



## 2 Channel, 14-Bit, 70 MS/s, PXI Digitizer

### Complete Signal Acquisition

Racal Instruments™ 2165 is a high-performance, single-slot, two-channel, PXI-based digitizer. It has true dual channel performance, including separate user-selectable triggering and clock frequency for each channel.

### Maximum Independence and Control

To provide maximum control while maintaining the unit's dual channel flexibility, the 2165 allows for signal acquisition either with or without triggering. Triggering can be either software-initiated or front-panel controlled, allowing each channel to start from different sources. For trigger inputs, the 2165 accepts PXI back-plane sources, including PXI Trigger 1 to 5 or PXI STAR Trigger, as well as normal TTL signals from the front-panel connector, with positive or negative polarity, and edge or level triggering.

Complementing the unit's flexible triggering is the capability of selecting either an external clock source or utilizing the available 70 MHz or 50 MHz internal clock.

With easy-to-use soft front panels, reliable signal acquisition, non-triggered signal capture, and accurate signal analysis in time and frequency domains, the 2165 is the natural choice.

The 2165 comes with pre-installed LabView™ and LabWindows™ libraries, and supports VISA and Kernel drivers.

To ensure continued, uninterrupted, and reliable performance, the 2165 can be user-calibrated with the supplied software.

### Soft Front Panel Control

Soft front panels control the unit's settings for signal acquisition and for analyzing the acquired signal. Multiple graphs display in a single window, and one can zoom in or out of the viewed area. All results can be either selected or deselected with the active cursor.

### Wealth of Features

The unit has a wealth of features for signal acquisition, including selection of the number of samples to be read and analyzed, trigger source and mode, continual signal capture mode (loop mode), input offset voltage, clock source and frequency, and filtering type. All settings can be stored and recalled from the memory.

2165 displays the acquired signal and the results of time domain and frequency domain analysis. In the time domain, one can display samples or a time axis. Frequency domain analysis offers windowing such as Hanning, Hamming, Flat-Top, Blackman-Harris, and others. Windowing is most beneficial when analyzing signals having a non-integer number of periods or when analyzing just part of the signal. Also, in the frequency domain, a summary of the harmonics is available. One can set the frequency domain settings as needed to ensure complete and accurate analysis and display, including Y-scale (auto, min, max, fixed), Reference (carrier, full scale of device, custom), and Spectrum (only the displayed content is taken into account for the parameter calculations). Lastly, the parameters SINAD, ENOB, THD, SNR, and Peak distortion are calculated and displayed.

- ◆ **Two Independent Analog Input Channels, Single-Ended or Differential**
- ◆ **14-bit Resolution per Channel**
- ◆ **Pre-Installed LabView™ and LabWindows™ libraries**
- ◆ **External or Internal Triggering**
- ◆ **Easy-to-Use Soft Front Panels**
- ◆ **Fully Supported VISA and Kernel drivers**

# 2165 PRODUCT SPECIFICATIONS

## PERFORMANCE

### ADC Resolution

14-bits each channel

### Sample Rate

Internal Clock:

500 kHz to 70 MHz

### Absolute Accuracy (INL)

$\pm(500 \mu\text{V} + 0.1\% \text{ of range})$

With attenuator on:

$\pm(2.5 \text{ mV} + 0.2\% \text{ of range})$

### Relative Accuracy

$\pm 0.025\% \text{ of range}$

### DC Offset Voltage

-5 V to +5 V

With attenuator on:

-25 V to +25 V

### Clock Sources

Internal: 70 MHz or 50 MHz

External: Front panel connector

### External Clock Input

Logic Thresholds:

$V_{\text{LOW}} < 0.6 \text{ V}$

$V_{\text{HIGH}} > 4.5 \text{ V}$

Impedance: 50  $\Omega$

Maximum Input: 100 MHz

### External Clock Output

Clock Levels:

$V_{\text{LOW}} < 0.6 \text{ V}$

$V_{\text{HIGH}} > 4.5 \text{ V}$

Impedance: 50  $\Omega$

### Clock Division Rate

User-selectable from 1 to 256

Independent clock source selection per channel

### Clock Accuracy

100 ppm

### Memory Depth

512 k-words per channel

### Frequency Response

(Referenced at 500 kHz)

0 to 20 MHz ( $\pm 0.5 \text{ dB}$ )

20 MHz to 50 MHz ( $\pm 2.0 \text{ dB}$ )

## TRIGGERING

### External Sources

Impedance: 10 k $\Omega$  DC

Levels:  $V_{\text{LOW}} < 0.6 \text{ V}$

$V_{\text{HIGH}} > 2.4 \text{ V}$

### Internal Sources

PXI STAR

PXI TRIG 0 to 5

Software Trigger, Analog

(Independent trigger source selection per channel)

### Polarity

Positive

Negative

### Response

Edge

Level, Continuous

## INPUTS

### DC Offset Range

Normal: -5 V to +5 V

With attenuator on: -25 V to +25 V

### Ranges

Normal:

1 V (p-p)

2 V (p-p)

4 V (p-p)

With attenuator on:

5 V (p-p)

10 V (p-p)

20 V (p-p)

### Filters

None

30 MHz

15 MHz

6 MHz

(3-pole Butterworth)

**SFDR** ( $f_s = 50 \text{ MHz}/V_{\text{IN}} = 2 \text{ V(p-p)}$ )

80 dB @  $f_{\text{IN}} = 1 \text{ MHz}$

72 dB @  $f_{\text{IN}} = 10 \text{ MHz}$

**SINAD** ( $f_s = 50 \text{ MHz}/V_{\text{IN}} = 2 \text{ V(p-p)}$ )

68 dB @  $f_{\text{IN}} = 1 \text{ MHz}$

64 dB @  $f_{\text{IN}} = 10 \text{ MHz}$

### Channel Crosstalk

<70 dB @ 1 MHz

## MAXIMUM CURRENT CONSUMPTION

+3.3 VDC: 300 mA

+5 VDC: 650 mA

-12 VDC: 40 mA

+12 VDC: 40 mA

## FRONT PANEL INPUTS

**Bandwidth** (-3dB, filter off)

70 MHz

### Coupling

DC

AC

Connector

SMB

**Impedance** (Selectable)

50  $\Omega$  AC-coupled

50  $\Omega$  DC-coupled

10 K  $\Omega$  DC-coupled

Input Configuration

Single ended

Differential

## ENVIRONMENTAL

### Temperature

Operating: 0° C to 50° C

Storage: 0° C to 70° C

### Relative Humidity

10% to 80%, non-condensing

### Weight

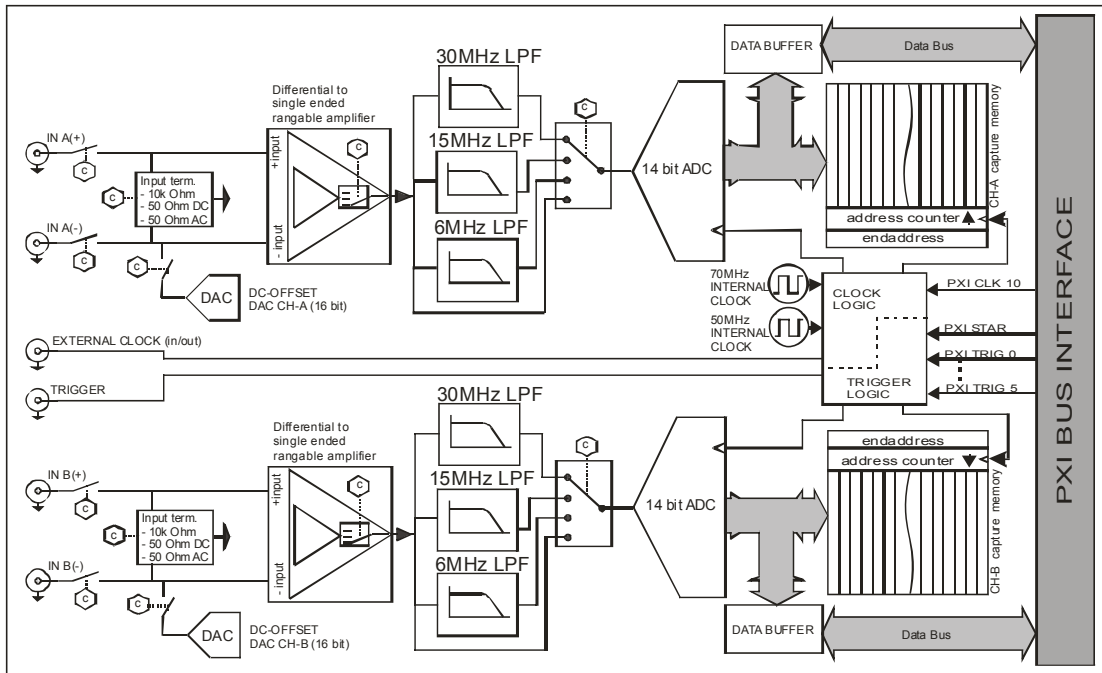
7.4 oz. (210 grams)

### Module Dimensions

3 U high, Single width



# 2165 FUNCTIONAL BLOCK DIAGRAM



2165 FUNCTIONAL BLOCK DIAGRAM

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

## ORDERING INFORMATION

### MODEL/DESCRIPTION

Racal Instruments 2165, 70 MS/s, 14-bit, 2-channel Digitizer

### PART NUMBER

407946

The EADS North America Defense Test and Services policy is one of continuous development, consequently the equipment may vary in detail from the description and specification in this publication.



**EADS North America Defense Test and Services**  
 1.800.722.2528/1.949.859.8999      sales@eads-nadefense.com