Simulate, Stimulate, Test...

PRODUCT GUIDE

Arbitrary Function Generators • Arbitrary Waveform Generators
High-Speed AWGs • Pulse Waveform Generators • Digital Signal Amplifiers
Signal Amplifiers • Waveform Creation Software • Modular Instruments

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Leading the Way
In Waveform Generation

TABOR ELECTRONICS Ltd.
Since 1971

Arbitrary Function Generators

Wave Standard Series

WAVE STANDARD SERIES

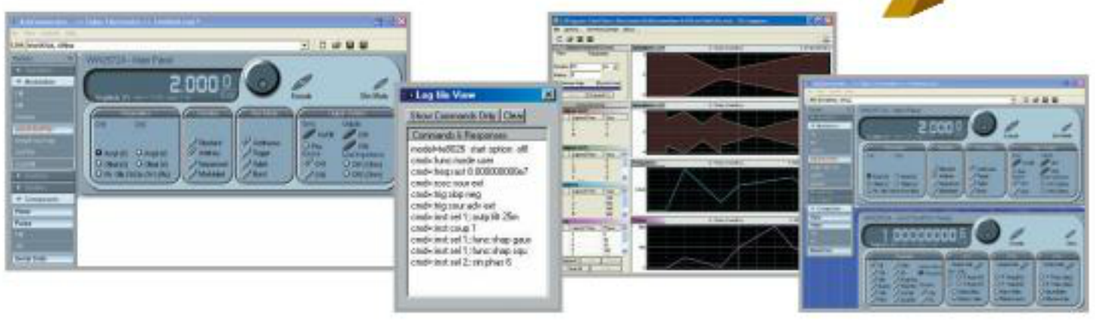
The Wave Standard Series is a family of single and dual channel arbitrary/function generators, designed to provide superior performance at a low price. The new series incorporates an easy to use built in waveform gallery and modulation schemes as well as a memory-based true arbitrary waveform generator architecture for accurate, jitter-free waveforms reaching frequencies of up to 350MHZ. Packed into a compact and efficient rack mountable box, having all in one easy to use high performance unit, makes the Wave Standard series, by far, the best in its category (AFGs) for size, price and performance.

MODEL	8101 I 8102	8351 I 8352 (New)
Channels	1 I 2	1 I 2 [1]
Waveform Type	Standard, Arbitrary, Pulse and Modulated	Standard, Arbitrary, Pulse, Pattern, PAM and Modulated
Max Frequency (Sine/Square/others)	100MHz / 62.5MHz / 31.25MHz	350MHz / 250MHz / 125MHz
Max. Sample Clock Rate	250MS/s	2GS/s
Memory Size	512k	512k
Vertical Resolution	16 bits	14 bits
Modulation	AM, FM, FSK, PSK, Sweep	AM, FM, ASK, Amp. Hop, FSK, Freq. Hop, Sweep, Chirp
Max Amplitude (into 50Ω)	16Vp-p	4Vp-p
Transition Time (typ.)	<4ns	<1ns
Run Modes	Continuous, Triggered, Burst, Gated	Continuous, Self armed, Armed, Triggered, Burst, Normal, Override & Gated
Display	User Friendly 3.8" color LCD Display	4" Color LCD
Storage	N/A	1GB Internal Flash and USB host
Remote Programming	Full IVI driver (C++, CVI, LabView), MATLAB and ArbConnection	
Connectivity	LAN, USB, GPIB	LAN, USB, GPIB and LXI-C compliant

[1] Fully independent or synchronized with 10ps resolution control

ArbConnection

ArbConnection is a powerful software package that allows you to easily design any type of waveform and control the instrument functions, modes and features via a graphical user interface (GUI). Whether you need to generate an output using a built-in waveform, a hand sketched or played back waveform, a pulse pattern, a serial data string, a modulated carrier or even an equation, ArbConnection provides you the editing tools which makes virtually any application possible.



- Virtual front panels - To easily access all functions and features that control the instrument
- Wave composer - For fast and simple waveforms creation, either hand sketch, pre-defined function, equation or loaded external file (Binary, ASCII, MATLAB or Scope capture)
- Modulation composers - To control the different domains with the very same simplicity as using the Wave Composer
- Pulse / Pattern composer - For fast and easy pulses and patterns creation either transition points or level intervals
- Serial Data composer - For quick and easy serial data creation
- Equation editor - To write equations and mathematical expressions and convert them into waveforms
- Waveform Studio - To capture or upload waveforms into the various segments, used either as individual arbitrary waveforms or replayed as part of the complete waveform (sequence)
- SCPI command editor - To validate or test various commands
- Log editor - To validate remote interface programming or save in a text file and use in external applications

For more information or to schedule a demo, call today

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Arbitrary Waveform Generators

Wonder Wave Series

20 BEST IN TEST 07
TEST & MEASUREMENT WORLD HONORABLE MENTION

WONDER WAVE SERIES

The Wonder Wave Series line of arbitrary waveform generators breaks new ground by combining two technologies. While being a true, memory-based arbitrary waveform generator (AWG), with all of the memory management capabilities needed to create complex waveforms, it also implements a Direct Digital Synthesizer (DDS) enabling many standard modulation types and frequency agility capabilities.

MODEL	5061 I 5062 I 5064	1071 I 1072 I 1074	2571A I 2572A I 2074
Channels	1 I 2 I 4	1 I 2 I 4	1 I 2 I 4
Waveform Type	Standard, Arbitrary, Pulse, Modulated and Sequenced		
Max. Sample Clock Rate	50MS/s	100MS/s	300MS/s [1] I 300MS/s [1] I 200MS/s
Memory Size	512k (1M option)	1M (2M/4M option)	1M (2M/4M option)
Memory Management	2k Segments; 4k Steps; 1M Loops		10k Segments; 4k Steps; 1M Loops
Vertical Resolution	14 bits I 14 bits I 16 bits	14 bits I 14 bits I 16 bits	16 bits
Modulation	AM, FM, Arbitrary FM, FSK, Ramped FSK, Sweep 5064, 1074, 2074: (n)PSK, (n)QAM only		
Max Frequency (Sine/Square/others)	25MHz / 15MHz / 7.5MHz	50MHz / 30MHz / 15MHz	100MHz / 62.5MHz / 31.25MHz 2074: 80MHz / 50MHz / 25MHz
Max Amplitude (into 50Ω)	10Vp-p	10Vp-p	16Vp-p [2] I 16Vp-p [2] I 10Vp-p
Transition Time (typ.)	<8ns	<6ns	<4ns
Digital Outputs	N/A	N/A	16 Bit LVDS Parallel Output [3,4]
Display	User Friendly 3.8" color LCD Display		
Remote Programming	Full IVI driver (C++, CVI, LabView), MATLAB and ArbConnection		
Connectivity	LAN, USB, GPIB		

[1] Typ. [2] 20Vp-p into 50Ω option [3] Optional 10Vp-p Programmable digital amplifier/POD. For further details, see model 2816. [4] N/A in 2074

High Speed Function Generator
The Wonder Wave Series features 10 built-in standard functions that cover most routine requirements with frequencies ranging from 100µHz to 100MHz. All functions and their respective parameters are accessible via the front panel.

Long Waveform Memory, Segmentation and Sequencing
Longer waveform memory, powerful segmentation and sequencing are critical for solving complex waveform generation applications. With up to 4M points of memory per channel, multiple waveforms can be loaded simultaneously and retrieved as needed. Additionally, the waveform memory can be divided into multiple waveform segments that can then be sequenced and advanced in five different ways to create complex waveforms while saving precious memory space.

Modulation Capability
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 Wonder Wave Series can also do standard modulation schemes such as FM, AM, FSK, ASK, (n)PSK, (n)QAM, as well as amplitude and frequency hopping, without sacrificing the power of the instrument control and output run modes. Furthermore, some of the models can generate modulation in three domains (3D) simultaneously: frequency, amplitude and phase.

Up to four synchronized Channels
The WW series offers up to four synchronized channels in a single instrument. All channels are synchronized to the same reference clock and share the same sample clock. This is not a limitation because the output frequency is a function of the number of points which are used for creating the waveform shape. On the other hand, the advantage of having up to four synchronous channels is huge in applications that require accurate and controlled phase between channels. Many applications require XY drive so two channels is just what is needed however, for three phase power simulations and four channel MEMS micro engine actuators, the four channel models are ideal.

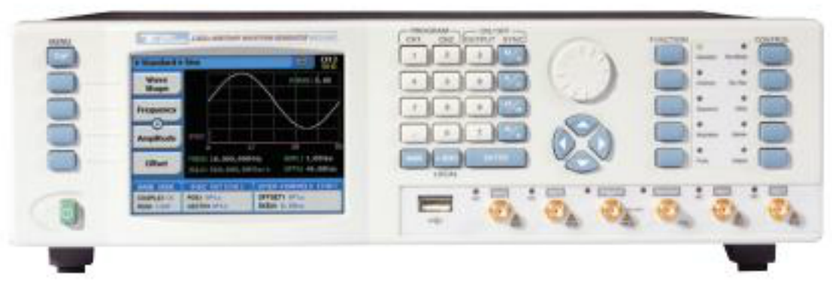
Multi-Instrument Synchronization
Several units of the same model can be synchronized using a Master-Slave arrangement allowing users to benefit from the same high quality performance in their multi-channels needs.

Easy to Use
Large and user-friendly 3.8" backlit color LCD display facilitates browsing though 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.

High-Speed Arbitrary Waveform Generators

WaveXciter Series

Tabor's all-new WaveXciter series offers unrivaled performance, even when compared to instruments designed to generate fewer types of signals or higher sampling rates. The WaveXciter can generate literally any waveform, at frequencies up to 1GHz with 12 digits of resolution and 1 point granularity, resulting in the highest precision signal creation and regeneration. Aside from its natural ability to generate arbitrary waveforms, the WaveXciter can also be used as a full-featured standard, modulation or pulse generator to solve various applications. Its affordable footprint saves space and cost without compromising bandwidth and signal integrity.



MODEL	1281C | 1282C | 1284C (New)	2181C | 2182C | 2184C (New)
Channels	1 | 2 | 4	1 | 2 | 4
Waveform Type	Standard, Arbitrary, Pulse, Pattern, Modulated and Sequenced	
Max. Sample Clock Rate	1.25GS/s	2.3GS/s
Waveform Memory	16M (32M option)	16M (32M option)
Memory Management	Advanced Sequencing with up to 32K segments; 48K steps; 16M loops	
Vertical Resolution	14 bits	14 bits
Modulation	AM, FM, ASK, Amp. Hop, FSK, Freq. Hop, Sweep, Chirp	
Max Frequency (Sine/Square/others)	500MHz / 350MHz / 125MHz	1GHz / 500MHz / 250MHz
Max Amplitude (into 50Ω)	DC: 2Vp-p / HV: 4Vp-p / AC [1]: -20 to +10dBm (double into open circuit)	
Transition Time	DC: <600ps (<500ps typ.) / HV: <1ns	
Run Modes	Continuous, Self armed, Armed, Triggered, Burst, Normal, Override & Gated	
Markers	4 Programmable differential markers	
Storage	4GB Internal Flash memory and USB host	
Digital Outputs (Option D)	32 Bit digital outputs [2]	
Display	4" Color LCD	
Remote Programming	Full IVI-COM & IVI-C drivers (C++, CVI, LabView), MATLAB and ArbConnection	
Connectivity	1000BASE-T LAN, USB 2.0, GPIB and LXI -C compliant	

[1] AC Path is not available on WXxx84C [2] Optional 8Vp-p Programmable digital amplifier/POD. For further details, see model WXD1.

Common or Separate Clocks

The new WaveXciter series architecture offers two SCLK sources for its 2 & 4 channels units, 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 and I&Q output applications. Alternatively, users can select to work with two separate SCLK sources resulting in two separate channels (or channel couples 1&2 and 3&4 in the 4CH units) 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 instruments in one box.

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.

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 or 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.

Powerful Segmentation and Sequencing

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, whether 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.

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Pulse Waveform Generators

Pulse Master Series

BEST in TEST 2008 — TEST & MEASUREMENT WORLD Honorable Mention

PULSE MASTER SERIES

The Pulse Master is a Series of Single and Dual Channel Pulse/Waveform Generators that offers a complete array of pulse, standard, arbitrary, sequenced and modulated waveforms with unmatched performance, even compared to instruments designed to generate fewer types of signals. Its smart, compact, 2U 1/2 rack-width footprint allows designers and manufacturers to conserve substantial benchtop or rack space, while benefiting from high-performance, bandwidth, signal integrity, and reliability with the flexibility to adapt to a full spectrum of applications making the Pulse Master an important laboratory tool, both now and for many years to come.

MODEL	8571A	8572A
Channels	1	2
Waveform Type	Pulse, Standard, Arbitrary, Modulated and Sequenced	
Pulse Modes	Single,Delayed, Double, Fixed Duty Cycle and External Width	
Pulse Type	Normal, Complement, Inverted and Linear Transitions	
Period Range	20ns to 1000s	20ns to 1000s
Pulse Width Range	8ns to 10s	8ns to 10s
Timing Resolution	10ps	10ps
Trigger Jitter	<100ps	<100ps
Max. Std. Frequency (Sine/Square/Others)	100MHz / 62.5MHz / 31.25MHz	100MHz / 62.5MHz / 31.25MHz
Max. Sample Clock Rate (typ.)	300MS/s	300MS/s
Memory Size	1M (2M/4M option)	1M (2M/4M option)
Memory Management	10k Segments; 4k Steps; 1M Loops	
Vertical Resolution	16 bits	16 bits
Modulation	AM, FM, FSK, ASK, PSK, Amplitude and Frequency Hop, (n)PSK, (n)QAM, PWM and Sweep	
Max Amplitude (into 50Ω)	16Vp-p (20Vp-p option)	
Transition Time (typ.)	<4ns	<4ns
Digital Outputs	16 Bit LVDS parallel Output (1)	
Display	User Friendly 3.8" color LCD Display	
Store / Recall	USB Stick, CD, DVD	
Remote Programming	Full IVI-C driver (C++, CVI, LabView), MATLAB and ArbConnection	
Connectivity	LAN, USB, GPIB	

(1) Optional 10Vp-p Programmable digital amplifier/POD. For further details, see model 2816.

Versatile Pulse Control

If your application requires more than just a fixed duty cycle or programmable pulse width, then you can add jitter to the leading edge using a standard or arbitrary waveform shape. Combine this feature with external pulse width control and you have an extremely versatile pulse generation tool.

Extremely High Resolution

Need to control pulse transitions and placement? Just program each channel to output pulses with linear or fast transitions and control edge placement with 10 ps resolution.

Trigger Jitter

Many applications require accurate triggering capabilities, with a trigger jitter of less than 100ps the PM series offers unprecedented triggering accuracy enabling users to implement various testing scenarios.

Emulataing Legacy Products

The Pulse Master Series implements command emulators for both new and discontinued Pulse and Function Generators, providing a smooth transition for all aging automatic test systems facing obsolescence and maintenance problems. This unique benefit allows clients to easily "drop-in" the Pulse Master into slots vacated by out-of-date models, helping to protect your TPS investment.

Store / Recall (Memory stick/CD/DVD)

The new PM series is equipped with a USB host enabling the loading and saving of setups and waveforms from various memory storage devices such as USB stick, CD ROM and DVD. This allows the user to instantly upload the waveforms and setup to the instrument without the need of a PC or Laptop.

Digital Signal Amplifiers/PODs

Tabor's new line of digital signal amplifiers allows for a better, more advanced utilization of the already available digital outputs on some of Tabor's arbitrary waveform generators. Combined, they offer the highest performance mixed signal generation package, having high-end, high speed arbitrary generation capabilities with the most sophisticated digital pattern generation, all in a single solution. Whether your application requires you to perform characterization, validation, verification or debugging, Tabor's mixed signal sources solutions combination will prevail.

MODEL	2816 (New)	WXD1 (New)
Channels	16	14
Data Rate	1.5b/s to 300Mb/s	10Mb/s to 1.15Gb/s
Gain	Programmable amplitude and offset control	
Max. Amplitude	5Vp-p [1]	4Vp-p [1]
Output Impedance	50Ω	50Ω
Transition Times	<2ns	<2Vp-p: <0.5ns; 2Vp-p to 4Vp-p: <1ns
Skew Between Bits	Initial: <2ns; Control: ±2.5ns with 5ps resolution	Initial: <100ps; Control: ±2.5ns with 5ps resolution
Auxiliary	Clock Output	Clock Output
Pattern Source	WW2571/2A and PM8571/2A	WX Series with option D
Pattern Memory	Dedicated: 128k/channel Parallel: Up to 4M/channel Arbitrary Memory	Dedicated: Up to 32M/channel Parallel: Up to 32M/channel Arbitrary Memory

[1] Double into Open Circuit

Signal Amplifiers

Signal amplifiers are a must in applications requiring both complex signals as well as high voltage throughput. Such a combination is rare in high performance instrumentation and therefore external amplification devices must be used to achieve this task. The Tabor line of wideband amplifiers was designed to operate in conjunction with its series of waveform generators thus providing the ultimate solution for high-voltage, wideband applications.

MODEL	9250	9260 (New)	9100 I 9200	9100A I 9200A	9400
Channels	2 Single or Differential	2 Single or Differential	1 I 2	1 I 2	4
Max Amplitude into matching Impedance	40Vp-p	34Vp-p	300Vp-p	400Vp-p	400Vp-p
Large Signal Bandwidth	15MHz	30MHz	500kHz	500kHz	500kHz
Small Signal Bandwidth	30MHz	45MHz	1MHz	1.5MHz	1.5MHz
Max. Output Current	200mA (50Ω)	750mA	150mA I 100mA	125mA I 100mA	50mA
Input Impedance	50Ω, 75Ω or 1MΩ	50Ω, 75Ω or 1MΩ	1MΩ	1MΩ	1MΩ
Output Impedance	50Ω, 75Ω or 600Ω	2.5Ω, 50Ω, 75Ω or 600Ω	0.1Ω	0.1Ω	0.1Ω
Gain	10 (or custom)	10 (or custom)	15 (or custom)	50 (or custom)	50 (or custom)
Transition Time	<22ns	<15ns	<1.5µs	<1µs	<1µs
Platform	Bench	Bench	Bench	Bench	Bench

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PXI & PCI Arbitrary Waveform / Function Generators

PC-based instruments are gaining vast momentum in the industry. Tabor's design is based on a very high level of integration, allowing it to implement its unique AWG technology in this platform easily. Being the bench models replica, the 5000 series set new standards in the PXI, cPXI and PCI class. It combines two technologies (DDS&ARB), making use of the best qualities from each of the types of technologies allowing it to create complex waveforms, on one hand, and generating all the standard functions and modulation formats, on the other.

MODEL	5200 | 5325	5201 | 5300	5251 | 5351
Channels	1	1	1
Waveform Type	Standard, Arbitrary, Modulated and Sequenced		
Sample Clock Rate	50MS/s	125MS/s	250MS/s
Memory Size	1M	2M	2M
Memory Management	4k Segments; 4k Steps; 128k Loops		10k Segments; 4k Steps; 1M Loops
Vertical Resolution	14 bits	14 bits	16 bits
Modulation	AM, FM, Arbitrary FM, FSK, Sweep		AM, FM, FSK, ASK, Freq. & Amp. Hop, Sweep
Max Frequency (Sine/Square/others)	25MHz/15MHz/7.5MHz	50MHz/30MHz/15MHz	100MHz/62.5MHz/31.25MHz
Max Amplitude (into 50Ω)	8Vp-p | 10Vp-p	8Vp-p | 10Vp-p	10Vp-p
Transition Time (typ.)	<8ns	<6ns	<4ns
Remote Programming	Full IVI-C driver (C++, CVI, LabView), MATLAB and ArbConnection		
Connectivity	PXI | PCI	PXI | PCI	PXI | PCI

PXI, PCI & Modular Signal Amplifiers

A common problem with PXI, cPCI and PCI equipment is the inability to produce high voltages resulting from low power supply rails. Tabor Electronics' new amplifiers solve the problem by converting the supply rails to higher voltage suitable for signals up to 180Vp-p. The line was designed to operate in conjunction with Tabor's Waveform Generators thus providing the ultimate solution for PXI, PCI and bench, high-voltage, wideband applications.

MODEL	3180 (New)	3222	3322	A10150 (New)	A10160 (New)
Channels	1	1	1	1	1
Max Amplitude into matching Impedance	180Vp-p	20Vp-p	20Vp-p	20Vp-p	34Vp-p
Large Signal Bandwidth	300kHz	20MHz	20MHz	150MHz	30MHz
Small Signal Bandwidth	1MHz	50MHz	50MHz	200MHz	45MHz
Max. Output Current	150mA	200mA (50Ω)	200mA (50Ω)	250mA	750mA
Input Impedance	50Ω	50Ω, 1MΩ	50Ω, 1MΩ	50Ω	50Ω
Output Impedance	0.1Ω	50Ω, 75Ω or 600Ω	50Ω, 75Ω or 600Ω	50Ω	2.5Ω
Gain	20 (or custom)	10 (or custom)	10 (or custom)	5 (or custom)	10 (or custom)
Transition Time	<1.5µs	<22ns	<22ns	<3ns	<15ns
Connectivity	PXI	PXI	PCI	Snap-On	Snap-On

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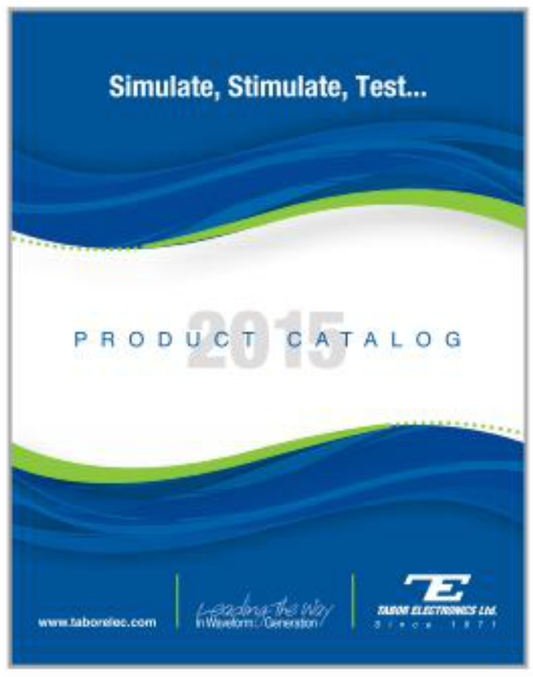

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