Sapphire Series

The Sapphire
Digital Delay Pulse Generator

The sapphire series is the most affordable Digital Delay Pulse Generator in our family of products. Despite its low cost, this robust model offers a full range of features, making it ideally suited for the budget sensitive user.

- 2 or 4 Independent Channel Outputs
- 10 ns Resolution
- < 500 ps RMS Jitter
- Output Multiplexer
- Fast Rise Time, < 2 ns
- Small Form Factor
- DC Wall Mount or USB Powered
- Wireless Option Via Bluetooth
- Full Customer Support
- 2 Year Warranty

Quantum®
COMPOSERS

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The Sapphire Pulse Generator

The Sapphire Series Digital Delay Pulse Generator with 2 or 4 independent outputs is our most affordable digital delay/pulse generator. It's ideal for applications that require moderate precision and multi-channel capability. The instrument offers a complete set of channel operating modes including continuous, single shot, burst, and duty cycle. When combined with an external trigger/gate input and output multiplexer, this allows for a full range of complex output waveforms. With intuitive, streamlined GUI (Graphical User Interface) control of timing parameters and quick recall of up to 6 system configurations, the instrument is instantly ready for use. Complete control of the Sapphire is provided through the standard USB interface and optional Bluetooth connectivity.

Digital Delay Output Modes
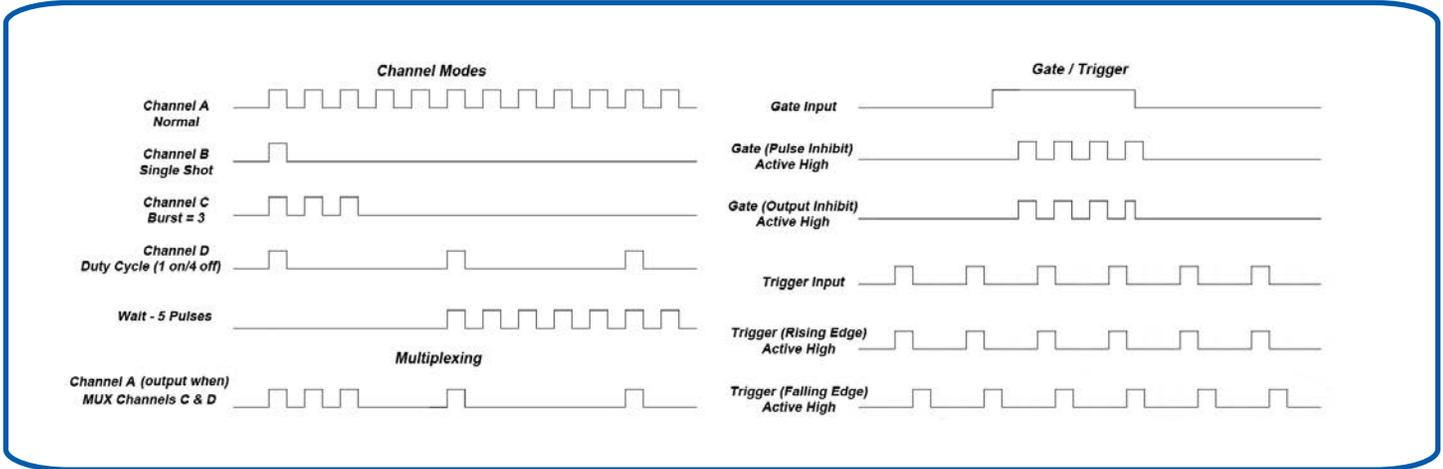

Special Features

Bluetooth Wireless Connectivity

The Bluetooth wireless capabilities are truly unique with this unit. With the Bluetooth option, you can control the instrument wirelessly using the included software application, Comm Terminal or other terminal program. This unique feature allows you to communicate with Bluetooth equipped devices, such as laptops and some tablets or smartphones.

Graphical User Interface

The Sapphire uses an included software application as the primary means of communication. The software allows simple and easy control of the unit via USB or optional Bluetooth wireless, enabling the user to create complex pulse trains and save them for future recall. The software also allows users to manually input SCPI (Standard Commands for Programmable Instruments) based commands via the Command Terminal Section.
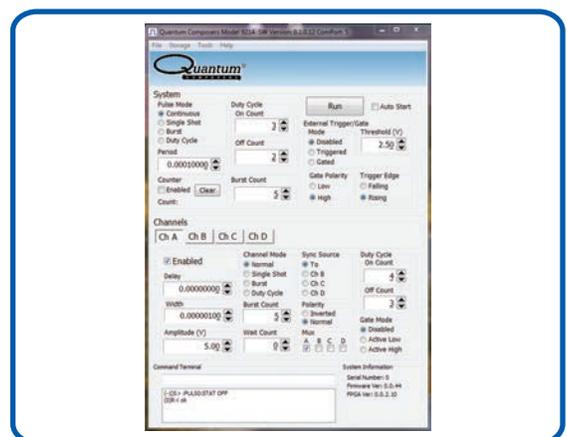
SPECIFICATIONS   Sapphire Series

MODEL 9212   2 independent channel outputs   Standard Communications: USB Port
       9214   4 independent channel outputs   Configurations: 6 Memory Slots

INTERNAL RATE GENERATOR

Rate (To period)	0.001 Hz to 5.000 MHz (200 ns – 1000 s)
Resolution	10 ns
Accuracy	5 ns + (0.0001 x period)
Jitter	< 500 ps RMS
Burst / Duty Cycle Mode	1 to 1,000,000 pulses
Timebase	100 MHz, low jitter PLL
Oscillator	50 MHz, 50 ppm crystal oscillator
Pulse Control Modes	Internal rate generator, external trigger / gate
System Output Modes	Single, continuous, burst, duty cycle

PULSE / DELAY GENERATION

Width / Delay Resolution	10 ns
Width Range	10 ns - 1000 s
Width Accuracy	10 ns + 0.0001 x (width + delay)
Delay Range	±1000 s
Delay Accuracy	10 ns + (0.0001 x delay)
Output Multiplexer	Timing of any / all channels may be OR'd to any / all outputs.
Channel Output Modes	Single Shot, normal, burst, duty cycle
Channel Control Modes	Internally triggered or externally gated. Each channel may be independently set to any of the modes.
Jitter (Channel to Channel)	< 250 ps RMS
TZ50 (Optional)	3.3 - 4VDC into 50ohm

EXTERNAL GATE / TRIGGER INPUT

Threshold	0.2 to 15 VDC
Max Input Voltage	30 V Peak
Gate Polarity	Active high / active low
Gate Control Modes	Pulse inhibit / output inhibit
Trigger Edge	Rising or falling
Trigger Rate	DC to 5 MHz
Trigger Input Jitter	< 20 ns RMS
Trigger Minimum Pulse Width	20 ns
Trigger Insertion Delay	< 150 ns
Pulse Inhibit Delay	< 150 ns
Output Inhibit Delay	< 100 ns

OUTPUTS

Output Impedance	50 ohm
Output Level	3.3 – 5 VDC into ≥ 1 K ohm, 1.7 – 2.5 VDC into 50 ohm
Resolution	20 mV
Current	5 mA into 1 K ohm, 50 mA into 50 ohm
Rise Time	< 2ns @ 5 V (high impedance), < 1ns @ 2.5 V (50 ohm)
Overshoot	< 100 mV + 10 % of pulse amplitude

COMMUNICATIONS

USB (Standard)	USB 2.0
Bluetooth (Optional)	Bluetooth 2.1
Antenna	Class II Radio, 4 dBm output transmitter, - 80 dBm typical receiver sensitivity
Range	Typically 20 meters in open air (line-of-sight)
Baud Rate	115200 bits / second

GENERAL

Dimension	7.125 x 5.1 x 1.5 inches (18.1 x 13 x 3.8 cm)
Weight	1 lb
Power	Provided by USB
Voltage	+ 5 VDC ± 250 mVDC
Current	< 470 mA