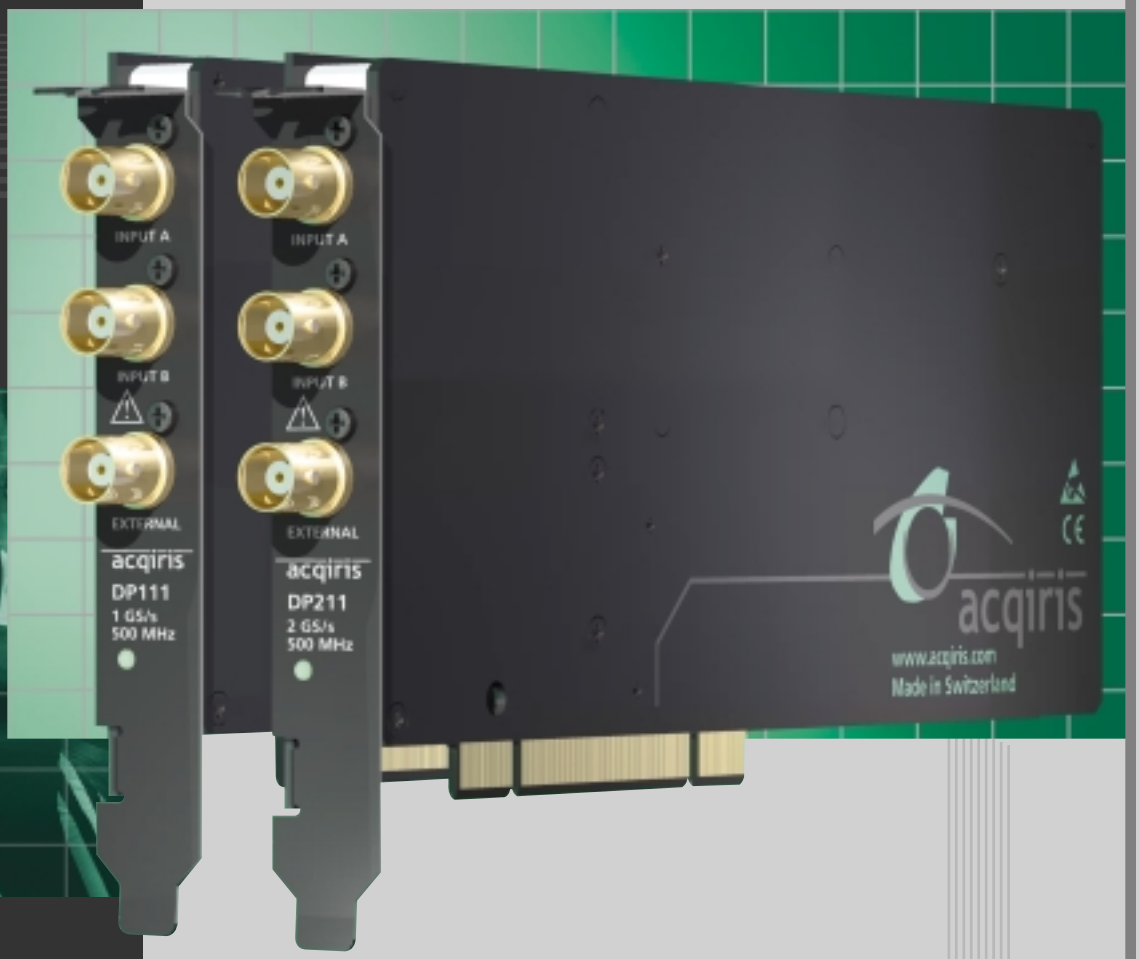
DP211

500 MHz
2 GS/s

DP111

500 MHz
1 GS/s



Dual Input PCI Digitizer Cards

Main Features

- **2 Software Selectable Inputs**
- **2 GS/s Sampling Rate (DP211), 1 GS/s (DP111)**
- **Bandwidth: 500 MHz for 100mV to 500mV, 300 MHz for 50mV FS.**
- **50 Ohm Input impedance**
- **High Voltage Input protection**
- **Full Front-end Amplification with Internal Calibration**
- **Software Selectable Bandwidth Limit (single pole 25MHz)**
- **Up to 16 Mpoints (DP211), 8 Mpoints (DP111) of Acquisition Memory**
- **Built-In 5ps Trigger Time Interpolator (TTI) for Accurate Timing Measurements**
- **±2ppm Clock Accuracy**
- **Complete Pre and Post Triggering**
- **Low dead-time (<500 ns) Sequential Recording with Time Stamps**
- **Low Power (DP211 < 25 W, DP111 < 20 W with standard memory)**
- **AcqirisLive Applications for Windows 95/98/NT4.0/2000**
- **Drivers complete with application code examples for C/C++, Microsoft Visual Basic, National Instruments LabVIEW and LabWindows/CVI**
- **Supported Operating Systems are Windows 95/98/NT4.0/2000 and VxWorks (support for other operating systems on request)**
- **"Plug & Play" Installation**
- **High-Speed PCI bus transfers data at sustained rates up to 100 Mbytes/s to processor**

Dual Input Digitizing Cards

Extraordinary PCI Performance - Top of the range is the Model DP211. The cards feature dual input channels and an analog-to-digital conversion (ADC) system capable of sampling at up to 2 GS/s (1 GS/s for the DP111). Each channel has 500 MHz of bandwidth and either can be selected, via software control, to connect to the ADC input. Standard memory is 256 kpoints on the DP211 and 128 kpoints for the DP111.

An optional memory length of 16 Mpoints is available on the DP211 and 8Mpoints is available on the DP111. Other features of the card include clock accuracy better than ±2 ppm, 50 ohm input coupling, over-voltage protection, a sequential trigger mode that rearms in less than 500 ns and an external trigger input.

Superior Measurement Precision and Resolution

Long Acquisition Memory - The cards long memories are essential for maintaining fast sampling rates and therefore superior timing resolution. For example, a Model DP211 with 16 Mpoints of memory can record flight times as long as 8 ms with a sampling rate of 2 GS/s (0.5 ns per point). The fast sampling rate ensures pulses received are accurately recorded with minimal distortion. Subsequently acquisitions can be calculated with greatly improved resolution and precision.

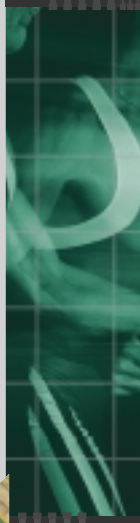
PC Control and Fast Averaging - Using a DP series digitizer is quite simple. Windows based software allows adjustment of the key acquisition settings such as time-base, trigger and sensitivity while state-of-the-art front-end electronics enables high fidelity recording with full control over gain and offset. Data recorded by the cards can be transferred directly to a host PC at rates up to 100 Mbytes/s. Combining the fast transfer rates with today's most powerful PC processors makes it possible to perform measurements and calculations hundreds of times

faster than with conventional instruments. The cards are supplied together with AcqirisLive, a complimentary digitizer control program, that allows easy installation "right-out-of-the-box". The program also has a high-speed processing function to enable rapid system testing and evaluation.

Mezzanine Front-end - The dual inputs of the DP211 and DP111 have programmable front-end electronics that provides a set of input voltage ranges (from 50 mV to 500 mV full scale) and variable voltage offset. The inputs have 50 Ω impedance and are fully protected against over-voltage signals. The amplifiers feature internal calibration (no need to disconnect input signals) and very fast recovery from out-of-range signals. The input buffer is mounted on a removable mezzanine card so, in the event of accidental damage or as components fatigue over time (e.g. relays in high duty cycle automated testing applications), replacement is fast and efficient. In addition, an optional external coaxial spark gap and 3 dB coaxial attenuator serve to protect the input of the card from over-voltage.

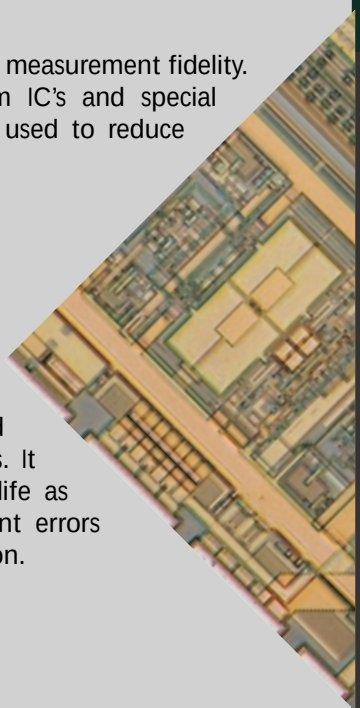
Flexible Trigger - The digitizers include a precision trigger system with full pre and post trigger adjustment. User selectable coupling is combined with internal or external trigger sources for maximum flexibility. The digitizers also provide a sophisticated sequential trigger mode with less than 500 ns dead time between successive triggers. This extremely low dead time enables events, which may occur at very high repetition rates, to be captured and stored in their correct arrival sequence. The sequential trigger mode and very low dead time greatly extend the digitizers timing range and resolution. Each event can be individually time stamped and relative time measurements (between events) can be made to 5 ps resolution.

Precision Time Base - Each digitizer also has its own crystal-controlled precision time base and sample rates can be selected, in a 1, 2, 2.5, 4, 5 sequence, from 100 S/s to 2 GS/s (to 1 GS/s for the DP111). An internal Trigger Time Interpolator (TTI) with high timing resolution is used to assist with timing calibration and trigger positioning. The TTI permits accurate positioning of the trigger signal with regards to the internal sample clock (10 MS/s to 500 MS/s). The sample rate can also be generated externally using the external input connector, for applications where the sample rate must be synchronized with the signal to be acquired.



High Fidelity Measurements

Quality Acquisitions - Acqiris digitizers are designed to provide superior measurement precision and accuracy. Key acquisition specifications (such as DC accuracy, Integral and differential linearity) are optimized to deliver maximum measurement fidelity. Careful circuit layout, custom IC's and special packaging techniques are all used to reduce overall system noise.



High Reliability and Low Power Design

Low Parts Count - A very high degree of integration is needed in order to achieve the level of performance obtained with the DP series digitizers. By drastically reducing the number of components the integration has clear benefits on reliability and lowers total power consumption. To maintain quality measurements the digitizers also use a proprietary-cooling scheme. This cooling method allows components to run at safe and stable operating temperatures. It helps to extend component life as well as minimize measurement errors caused by temperature variation.

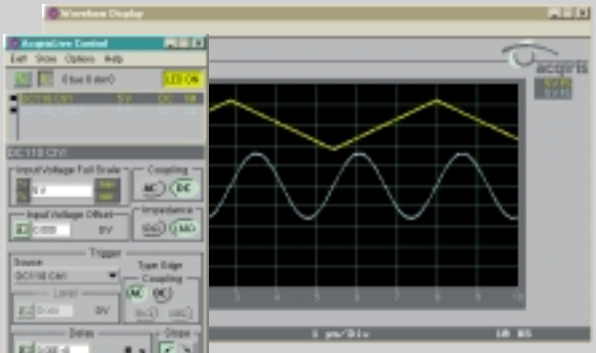
Ease of Installation, Ease of Use and AcqirisLive

Ease of use - Installing and operating your data acquisition system is easy thanks to "Plug&Play" modularity and Windows based installation software (on CD). Just insert the CD in your PC's drive, run the installation program, and power down and install the digitizers. Installation problems are quickly resolved using Acqiris' diagnostic tool-set and on-line help. Run AcqirisLive, a complimentary digitizer control and waveform display software package, and start making acquisitions immediately. Now you can leverage the power of your PC to perform rapid data analysis without paying the overhead costs associated with GPIB based stand-alone test instruments.

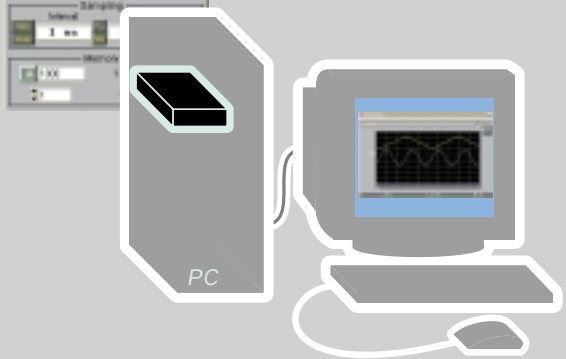
The installation and operation of the Model DP211 and DP111 is supported by the following software components:

- An automatic installation program (on CD) for the software components listed below
- Plug&Play drivers for Windows 95/98, capable of managing several digitizers simultaneously. The drivers work with C/C++, Visual BASIC, National Instruments' LabView and Lab-Windows/CVI environments.
- AcqirisLive permits the interactive operation of the digitizers 'right-out-of-the-box'. The program provides a high-speed averaging function and data files can be stored in ASCII format for convenient use in spreadsheet programs such as Microsoft Excel.

Getting Started - Acqiris also supplies simple application examples in source code as a starting-point for application-specific developments in C/C++ or Visual BASIC, as well as with test environments such as LabWindows/CVI and LabView. The software drivers make system integration fast and affordable. Acqiris Model DP211 and DP111 are ideal instruments in applications where high-speed measurements are required.



AcqirisLive Application



PC Solution

DP211 Waveform Digitizer

500 MHz, 8 bit, 2 GS/s, 256 kpoints or 16Mpoints, Dual-input

Signal Input

Bandwidth (-3 dB)
DC to 500 MHz at 100, 200, and 500 mV Full Scale.
DC to 300 MHz at 50 mV Full Scale

Full Scale Range (FSR)
50 mV, 100 mV, 200 mV, and 500 mV.

Connector
Gold Plated BNC's

Offset
±2 V

Channels
Two software selectable inputs

Impedance
50 Ω DC ±0.5%

Coupling
DC

Maximum Input Voltage
±5 V DC (500 mW) or 5 V RMS at 50 Ω

Maximum Current
40A/1µs clamped at ±5 V

Digital Conversion

Conversion Rate
100 S/s to 2 GS/s (optional)
in 1, 2, 2.5, 4, 5 sequence

Aperture Uncertainty
±1 ps

Differential Linearity
±0.7 LSB

Acquisition Memories
256 kpoints and 16 Mpoints

Resolution
8 bits (1:256)

Time Base

Range
Up to 128 us at 2 GS/s, (8 ms opt.)

Clock Accuracy
Better than ±2 ppm

Trigger Time Interpolator
5 ps resolution

Acquisition Modes
Single shot,
Sequence: 1 to 200 segments (8000 optional)
Dead Time: <500 ns

Trigger (Internal + External)

Slope
Positive and Negative

Coupling
AC LFReject and DC

Pre-Trigger
Adjustable to 100% of full scale

Post-Trigger
Adjustable up to 200 Mpoints

Trigger Sensitivity
From DC to 500 MHz

Triggers on signals
>15% FSR of Channels Setting
>500 mV in external

External Input for Trigger, Clock & Reference

Bandwidth
DC to 500 MHz (-3dB)

External Clock Frequency
10 MHz to 500 MHz (clock)

External Reference Frequency
10 MHz

Maximum Input Voltage
±5 V DC (500mW)

Impedance
1 MΩ or 50 Ω

Connector
Gold Plated BNC

External Trigger Threshold
Variable between –3 V and +3 V

External Clock/Ref Threshold
Variable between –3 V and +3 V

Minimum Clock/Ref Amplitude
500 mV pkpk

PC System Requirements

Processor
150 MHz Pentium (or higher)

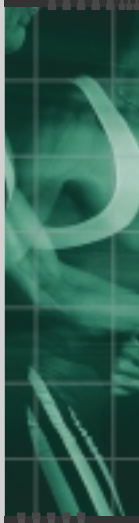
Operating system
Windows 95/98/NT4/2000 or VxWorks

Memory
32 Mbytes RAM (more is recommended when working with several cards with 16Mpoint acquisition memories)

CD Drive

Hard Drive Space
20 Mbytes Minimum

Display Resolution
At least 800 x 600
(for use with AcqirisLive)



System Performance

DC Accuracy
±2% FS
< ±1% FSR Typical

Integral Linearity
< ±1% FSR

Effective Bits (at 2GS/s)
DC-20 MHz: >6.5
20-200 MHz: >6.0

General

Power
<25 W (with standard memory)

Current Requirements

+12 V	0.9 A
+5 V	2.0 A (3.0 A with M16M)
-12 V	30 mA

Warranty
3 years

High-speed PCI bus transfers data at rates up to 100 Mbytes/s peak to local processor

Front panel led indicates digitizer status
Green: ready for trigger yellow: module identification red: triggered

Environmental and Physical

Operating Temperature
0°C to 50°C

Required Airflow
>7 l/s (2 m/s)

Relative Humidity*
5% to 95% (non-condensing)

Shock*
30 G, half-sine pulse

Vibration*
5-500 Hz, random

EMC Immunity
Complies with EN50082-1

EMC Emissions
Complies with EN50081-1,
EN55022 Class B for radiated emissions

Dimensions
PCI Standard

Certification and Compliance CE
* As defined by MIL-T-28800E Class 3
PCI standard, long card slot required (Board dimensions 107 mm x 210 mm)

DP111 Waveform Digitizer

500 MHz, 8 bit, 1 GS/s, 128 kpoints or 8Mpoints, Dual-input

Signal Input

Bandwidth (-3 dB)
DC to 500 MHz at 100, 200,
and 500 mV Full Scale.
DC to 300 MHz at 50 mV Full Scale

Full Scale Range (FSR)
50 mV, 100 mV, 200 mV, and
500 mV.

Connector
Gold Plated BNC's

Offset
±2 V

Channels
Two software selectable inputs

Impedance
50 Ω DC ±0.5%

Coupling
DC

Maximum Input Voltage
±5 V DC (500 mW) or 5 V RMS at
50 Ω

Maximum Current
40A/1µs clamped at ±5V

Digital Conversion

Conversion Rate
100 S/s to 1 GS/s
(optional)
in 1, 2, 2.5, 4, 5 sequence

Aperture Uncertainty
±1 ps

Differential Linearity
±0.7 LSB

Acquisition Memories
128 kpoints and 8 Mpoints

Resolution
8 bits (1:256)

Time Base

Range
Up to 128 us at 1 GS/s, (8 ms opt.)

Clock Accuracy
Better than ±2ppm

Trigger Time Interpolator
5 ps resolution

Acquisition Modes
Single shot,
Sequence: 1 to 200 segments
(8000 optional)
Dead Time: <500 ns

Trigger (Internal + External)

Slope
Positive and Negative

Coupling
AC LFReject and DC

Pre-Trigger
Adjustable to 100% of full scale

Post-Trigger
Adjustable up to 200 Mpoints

Trigger Sensitivity
From DC to 500 MHz

Trigger on signals
>15% FSR of Channel Setting
>500 mV in external

External Input for Trigger, Clock & Reference

Bandwidth
DC to 500 MHz (-3dB)

External Clock Frequency
10 MHz to 500 MHz (clock)

External Reference Frequency
10 MHz

Maximum Input Voltage
±5 V DC (500mW)

Impedance
1 MΩ or 50 Ω

Connector
Gold Plated BNC

External Trigger Threshold
Variable between –3 V and +3 V

External Clock/Ref Threshold
Variable between –3 V and +3 V

Minimum Clock/Ref Amplitude
500 mV pkpk

PC System Requirements

Processor
150 MHz Pentium (or higher)

Operating System
Windows 95/98/NT4/2000
or VxWorks

Memory
32 Mbytes RAM (more is recommended when working with several cards with 16Mpoint acquisition memories)

Hard Drive Space
20 Mbyte Minimum

Display Resolution
At least 800 x 600
(for use with AcqirisLive)

CD Drive

System Performance

DC Accuracy
±2% FS
< ±1% FSR Typical

Integral Linearity
< ±1% FSR

Effective Bits (at 2GS/s)
DC-20 MHz: >6.5
20-100 MHz: >6.0

General

Power
<20 W (with standard memory)

Current Requirements

+12 V	0.75 A
+5 V	1.4 A (2.0 A with M8M)
-12 V	30 mA

Warranty
3 years

High-speed PCI bus transfers data at rates up to 100 Mbytes/s peak to local processor

Front panel led indicates digitizer status
Green: ready for trigger yellow: module identification red: triggered

Environmental and Physical

Operating Temperature
0°C to 50°C

Required Airflow
>7 l/s (2 m/s)

Relative Humidity*
5 to 95% (non-condensing)

Shock*
30 G, half-sine pulse

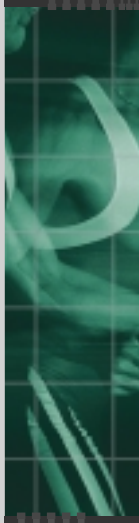
Vibration*
5-500 Hz, random

EMC Immunity
Complies with EN50082-1

EMC Emissions
Complies with EN50081-1,
EN55022 Class B for radiated emissions

Dimensions
PCI Standard

Certification and Compliance CE
* As defined by MIL-T-28800E Class 3
CI standard, long card slot required (Board dimensions 107 mm x 210 mm)



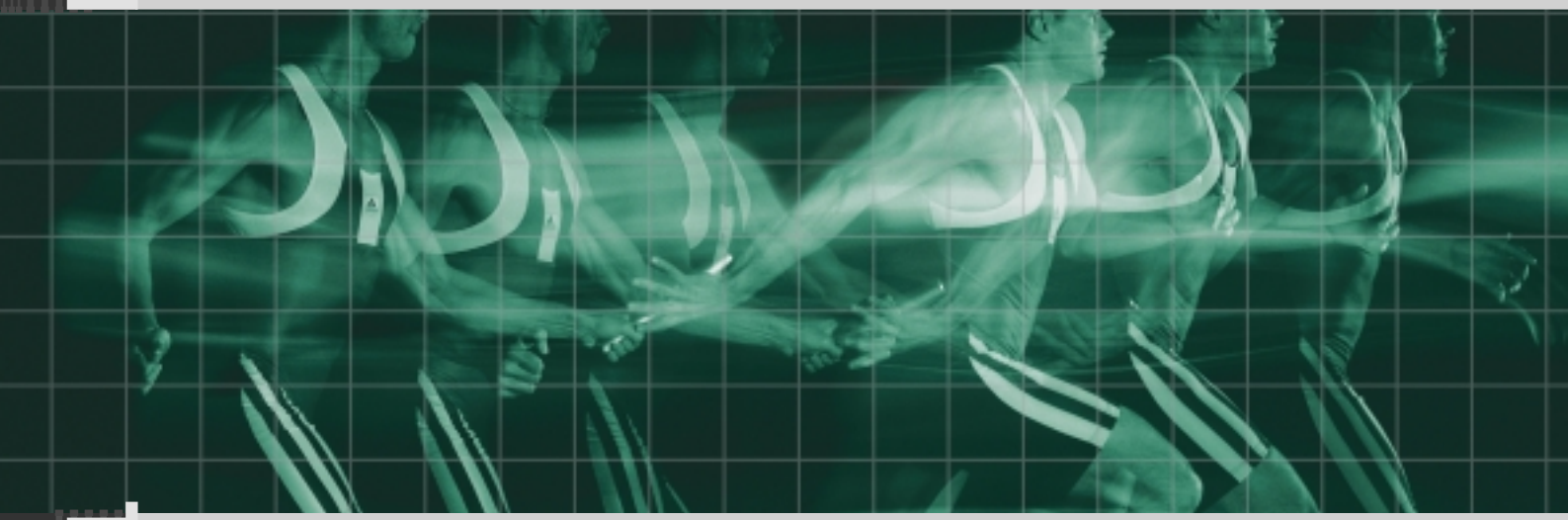
Ordering Information

DP211

Model Number	Description
DP211	500 MHz, 2 GS/s, dual input, 256 kpoints PCI digitizer
DP211-M16M	16 Mpoints acquisition memory option
DP211-W5	5 years extended warranty
DP211-CAL	Calibration certificate

DP111

Model Number	Description
DP111	500 MHz, 1 GS/s, dual input, 128 kpoints PCI digitizer
DP111-M8M	8 Mpoint acquisition memory option
DP111-W5	5 years extended warranty
DP111-CAL	Calibration certificate



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