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Find the *Acqiris U1063A-002 / DC270* at our website: *Click HERE*

DC270

250 MHz
1 GS/s

DC265

150 MHz
500 MS/s





Modular Quad-Channel CompactPCI Digitizers with Oscilloscope Characteristics

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DC270

DC265

Main Features

- **1 GS/s Sampling Rate (DC270) simultaneously on all four channels, 500 MS/s (DC265)**
- **250 MHz Bandwidth (DC270), 150 MHz (DC265)**
- **50 Ω and 1 MΩ Input Impedance**
- **128 kpoints Acquisition Memory per Channel (1 or 2 Mpoints Optional)**
- **Up to 28 Channels in One Crate**
- **Memory Battery Backup Option**
- **Full Front-end Amplification with Internal Calibration**
- **Mezzanine Front-end with Input Protection**
- **Complete Pre and Post Triggering**
- **Low Dead-Time (<500 ns) Sequential Recording with Time Stamps**
- **Built-In High Resolution Trigger Time Interpolator (TTI) for Accurate Timing Measurements**
- **1 GHz Auto-Synchronization-Bus (ASBus) for Trigger and Clock Signal Distribution**
- **Modular, 6U CompactPCI**
- **Low Power (<40 W)**
- **Very high data transfer rate to host PC**
- **National Instruments LabVIEW and LabWindows/CVI Drivers**

High-Density Multi-Channel Waveform Recording

More per Module - The Model DC270 and DC265 Digitizers provide a cost-effective solution for high-speed multi-channel data acquisition applications. The digitizers feature four independent channel inputs. The DC270 offers top of the range performance with each channel delivering 1 GS/s sampling rates, 250 MHz wide bandwidth and 128 kpoints long acquisition memories (optional to 2 Mpoints). The DP265 offers a lower cost alternative with 500 MS/s sampling rates, 150 MHz bandwidth and 128kpoints memories (optional to 1 Mpoints). Both digitizers are packaged in a single 6U CompactPCI module (measuring just 233 mm by 160 mm) that provides a breakthrough in size, density and power consumption.

Up to 28 Channels in One Crate – The high-density design of the DC270 and DC265 allows the modules to be used in a variety of systems where the user needs from four to hundreds of channels of high-speed data acquisition. For example, a single 6U CompactPCI 8 slots crate (Model CC108) can house up to seven modules (plus a PC interface) to make a 28 channel bench-top data acquisition system. The low power consumption of the digitizers (typically < 40 W per module) results in a 28-channel system that uses comparable power 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!

The Model DC270 and DC265 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. 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 a DC270 or DC265 Digitizer is just like driving a familiar digital oscilloscope. 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 allow high fidelity recording with full control over features such as input impedance, coupling, gain and offset. Data recorded by the digitizer 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. The Model DC270 and DC265 are the instruments of choice for multi-channel applications in

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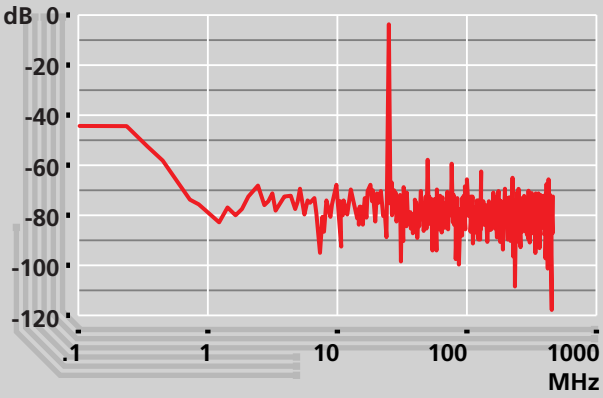
Telecommunications, Magnetic Media, Automotive, Chemistry, Computing, Ultrasonics, Mechanics, Physics, Military, Explosive-Weapons and Ballistic Testing.

Precision Acquisition - The fast sampling rates of the DC270 and DC265 ensure the accurate capture of signals with frequencies up to the full bandwidth of each instrument. 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 DC270 with 2 Mpoints of memory can record a signal over a 2 ms period with a sampling rate of 1 GS/s (1 ns per point). The fast sampling rate ensures all high frequency signal components, up to the full 250 MHz bandwidth of the digitizer, are accurately recorded. If the memory was reduced to 20 kpoints the sampling rate would have to fall to just 10 MS/s (20,000 points / 2 ms). Frequencies above 5 MHz would then be incorrectly digitized and important events may be missed completely. The Model DC270 and DC265 digitizers both deliver high-speed performance without having to compromise on acquisition memory.

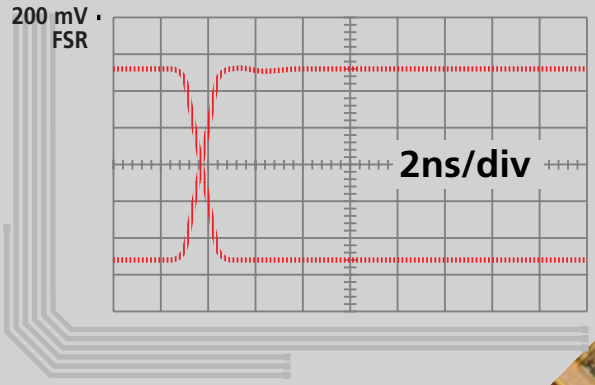
High Fidelity Measurements

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.

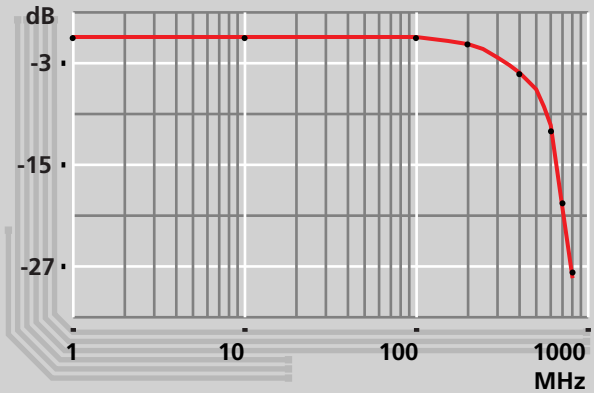
The low noise and low harmonic distortion are best demonstrated by the following Fourier Transform performed on an acquired signal. Other important qualities of the digitizer are demonstrated by its "low–overshoot" step response, flat frequency response and high effective bit score. The following figures depict typical measurements.



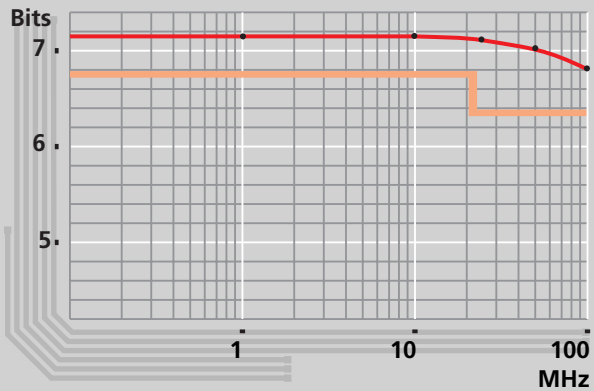
FFT analysis of a pure 25MHz sinewave, measured at 500 mV full scale, shows very low noise floor and little harmonic distortion



Positive and negative step responses show little or no overshoot or undershoot



Frequency response is very flat and system bandwidth reaches well beyond the specified 250 MHz



Effective bits (top graph) are significantly higher than the minimum guaranteed performance (bottom graph)

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Scope Like Characteristics: Amplifier, Trigger and Time Base

Mezzanine Front-end – Each channel input of the digitizers has programmable front-end electronics that provides a complete set of input voltage ranges (from 50 mV to 5 V full scale in a 1, 2, 5 sequence) and variable voltage offset. The inputs have selectable impedance (50 Ω or 1 MΩ) 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.

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.

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 1 GS/s (500 MS/s for the DC265). An internal Trigger Time Interpolator (TTI) with high timing resolution (5ps) 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 external input connector, for applications where the sample rate must be synchronized with the signal to be acquired.

High Reliability

Low Parts Count - A very high degree of integration is needed in order to achieve the level of performance obtained with the Model DC270 and DC265 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 minimizing measurement errors caused by temperature variation.

Ease of Installation, 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 DC270 and DC265 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/NT4, capable of managing several digitizers simultaneously. The drivers work with Visual C++ as well as Visual BASIC.
- Drivers for National Instruments' LabView and LabWindows/CVI environments
- AcqirisLive, which permits the interactive operation of the digitizers 'right-out-of-the-box'. Data files can be stored in ASCII or binary format for convenient use in spreadsheet programs such as 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 environment such as LabWindows/CVI and LabView. The software drivers make system integration fast and affordable. Acqiris data acquisition systems are ideal in applications (laboratory or production) where low cost and high-speed measurements are required.

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DC270 Waveform Digitizer

250 MHz, 8 bit, 1 GS/s, 128 kpoints or 2 Mpoints, Quad Channel

Signal Input

Bandwidth
DC to 250 MHz (-3 dB)

Full Scale Range (FSR)
50 mV, 100 mV, 200 mV,
500 mV, 1 V, 2 V and 5 V

Impedance
1 MΩ//10 pF; 50 Ω ±1%

Connector
Gold plated BNC

Offset
±2 V below 500 mV FSR
and ±20 V above

Channels
Four

Coupling
AC, DC

Maximum Input Voltage
100 V (DC+ peak AC < 10 kHz)
at 1 MΩ
±5 V DC (500 mW) or 5 V RMS
at 50 Ω

Digital Conversion

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

Resolution
8 bits (1:256)

Aperture Uncertainty
±0.5 ps

Differential Linearity
±0.7 LSB

Acquisition Memories
128 kpoints and 2 Mpoints (optional)
per channel

Battery Backup
Holds acquisition data for up to
2 weeks without external power

Time Base

Range
Up to 128 µs at 1 GS/s, (2 ms opt.)
Up to 1280 s at 100 S/s, (20 ks opt.)

Clock Accuracy
Better than ±2 ppm

Trigger Time Interpolator
5ps resolution

Acquisition Modes
Single shot,
Sequence: 1 to 200 segments (4000 opt.)
Dead Time: < 500ns

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

Trigger (Internal + External)

Slope
Positive and Negative

Coupling
AC LFReject and DC

Connector
Gold plated BNC

Pre-Trigger
Adjustable to 100% of full scale

Post-Trigger
Adjustable up to 200 Mpoints
in 16 point increments

Trigger Sensitivity
From DC to150 MHz:
Triggers on signals
>10% FSR of channel setting
in internal
>500 mV in External

External Input for Trigger, Clock & Reference

Impedance
1 MΩ or 50 Ω

Maximum Input Voltage
±5 V DC (500 mW)

Bandwidth
500 MHz (- 3 dB)

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

External Clock Frequency
10 MHz to 500 MHz

External Clock/Ref Threshold
Variable between –2 V and +2 V

Minimum Clock/Ref Amplitude
750 mV pkpk

External Reference Frequency
10 MHz

System Performance

DC Accuracy
±2% FSR

Integral Linearity
< ±1% FSR

Effective Bits (at 1 GS/s)
DC-20 MHz: > 6.8
20-100 MHz: > 6.4

PC System Requirements

Processor
150 MHz Pentium (or higher)

Operating System
Windows 95/98/NT4

Memory
32 Mbyte RAM (more is recommended when working with several cards with 2Mpoint acquisition memories)

CD Drive

Hard Drive Space
20 Mbyte Minimum

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

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General

Power
< 40 W

Current Requirements
+12 V 1.2 A
+5 V 2.9 A
+3.3 V 1.9 A (< 5 A with M2M)

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: triggered

Environmental and Physical

Operating Temperature
0° to 50°C

Required Airflow
>10 l/s (2 m/s)

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

Dimensions
6U CompactPCI ® standard
(233 mm by 160 mm x 20 mm)

Shock*
30 G, half-sine pulse

Vibration*
5-500 Hz, random

EMC Immunity
Complies with EN50082-1

Certification and Compliance CE
* As defined by MIL-T-28800E Class 3

EMC Emissions
Complies with EN50081-1,
EN55022 Class B for radiated emissions
Front Panel complies with
IEEE1101.10

DC265 Waveform Digitizer

150 MHz, 8 bit, 500 MS/s, 128 kpoints or 1 Mpoints, Quad Channel

Signal Input

Bandwidth
DC to 150 MHz (-3 dB)

Full Scale Range (FSR)
50 mV, 100 mV, 200 mV,
500 mV, 1 V, 2 V and 5 V

Impedance
1 MΩ//10 pF; 50 Ω ±1%

Connector
Gold plated BNC

Offset
±2 V at 500 mV FSR
and below, ±20 V above

Channels
Four

Coupling
AC, DC

Maximum Input Voltage
100 V (DC+ peak AC < 10 kHz) at
1 MΩ
±5 V DC (500 mW) or 5 V RMS at
50 Ω

Digital Conversion

Conversion Rate
100 S/s to 500 MS/s
Synchronous on all channels
in 1, 2, 2.5, 4, 5 sequence

Resolution
8 bits (1:256)

Aperture Uncertainty
±0.5 ps

Differential Linearity
±0.7 LSB

Acquisition Memories
128 kpoints or 1 Mpoints (optional)
per channel

Battery Backup
Holds acquisition data for up to
2 weeks without external power

Time Base

Range
Up to 256 µs at 500 MS/s,
(2 ms optional)
Up to 1280 s at 100 S/s,
(10 ks optional)

Clock Accuracy
Better than ±2 ppm

Trigger Time Interpolator
5 ps resolution

Acquisition Modes
Single shot,
Sequence: 1 to 200 segments
(2000 optional)
Dead Time: < 500ns

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

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Trigger (Internal + External)

Slope
Positive and Negative

Coupling
AC LFReject and DC

Connector
Gold plated BNC

Pre-Trigger
Adjustable to 100% of full scale

Post-Trigger
Adjustable up to 200 Mpoints
in 16 point increments

Trigger Sensitivity
From DC to 150 MHz:
Triggers on signals
> 10% FSR of channel setting
in internal
> 500 mV in External

External Input for Trigger, Clock & Reference

Impedance
1 MΩ or 50 Ω

Maximum Input Voltage
±5 V DC (500 mW)

Bandwidth
500 MHz (-3 dB)

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

External Clock Frequency
10 MHz to 500 MHz

External Clock/Ref Threshold
Variable between –2 V and +2 V

Minimum Clock/Ref Amplitude
750 mV pkpk

External Reference Frequency
10 MHz

System Performance

DC Accuracy
±2% FSR

Integral Linearity
< ±1% FSR

Effective Bits (at 500MS/s)
DC-20 MHz: > 6.8
20-100 MHz: > 6.4

PC System Requirements

Processor
150 MHz Pentium (or higher)

Operating System
Windows 95/98 or NT4

Memory
32 Mbytes RAM (more is recommended when working with several cards with 1Mpoint acquisition memories)

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

Hard Drive Space
20 Mbytes Minimum

CD Drive

General

Power
< 40 W

Current Requirements

+12 V	1.2 A
+5 V	2.9 A
+3.3 V	1.9 A (< 3.5 A with M1M)

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: triggered

Environmental and Physical

Operating Temperature
0° to 50°C

Required Airflow
> 10 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
Front panel complies with
IEEE1101.10

Dimensions
6U CompactPCI ® standard
(233 mm by 160 mm x 20 mm)

Certification and Compliance CE

* As defined by MIL-T-28800E Class 3



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DC270

DC265

Ordering Information

DC270

Model Number	Description
DC270	Quad-channel, 250 MHz, 1 GS/s, 128 kpoints CompactPCI digitizer
DC270-M2M	2 Mpoints/channel acquisition memory option
BB200	Battery Backup for DC2XX series digitizers
P001	300 MHz 10:1 10 MΩ passive probe
DC270-5years	5 years extended warranty
DC270-Calib	Calibration certificate

DC265

Model Number	Description
DC265	Quad-channel, 150 MHz, 500 MS/s, 128 kpoints CompactPCI digitizer
DC265-M1M	1 Mpoints/channel acquisition memory option
BB200	Battery Backup for DC2XX series digitizers
P001	300 MHz 10:1 10 MΩ passive probe
DC265-5years	5 years extended warranty
DC265-Calib	Calibration certificate



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