DEVICE SPECIFICATIONS

NI USB-5132

50 MS/s Bus-Powered USB Oscilloscope

This document lists specifications for the NI USB-5132 (NI 5132).

Unless otherwise noted, these specifications are valid for the following conditions:

- Full bandwidth
- Sample Clock set to full rate

Typical values are representative of an average unit operating at room temperature. Specifications are subject to change without notice. For the most recent NI 5132 specifications, visit *ni.com/manuals*.

To access NI 5132 documentation, including the *NI High-Speed Digitizers Getting Started Guide*, go to **Start»All Programs»National Instruments»NI-SCOPE»Documentation**. In Windows 8, click **NI Launcher** and select **NI-SCOPE** in the window that appears.

Caution The protection provided by the NI 5132 can be impaired if it is used in a manner not described in this document.

Contents

NATIONAL INSTRUMENTS

Vertical

Analog Input

Number of channels ..... 2, simultaneously sampled

Connector ..... BNC

Impedance and Coupling

Input impedance ..... 1 MΩ ±1% in parallel with a typical capacitance of 19 pF

Input coupling ..... AC, DC, GND

Voltage Levels

Table 1. Full Scale (FS) Input Range and Programmable Vertical Offset

Range (V_{pk-pk})	Vertical Offset Range (V)[1]
0.04	±0.4
0.1	±0.4
0.2	±0.4

[1] Programmable Vertical Offset Accuracy: ±2 mV on 40 mV range, ±2.5% on all other ranges.

Table 1. Full Scale (FS) Input Range and Programmable Vertical Offset (Continued)

Range (V_{pk-pk})	Vertical Offset Range (V)[1]
0.4	±0.4
1.0	±4.0
2.0	±4.0
4.0	±4.0
10	±25.0
20	±20.0
40	±10.0

Maximum input overload.....|Peaks| ≤ 30 V

Accuracy

Resolution.....8 bits

Accuracy[2].....±(2% of input + 1% FS + 300 µV)

DC drift.....±(0.033% of input + 0.06% of FS + 40 µV) per °C

AC coupling cutoff (-3 dB).....12 Hz, typical

Bandwidth and Transient Response

Bandwidth (-3 dB)

All ranges except 0.04 V_{pk-pk} range.....50 MHz

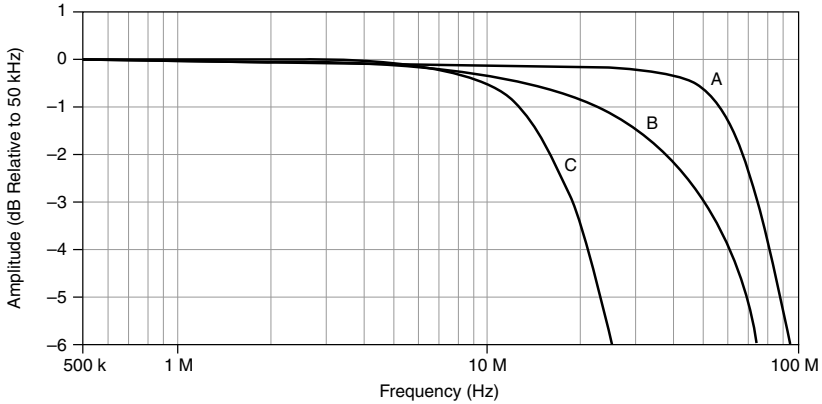
0.04 V_{pk-pk} range.....35 MHz

Bandwidth limit filter.....20 MHz noise filter

[1] Programmable Vertical Offset Accuracy: ±2 mV on 40 mV range, ±2.5% on all other ranges.

[2] Within 5 °C of self-calibration temperature.

Figure 1. Frequency Response, Typical



A	Frequency response at full bandwidth, all ranges except 40 mV_{pk-pk} range, typical
B	Frequency response at full bandwidth, 40 mV_{pk-pk} range, typical
C	Frequency response with 20 MHz noise filter, all ranges, typical

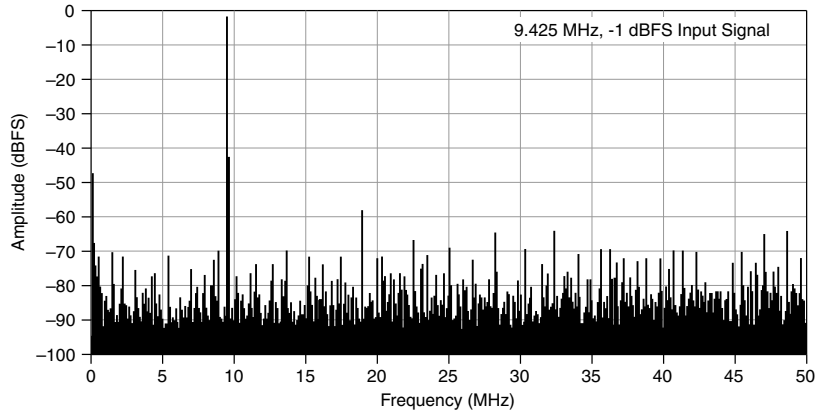
Spectral Characteristics

RMS noise, typical

All ranges except 0.04 V_{pk-pk} range.....0.35% FS

0.04 V_{pk-pk} range.....0.55% FS

Figure 2. NI 5132 Dynamic Performance, 1 V_{pk-pk} Range, 524,288-Point FFT, Typical



Horizontal

Sample Clock

Onboard Clock

Sample rate range, real-time sampling (single shot)[3] ..... 763 S/s to 50 MS/s

Timebase frequency ..... 50 MHz

Timebase accuracy ..... ±50 ppm

Related Information

Fore more information about Sample Clock and decimation, refer to the NI High-Speed Digitizers Help.

External Sample Clock[4]

Sources ..... PFI 1

Frequency range ..... 1 MHz to 50 MHz

Duty cycle tolerance ..... 45% to 55%

Related Information

PFI 1 (Programmable Function Interface) on page 6

Trigger

Reference (Stop) Trigger

Table 2. Trigger Types and Sources[5]

Types	Sources
Edge, window, hysteresis	CH 0, CH 1
Digital	PFI 1
Immediate, software	—

[3] Divide by *n* decimation used for all rates less than maximum speed.
[4] Input must meet 3.3 V CMOS Logic requirements.
[5] If a digital trigger is being supplied through the PF1 line, an external clock cannot be used.

Analog Trigger (Edge, Window, and Hysteresis Trigger Types)

Sources.....CH 0 (front panel BNC connector), CH 1 (front panel BNC connector)

Trigger level resolution.....8 bits

Trigger level range.....Same as input signal

Digital Trigger (Digital Trigger Type)

Sources.....PFI 1

Start Trigger

Table 3. Trigger Types and Sources[6]

Types	Sources
Digital	PFI 1
Immediate and Software	—

Digital Trigger (Digital Trigger Type)

Sources.....PFI 1

PFI 1 (Programmable Function Interface)

Connector.....BNC

Direction.....Bidirectional

As an Input (Trigger)

Destinations.....Start Trigger, Reference Trigger, External Sample Clock

Input impedance.....1 MΩ

V_{IH}.....2.4 V

V_{IL}.....400 mV

Maximum input overload.....-0.5 V to 3.5 V

Minimum pulse width.....20 ns

[6] If a digital trigger is being supplied through the PFI line, an external clock cannot be used.

As an Output (Event)

Sources	Ready for Start, Ready for Reference, End of Acquisition (Done)
Output impedance	50 Ω
Logic type	3.3 V CMOS
Maximum drive current	20 mA
Minimum pulse width	100 ns

Waveform Specifications

Onboard memory size	4 MB per channel option or 32 MB per channel option
Minimum record length	1 Sample
Number of pretrigger samples	4 MB – posttrigger samples or 32 MB – posttrigger samples
Number of posttrigger samples	4 MB – pretrigger samples or 32 MB – pretrigger samples

Calibration

Self-calibration	Self-calibration is done on software command. The calibration corrects for offset.
External calibration (factory calibration)	The external calibration calibrates the gain, the 1 MΩ attenuator, and the programmable vertical offset accuracy. Appropriate constants are stored in nonvolatile memory.
Interval for external calibration	2 years
Warm-up time	10 minutes

Power

+5 VDC	230 mA, typical
Total power	1.15 W, typical

Software

Driver Software

Driver support for this device was first available in NI-SCOPE 3.4 or later (for 4 MB/channel option) and NI-SCOPE 3.5.1 or later (for 32 MB/channel option).

NI-SCOPE is an IVI-compliant driver that allows you to configure, control, and calibrate the NI 5132. NI-SCOPE provides application programming interfaces for many development environments.

Application Software

NI-SCOPE provides programming interfaces, documentation, and examples for the following application development environments:

- LabVIEW
- LabWindows™/CVI™
- Measurement Studio
- Microsoft Visual C/C++
- Microsoft Visual Basic

Related Information

For NI-SCOPE .NET support, visit ni.com.

Interactive Soft Front Panel and Configuration

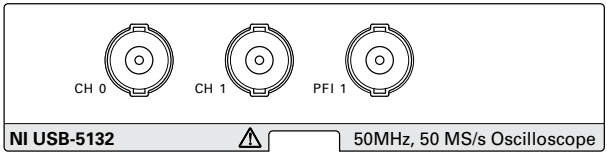
The NI-SCOPE Soft Front Panel version 2.8 or later supports interactive control of the NI 5132. The NI-SCOPE Soft Front Panel is included on the NI-SCOPE DVD.

National Instruments Measurement & Automation Explorer (MAX) also provides interactive configuration and test tools for the NI 5132. MAX is included on the NI-SCOPE DVD.

Physical

Front Panel

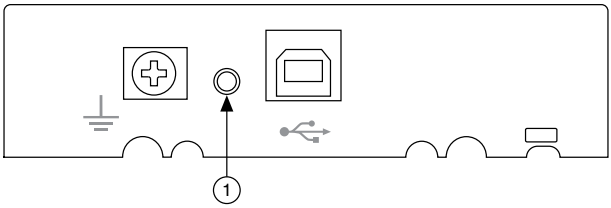
Figure 3. NI 5132 Front Panel



Connector	Function	Connector Type
CH 0	Analog input	BNC female
CH 1	Analog input	BNC female
PFI 1	Digital input/output/clk in	BNC female

Back Panel

Figure 4. NI 5132 Back Panel



Indicator	Function	Indicator Type
1	Indicates that the device has power and has been recognized by the system	LED

Cleaning Statement

Caution Clean the hardware with a soft, nonmetallic brush. Make sure that the hardware is completely dry and free from contaminants before returning it to service.

Dimensions and Weight

Dimensions.....18.49 × 3.38 × 10.29 cm
(7.279 × 1.314 × 4.053 in.)

Weight.....244 g (8.6 oz)

Environment

Maximum altitude.....2,000 m (at 25 °C ambient temperature)

Pollution Degree.....2

Indoor use only.

Operating Environment

Ambient temperature range.....0 °C to 45 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2.)

Relative humidity range.....10% to 90%, noncondensing (Tested in accordance with IEC 60068-2-56.)

Storage Environment

Ambient temperature range.....-20 °C to 70 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2.)

Relative humidity range.....10% to 90%, noncondensing (Tested in accordance with IEC 60068-2-56.)

Compliance and Certifications

Safety

This product is designed to meet the requirements of the following electrical equipment safety standards for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1

Note For UL and other safety certifications, refer to the product label or the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia, and New Zealand (per CISPR 11), Class A equipment is intended for use only in heavy-industrial locations.

Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.

Note For EMC declarations, certifications, and additional information, refer to the *Online Product Certification* section.

CE Compliance CE

This product meets the essential requirements of applicable European Directives, as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, visit *ni.com/certification*, search by model number or product line, and click the appropriate link in the Certification column.

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *Minimize Our Environmental Impact* web page at *ni.com/environment*. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit *ni.com/environment/weee*.

电子信息产品污染控制管理办法（中国 RoHS）

中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令(RoHS)。关于 National Instruments 中国 RoHS 合规性信息，请登录 `ni.com/environment/rohs_china`。(For information about China RoHS compliance, go to `ni.com/environment/rohs_china`.)

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