USB-2405 4-CH 24-Bit 128kS/s Dynamic Signal Acquisition USB 2.0 Module

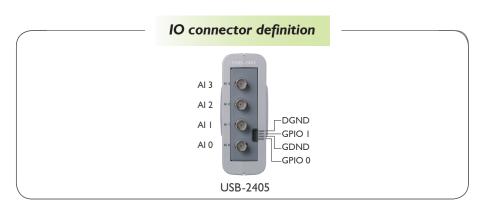


Introduction

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 micro-phones.

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.



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



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



Module stand





• Rail-mount kit

• 2 M USB Type A to USB Mini-B

cable with lockable connecto

Specifications

Analog Input

Channels	4 (simultaneous sampling)
ADC Resolution	24 Bit
ADC type	Delta-sigma
Sampling rate	I kS/s to I28 kS/s
Input range	±IOV
FIFO buffer size	2k samples per channel
Input Configura- tion	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	±60V
Input common mode range	±IOV
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: ±0.15mV	Typical: ±0.15%
Max. ±0.3mV	Max. ±0.3%

AC Dynamic Performance (typical, 25°C)

• THD, THD+N (Vin = 8.9 Vpk)

Input configura- tion	Input Signal Frequency (fin)	THD	THD+N
Differential	20 Hz to 20 kHz	-94 dB	-91 dB
	20 Hz to 46.4 kHz	-89 dB	-88 dB
Pseudo-	20 Hz to 20 kHz	-92 dB	-88 dB
differen- tial	20 Hz to 46.4 kHz	-85 dB	-85 dB

• CMRR

AC (20 Hz to 1 kHz)	60 dB
• Bandwidth	
-3dB bandwidth	0.49 * sampling rate
AC cut-off frequency (-3dB)	0.4 Hz
AC cut-off frequency (-0.1d	B) 2.4 Hz

Flatness

Input Signal Frequency (fin)	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
I kHz	-102 dB
46.4 kHz	-95 dB

• System noise

Mode	Al Noise
High-Resolution (< 52.734 kHz)	50µVrms
High-Speed Mode (52.734 kHz to 128 kHz)	65µVrms

• SFDR (Vin = -1 dBFS)

Input Signal Frequency (fin)	SFDR
IkHz	104 dB

• Dynamic Range (Vin = -60 dBFS, fs=102.4kS/s)		
	Input Signal Frequency (fin)	Dynamic range
	l kHz	100 dB

Digital Input / Output

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Channels	2 programmable function I/O	
Compatibility	3.3V / TTL (single-ended)	
Initial status	Input (pull low)	
Input voltage	Logic low: VIL = 0.8 V max; IIL = 0.2 mA max. Logic high: VIH = 2.0 V min.; IIH = 0.2 mA max.	
Output voltage	Logic low: VOL = 0.8 V max; IIL = 0.2 mA max. Logic high: VOH = 2.0 V min.; IIH = 24 mA max.	
Over-voltage protec- tion	$-2V \sim +7V$	
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