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**USB-6002**

## USER GUIDE

# NI USB-6001/6002/6003 OEM

This document provides information about the dimensions, pinouts, connectors, LEDs, and mounting holes of the National Instruments USB-6001/6002/6003 OEM device.

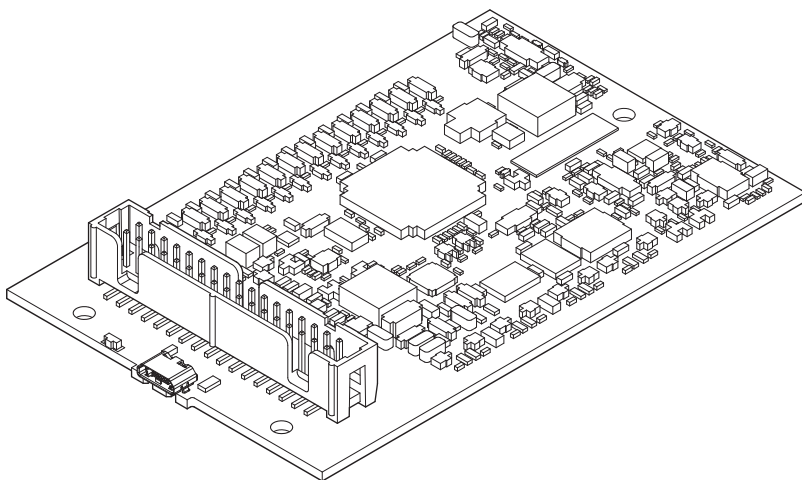
For more information about the device, refer to the *NI USB-6001/6002/6003 User Guide* and *NI USB-6001 Specifications*, *NI USB-6002 Specifications*, and *NI USB-6003 Specifications* documents available at [ni.com/manuals](http://ni.com/manuals).



**Caution** There are no product safety, electromagnetic compatibility (EMC), or CE marking compliance claims made for the NI USB-6001/6002/6003 OEM devices.

The NI USB-6001/6002/6003 OEM device is intended to be used as a component of a larger system. National Instruments can help developers meet their compliance requirements. The end product supplier, however, is responsible for conforming to any and all compliance requirements.

**Figure 1.** USB-6001/6002/6003 OEM Device



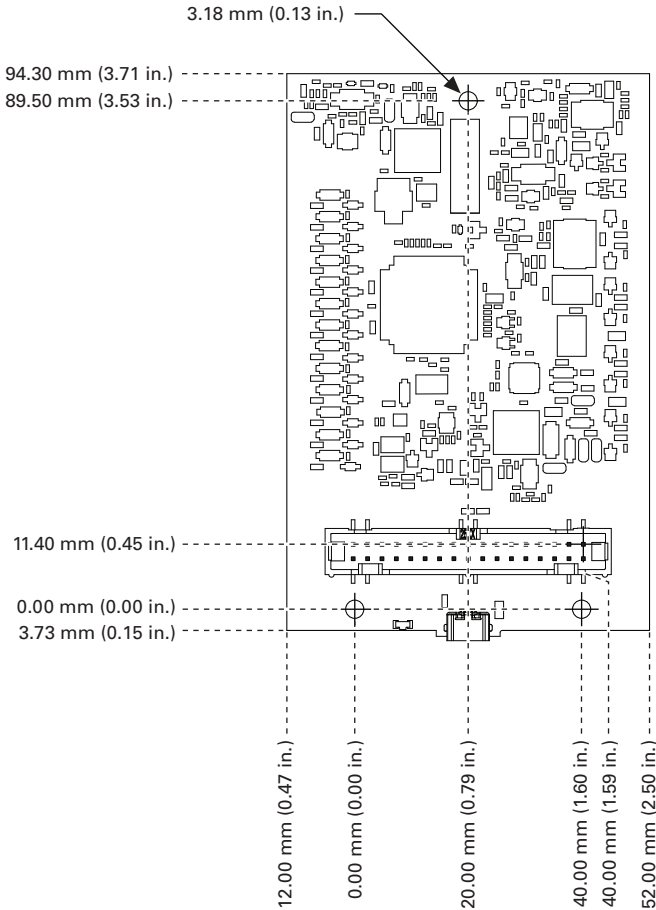
# USB-6001/6002/6003 OEM Device Specifications

Most specifications of the USB-6001/6002/6003 OEM device are listed in the *NI USB-6001*, *NI USB-6002*, *NI USB-6003 Specifications* documents on [ni.com/manuals](http://ni.com/manuals). The following sections contain exceptions to the main specifications.

## Physical Characteristics

Weight .....	31 g (1.10 oz)
Dimensions .....	98 mm × 64 mm × 12 mm (3.90 in. × 2.50 in. × 0.50 in.)

**Figure 2.** USB-6001/6002/6003 OEM Device Dimensions



# I/O Connector Pinouts

Figure 3 shows the USB-6001/6002/6003 OEM device I/O connector pinouts.

**Figure 3.** USB-6001/6002/6003 OEM Terminal Assignments

+5 V	34	33	P2.0/PFI 0
D GND	32	31	P1.3
P1.2	30	29	P1.1/PFI 1
P1.0	28	27	P0.7
P0.6	26	25	P0.5
P0.4	24	23	P0.3
P0.2	22	21	P0.1
P0.0	20	19	D GND
LED	18	17	D+
VBUS	16	15	D-
AI GND	14	13	AI GND
AI 4 (AI 0-)	12	11	AI 0 (AI 0+)
AI 5 (AI 1-)	10	9	AI 1 (AI 1+)
AI 6 (AI 2-)	8	7	AI 2 (AI 2+)
AI 7 (AI 3-)	6	5	AI 3 (AI 3+)
AI GND	4	3	AO GND
AO1	2	1	AO0

## Signal Descriptions

Most of the signals available on the I/O connector are described in the *NI USB-6001/6002/6003 User Guide* document available for download at [ni.com/manuals](http://ni.com/manuals). Table 1 describes additional signals on the I/O connector of the OEM device.

**Table 1.** Additional Signal Descriptions

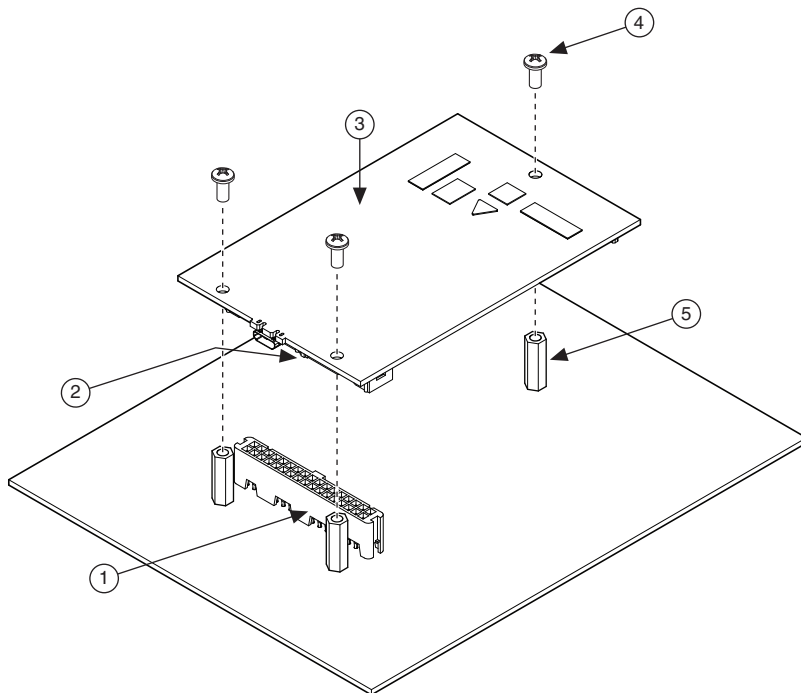
Signal Name	Reference	Direction	Description
VBUS	D GND	Input	USB Power
D+, D-	D GND	Input/Output	USB Data Lines
LED	D GND	Output	Status LED Driver

For more information about USB signals, refer to the *Universal Serial Bus Specification* accessible at [www.usb.org](http://www.usb.org).

# Using the 34-Pin Connector with a Board Mount Socket

The USB-6001/6002/6003 OEM device can be mounted to a motherboard using the 34-pin connector, as shown in Figures 4 and 5.

**Figure 4.** Mounting Using a 34-Pin Connector



- 1 Board Mount Socket
- 2 34-Pin Connector
- 3 USB-6001/6002/6003 OEM Device

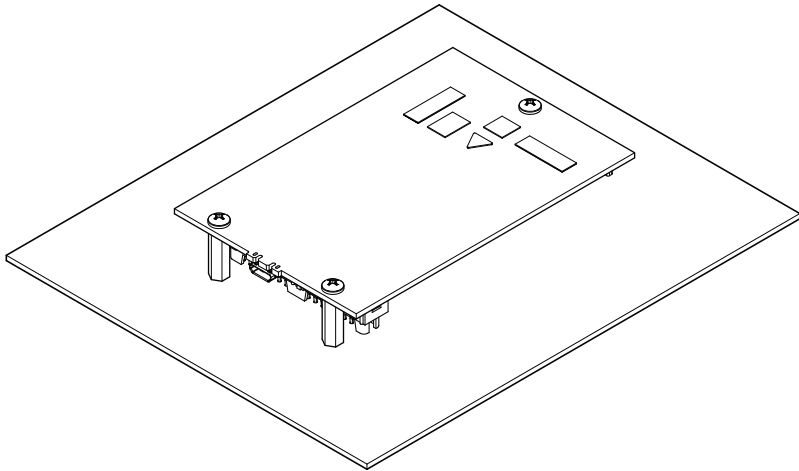
- 4 Mounting Screw
- 5 Mounting Standoff



**Note** Refer to the *Device Components* section for more information about mounting components.

**Figure 5.** USB Device Installed on Motherboard

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## Connecting to USB

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You can use the USB connector on the USB-6001/6002/6003 OEM device to connect to the USB host. In this case, leave the D+ and D- signals and VBUS (on the 34-pin connector) unconnected.

You can also use a USB connector on your motherboard to connect the USB-6001/6002/6003 OEM device to the USB host through the 34-pin connector. In this case, do not connect to the USB connector on the USB-6001/6002/6003 OEM device.

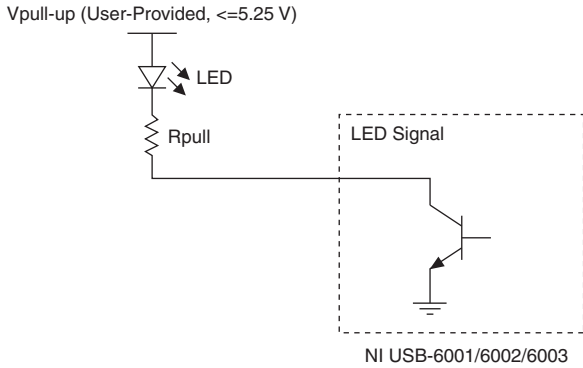
## Using the Status LED Driver

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The LED signal indicates the device status as listed in the *NI USB-6001/6002/6003 User Guide* document on [ni.com/manuals](http://ni.com/manuals). An open collector output drives the LED signal. For applications that use the LED signal, connect an external pull-up resistor from the LED signal to an external voltage.

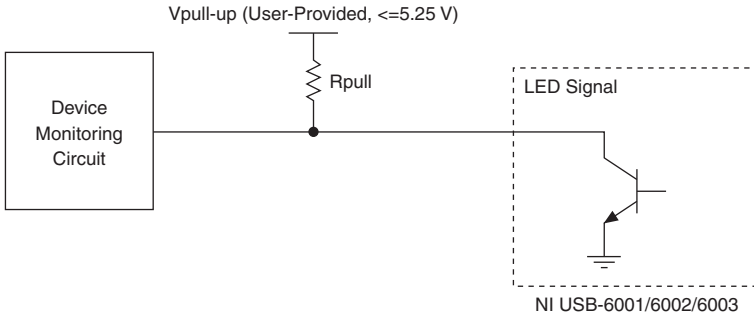
To drive a status LED, refer to the circuit as shown in Figure 6.

**Figure 6. To Drive a Status LED**



To use the LED signal to monitor the device state, refer to the circuit as shown in Figure 7.

**Figure 7. To Monitor Device State Through the LED Signal**



## Electrical Characteristics

Table 2 lists the LED electrical characteristics.

**Table 2. LED Electrical Characteristics**

Parameter	Condition	Typical	Maximum
Output Low Voltage	$I_{OL} = 8 \text{ mA}$	—	0.4 V
	$I_{OL} = 18 \text{ mA}$	1.2 V	—
External Pull-up Voltage	—	—	5.25 V
Maximum Sinking Current	—	—	18 mA

# Device Components

Table 3 lists the components used for interfacing and interacting with the USB-6001/6002/6003 OEM device.

**Table 3.** NI USB-6001/6002/6003 OEM Device Components

Component		Reference Designator(s) on PCB	Manufacturer	Manufacturer Part Number	Part Specifications
Micro USB connector		J001	Molex	105164-0001	—
Hi-Speed USB cable, A to Micro-B, 1 m		—	NI	782909-01	—
Hi-Speed USB cable, A to Micro-B, 2 m		—	NI	782909-02	—
34-pin connector		J002	3M	N2534-6V0C-RB-WF	—
34-pin mating connector		—	3M	8534-4500PL (or equivalent)	—
Mounting Standoff	Using 34-pin board mount socket	—	—	—	4.76 mm (3/16 in.) HEX female-to-female, 15 mm (0.59 in.) long
	Using ribbon cable	—	—	—	4.76 mm (3/16 in.) HEX female-to-female, 6.35 mm (1/4 in.) long
Screw		—	—	—	M3 × 0.5, 4-40 UNC



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