

USB-2405

4-CH 24-Bit 128kS/s Dynamic Signal Acquisition USB 2.0 Module

NEW



Features

- Hi-Speed USB 2.0
 - USB bus powered
 - 24-bit Sigma-Delta ADC with built-in anti-aliasing filter
 - 4-CH simultaneous sampling analog inputs, up to 128kS/s
 - AC or DC input coupling, software selectable
 - Analog or digital triggering
 - Supports 2mA excitation output on each analog input channel for IEPE sensor measurement
 - Full auto-calibration
 - Ready-to-use testing application (U-Test) provided
- OS Information
 - Windows XP, Windows 7/8 x64/x86
 - Software Compatibility
 - LabVIEW, MATLAB, Visual Studio.NET
 - Software Recommendations
 - U-Test, DAQBench, DAQMaster

Standard Shipped Accessories

- 4-pin removable spring terminal
- 2 M USB Type A to USB Mini-B cable with lockable connector



- Module stand

- Rail-mount kit



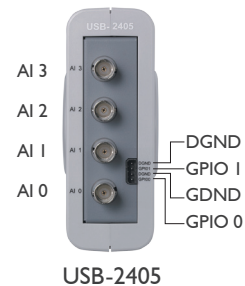
Introduction

The USB-2405 is a 24-bit high-performance dynamic signal acquisition USB module equipped with 4 analog input channels providing simultaneous sampling at up to 128 kS/s per channel. The USB-2405 also features software-selectable AC or DC coupling input configuration and built-in high precision 2 mA excitation current to measure integrated electronic piezoelectric (IEPE) sensors such as accelerometers and microphones.

The USB-2405 delivers high precision, DC and dynamic measurement performance with very low temperature drift. The onboard 24-bit Sigma-Delta ADC supports anti-aliasing filtering, suppressing modulator and signal out-of-band noise and providing usable signal bandwidth of the Nyquist rate, making it ideal for high dynamic range signal measurement in vibration and acoustic applications.

The USB-2405 supports digital and analog trigger sources and flexible trigger modes, including post, delay, middle, gated, and pre-triggering for efficient data acquisition with no need for post-processing. The USB-2405 is USB bus-powered and equipped with BNC connectors and removable spring terminals for easy device connectivity.

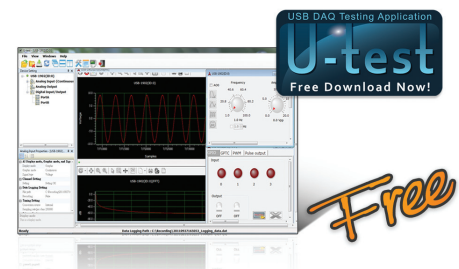
IO connector definition



Ready-to-Use ADLINK U-Test Utility

U-Test is a free ready-to-use testing program allowing configuration and test data acquisition with no programming required. Easy out-of-the-box configuration and generation of simple functions, including full data monitoring, logging and FFT analysis is easy and fast, with no programming requirement.

- No programming necessary for operation and full function testing of ADLINK USB DAQ/DIO
- Intuitive interface for data monitoring and logging, waveform generation, and digital I/O control panel use as virtual instrument
- Useful analysis functions, such as direct cursor measurement of traces and real-time FFT analysis
- Data exportable to Microsoft Excel for offline analysis
- Supports auto-recollection of configuration settings for future use



Specifications

Analog Input

Channels	4 (simultaneous sampling)
ADC Resolution	24 Bit
ADC type	Delta-sigma
Sampling rate	1 kS/s to 128 kS/s
Input range	$\pm 10V$
FIFO buffer size	2k samples per channel
Input Configuration	Differential or pseudo-differential
Input impedance	200 k Ω (between positive input and negative input) 16.93 k Ω (Between negative input and chassis ground)
Input coupling	AC or DC, software selectable
Integrated Electronic Piezoelectric (IEPE)	Current: 2 mA or 0 mA, software selectable IEPE compliance: 24V
Over-voltage protection	$\pm 60V$
Input common mode range	$\pm 10V$
Trigger source	Analog or digital, software selectable
Trigger mode	Post trigger, delay trigger, middle trigger, gated trigger, pre-trigger, post or delay trigger with re-triggering
Data Transfer	Programmed I/O, continuous (bulk transfer mode)

DC accuracy (25°C)

Offset Error (mV)	Gain Error (%)
Typical: $\pm 0.15mV$	Typical: $\pm 0.15\%$
Max. $\pm 0.3mV$	Max. $\pm 0.3\%$

AC Dynamic Performance (typical, 25°C)

- THD, THD+N ($V_{in} = 8.9 V_{pk}$)

Input configuration	Input Signal Frequency (f_{in})	THD	THD+N
Differential	20 Hz to 20 kHz	-94 dB	-91 dB
	20 Hz to 46.4 kHz	-89 dB	-88 dB
Pseudo-differential	20 Hz to 20 kHz	-92 dB	-88 dB
	20 Hz to 46.4 kHz	-85 dB	-85 dB

- CMRR

AC (20 Hz to 1 kHz)	60 dB
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- Bandwidth

-3dB bandwidth	0.49 * sampling rate
AC cut-off frequency (-3dB)	0.4 Hz
AC cut-off frequency (-0.1dB)	2.4 Hz

- Flatness

Input Signal Frequency (f_{in})	Flatness
20 Hz to 20 kHz	± 0.01 dB
20 Hz to 46.4 kHz	± 0.15 dB

- Crosstalk

Input Signal Frequency (f_{in})	Crosstalk
1 kHz	-102 dB
46.4 kHz	-95 dB

- System noise

Mode	AI Noise
High-Resolution (< 52.734 kHz)	50 μ Vrms
High-Speed Mode (52.734 kHz to 128 kHz)	65 μ Vrms

- SFDR ($V_{in} = -1$ dBFS)

Input Signal Frequency (f_{in})	SFDR
1 kHz	104 dB

- Dynamic Range ($V_{in} = -60$ dBFS, $f_s = 102.4kS/s$)

Input Signal Frequency (f_{in})	Dynamic range
1 kHz	100 dB

Digital Input / Output

Channels	2 programmable function I/O
Compatibility	3.3V / TTL (single-ended)
Initial status	Input (pull low)
Input voltage	Logic low: $V_{IL} = 0.8 V$ max; $I_{IL} = 0.2 mA$ max. Logic high: $V_{IH} = 2.0 V$ min.; $I_{IH} = 0.2 mA$ max.
Output voltage	Logic low: $V_{OL} = 0.8 V$ max; $I_{OL} = 0.2 mA$ max. Logic high: $V_{OH} = 2.0 V$ min.; $I_{IH} = 24 mA$ max.
Over-voltage protection	-2V ~ +7V
Supporting modes	- Static digital input/output - Pulse output, max. frequency: 4 MHz - Frequency/Event counter, max. frequency: 4MHz - Digital trigger IN - Synchronization sample clock IN
Data Transfer	Programmed I/O

Note: Function I/O shares the same I/O pins, such that only one of these modes can be selected at a time.

General Specifications

- I/O connector: Four BNC connectors and 4-pin removable spring terminals
- Operating temperature: 0 to 55°C (32 to 131 °F)
- Storage temperature: -20 to 70°C (-4 to 158 °F)
- Power requirements: 5V @ 400mA (USB bus powered)
- Dimensions (not including connectors and stand): 115 mm (W) x 150 mm (D) x 40 mm (H) (4.5" x 5.91" x 1.57")
- Relative humidity: 5% to 95%, non-condensing

Ordering Information

■ USB-2405

4-CH 24-Bit 128kS/s Dynamic Signal Acquisition
USB 2.0 Module

Optional Accessories

■ RST-20P

One pair of 20-pin removable
screw terminals

■ USB-2M-L

2 M USB Type A to USB Mini-B cable
with lockable connector