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# Astronics Test Systems
# PXIe-1209
## Dual Channel 100 MHz Pulse Generator

The Astronics Test Systems PXIe-1209 PXI is a high-performance, 2-channel, 100 MHz Pulse Generator. Occupying a single PXI Express peripheral slot or hybrid slot, the PXIe-1209 provides dual independent pulse generation with full control of all timing parameters with extremely high resolution.

### Key Features

- **Dual independent analog pulse generators to 100 MHz**
- **PXI replacement for analog Pulse Generators up to 100 MHz**
- **Ultra-low trigger jitter**
- **Timing resolution as Fine as 10 picoseconds for delay, width, and double pulse spacing**
- **Programmable slew rate on pulse output**

## Product Information

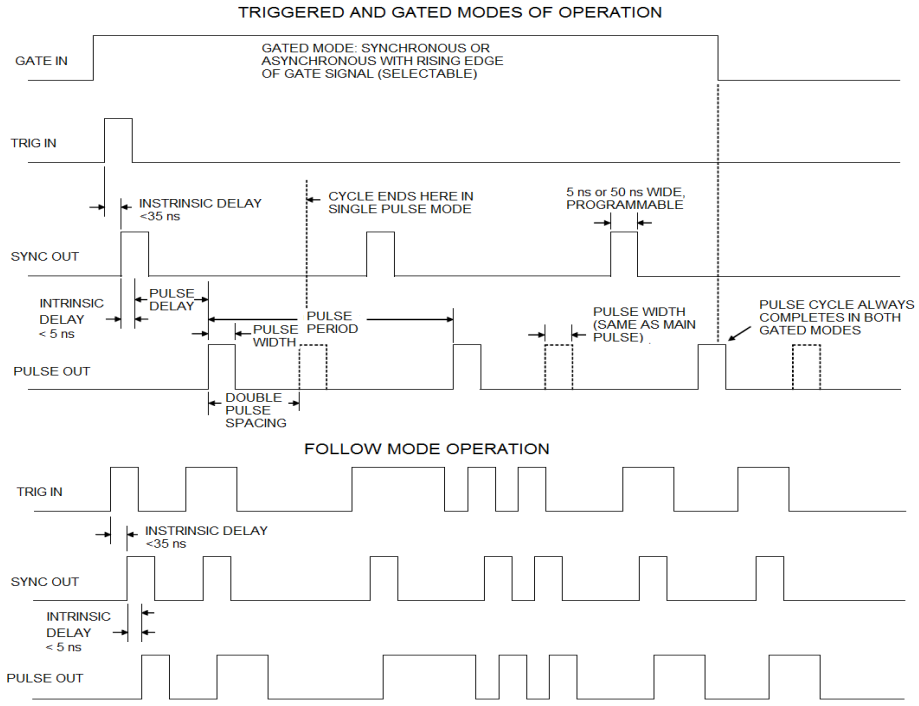
The PXIe-1209 is a fully programmable dual pulse generator with pulse timing granularity as fine as 10 ps at repetition rates up to 100 MHz. Both channels are fully independent and offer full control over pulse delay, double pulse spacing (when double pulse mode is used), width and period. Front panel trigger inputs with software programmable thresholds as well as PXI backplane triggering are provided for each channel.

**Trigger Repeatability**

The PXIe-1209 can be triggered from either the front panel or from the PXI trigger bus. With either method, a minimum of trigger jitter is observed. This also applies to asynchronous gated mode (synchronous gated mode has 5-10 ns of jitter).

**Analog Pulse Generation**

The PXIe-1209 produces true analog pulses so it can be used to replace laboratory pulse generators up to 100 MHz and can be a PXI replacement for legacy HP pulse generators. True analog pulse generators can outperform an AWG at pulse generation in a number of areas.




*PXIe-1209 Pulse Generation Modes*

ASTRONICS TEST SYSTEMS

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# Specifications

Note: The Astronics Test Systems policy is one of continuous development and improvement. Consequently, the equipment may vary in detail from the description and specifications in this publication.

## Timing Characteristics

Number of Channels: 2

- Frequency: 0.1 Hz to 100 MHz
- Pulse Output: -1.5 V to 6.5 V

**Operational Modes:**

- Single or continuous pulsing
- Single pulse or double pulse
- Burst from 2 to >1 B pulses
- Follow trigger
- Inverted Pulse/Sync
- External triggering
- Asynchronous or synchronous gating

**Clock Disciplining**

- Internal clock can be disciplined to a 10 MHz external reference for increased accuracy and stability

**Pulse Frequency (internal clock)**

- Range: 0.093 Hz to 100 MHz
- Resolution: 0.093 Hz
- Accuracy: 0.01%[1]

**Pulse Width**

- Range: 5 ns to (period - 3 ns)
- Accuracy: ±(3% + 250 ps)[2]

**Pulse Delay (from Sync Out):**

- Range: 0 ns to 5 s
- Accuracy: ±(3% + 250 ps)[2]

**Double Pulse Spacing**

- Range: (width + 3 ns) to (period - width - 3 ns)
- Accuracy: ±(3% + 250 ps)[2]

**Timing (Width, Delay, Double Spacing)**

- Temperature Coefficient + 17 ppm/° C typ
- Resolution: [10 ps x (TI/12 ns)] rounded up where TI is the programmed time internally for a given timing parameter

## Pulse Output Characteristics

- Time from Sync Output: <5 ns
- Time from External Trigger: <40 ns
- Pulse Output: -1.5 V to 6.5 V
- Output Impedance: 50 Ω
- Resolution: 2 mV (12 bits)
- Accuracy: ±(2.0% + 100mV)
- Output Current (source or sink): 60 mA
- Short Circuit Current (max): ±120mA
- Rise/Fall Time (RL = ∞): 0.625 to 2.5 V/ns, programmable

## Sync Out Characteristics

- Time from External Trigger: <35 ns[3]
- Output Impedance: 50 Ω
- Amplitude (selectable, RL = ∞): 5 V or 6.5 V
- Output Current (source or sink): 60 mA
- Rise/Fall Time (RL = ∞): 2.5 V/ns typ
- Width (software selectable): 5 ns or 55 ns

## Trigger Input Characteristics

- Threshold: -5 V to +5 V, programmable
- Resolution: (8 bit) 39 mV
- Impedance: 50 Ω
- Accuracy (mid-point falling/rising): ±(5% + 150 mV)
- Frequency: 100 MHz (max)
- Pulse Width: 3 ns (min)
- Maximum Input Voltage (no damage): 12 $V_{rms}$

## Interface

**Power Requirements**

- +3.3 VDC at 3A
- +12 VDC at 1.6 A

**PXI Backplane Information**

- PXI Trigger 1-7: Trigger Input CH1 and/or CH2, Sync Out from CH1 and/or CH2, Pulse Out from CH1 and/or CH2
- PXI CLK10: Selectable as frequency reference

***Front Panel I/O Connectors***

- Outputs (MCX, 50 Ω)
  - OUT 1, OUT 2 (Pulse)
  - SYNC 1, SYNC 2 (5 or 6.5V, jumper configurable)
- Inputs (MCX, 100 kΩ or 50 Ω, jumper configurable)
  - IN 1A, IN 1B, IN 2A, IN 2B (Either can be configured as a trigger, gate, or reference clock input)

## Software

**Driver Installations**

- VXI*plug&play* WIN32, WIN64, LabWindows/CVI, LabVIEW, Visual Studio

**Executable**

- Interactive Control Soft Front Panel

## Environmental

**Temperature/Altitude**

- Operating: 0° C to 55° C/10,000 ft
- Storage: -40° C to 75° C/15,000 ft

**Relative Humidity**

- 5 to 95%, non–condensing <30° C
- 5 to 75%, non–condensing <40° C

**Mechanical**

- Shock: 30 g, 11 ms, ½ sinewave
- Vibration: 0.013 in (pk-pk), 5 to 55 Hz
- Bench Hanling: 4-inch drop at 45°

**CE Certifications**

- Emissions/Immunity: EN61326: 1997 + A1: 1998, Class A
- Safety: EN61010-1: 1993 + A2: 1995

**MTBF (MIL-HDBK-217 FN2, GB GC, 25°)**

- 379,878 hrs

## Mechanical

**Weight**

- 1.26 lbs (0.567 kg)

**Dimensions**

- Single Slot PXI Express Module

Notes on timing accuracy:

1. The percent accuracy can be improved by disciplining the internal clock to an external precision 10 MHz reference clock such as the PXIe-3352A from Astronics Test Systems. The internal clock accuracy will discipline in about 10 minutes to within one decade of the external reference, up to 0.01 ppm accuracy.
2. Accuracy is within the tolerance specified at the calibration temperature. Temperature coefficient can be used to correct for temperature variation.
3. The Sync Out time specified is from the external front panel trigger to the external front panel Sync Out. Backplane trigger timing will vary depending on the carrier used.

# Ordering Information

**408674 : Astronics Test Systems PXIe-1209**

Dual 100 MHz Pulse Generator, NI Reference: 142116A-01L

The CE Mark indicates that the product has completed and passed rigorous testing in the area of RF Emissions and Immunity to Electromagnetic Disturbances, and complies with European electrical safety standards.

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