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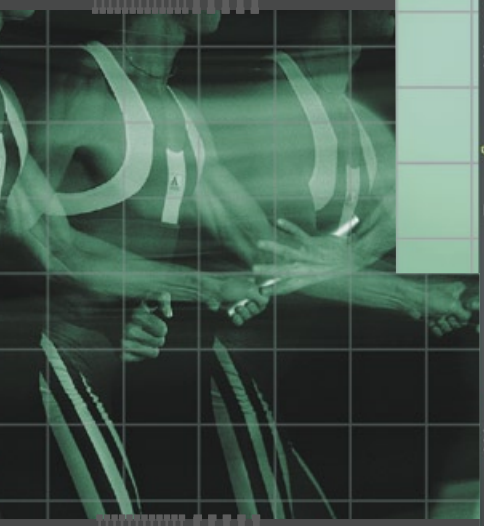
Find the *Keysight / Agilent / Acqiris DC241 / U1064A-002* at our website: *Click HERE*

DC211
1 ch

DC241
2 ch

DC271
4 ch

1 GHz
4 GS/s





V Class
Performance with Class

Modular V-Class CompactPCI Digitizers with Oscilloscope Characteristics

ASBus
Auto Synchro Bus

GS/s

Ctrl I/O

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acqiris

V-Class,
Performance with Class

The new V-Class digitizer cards from Acqiris deliver enhanced features, improved performance and absolute measurement precision.

Main Features

- **Up to 4 GS/s sampling rate**
- **1, 2 and 4 channel models**
- **1 GHz bandwidth**
- **Acquisition memory from 512 kpoints up to 32 Mpoints (optional)**
- **Full featured 50 Ω front-end with internal calibration**
- **Mezzanine front-end with input protection**
- **Complete pre and post triggering**
- **Multi-purpose I/O connectors for trigger, clock, reference and control signals**
- **Low dead-time (< 800 ns) sequential recording with time stamps**
- **Built-In high resolution TTI for accurate timing measurements**
- **1 GHz Auto-Synchronization-Bus (ASBus) for trigger and clock signal distribution**
- **Modular, 6U CompactPCI© Standard (PXI Compliant)**
- **Reduced total power consumption < 40 W**
- **High-speed PCI bus transfers data at sustained rates up to 100 Mbytes/s to host PC**
- **AcqirisLive applications for Windows 95/98/NT4.0/2000/XP**
- **Drivers complete with application code examples for C/C++, Microsoft Visual Basic, National Instruments LabVIEW and LabWindows/CVI**
- **Windows 95/98/NT4.0/2000/XP, VxWorks and Linux are supported (other operating systems on request)**
- **"Plug & Play" installation**

High-Density Multi-Channel Waveform Recording

More per Module

The Model DC211, DC241 and DC271 Digitizers, with single, dual and quad channels respectively, set a new performance standard in single width 6U CompactPCI modules. The DC271 has four channels that can synchronously sample signals at 1 GS/s rates. The DC241 has two channels each with up to 2 GS/s sampling. Both modules use channel interleaving to achieve the same blistering 4 GS/s single channel performance of the DC211. All the modules combine this ultrafast sampling rate with 1 GHz wide bandwidth and 512 kpoints of storage memory (optional to 32 Mpoints). Measuring just 233 mm by 160 mm in size the digitizers smash all previous speed, density and power consumption performance levels.

Precision Acquisition



The DC211, DC241 and DC271 are the ideal instruments for characterizing very fast signals. With over 1 GHz bandwidth and 4 GS/s sampling rate the digitizers allow precise measurements (jitter, risetime, falltime, overshoot, etc.) with sub-nanosecond accuracy and resolution. Waveforms are stored directly into the digitizer's large acquisition memories so that complex signals can be stored over very long periods of time. Large memories are essential for maintaining fast sampling rates and, therefore, timing resolution. For example, a Model DC211 with 32 Mpoints of memory can record a signal over an 8 ms period with a sampling rate of 4 GS/s (250 ps per point). The fast sampling rate ensures that all high frequency signal components, up to the full 1 GHz bandwidth of the digitizer, are accurately recorded. If

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the memory were reduced to 50 kpoints the sampling rate would have to fall to just over 60 MS/s (50,000 points / 8 ms). Frequencies above 30 MHz would then be incorrectly digitized and important events might be missed completely. Unlike most high-speed digitizers the DC211, DC241 and DC271 all deliver high-speed performance without having to compromise on acquisition memory.

Multiple Channels in One Crate

The high-density design of the digitizers allows them to be used in a variety of systems where the user needs from one to hundreds of channels of high-speed data acquisition. For example, a single 6U PXI crate (Model CC108) can house up to seven DC271 modules (plus a PC interface) to make a multi-channel bench-top data acquisition system. The low power consumption of the digitizers (typically < 40 W per module) results in a 28-channel @ 1 GS/s, or 7-channel @ 4 GS/s, system that uses power comparable to most high-end 4 channel Digital Oscilloscopes. Furthermore, for high-density rack mounted applications, multiple crates can be daisy-chained together. This makes it possible to build systems containing hundreds of channels of data acquisition that are totally controlled over a single bus!

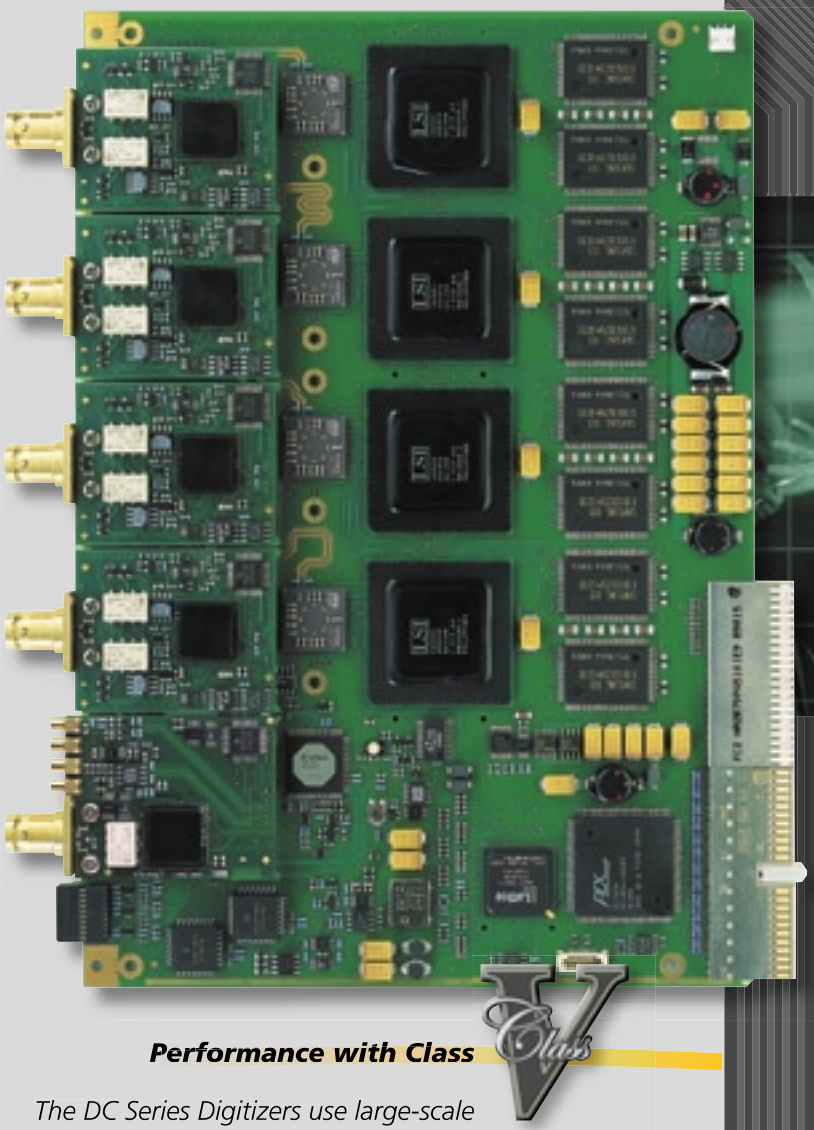
Auto-Synchronous Bus System



The DC211, DC241 and DC271 also include Acqiris' ASBus, a proprietary high bandwidth auto-synchronous bus system. In multi-channel applications, ASBus is a vital tool that takes care of the distribution of all necessary trigger and clock signals. The system improves trigger flexibility by allowing any module's input to be used as the trigger source for all the digitizers. For synchronous data acquisition, ASBus allows all the digitizers to be clocked at precisely the same time (to better than ±100 ps). Synchronous digitizing improves the accuracy of cross-channel measurements and is essential for accurate time correlation. The ASBus can also be used to phase-synchronize all the digitizers to an external standard (such as a 10 MHz reference).

PC Control and Convenience

Using the DC211, DC241 and DC271 is just like driving a familiar digital oscilloscope. Acqiris software allows adjustment of the key acquisition settings such as time-base, trigger and sensitivity while state-of-the-art front-end electronics allow high fidelity recording with full control over features such as input coupling, gain and offset. Data recorded by the digitizers 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. You can also store hundreds of waveforms directly on the PC's hard disc or make hard copies instantly on your printer. Archiving important waveforms has never been easier. Furthermore, you can interface directly to your desktop PC and use the Internet (or a local network) to send important information to others anywhere and at anytime. The result is flexibility and performance that can dramatically reduce testing times, increase measurement throughput and lower overall cost.



Performance with Class

The DC Series Digitizers use large-scale integrated circuit technology to reduce size and power requirements. This essential technology allows the DC211, DC241 and DC271 to deliver the fastest sampling rate, highest bandwith and most memory for any digitizer in a 6 U Compact PCI/PXI package.

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Scopelike Characteristics: Amplifier, Trigger and Time Base

GHz Mezzanine Front-End

Using the latest SiGe BiCMOS technology the DC211, DC241 and DC271 all deliver outstanding high frequency performance. Each of the channel inputs has bandwidth in excess of 1 GHz. Programmable front-end electronics are used to provide a complete set of input voltage ranges (from 50 mV to 5 V full scale in a 1, 2, 5 sequence) with variable voltage offset. Amplifier response (flatness, overshoot and accuracy) has been optimized to ensure that high frequency measurements can be made with the greatest precision and confidence. Furthermore, the 50 Ω impedance inputs are fully protected against over-voltage signals. The front-end circuitry features internal calibration (no need to disconnect input signals), switchable filtering and very fast recovery from out-of-range signals. The entire front-end 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.

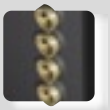
Flexible Trigger

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 (positive or negative edges and windows) for maximum flexibility. The digitizers also provide a sophisticated sequential trigger mode with less than 800 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. This trigger mode is perfect for "impulse-response" type applications (radar, sonar, lidar, time-of-flight, ultrasonic, medical & biomedical research, etc.). 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 with less than 1 ns 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 4 GS/s. An internal Time-to-Trigger 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 respect to the internal clock (sampling time). The sample rate can also be generated externally, using the dedicated MMCX CLK IN connector, for applications where the sample rate must be synchronized with the signal to be acquired.

Front Panel Multi I/O Ports



Ctrl I/O

The control over the trigger and time base is made even more flexible by the addition of high density, high-frequency front panel connectors. The four MMCX-type connectors enable the use of an external clock (up to 2 GHz) or reference signal (10 MHz), trigger output and two additional I/O digital control lines. They can be used for monitoring or modifying the digitizer's status and configuration. Examples of the control available are trigger gating, 10 MHz reference clock output and acquisition states.

High Reliability

Low Parts Count

A very high degree of integration is needed in order to achieve the level of performance obtained with the DC211, DC241 and DC271 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.

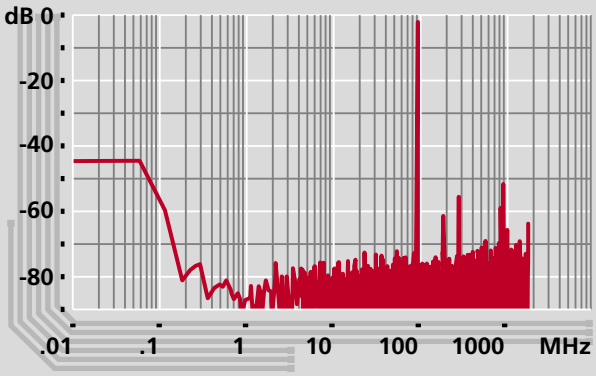
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High-Fidelity Measurements

Quality Acquisitions

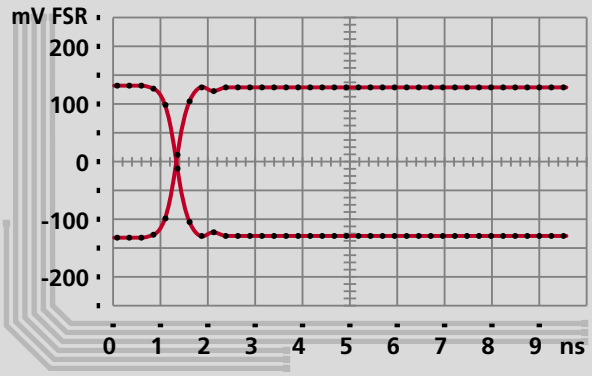
Acqiris digitizers are designed to provide superior measurement precision and accuracy. Key acquisition specifications (such as SNR, DC accuracy, Integral and differential linearity) are optimized to deliver maximum measurement fidelity. Careful circuit layout, custom ICs and special packaging techniques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

FFT Analysis



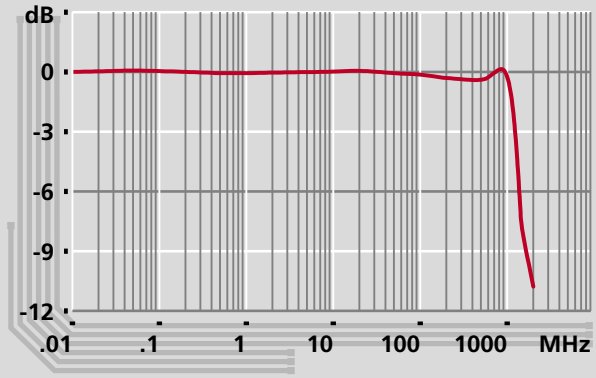
FFT analysis of a pure 100 MHz sinewave at 4 GS/s shows very low noise floor, high SFDR and little harmonic distortion.

Step Response



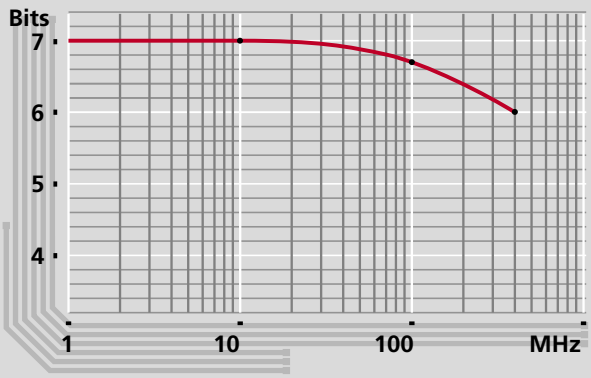
Positive and negative step responses with 700 MHz BWL show no overshoot and undershoot at 4 GS/s in single shot.

Frequency Response



Frequency response is very flat and system bandwidth reaches well beyond the specified 1 GHz.

Effective Bits



Effective bits at 4 GS/s are high.

Ease of Installation, Ease of Use

Acqiris Software

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. Find detailed information in our software datasheet.

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V-Class Waveform Digitizer

Model DC211

Single Channel, 1 GHz, 8 bit, 4 GS/s, from 512 kpoints up to 32 Mpoints

Model DC241

Dual Channel, 1 GHz, 8 bit, 2 GS/s in dual channel, 4 GS/s in single channel, from 256 kpoints up to 16 Mpoints per channel

Model DC271

Quad Channel, 1 GHz, 8 bit, 1 GS/s in quad channel, 2 GS/s in dual channel, 4 GS/s in single channel, from 128 kpoints up to 8 Mpoints per channel

Signal Input

Bandwidth
DC to 1 GHz, guaranteed

Bandwidth Limit Filters
700 MHz, 200 MHz, 20 MHz

Full Scale Setting (FS)
50 mV, 100 mV, 200 mV,
500 mV, 1 V, 2 V and 5 V

VSWR
< 1.25 (typ.) @ DC to 1 GHz

Connectors
BNC, gold plated

Channels
One @ 4 GS/s (All)
Two @ 2 GS/s (DC241 and DC271)
Four @ 1 GS/s (DC271 only)

Offset
±2 V for 50 to 500 mV FS
±5 V for 1 to 5 V FS

Coupling
DC, AC, GND

Impedance
50 Ω ±1% @ DC

Maximum Input Voltage
±5 V DC

Digital Conversion

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

Differential Linearity
± 0.7 LSB

Acquisition Memory
512 kpoints (DC211)
256 kpoints/channel (DC241)
128 kpoints/channel (DC271)

Resolution
8 bits (1:256)

Optional Memory
32 Mpoints (DC211)
16 Mpoints/channel (DC241)
2 or 8 Mpoints/channel (DC271)

Clock or Reference Input

Connector
MMCX, gold plated

Minimum Amplitude
500 mV pkpk

Ext. Clock Threshold
Variable between –2 V and +2 V

Impedance
50 Ω

Maximum Input Voltage
Max. voltage ±2 V DC

Ext. Reference Frequency
10 MHz

Ext. Clock Frequency
Frequency from 10 MHz to 2 GHz

A high-speed front-panel bus (ASBus) distributes clock and trigger to synchronize multiple modules

Time Base

Clock Accuracy and Stability
Better than ± 2 ppm

Sampling Jitter
< 1ps rms

Acquisition Modes
Single shot
Sequence: 1 to 200 segments
(optional 8000)
Dead time: < 800 ns

Trigger Time Interpolator
5 ps resolution

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Trigger (Internal and External)

Internal Trigger Input
Bandwidth DC to 1 GHz (- 3 dB)

Threshold Adjust Range:
same as vertical FSR

Trigger sensitivity DC to 1 GHz
Trigger on pk-pk signal: > 15% FS

Pre-Trigger
Adjustable to 100% of horizontal full scale

Post-Trigger
Adjustable up to 200 Mpoints

External Trigger Input
BNC, gold plated

Impedance: 50 Ω

Bandwidth: DC to 1 GHz (- 3 dB)

Threshold Adjust Range:
(-FS/2, FS/2) for FS = 0.5, 1, 2 and 5V

Maximum input voltage: ±5 V DC

Trigger sensitivity: DC to 1 GHz
Trigger on pk-pk signals > 15% FS

Coupling
DC, AC (50 Hz LFReject), HF Reject (50kHz)

Modes
Positive, Negative, Window,
HF: divide by 4

Trigger Output

Output Level
Offset ±2.5 V (no load)
Amplitude ±0.8 V (no load)
±15 mA max

Connector
MMCX

Rise/Fall Time
2.5 ns

Coupling
DC

Output Impedance
50 Ω

System Performance

DC Accuracy
< ±2% FS at 0 V offset
±1% FS typical

Effective Bits (typ.)
DC – 10 MHz, BWL 200 MHz, 1GS/s: 7.0
10 – 100 MHz, BWL 700 MHz, 1GS/s: 6.7
100 MHz – 400 MHz, Full BW, 4 GS/s: 6.0

Integral Linearity
< ±1% FS

SFDR (typ.)
> 55 dB (10 MHz)
> 40 dB (400 MHz)

Transfer Speed
High-speed PCI bus transfers data at sustained rates up to 100 Mbytes/sec to host PC.

PC System Requirements

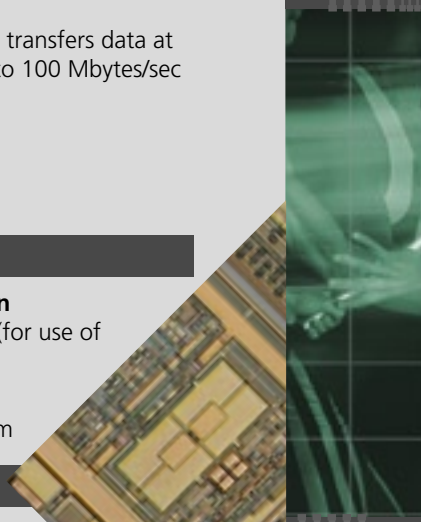
Processor
150 MHz Pentium (or higher)

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

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

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

Hard Drive Space
20 Mbytes minimum



General

Power (typ./max.)
38/40 W with standard memory option
46/50 W with maximum memory option and ASBus

Current Requirements (typ./max.)

+12 V	1.4/1.5 A (1.7 A with ASBus)
+5 V	2.4/2.7 A
+3.3 V	2.8/3.0 A (4.5 with maximum memory option)
-12V	0.03/0.05 A

Warranty
3 years

High-speed PCI bus transfers data at rates up to 100 Mbytes/s peak to local CompactPCI processor.
Front Panel LED indicates digitizer status Green: ready for trigger Yellow: module identification Red: trigger

Environmental and Physical

Operating Temperature*
0° to 40°C

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

Dimensions
6U CompactPCI standard
233 mm x 160 mm x 20 mm

Front panel complies with IEEE1101.10
CE Certification and Compliance

Shock*
30 G, half-sine pulse

Vibration*
5-500 Hz, random

Safety
Complies with EN61010-1

EMC Immunity
Complies with EN61326-1
Industrial Environment

EMC Emissions
Complies with EN61326-1
Class A for radiated emissions

Required Airflow
>3 l/s (2 m/s)

*As defined by MIL-T-28800E Class3

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Ordering Information

DC211

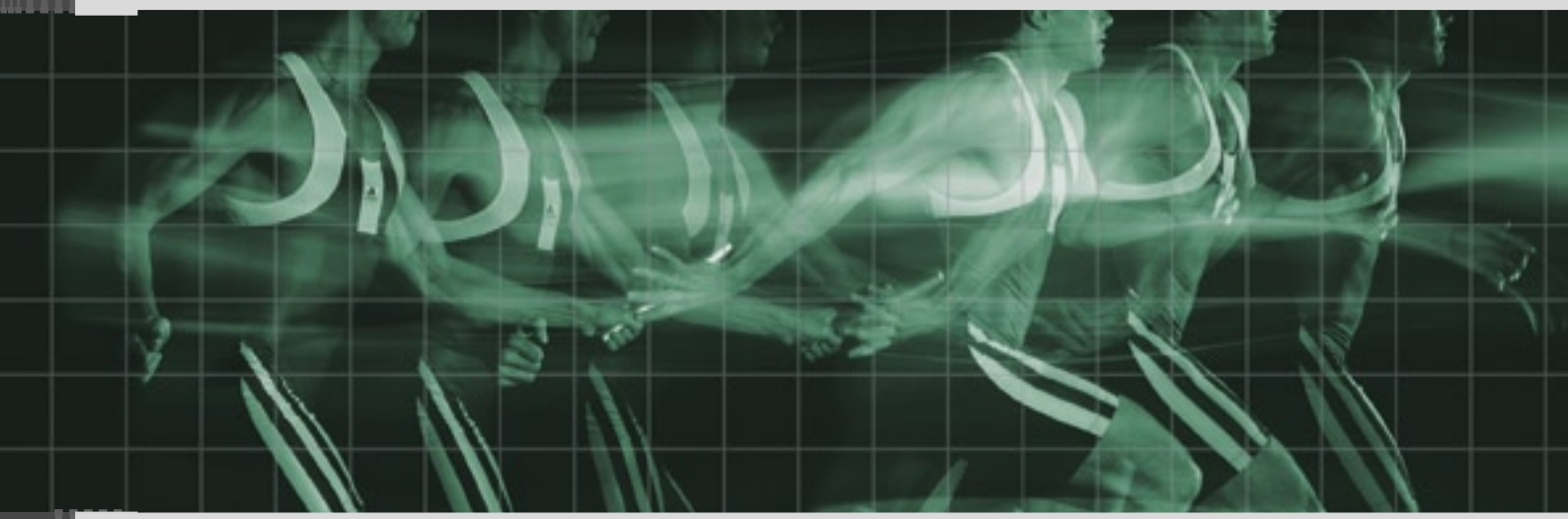
Model	Description
DC211	Single channel 1 GHz, 4 GS/s, 512 kpoints CompactPCI Digitizer
DC211-M32M	32 Mpoints acquisition memory option
DC211-W5	5 year extended warranty
DC211-CAL	Calibration certificate
XA200	Ctrl I/O MMCX to BNC Cable (1m)

DC241

Model	Description
DC241	Dual channel 1 GHz, 2 - 4 GS/s, 256 kpoints CompactPCI Digitizer
DC241-M16M	16 - 32 Mpoints/ channel acquisition memory option
DC241-W5	5 year extended warranty
DC241-CAL	Calibration certificate

DC271

Model	Description
DC271	Quad channel 1 GHz, 1 - 4 GS/s, 128 kpoints CompactPCI Digitizer
DC271-M2M	2 - 8 Mpoints/channel acquisition memory option
DC271-M8M	8 - 32 Mpoints/channel acquisition memory option
DC271-W5	5 year extended warranty
DC271-CAL	Calibration certificate



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