# USB-1210

## 4-CH 16-Bit 2MS/s Simultaneous-Sampling USB DAQ Module

### Introduction

The USB-1210 is a 16-bit high-speed USB 2.0-based DAQ module equipped with 4 analog input channels providing simultaneous sampling at up to 2MS/s per channel. The USB-1210 delivers high accuracy and excellent dynamic performance at maximum sampling rates, and flexible trigger functions. In addition, onboard 256M samples FIFO ensures no data loss during acquisition even when CPU or system loading is heavy.

The USB-1210 is USB bus-powered and equipped with removable screw-down terminals for easy device connectivity. The attached multifunctional stand can be used for desktop, rail, or wall mounting.

Suitable for high-speed data acquisition, laboratory and medical research, the USB-1210 provides a reliable measurement solution at an affordable price.

### Features

- **USB 2.0 Hi-speed**
- **USB bus power**
- **500VDC Isolation**
- **256M samples FIFO**
- **4-CH simultaneous-sampling analog input, up to 2MS/s per channel**
- **Analog and digital triggering**
- **Removable screw terminals on module**
- **Lockable USB cable for secure connectivity**
- **Analog and digital triggering**
- **Ready-to-use testing application (U-Test) provided**

- Supported OS
  - Windows 7/8 x64/x86

- Driver and SDK
  - UD-DASK
  - DAQPilot for LabVIEW®
  - DAQ-MTLB for MATLAB®

- Software Utility
  - U-Test

### Standard Shipped Accessories

- One pair 20-pin removable screw terminals
- 2 M USB Type A to USB Mini-B cable with lockable connector
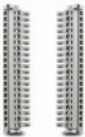
- Module stand
- Rail-mount kit

### Pin Assignment

#### USB-1901/1902

| | | | |
|---|---|---|---|
| IGND | 20 | 40 | IGND |
| GPI0 | 19 | 39 | GPO0 |
| GPI1 | 18 | 38 | GPO1 |
| GPI2 | 17 | 37 | GPO2 |
| GPI3 | 16 | 36 | GPO3 |
| GPI4 | 15 | 35 | IGND |
| GPI5 | 14 | 34 | CONV |
| GPI6 | 13 | 33 | IGND |
| GPI7 | 12 | 32 | AITG |
| IGND | 11 | 31 | NC |
| IGND | 10 | 30 | IGND |
| AI0- | 9 | 29 | AI2- |
| AI0+ | 8 | 28 | AI2+ |
| IGND | 7 | 27 | IGND |
| AI1- | 6 | 26 | AI3- |
| AI1+ | 5 | 25 | AI3+ |
| IGND | 4 | 24 | IGND |
| NC | 3 | 23 | NC |
| NC | 2 | 22 | NC |
| CGND | 1 | 21 | IGND |

### Ordering Information

- **USB-1210**
  4-CH 16-Bit 2MS/s Simultaneous-Sampling Analog Input USB 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

## Specifications

| Model Name | USB-1210 |
|---|---|
| **Analog Input** | |
| Resolution | 16-Bit |
| Number of channels | 4 differential (simultaneous-sampling) |
| Maximum sampling rate | 2MS/s per channel |
| Programmable gain | 1, 5 |
| Input range (Voltage) | ± 10 V, ± 2 V |
| Offset error | ± 1mV (gain=1)<br>± 0.2mV (gain=5) |
| Gain error | Typical: ± 0.01% of FSR (gain=1 & 5)<br>Maximum: ± 0.02% of FSR (gain=1 & 5) |
| -3dB Bandwidth | 600 kHz |
| CMRR (fin=1 kHz) | 80 dB (gain=1)<br>90 dB (gain=5) |
| SFDR (fin=10 kHz) | 98 dB (gain=1 & 5) |
| SINAD (fin=10 kHz) | 89 dB (gain=1 & 5) |
| THD (fin=10 kHz) | -100 dB (gain=1 & 5) |
| SNR (fin=10 kHz) | 89 dB (gain=1 & 5) |
| ENOB (fin=10 kHz) | 14.3-bit (gain=1 & 5) |
| FIFO buffer size | 256M Samples |
| Trigger sources | Software, external digital, analog trigger ( from one analog input channel) |
| Trigger mode | Post trigger, pre-trigger, delay trigger, middle trigger, gate trigger, post or delay trigger with re-trigger |
| External A/D conversion source | Yes (from CONV) |
| Input coupling | DC |
| Overvoltage protection | Power on: ± 35 V<br>Power off: ± 15V |
| Input impedance | 1 GΩ |
| Data transfer | Programmed I/O, continuous (USB bulk transfer mode) |
| **Function I/O** | |
| Mode* | Digital I/O, general timer/counter, pulse generation |
| Digital I/O | 8 DI / 4 DO (TTLLVTTL level) |
| General timer/counter | Two 32-bit, base clock: 80 MHz, external to 10 MHz |
| Pulse generation | Two PWM outputs (Modulation frequency: 0.01 Hz to 5 MHz; duty cycle: 1%-99%) |
| **General Specifications** | |
| Interface | USB 2.0 high speed |
| I/O connector | Two 20-pin removable screw terminals |
| Operating temperature | 0 to 55℃ (32 to 131°F) |
| Storage temperature | -20 to 70℃ (-4 to 158°F) |
| Relative humidity | 5 to 95% non-condensing |
| Power requirements | 5V@ 500 mA (USB bus powered) |
| Dimensions | 114 mm (H) x 156.5 mm (L) x 41.3 mm (W) (4.5" x 6.16" x 1.63") (without connector and stand) |

Note: As function I/Os share the same I/O pins, only one of these modes can be selected.