.3GS/s Four Channel Arbitrary Waveform Generator</td>
</tr>
</tbody>
</table>

**OPTIONS**

| Option 1: | 32M Memory (per channel) |
| Option D: | 32 Bits / Digital Outputs |

**ACCESSORIES**

| Sync Cable: | Multi-instrument synchronization |
| S-Rack Mount: | 19" Single Rack Mounting Kit |
| Case Kit: | Professional Carrying Bag |

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(1) Standard warranty in India is 1 year.

(2) Options and Accessories must be specified at the time of your purchase.

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