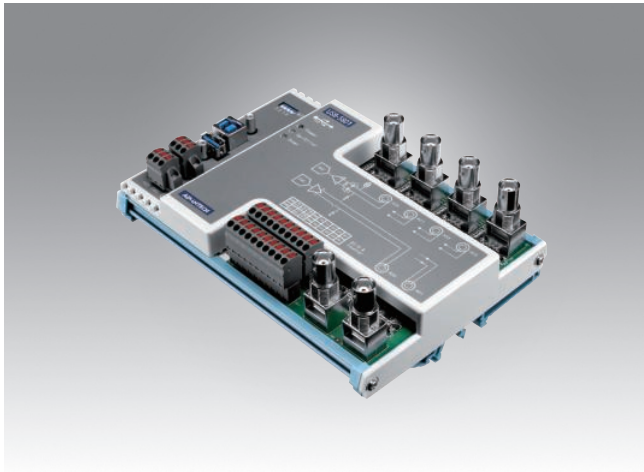


# USB-5801

## 4-ch, 24-bit, 192 kS/s Dynamic Signal Acquisition USB 3.0 I/O Module with Analog Output and Tachometer



### Features

- USB 3.0 SuperSpeed and daisy chainable by built-in USB hub
- 4 simultaneously sampled analog inputs, up to 192 kS/s
- 24-bit resolution ADCs with -95 dB total harmonic distortion plus noise (THD+N)
- Built-in anti-aliasing filter
- 2 mA integrated electronic piezoelectric (IEPE) excitation currents
- 2 analog outputs with update rate up to 192 kS/s
- 24-bit resolution DACs with -91 dB total harmonic distortion plus noise (THD+N)
- 2 tachometer inputs for period or frequency measurement
- 4-ch isolated digital input and 4-ch isolated digital output

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### Introduction

USB-5801 is a high accuracy dynamic signal acquisition USB 3.0 module specifically designed for vibration and acoustic measurements. It provides four simultaneously sampled, 24-bit, IEPE sensor inputs with up to 192 kS/s sample rate for high resolution measurements. It is also equipped with two 24-bit analog outputs with up to 192 kS/s update rate. In addition, it has two tachometer inputs whose data can be correlated to the sensor data. The built-in USB hub makes this module daisy chainable with other USB-5000 series products.

### Specifications

#### Analog Input

- **Channels** 4 (simultaneous sampling, 50  $\Omega$  pseudo-differential configurable)
- **Resolution** 24 bits (delta-sigma ADC)
- **Max. Sampling Rate** 1 ~ 192 kS/s
- **Input Coupling** AC/DC, selectable per channel
- **Trigger Modes** Start, Delayed Start, Stop, Delayed Stop
- **Input Range**  $\pm 1$  V,  $\pm 2$  V,  $\pm 5$  V,  $\pm 10$  V
- **Offset Error**  $< \pm 0.2$  mV
- **Gain Error**  $< \pm 0.02\%$  of full-scale range
- **Total Harmonic Distortion Plus Noise (THD+N)** -95 dB
- **IEPE Excitation** 2 mA

#### Analog Output

- **Channels** 2 (50  $\Omega$  pseudo differential)
- **Resolution** 24 bits (delta-sigma DAC)
- **Update rate** 1 ~ 192 kS/s
- **Output coupling** DC
- **Output range**  $\pm 1$  V,  $\pm 10$  V
- **Offset error**  $< \pm 0.5$  mV
- **Gain error**  $< \pm 0.03\%$  of full-scale range
- **Total harmonic distortion plus noise (THD+N)** -91 dB
- **Trigger mode** Start, delay to start, stop, delay to stop
- **Auto calibration** Yes

#### Tachometer Input

- **Channels** 2
- **Input voltage** Logic 0: 3 V max.  
Logic 1: 10 V min. (30 V max.)
- **Input frequency** 5 kHz max.
- **Isolation protection** 2,500 V<sub>DC</sub>
- **Digital Filter** 16  $\mu$ s ~ 131 ms

#### Digital Input

- **Channels** 4
- **Input voltage** Logic 0: 3 V max.  
Logic 1: 10 V min. (30 V max.)
- **Opto-isolator response time** 100  $\mu$ s
- **Isolation protection** 2,500 V<sub>DC</sub>
- **Digital Filter** 16  $\mu$ s ~ 131 ms

#### Digital Output

- **Channels** 4
- **Load voltage** 5 ~ 40 V<sub>DC</sub>
- **Load current** 350 mA/ch (sink)
- **Opto-isolator response time** 100  $\mu$ s
- **Isolation protection** 2,500 V<sub>DC</sub>

#### General

- **Interface** USB 3.0
- **Data transfer rate** 5 Gbps
- **Connectors** 6 x BNC (AI and AO)  
2 x 10-pin, 3.81-mm terminal blocks (tachometer, trigger, and DI/O)  
2 x 3-pin, 3.81-mm terminal blocks (power)  
1 x USB 3.0 type A (downstream port)  
1 x USB 3.0 type B (upstream port)
- **Dimensions** 168 mm x 120 mm x 40 mm (6.6" x 4.7" x 1.6")
- **Operating temperature** 0 ~ 60 °C (32 ~ 140 °F)
- **Storage temperature** -40 ~ 70 °C (-40 ~ 158 °F)
- **Storage humidity** 5 ~ 95% RH (non-condensing)
- **Power supply** External 10 ~ 30 V<sub>DC</sub> or USB bus power
- **Power consumption** 150 mA typ./200 mA max. @24 V external power  
700 mA typ./860 mA max. @5 V bus power

### Ordering Information

- **USB-5801-AE** 4-ch, 24-bit, 192 kS/s Dynamic Signal Acquisition USB 3.0 I/O Module with Analog Output and Tachometer
- **96PSD-A40W24-MM** DIN RAIL A/D 100-240V 40W 24V