Technical Sales

(866) 531-6285
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Ordering Information | Detailed Specifications
For user manuals and dimensional drawings, visit the product page resources tab on ni.com.

Last Revised: 2014-09-24 22:47:50.0

Bus-Powered USB Digitizers

NI USB-5132, NI USB-5133

- Bus-powered and portable
- 100 and 50 MS/s sample rates
- 50 MHz bandwidth
- 8-bit resolution
- 2 channels
- Input ranges from 40 mVpp to 40 Vpp

Overview

The NI USB-5132 50 MS/s and USB-5133 100 MS/s digitizers/oscilloscopes offer two simultaneously sampled channels with 8-bit resolution. These USB digitizers have 10 input ranges from 40 mV to 40 V and programmable DC offset. They also come standard with 4 MB per channel of onboard memory for measurements requiring extended data captures. The small, bus-powered, plug-and-play form factor makes the USB-5132 and USB-5133 ideal for portable, benchtop, and OEM applications. The included NI-SCOPE Soft Front Panel provides an interactive interface with more than 40 built-in measurements.

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Application and Technology

Dual 8-Bit Input Channels

- 100 MS/s real-time sampling on two channels (USB-5133)
- 50 MS/s real-time sampling on two channels (USB-5132)
- 50 MHz input bandwidth with selectable 20 MHz noise filter
- Independent channel-selectable 40 mVpp to 40 Vpp input ranges
- 1 MΩ input impedance
- 4 MB of memory per channel
- Two-year calibration interval and 0 to 45 °C operating temperature

Triggering and Clocking

- Edge, window, hysteresis, and digital triggering
- Ability to capture pretrigger and posttrigger acquisition data
- Internal 100/50 MHz clock or external clock from 1 MHz to maximum sample rate

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Ordering Information

For a complete list of accessories, visit the product page on ni.com.

Products	Part Number	Recommended Accessories	Part Number
		No accessories required.	
		No accessories required.	
		No accessories required.	

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Support and Services

System Assurance Programs

NI system assurance programs are designed to make it even easier for you to own an NI system. These programs include configuration and deployment services for your NI PXI, CompactRIO, or Compact FieldPoint system. The NI Basic System Assurance Program provides a simple integration test and ensures that your system is delivered completely assembled in one box. When you configure your system with the NI Standard System Assurance Program, you can select from available NI system driver sets and application development environments to create customized, reorderable software configurations. Your system arrives fully assembled and tested in one box with your software preinstalled. When you order your system with the standard program, you also receive system-specific documentation including a bill of materials, an integration test report, a recommended maintenance plan, and frequently asked question documents. Finally, the standard program reduces the total cost of owning an NI system by providing three years of warranty coverage and calibration service. Use the online product advisors at ni.com/advisor to find a system assurance program to meet your needs.

Calibration

NI measurement hardware is calibrated to ensure measurement accuracy and verify that the device meets its published specifications. To ensure the ongoing accuracy of your measurement hardware, NI offers basic or detailed recalibration service that provides ongoing ISO 9001 audit compliance and confidence in your measurements. To learn more about NI calibration services or to locate a qualified service center near you, contact your local sales office or visit ni.com/calibration.

Technical Support

Get answers to your technical questions using the following National Instruments resources.

- **Support** - Visit ni.com/support to access the NI KnowledgeBase, example programs, and tutorials or to contact our applications engineers who are located in NI sales offices around the world and speak the local language.
- **Discussion Forums** - Visit forums.ni.com for a diverse set of discussion boards on topics you care about.
- **Online Community** - Visit community.ni.com to find, contribute, or collaborate on customer-contributed technical content with users like you.

Repair

While you may never need your hardware repaired, NI understands that unexpected events may lead to necessary repairs. NI offers repair services performed by highly trained technicians who quickly return your device with the guarantee that it will perform to factory specifications. For more information, visit ni.com/repair.

Training and Certifications

The NI training and certification program delivers the fastest, most certain route to increased proficiency and productivity using NI software and hardware. Training builds the skills to more efficiently develop robust, maintainable applications, while certification validates your knowledge and ability.

- **Classroom training in cities worldwide** - the most comprehensive hands-on training taught by engineers.
- **On-site training at your facility** - an excellent option to train multiple employees at the same time.
- **Online instructor-led training** - lower-cost, remote training if classroom or on-site courses are not possible.
- **Course kits** - lowest-cost, self-paced training that you can use as reference guides.
- **Training memberships** and training credits - to buy now and schedule training later.

Visit ni.com/training for more information.

Extended Warranty

NI offers options for extending the standard product warranty to meet the life-cycle requirements of your project. In addition, because NI understands that your requirements may change, the extended warranty is flexible in length and easily renewed. For more information, visit ni.com/warranty.

OEM

NI offers design-in consulting and product integration assistance if you need NI products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.

Alliance

Our Professional Services Team is comprised of NI applications engineers, NI Consulting Services, and a worldwide National Instruments Alliance Partner program of more than 700 independent consultants and integrators. Services range from start-up assistance to turnkey system integration. Visit ni.com/alliance.

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Detailed Specifications

This document lists the specifications for the NI USB-5132/5133 (NI 5132/5133) high-speed digitizers. 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 5132/5133 specifications, visit ni.com/manuals.

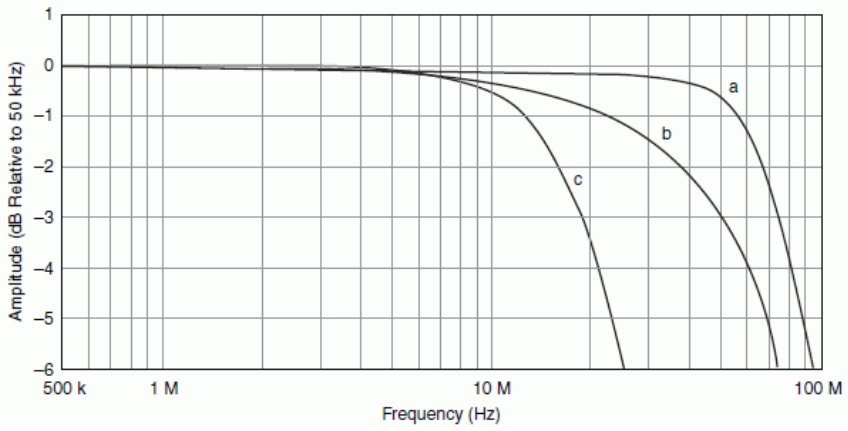
To access the NI 5132/5133 documentation, including the *NI High-Speed Digitizers Getting Started Guide*, which contains functional descriptions of the NI 5132/5133 signals, navigate to **Start»All Programs»National Instruments»NI-SCOPE»Documentation**.

Vertical

Analog Input (Channel 0 and Channel 1)

Specification	Value		Comments
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			
Full Scale (FS) Input Range and Programmable Vertical Offset	Range (V_{pk-pk})	Vertical Offset Range (V)*	* Programmable Vertical Offset Accuracy: ±2 mV on 40 mV range, ±2.5% on all other ranges
	0.04	±0.4	
	0.1	±0.4	
	0.2	±0.4	
	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% of Input + 1% FS + 300 µV)		Within 5 °C of self-calibration temperature
DC Drift	±(0.033% of Input + 0.06% of FS + 40 µV) per °C		—
AC Coupling Cutoff (–3 dB), Typical	12 Hz		—

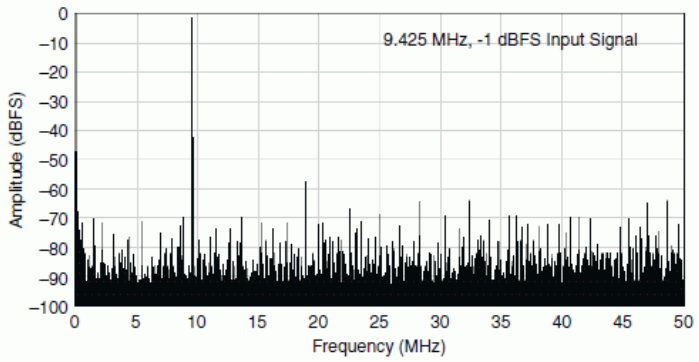
Specifications	Value		Comments
Bandwidth and Transient Response			
Bandwidth (–3 dB)	Range (V_{pk-pk})	Minimum Bandwidth	—
	All ranges except 0.04	50 MHz	—
	0.04	35 MHz	—
Bandwidth Limit Filter	20 MHz Noise Filter		—



a. Typical Frequency Response at Full Bandwidth, All Ranges Except 40 mV_{pk-pk} Range
b. Typical Frequency Response at Full Bandwidth, 40 mV_{pk-pk} Range
c. Typical Frequency Response with 20 MHz Noise Filter, All Ranges

Specification	Value		Comments
Spectral Characteristics			
RMS Noise, Typical	Range (V_{pk-pk})	RMS Noise	—
	All ranges except 0.04	0.35% FS	
	0.04	0.55% FS	

NI 5132/5133 Dynamic Performance, 1 V_{pk-pk} Range, 524,288-Point FFT (Typical)



Horizontal

Sample Clock

Specification	Value		Comments
Onboard Clock			
Sample Rate Range	Real-Time Sampling (Single Shot)		Divide by *n* decimation used for all rates less than maximum speed. For more information about Sample Clock and decimation, refer to the *NI High-Speed Digitizers Help*.
	NI USB-5132	NI USB-5133	
	763 S/s to 50 MS/s	1.526 kS/s to 100 MS/s	
Timebase Frequency	NI USB-5132	NI USB-5133	—
	50 MHz	100 MHz	
Timebase Accuracy	±50 ppm		—
External Sample Clock			
Sources	PFI 1		Input must meet 3.3 V CMOS Logic requirements. *Refer to PFI 1 (Programmable Function Interface)*.
Frequency Range	NI USB-5132	NI USB-5133	
	1 MHz to 50 MHz	1 MHz to 100 MHz	
Duty Cycle Tolerance	45% to 55%		

Trigger

Reference (Stop) Trigger

Specification	Value		Comments
Trigger Types and Sources	Types	Sources	If a digital trigger is being supplied through the PFI line, an external clock cannot be used.
	Edge, Window, Hysteresis	CH 0, CH 1	
	Digital	PFI 1	
	Immediate, Software	—	
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

Specification	Value		Comments
Trigger Types and Sources	Types	Sources	If a digital trigger is being supplied through the PFI line, an external clock cannot be used.
	Digital	PFI 1	
	Immediate and Software	—	—
Digital Trigger (Digital Trigger Type)			
Sources	PFI 1		—

PFI 1 (Programmable Function Interface)

Specification	Value
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
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

Specification	Value	Comments
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

Specification	Value
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

Specification	Typical Value
+5 VDC	230 mA
Total Power	1.15 W

Software

Specification	Value
Driver Software	NI-SCOPE 3.4 or later (for 4 MB /channel option) 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 5132/5133. 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++ ▪ Measurement Studio ▪ Microsoft Visual Basic ▪ For NI-SCOPE .NET support, visit ni.com
Interactive Soft Front Panel and Configuration	The NI-SCOPE Soft Front Panel 2.8 or later supports interactive control of the NI 5132/5133. The NI-SCOPE Soft Front Panel is included on the NI-SCOPE CD. National Instruments Measurement & Automation Explorer (MAX) also provides interactive configuration and test tools for the NI 5132/5133. MAX is included on the NI-SCOPE CD.

Environment

Specification	Value
Operating Temperature	0 ºC to +45 ºC (Meets IEC 60068-2-1 and IEC 60068-2-2)
Storage Temperature	−20 ºC to +70 ºC (Meets IEC 60068-2-1 and IEC 60068-2-2)
Operating Relative Humidity	10% to 90% relative humidity, noncondensing (Meets IEC 60068-2-56)
Storage Relative Humidity	10% to 90% relative humidity, noncondensing (Meets IEC 60068-2-56)
Altitude	2,000 meter maximum (at 25 °C ambient temperature)
Pollution Degree	2 (indoor use only)

Safety, Electromagnetic Compatibility, and CE Compliance

Safety Standards

This product is designed to meet the requirements of the following standards of safety for electrical equipment 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 (IEC 61326): 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 For the standards applied to assess the EMC of this product, refer to the *Online Product Certification* section.

Note For EMC compliance, operate this device with RG223/U or equivalent shielded cable. Operate according to product documentation.

CE Compliance CE

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; 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 module number or product line, and click the appropriate link in the Certification column.

Environmental Management

National Instruments is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial not only to the environment but also to NI customers.

For additional environmental information, refer to the *NI and the Environment* 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 products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste Electrical and Electronic Equipment, visit ni.com/environment/weee.htm.

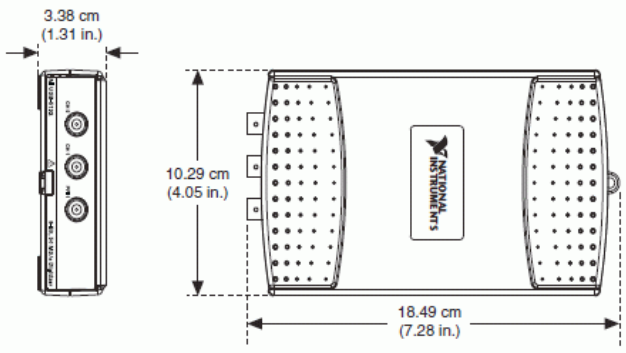
电子信息产品污染控制管理办法 （中国 RoHS）

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.)

Physical

Label	Function	Connector Type	Comments
NI USB-5132/5133 Front Panel Connectors			
CH 0	Analog Input	BNC female	—
CH 1	Analog Input	BNC female	
PFI 1	Digital Input/Output/Clk In	BNC female	
NI USB-5132/5133 Back Panel Indicators			
Indicator	Function		—
LED	Indicates that the device has power and has been recognized by the system.		

Dimensions and Weight

NI USB-5132/5133	
Dimensions	18.49 × 3.38 × 10.29 cm (7.279 × 1.314 × 4.053 in.) 
Weight	244 g (8.6 oz)

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