

USB-5817

8-Channel, 16-Bit, 200 kS/s USB 3.0 Isolated Analog Input Module Startup Manual

Packing List

Before installation, please ensure that the following items are included with the product:

1. 1 x USB-5817 module
2. 4 x Terminal blocks
3. 1 x Startup manual
4. 1 x USB 3.0 lockable cable (1 m)

If any of the above items are missing or damaged, contact your distributor or sales representative immediately.

User Manual

For more detailed information regarding this product, please download the USB-5817 user manual from the Advantech website.

Overview

Advantech's USB-5817 is an industrial USB 3.0 isolated analog input module. To ensure easy installation in cabinet computers, USB-5817 modules are compact and equipped with a DIN rail mount kit. The built-in USB hub can support a daisy-chain topology, while Euro-type pluggable terminal blocks and LED indicators facilitate configuration and maintenance.

For more information about this or other Advantech products, please visit our website at

<http://www.advantech.com>



For driver/SDK downloads and technical support services, please visit our support website at

<http://support.advantech.com>

This manual is for USB-5817.

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Specifications

General

- **Connectors:**
 - 2 x 10-pin terminal block (3.81 mm, AI)
 - 2 x 3-pin screw terminal block (3.81 mm, power)
 - USB 3.0 type A (downstream port)
 - USB 3.0 type B (upstream port)
- **Dimensions:**
120 x 120 x 40 mm³ (4.72 x 4.72 x 1.57 in³)
- **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:** 10 ~ 30 V_{DC}
- **Interface:** USB 3.0
- **Data Transfer Rates:** 5 Gbps
- **Power Consumption:**
 - Using USB bus power: 350 mA typical @ 5 V
 - Using external power: 100 mA typical @ 24 V
- **ESD Protection**
 - Air: ±8 kV
 - Contact: ±6 kV
- **DC Surge Protection:** 2 kV

Analog Input

- **Number of Input Channels:** 8 differential, can be enabled/disabled independently using software
- **A/D Converter (ADC) Resolution:** 16 bits (15 bits for current measurement)
- **A/D Converter (ADC) Type:** Successive approximation (SAR)
- **Maximum Sample Rates (fs):** 200 kS/s shared by all channels
- **Input Coupling:** DC
- **Input Range:** ±10 V, 0 ~ 20 mA
- **Input Common-Mode Voltage Range:** ±275 V
- **Absolute Accuracy**
 - **Offset Error:** < ±1 mV
 - **Gain Error:** < ±0.01% of full-scale range
- **Temperature Drift**
 - **Offset Drift:** 25 ppm/°C
 - **Gain Drift:** 15 ppm/°C
- **Bandwidth (-3dB):** 10 kHz
- **Idle Channel Noise:** 0.27 mV_{RMS} (16 bits effective resolution)
- **Signal-to-Noise Ratio (SNR):** 87 dB
- **Total Harmonic Distortion (THD):** -98 dB
- **Total Harmonic Distortion Plus Noise (THD+N):** -87 dB
- **Spurious-Free Dynamic Range (SFDR):** 102 dB
- **Effective Number of Bits (ENOB):** 14.2 bits

Specifications (Cont.)

- **Input Impedance**
 - **Differential:** 800 k Ω
 - **Common Mode:** 200 k Ω
- **Input FIFO Size:** 4,096 samples shared among all enabled channels

Installation Instructions

1. Install the SDK and drivers downloaded from the Advantech website.
2. Touch the metal case of the computer to discharge any static electricity that may be in your body.
3. Insert the USB module into the designated USB port. Use caution when inserting the module to avoid damaging the components from excessive force.

Declaration of Conformity

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and operated in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference. In such cases, users are required to correct the interference at their own expense.

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. Such cables are available from Advantech. Please contact your local supplier for ordering information.

Power

USB-5817 modules feature two power input terminals with an input power range of 10 ~ 30 V_{DC} and power redundancy support. For modules connected to two power input sources, if one source is inactive or interrupted, the other power source can immediately assume supply operations. Accordingly, USB-5817 modules can operate with a single power source. (The modules can also be powered via USB if there is no device connected to the downstream port.)

Board ID Switch

USB-5817 modules have a built-in DIP switch that is used to define the board ID for each module. When multiple modules are installed in the same system, the board ID switch can be used to identify each module's device number. Every module in the system should be assigned different device numbers. The default board ID value is 0. When configuring the board ID to any other value, refer to the settings in the following table:

Board ID Setting				
SW1	Position 1	Position 2	Position 3	Position 4
BoardID	ID3	ID2	ID1	ID0
0	ON	ON	ON	ON
1	ON	ON	ON	OFF
2	ON	ON	OFF	ON
3	ON	ON	OFF	OFF
4	ON	OFF	ON	ON
5	ON	OFF	ON	OFF
6	ON	OFF	OFF	ON
7	ON	OFF	OFF	OFF
8	OFF	ON	ON	ON
9	OFF	ON	ON	OFF
10	OFF	ON	OFF	ON
11	OFF	ON	OFF	OFF
12	OFF	OFF	ON	ON
13	OFF	OFF	ON	OFF
14	OFF	OFF	OFF	ON
15	OFF	OFF	OFF	OFF

Default Setting is 0

Switches

SW2~SW8 are used to configure the analog input as voltage measurement (± 10 V) or current measurement (0 ~ 20 mA). The default setting is voltage measurement.



LED Indicators

Power

State	Description
Off	Module is not powered on
Green	Module is powered on using either USB bus power or external power

Up/Error

State	Description
Green	Upstream port is connected. Module is functioning normally
Red	Upstream port is not connected/disconnected. Module function is halted

Down

State	Description
Off	Downstream port is not connected
Blue	Downstream port is connected

Layout/Dimensions

