Data Sheet

Dual Channel Function/Arbitrary Waveform Generators

4060 Series

The 4060 Series Dual Channel Function/Arbitrary Waveform Generators are capable of generating stable and precise sine, square, triangle, pulse, and arbitrary waveforms. With an easy-to-read color display and intuitive user interface with numeric keypad, these instruments offer plenty of features including linear/logarithmic sweep, built-in counter, extensive modulation and triggering capabilities, a continuously variable DC offset, and a high performance 14-bit, 500 MSa/s arbitrary waveform generator.

Easily create custom arbitrary waveforms using the included waveform editing software or use any of the 36 built-in predefined arbitrary waveforms. Up to 8 user-defined 512-kpt arbitrary waveforms and 24 user-defined 16-kpt arbitrary waveforms can be saved to the instrument. Additionally, the included LabVIEW™ drivers allow users to conveniently load and save .CSV or text file data directly into the arb memory without having to use waveform editing software.

Extensive modulation capabilities include amplitude and frequency modulation (AM/FM), double sideband amplitude modulation (DSB-AM), amplitude and frequency shift keying (ASK/FSK), phase modulation (PM), and pulse width modulation (PWM).

The standard external 10 MHz reference clock input and output allows users to synchronize their instrument with another generator. This feature is typically not found in function generators at this price point. Additionally, the phase of both output channels can be synchronized conveniently with the push of a button.

These versatile function/arbitrary waveform generators are suitable for education and other applications that require high signal fidelity, a variety of modulation schemes, or arbitrary waveform generation capabilities.

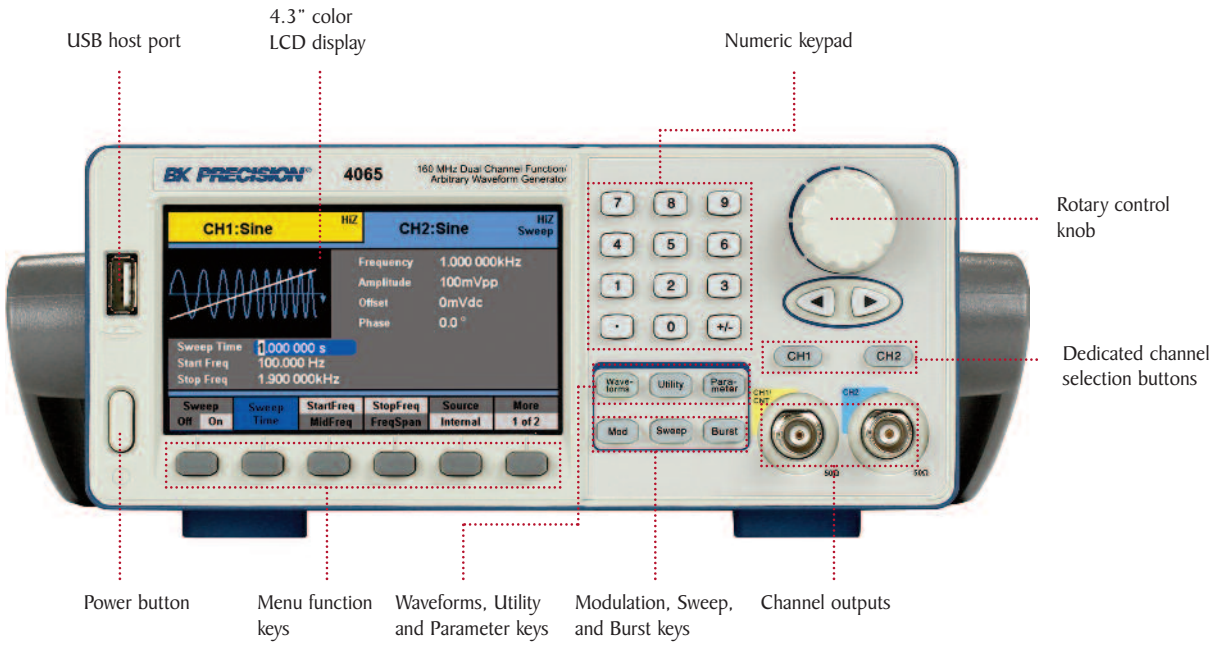
Model	4063	4064	4065
Sine frequency range	1 μHz – 80 MHz	1 μHz – 120 MHz	1 μHz – 160 MHz
Square frequency range	1 μHz – 40 MHz	1 μHz – 50 MHz	

Features & Benefits

- 14-bit, 500 MSa/s, 512k point (Ch2 only) arbitrary waveform generator
- Two independent channels with one-button synchronization
- Generate sine waves up to 160 MHz
- Large 4.3-inch LCD color display
- Linear and logarithmic sweep
- AM/DSB-AM/ASK/FM/FSK/PM/PWM modulation functions
- Variable DC offset
- Adjustable duty cycle
- Internal/external triggering
- Gate and burst mode
- 36 built-in predefined arbitrary waveforms
- Store/recall up to 10 instrument settings and 32 user-defined arbitrary waveforms (8 x 512 kpts, 24 x 16 kpts)
- Built-in counter
- USB device port (USBTMC-compliant) and front panel USB host port
- GPIB connectivity with optional USB-to-GPIB adapter
- Arbitrary waveform editing software included
- Short circuit output protection
- LabVIEW™ drivers available

B&K PRECISION
ELECTRONIC TEST INSTRUMENTS

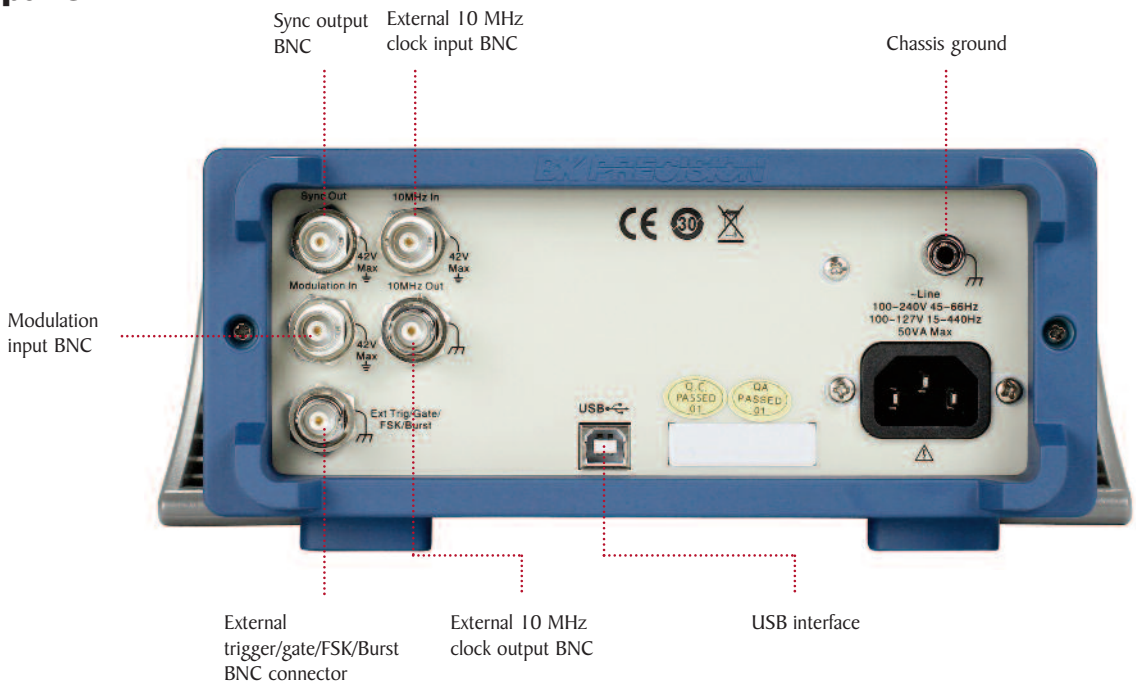
Front panel



Intuitive user interface

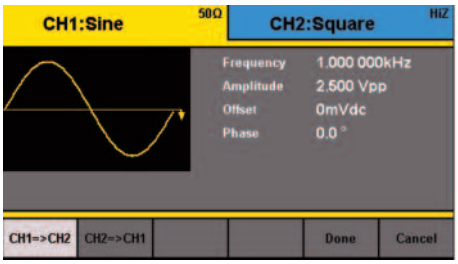
Easily adjust all waveform parameters using the intuitive menu-driven front panel keypad with dedicated channel selection keys, numeric keypad, and rotary control knob. Connect your USB flash drive to the USB host port to quickly save and recall instrument settings and waveforms.

Rear panel



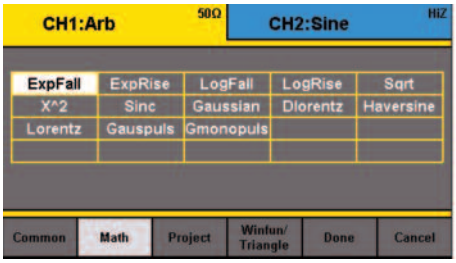
Flexible operation

Dual channel output



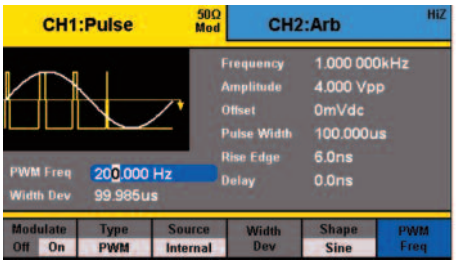
Save time with the 4060 Series' two independent channels to output synchronous signals. With a push of a button, all waveform parameters can be quickly copied between channels to set up identical output signals. Phase between channels can also be adjusted from the front panel.

Arbitrary waveform generation



All models in the 4060 series provide non-volatile memory to create, store, and recall up to 24 different 16-kpt arbitrary waveforms and up to 8 different 512-kpt arbitrary waveforms. Users can also output any of the 36 built-in predefined arbitrary waveforms.

Wide variety of modulation schemes

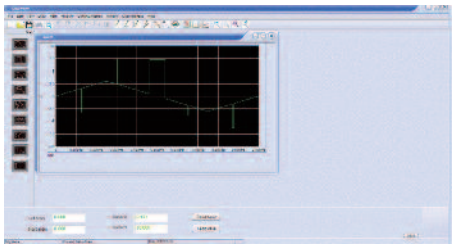


These instruments are capable of many different types of modulation for various applications. Modulate your waveforms with AM, DSB-AM, FM, PM, ASK, FSK, and PWM modulation schemes.

Synchronization and external triggering

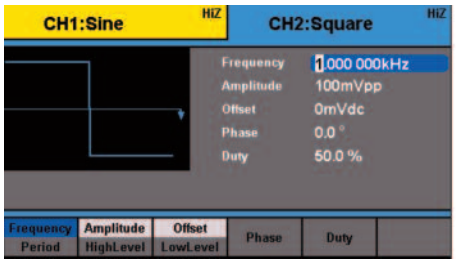
Use the external 10 MHz clock input and output to synchronize your signals to a master time base. The Sync output generates a TTL pulse for synchronization to a channel's frequency. An external trigger BNC connector is also available for inputting or generating a trigger signal.

Generate waveforms with ease



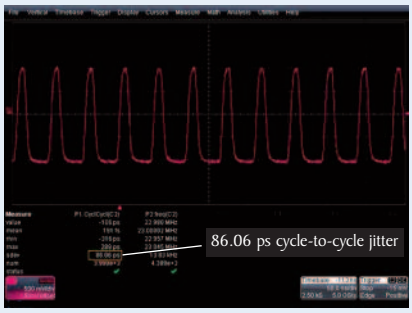
The provided waveform editing software can be used to create point-by-point arbitrary waveforms via freehand or waveform math functions. A standard USB interface on the rear panel allows users to easily interface with a PC to load these arbitrary waveforms into the instrument. The front panel also offers a convenient USB host port for connecting your USB flash drive to save/recall instrument settings and waveforms.

Easy-to-read color display



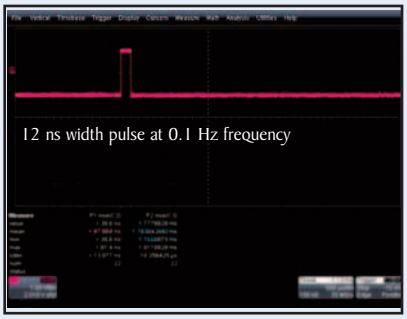
Large 4.3" color display shows the currently selected channel and all relevant parameters.

Advanced pulse generator



For applications requiring high signal integrity and edge stability, the 4060 Series can generate pulses with a low cycle-to-cycle jitter of < 100 ps.

Capable of setting edge times within a large range, the 4060 Series can generate pulses with minimum rise/fall times of 6 ns and maximum rise/fall times of 6 seconds.



Unlike traditional DDS generators, the 4060 Series has the capability to output a rapid pulse at very low frequencies. Duty cycle can be set to as low as 0.0001%.

Specifications

Model	4063	4064	4065
Channels	2		
Frequency Characteristics			
Sine	1 µHz – 80 MHz	1 µHz – 120 MHz	1 µHz – 160 MHz
Square	1 µHz – 40 MHz	1 µHz – 50 MHz	
Triangle, Ramp	1 µHz – 4 MHz		
Pulse	1 µHz – 20 MHz	1 µHz – 30 MHz	1 µHz – 40 MHz
Gaussian Noise (-3 dB)	100 MHz		
Arbitrary	1 µHz – 20 MHz	1 µHz – 30 MHz	1 µHz – 40 MHz
Accuracy	± 2 ppm (1 year)		
Resolution	1 µHz		
Arbitrary Characteristics			
Built-in Waveforms	36		
Waveform Length	Ch1: 16,000 points, Ch2: 512,000 or 16,000 points		
Vertical Resolution	14 bits		
Sampling Rate	500 MSa/s		
Minimum Rise/Fall Time	6 ns (typical)		
Jitter (pk-pk)	2 ns (typical)		
Non-volatile Memory Storage	8 x 512 kpts waveforms and 24 x16 kpts waveforms		
Output Characteristics			
Amplitude Range (into 50 Ω)	1 mVpp – 10 Vpp, ≤ 40 MHz 1 mVpp – 5 Vpp, ≤ 100 MHz 1 mVpp – 1.5 Vpp, ≤ 160 MHz		
Amplitude Resolution	up to 4 digits		
Amplitude Accuracy (100 kHz)	± (0.3 dBm + 1 mVpp)		
Amplitude Flatness (relative to 100 kHz Sine, 1 Vpp)	≤ 10 MHz ± 0.2 dB ≤ 80 MHz ± 0.5 dB ≤ 160 MHz ± 0.8 dB		
Cross Talk	< -65 dBc		
Offset Range (DC)	± 5 V into 50 Ω ± 10 V into open circuit		
Offset Resolution	up to 4 digits		
Offset Accuracy	± (|offset setting value| x 1% + 1 mV)		
Output Impedance	50 Ω, high impedance		
Output Protection	short-circuit protection		
Waveform Characteristics			
Harmonic Distortion (Sine)	DC – 1 MHz, < -54 dBc 1 MHz – 10 MHz, < -46 dBc 10 MHz – 100 MHz, < - 35 dBc 100 MHz – 160 MHz, < -26 dBc		
Total Harmonic Distortion (Sine)	DC – 20 kHz at 1 Vpp, < 0.2 %		
Spurious (non-harmonic)	DC – 1 MHz, < -70 dBc 1 MHz – 10 MHz, < -65 dBc		
Phase Noise	100 kHz offset, - 116 dBc/Hz (typical)		
Rise/Fall Time (Square)	< 8 ns (10 % - 90 %) at full amplitude into 50 Ω		
Variable Duty Cycle (Square)	20% - 80% to 10 MHz 40% - 60% to 40 MHz 50% > 50 MHz		
Asymmetry (50% duty cycle)	1% of period + 5 ns (typical,1 kHz, 1 Vpp)		
Jitter (Square)	100 ps rms (typical)		
Ramp Symmetry	0% - 100%		
Linearity (Triangle, Ramp at 1 kHz, 1 Vpp, 100% Symmetry)	< 0.1% of peak output (typical)		

Model	4063, 4064 & 4065
Pulse	
Pulse Width	12 ns minimum, 100 ps resolution, 1,000,000 s max
Rise/Fall Time	6ns – 6s(1), 100 ps resolution
Duty Cycle Range	0.0001 % to 99.9999 %
Overshoot	< 3%
Jitter (pk-pk)	< 100 ps rms (typical)
Burst	
Waveform	sine, square, ramp, pulse, arbitrary (except DC)
Type	cycle (1 – 1,000,000 cycles), infinite, gated
Start/Stop Phase	0 ° – 360 °
Internal Period	1 µs – 1000 s ± 1%
Gated Source	external trigger
Trigger Source	internal, external, manual
Phase Offset	
Range	-360 ° – 360 °
Resolution	0.1 °
Trigger Characteristics	
Trigger Input	
Input Level	TTL compatible
Slope	rising or falling, selectable
Pulse Width	> 50 ns
Input Impedance	> 5 kΩ, DC coupling
Maximum Frequency	1 MHz
Input Latency	< 380 ns
Trigger Output	
Voltage Level	TTL compatible
Pulse Width	> 60 ns (typical)
Output Impedance	50 Ω (typical)
Maximum Frequency	1 MHz
AM, FM & PM Modulation Characteristics	
Carrier	sine, square, ramp, arbitrary (except DC)
Source	internal, external
Modulation Waveform	sine, square, ramp, noise, arbitrary (1 mHz – 50 kHz)
AM Modulation Depth	0% - 120%, 0.1% resolution
FM Frequency Deviation	0 – 0.5 x bandwidth, 1 mHz resolution
PM Phase Deviation	0 – 360 °, 0.1 ° resolution
ASK & FSK Modulation Characteristics	
Carrier	sine, square, ramp, arbitrary (except DC)
Source	internal, external
Modulation Waveform	50% duty cycle square waveform (1 mHz – 1 MHz)
DSB-AM Modulation Characteristics	
Carrier	sine, square, ramp, arbitrary (except DC)
Source	internal, external
Modulation Waveform	sine, square, ramp, noise, arbitrary (1 mHz – 50 kHz)
PWM Modulation Characteristics	
Source	internal, external
Modulation Waveform	sine, square, ramp, arbitrary (except DC)
External Modulation	- 5 V to + 5 V (max. width deviation)
Duty Cycle Modulating Frequency	1 mHz – 50 kHz

(1) depending on pulse width

Sweep Characteristics	
Waveforms	sine, square, ramp, arbitrary (except DC)
Sweep Shape	linear or logarithmic, up or down
Sweep Time	1 ms – 500 s ± 0.1%
Sweep Trigger	internal, external, manual
Inputs and Outputs	
Output Impedance	50 Ω, high impedance
Sync Out	TTL compatible > 50 ns width, not adjustable 50 Ω (typical) output impedance 10 MHz max. frequency
Modulation In	± 5 V for 100% modulation > 10 kΩ input impedance max. voltage input: + 5 V
External Clock In	Frequency Range: 10 MHz ±1 kHz Min. Voltage Input: 2.3 V
External Clock Out	Frequency: 10 MHz Voltage Level: >1 Vpp
Ext Trig/Gate/FSK/Burst	TTL compatible max. voltage input: + 5 V
Frequency Counter	
Measurement	frequency, period, positive/negative pulse width, duty cycle
Measurement Range	100 mHz – 200 MHz
Frequency Resolution	6 bits
Voltage Range (non-modulated signal)	
DC Coupling	DC offset range: ± 1.5 VDC 100 mHz – 100 MHz, 50 mVrms - ± 2.5 V 100 MHz – 200 MHz, 100 mVrms - ± 2.5 V
AC Coupling	1 Hz – 200 MHz, 100 mVrms – 5 Vpp
Pulse Width/Duty Cycle Voltage Range	50 mVrms – 5 Vpp
Input Impedance	1 MΩ
Coupling	AC, DC
Trigger Level Range	-3 V to +1.8 V
Environmental and Safety	
Temperature	operating: 32 ºF – 104 ºF (0 °C – 40 °C) storage: -4 ºF – 140 ºF (-20 °C – 60 °C)
Humidity	< 95º F (< 35 °C), ≤ 90 % RH 95 ºF – 104 ºF (35 °C – 40 °C), ≤ 60 % RH
Altitude	operating: below 9,842 ft (3,000 m) storage: below 49,212 ft (15,000 m)
Electromagnetic Compatibility	EMC Directive 2004/108/EC, EN61326:2006, EN61000-3-2:2006+A2:2009, EN61000-3-3:2008
Safety	low voltage directive 2006/95/EC, EN61010-1:2001, EN61010-031:2002+A1:2008
General	
Display	4.3" TFT-LCD display, 480 x 272
Interfaces	USBTMC (standard), GPIB (optional), USB host port
Storage Memory	10 instrument settings, 32 arbitrary waveforms
AC Input	100 – 240 VAC ± 10%, 50 / 60 Hz ± 5% 100 – 120 VAC ± 10%, 45 – 440 Hz
Power Consumption	30 W max.
Dimensions (W x H x D)	10.3" x 4.1" x 13.5" (261 x 105 x 344 mm)
Weight	6.1 lbs (2.8 kg)
	Three-Year Warranty
Standard Accessories	Getting started manual, full instruction manual on CD, AC power cord, USB type A-to-type B cable, certificate of calibration
Optional Accessories	USB-to-GPIB adapter (model AK40G)

LifeElectronics
Живое партнерство

ООО «ЛайфЭлектроникс» **“LifeElectronics” LLC**

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- *Конкурентоспособные цены и скидки постоянным клиентам.*
- *Специальные условия для постоянных клиентов.*
- *Подбор аналогов.*
- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

- *Приемлемые сроки поставки, возможна ускоренная поставка.*
- *Доставку товара в любую точку России и стран СНГ.*
- *Комплексную поставку.*
- *Работу по проектам и поставку образцов.*
- *Формирование склада под заказчика.*

- *Сертификаты соответствия на поставляемую продукцию (по желанию клиента).*
- *Тестирование поставляемой продукции.*
- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- *Регистрацию проекта у производителя компонентов.*
- *Техническую поддержку проекта.*
- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

Тел: +7 (812) 336 43 04 (многоканальный)
Email: org@lifeelectronics.ru

www.lifeelectronics.ru