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USER GUIDE

USB-634*x*/635*x*/636*x* OEM

X Series USB-6341/6343/6356/6361/6363/6366 OEM Devices

This document provides dimensions, pinouts, and information about the connectors, switch, LEDs, and mounting holes of the National Instruments USB-6341 OEM, USB-6343 OEM, USB-6356 OEM (32 MS), USB-6361 OEM, USB-6363 OEM, and USB-6366 OEM (64 MS) devices. It also explains how to modify the USB device name in Microsoft Windows.

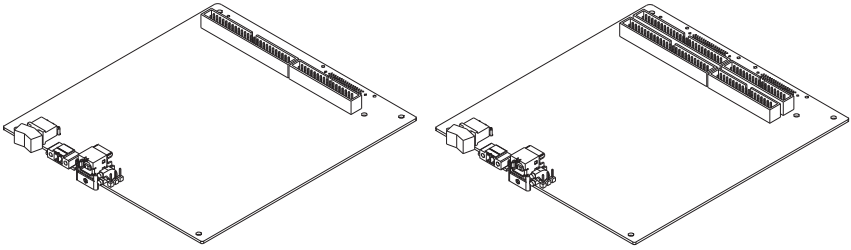
Caution The protection provided by the USB-634*x*/635*x*/636*x* OEM device can be impaired if it is used in a manner not described in this document or the *X Series User Manual*.

Caution There are no product safety, electromagnetic compatibility (EMC), or CE marking compliance claims made for the USB-634*x*/635*x*/636*x* OEM devices. Conformity to any and all compliance requirements rests with the end product supplier.

Caution The USB-634*x*/635*x*/636*x* OEM device *must* be installed inside a suitable enclosure prior to use.

Figure 1 shows the USB-6341/6356/6361/6366 OEM and USB-6343/6363 OEM devices.

Figure 1. USB-634x/635x/636x OEM Devices



NI USB-6341/6356/6361/6366 OEM

NI USB-6343/6363 OEM

X Series devices use the NI-DAQmx driver. NI-DAQmx includes a collection of programming examples to help you get started developing an application. USB-634*x*/635*x*/636*x* OEM devices are supported by NI-DAQmx 9.5 and later.

Refer to the *X Series User Manual* for more information about USB-634*x*/635*x*/636*x* devices. You can find this document at `ni.com/manuals`.

NATIONAL INSTRUMENTS

USB-634*x*/635*x*/636*x* OEM Device Specifications Addendum

The *Weight* and *Dimensions (PCB)* sections contain specification exceptions for the USB-634*x*/635*x*/636*x* OEM devices to the main specification documents. You can find the appropriate NI 634*x*/635*x*/636*x* specification document for your OEM device at `ni.com/manuals`.

Weight

USB-6341/6361 OEM ..... 156 g (5.4 oz)

USB-6343/6363 OEM ..... 167 g (5.8 oz)

USB-6356/6366 OEM ..... 172 g (6.0 oz)

Dimensions (PCB)

USB-6341 OEM ..... 175.3 × 162.6 mm (6.9 × 6.4 in.), Refer to Figure 2

USB-6343 OEM ..... 175.3 × 162.6 mm (6.9 × 6.4 in.), Refer to Figure 3

USB-6356/6361/6366 OEM ..... 175.3 × 162.6 mm (6.9 × 6.4 in.), Refer to Figure 4

USB-6363 OEM ..... 175.3 × 162.6 mm (6.9 × 6.4 in.), Refer to Figure 5

Figure 2. USB-6341 OEM Dimensions

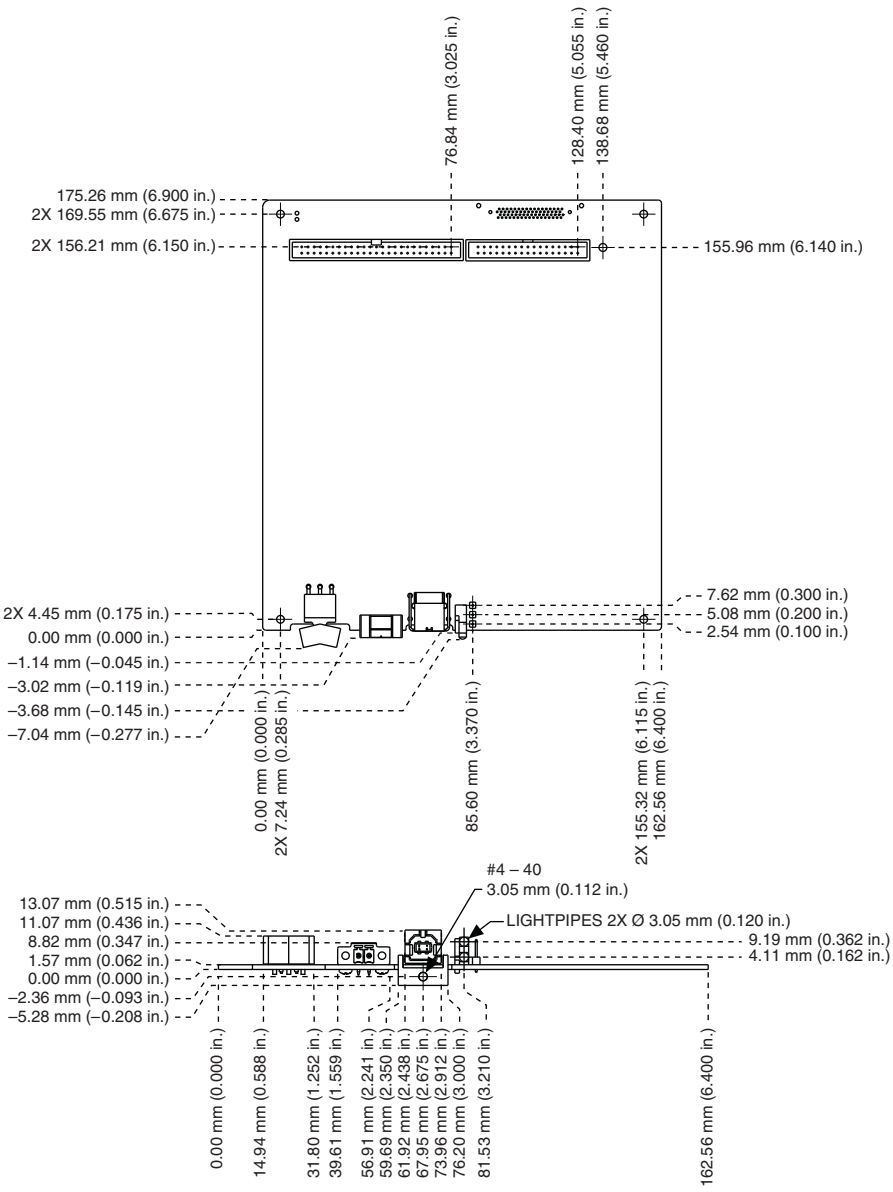


Figure 3. USB-6343 OEM Dimensions

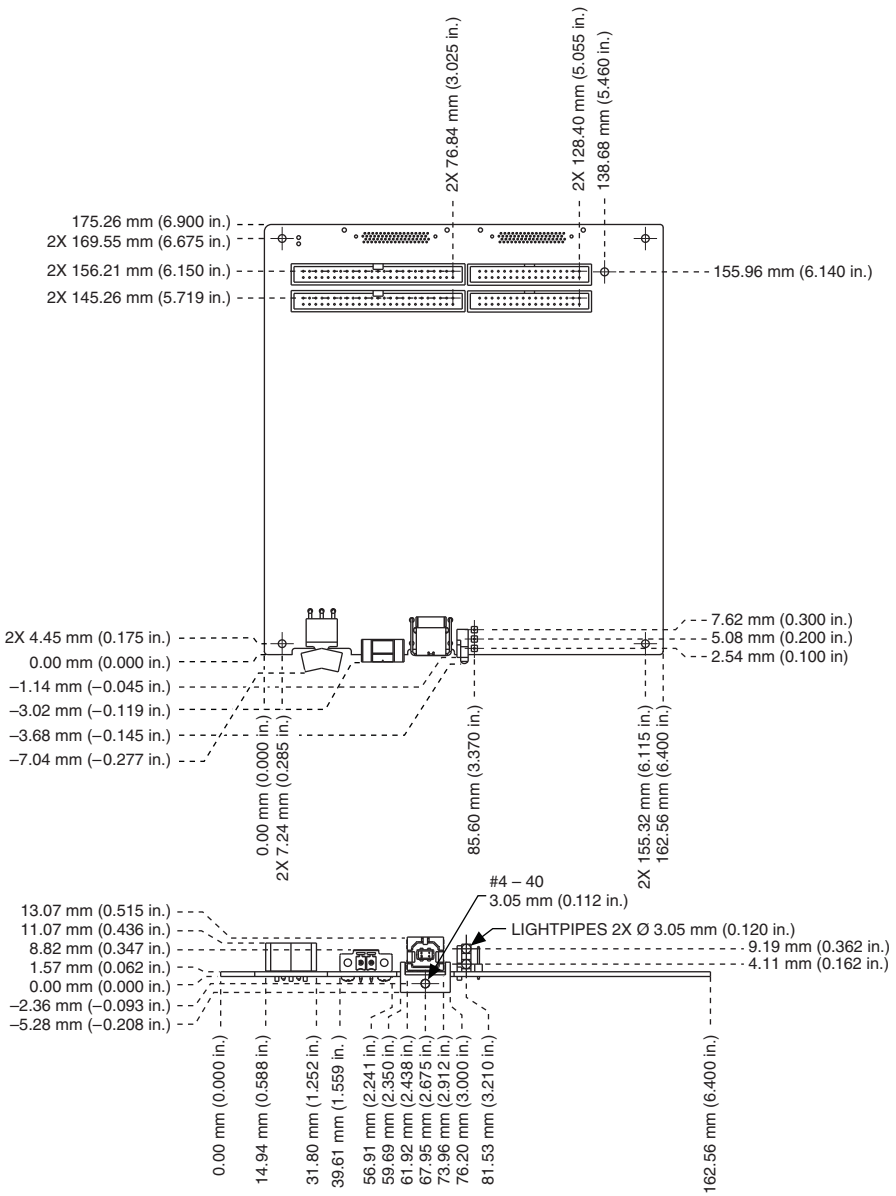


Figure 4. USB-6356/6361/6366 OEM Dimensions

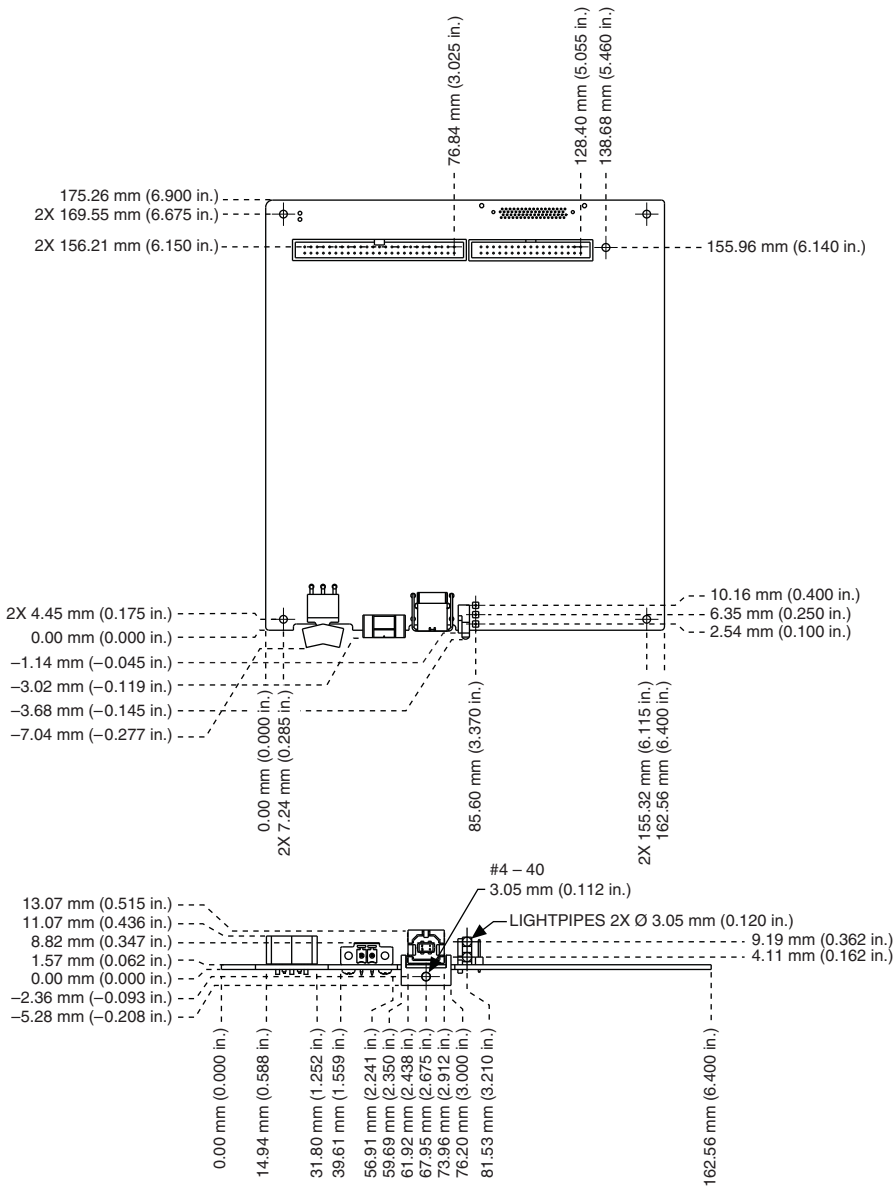
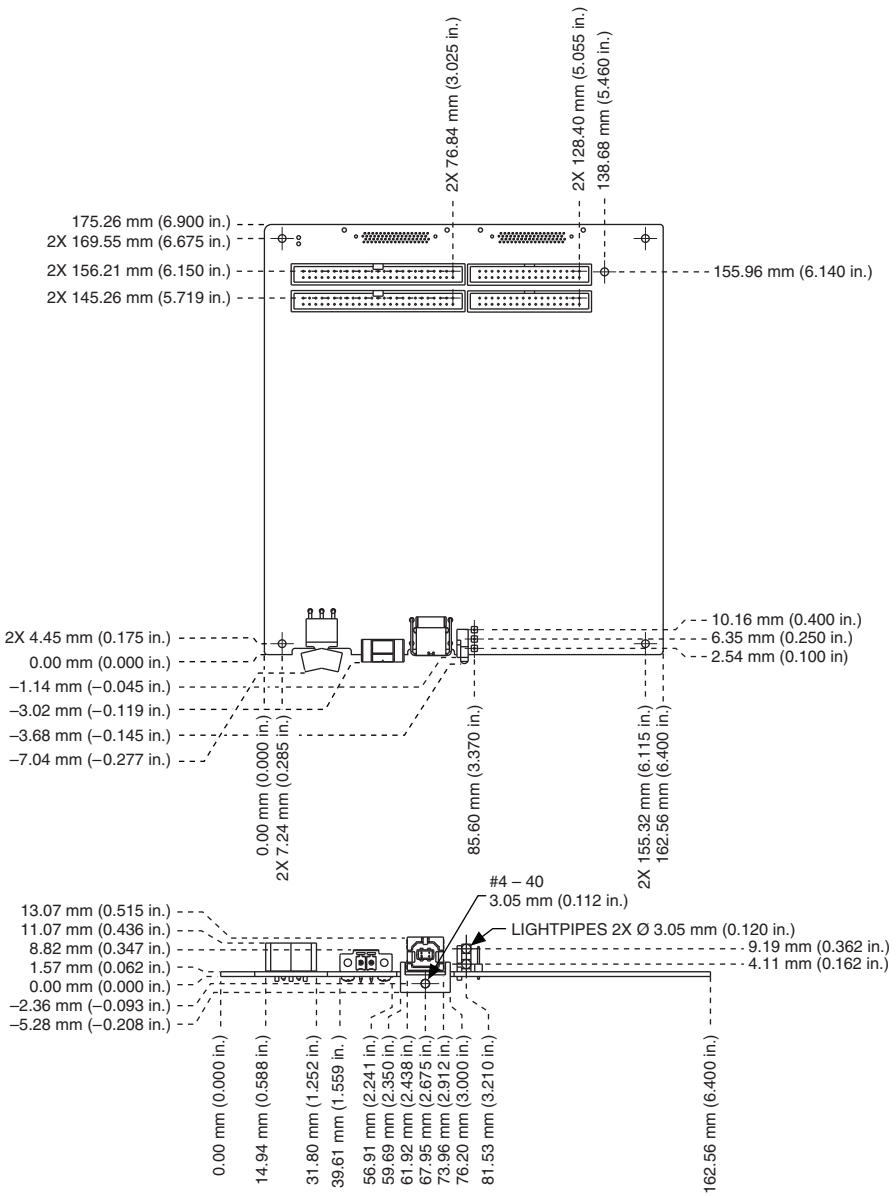


Figure 5. USB-6363 OEM Dimensions



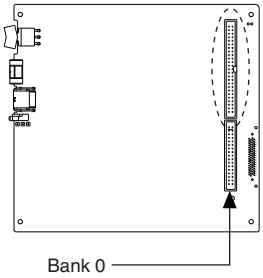
I/O Connector Pinouts

Figures 6 through 10 show the connector pinouts for the USB-6341 OEM, USB-6343 OEM, USB-6356/6366 OEM, USB-6361 OEM, and USB-6363 OEM devices.

Refer to the *X Series User Manual* at `ni.com/manuals` for more information about USB-634*x*/635*x*/636*x* OEM device signals and how to connect them.

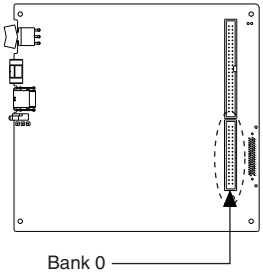
Figure 6. USB-6341 OEM Connector Pinout

50-Pin Digital Connector



	Bank 0		
+5 V	50	49	+5 V
D GND	48	47	PFI 15
D GND	46	45	PFI 14
D GND	44	43	PFI 13
D GND	42	41	PFI 12
D GND	40	39	PFI 11
D GND	38	37	PFI 10
D GND	36	35	PFI 9
D GND	34	33	PFI 8
D GND	32	31	PFI 7
D GND	30	29	PFI 6
D GND	28	27	PFI 5
D GND	26	25	PFI 4
D GND	24	23	PFI 3
D GND	22	21	PFI 2
D GND	20	19	PFI 1
D GND	18	17	PFI 0
D GND	16	15	P0.7
D GND	14	13	P0.6
D GND	12	11	P0.5
D GND	10	9	P0.4
D GND	8	7	P0.3
D GND	6	5	P0.2
D GND	4	3	P0.1
D GND	2	1	P0.0

34-Pin Analog Connector

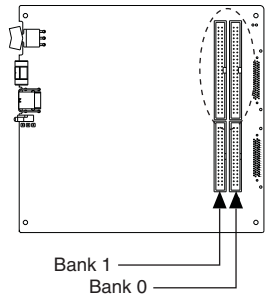


	Bank 0		
AI GND	34	33	AI 15 (AI 7–)
AI 7 (AI 7+)	32	31	AI GND
AI 14 (AI 6–)	30	29	AI 6 (AI 6+)
AI GND	28	27	AI 13 (AI 5–)
AI 5 (AI 5+)	26	25	AI GND
AI 12 (AI 4–)	24	23	AI 4 (AI 4+)
AI GND	22	21	AI 11 (AI 3–)
AI 3 (AI 3+)	20	19	AI GND
AI 10 (AI 2–)	18	17	AI 2 (AI 2+)
AI GND	16	15	AI 9 (AI 1–)
AI 1 (AI 1+)	14	13	AI GND
AI 8 (AI 0–)	12	11	AI 0 (AI 0+)
AI GND	10	9	AI SENSE
AI GND	8	7	NC
AI GND	6	5	AO GND
AO 1	4	3	AO GND
AO 0	2	1	AO GND

NC = No Connect

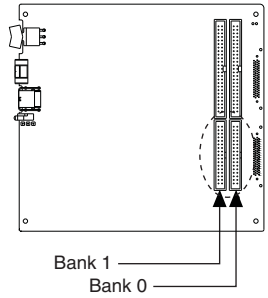
Figure 7. USB-6343 OEM Connector Pinout

50-Pin Digital Connectors



	Bank 1			Bank 0		
+5 V	50	49	+5 V	+5 V	50	49	+5 V
D GND	48	47	P0.31	D GND	48	47	PFI 15
D GND	46	45	P0.30	D GND	46	45	PFI 14
D GND	44	43	P0.29	D GND	44	43	PFI 13
D GND	42	41	P0.28	D GND	42	41	PFI 12
D GND	40	39	P0.27	D GND	40	39	PFI 11
D GND	38	37	P0.26	D GND	38	37	PFI 10
D GND	36	35	P0.25	D GND	36	35	PFI 9
D GND	34	33	P0.24	D GND	34	33	PFI 8
D GND	32	31	P0.23	D GND	32	31	PFI 7
D GND	30	29	P0.22	D GND	30	29	PFI 6
D GND	28	27	P0.21	D GND	28	27	PFI 5
D GND	26	25	P0.20	D GND	26	25	PFI 4
D GND	24	23	P0.19	D GND	24	23	PFI 3
D GND	22	21	P0.18	D GND	22	21	PFI 2
D GND	20	19	P0.17	D GND	20	19	PFI 1
D GND	18	17	P0.16	D GND	18	17	PFI 0
D GND	16	15	P0.15	D GND	16	15	P0.7
D GND	14	13	P0.14	D GND	14	13	P0.6
D GND	12	11	P0.13	D GND	12	11	P0.5
D GND	10	9	P0.12	D GND	10	9	P0.4
D GND	8	7	P0.11	D GND	8	7	P0.3
D GND	6	5	P0.10	D GND	6	5	P0.2
D GND	4	3	P0.9	D GND	4	3	P0.1
D GND	2	1	P0.8	D GND	2	1	P0.0

34-Pin Analog Connectors



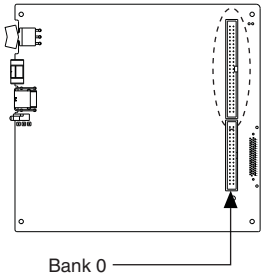
	Bank 1			Bank 0		
AI GND	34	33	AI 31 (AI 23–)	AI GND	34	33	AI 15 (AI 7–)
AI 23 (AI 23+)	32	31	AI GND	AI 7 (AI 7+)	32	31	AI GND
AI 30 (AI 22–)	30	29	AI 22 (AI 22+)	AI 14 (AI 6–)	30	29	AI 6 (AI 6+)
AI GND	28	27	AI 29 (AI 21–)	AI GND	28	27	AI 13 (AI 5–)
AI 21 (AI 21+)	26	25	AI GND	AI 5 (AI 5+)	26	25	AI GND
AI 28 (AI 20–)	24	23	AI 20 (AI 20+)	AI 12 (AI 4–)	24	23	AI 4 (AI 4+)
AI GND	22	21	AI 27 (AI 19–)	AI GND	22	21	AI 11 (AI 3–)
AI 19 (AI 19+)	20	19	AI GND	AI 3 (AI 3+)	20	19	AI GND
AI 26 (AI 18–)	18	17	AI 18 (AI 18+)	AI 10 (AI 2–)	18	17	AI 2 (AI 2+)
AI GND	16	15	AI 25 (AI 17–)	AI GND	16	15	AI 9 (AI 1–)
AI 17 (AI 17+)	14	13	AI GND	AI 1 (AI 1+)	14	13	AI GND
AI 24 (AI 16–)	12	11	AI 16 (AI 16+)	AI 8 (AI 0–)	12	11	AI 0 (AI 0+)
AI GND	10	9	AI SENSE 2	AI GND	10	9	AI SENSE
AI GND	8	7	NC	AI GND	8	7	NC
AI GND	6	5	AO GND	AI GND	6	5	AO GND
AO 3	4	3	AO GND	AO 1	4	3	AO GND
AO 2	2	1	AO GND	AO 0	2	1	AO GND

NC = No Connect

NC = No Connect

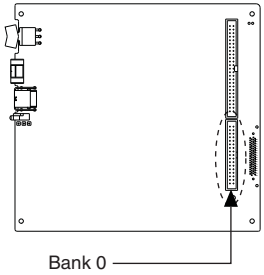
Figure 8. USB-6356/6366 OEM Connector Pinout

50-Pin Digital Connector



				Bank 0
+5 V	50	49	+5 V	
D GND	48	47	PFI 15	
D GND	46	45	PFI 14	
D GND	44	43	PFI 13	
D GND	42	41	PFI 12	
D GND	40	39	PFI 11	
D GND	38	37	PFI 10	
D GND	36	35	PFI 9	
D GND	34	33	PFI 8	
D GND	32	31	PFI 7	
D GND	30	29	PFI 6	
D GND	28	27	PFI 5	
D GND	26	25	PFI 4	
D GND	24	23	PFI 3	
D GND	22	21	PFI 2	
D GND	20	19	PFI 1	
D GND	18	17	PFI 0	
D GND	16	15	P0.7	
D GND	14	13	P0.6	
D GND	12	11	P0.5	
D GND	10	9	P0.4	
D GND	8	7	P0.3	
D GND	6	5	P0.2	
D GND	4	3	P0.1	
D GND	2	1	P0.0	

34-Pin Analog Connector

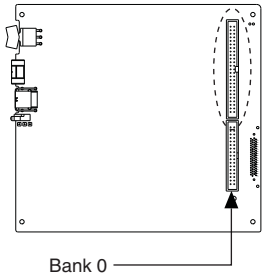


				Bank 0
AI GND	34	33	AI 7–	
AI 7+	32	31	AI GND	
AI 6–	30	29	AI 6+	
AI GND	28	27	AI 5–	
AI 5+	26	25	AI GND	
AI 4–	24	23	AI 4+	
AI GND	22	21	AI 3–	
AI 3+	20	19	AI GND	
AI 2–	18	17	AI 2+	
AI GND	16	15	AI 1–	
AI 1+	14	13	AI GND	
AI 0–	12	11	AI 0+	
AI GND	10	9	NC	
AI GND	8	7	APFI 0	
AI GND	6	5	AO GND	
AO 1	4	3	AO GND	
AO 0	2	1	AO GND	

NC = No Connect

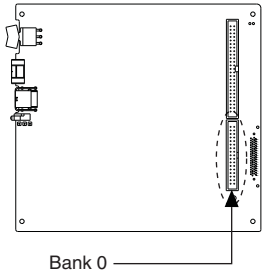
Figure 9. USB-6361 OEM Connector Pinout

50-Pin Digital Connector



	Bank 0		
+5 V	50	49	+5 V
D GND	48	47	PFI 15
D GND	46	45	PFI 14
D GND	44	43	PFI 13
D GND	42	41	PFI 12
D GND	40	39	PFI 11
D GND	38	37	PFI 10
D GND	36	35	PFI 9
D GND	34	33	PFI 8
D GND	32	31	PFI 7
D GND	30	29	PFI 6
D GND	28	27	PFI 5
D GND	26	25	PFI 4
D GND	24	23	PFI 3
D GND	22	21	PFI 2
D GND	20	19	PFI 1
D GND	18	17	PFI 0
D GND	16	15	P0.7
D GND	14	13	P0.6
D GND	12	11	P0.5
D GND	10	9	P0.4
D GND	8	7	P0.3
D GND	6	5	P0.2
D GND	4	3	P0.1
D GND	2	1	P0.0

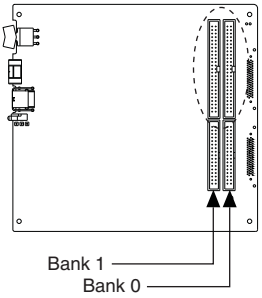
34-Pin Analog Connector



	Bank 0		
AI GND	34	33	AI 15 (AI 7–)
AI 7 (AI 7+)	32	31	AI GND
AI 14 (AI 6–)	30	29	AI 6 (AI 6+)
AI GND	28	27	AI 13 (AI 5–)
AI 5 (AI 5+)	26	25	AI GND
AI 12 (AI 4–)	24	23	AI 4 (AI 4+)
AI GND	22	21	AI 11 (AI 3–)
AI 3 (AI 3+)	20	19	AI GND
AI 10 (AI 2–)	18	17	AI 2 (AI 2+)
AI GND	16	15	AI 9 (AI 1–)
AI 1 (AI 1+)	14	13	AI GND
AI 8 (AI 0–)	12	11	AI 0 (AI 0+)
AI GND	10	9	AI SENSE
AI GND	8	7	APFI 0
AI GND	6	5	AO GND
AO 1	4	3	AO GND
AO 0	2	1	AO GND

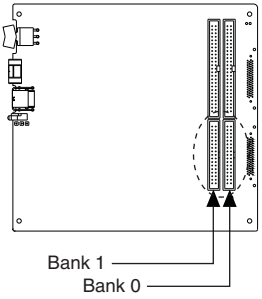
Figure 10. USB-6363 OEM Connector Pinout

50-Pin Digital Connectors



Bank 1				Bank 0			
+5 V	50	49	+5 V	+5 V	50	49	+5 V
D GND	48	47	P0.31	D GND	48	47	PFI 15
D GND	46	45	P0.30	D GND	46	45	PFI 14
D GND	44	43	P0.29	D GND	44	43	PFI 13
D GND	42	41	P0.28	D GND	42	41	PFI 12
D GND	40	39	P0.27	D GND	40	39	PFI 11
D GND	38	37	P0.26	D GND	38	37	PFI 10
D GND	36	35	P0.25	D GND	36	35	PFI 9
D GND	34	33	P0.24	D GND	34	33	PFI 8
D GND	32	31	P0.23	D GND	32	31	PFI 7
D GND	30	29	P0.22	D GND	30	29	PFI 6
D GND	28	27	P0.21	D GND	28	27	PFI 5
D GND	26	25	P0.20	D GND	26	25	PFI 4
D GND	24	23	P0.19	D GND	24	23	PFI 3
D GND	22	21	P0.18	D GND	22	21	PFI 2
D GND	20	19	P0.17	D GND	20	19	PFI 1
D GND	18	17	P0.16	D GND	18	17	PFI 0
D GND	16	15	P0.15	D GND	16	15	P0.7
D GND	14	13	P0.14	D GND	14	13	P0.6
D GND	12	11	P0.13	D GND	12	11	P0.5
D GND	10	9	P0.12	D GND	10	9	P0.4
D GND	8	7	P0.11	D GND	8	7	P0.3
D GND	6	5	P0.10	D GND	6	5	P0.2
D GND	4	3	P0.9	D GND	4	3	P0.1
D GND	2	1	P0.8	D GND	2	1	P0.0

34-Pin Analog Connectors



Bank 1				Bank 0			
AI GND	34	33	AI 31 (AI 23–)	AI GND	34	33	AI 15 (AI 7–)
AI 23 (AI 23+)	32	31	AI GND	AI 7 (AI 7+)	32	31	AI GND
AI 30 (AI 22–)	30	29	AI 22 (AI 22+)	AI 14 (AI 6–)	30	29	AI 6 (AI 6+)
AI GND	28	27	AI 29 (AI 21–)	AI GND	28	27	AI 13 (AI 5–)
AI 21 (AI 21+)	26	25	AI GND	AI 5 (AI 5+)	26	25	AI GND
AI 28 (AI 20–)	24	23	AI 20 (AI 20+)	AI 12 (AI 4–)	24	23	AI 4 (AI 4+)
AI GND	22	21	AI 27 (AI 19–)	AI GND	22	21	AI 11 (AI 3–)
AI 19 (AI 19+)	20	19	AI GND	AI 3 (AI 3+)	20	19	AI GND
AI 26 (AI 18–)	18	17	AI 18 (AI 18+)	AI 10 (AI 2–)	18	17	AI 2 (AI 2+)
AI GND	16	15	AI 25 (AI 17–)	AI GND	16	15	AI 9 (AI 1–)
AI 17 (AI 17+)	14	13	AI GND	AI 1 (AI 1+)	14	13	AI GND
AI 24 (AI 16–)	12	11	AI 16 (AI 16+)	AI 8 (AI 0–)	12	11	AI 0 (AI 0+)
AI GND	10	9	AI SENSE 2	AI GND	10	9	AI SENSE
AI GND	8	7	APFI 1	AI GND	8	7	APFI 0
AI GND	6	5	AO GND	AI GND	6	5	AO GND
AO 3	4	3	AO GND	AO 1	4	3	AO GND
AO 2	2	1	AO GND	AO 0	2	1	AO GND

Default NI-DAQmx Counter/Timer Pins

By default, NI-DAQmx routes the counter/timer inputs and outputs to the PFI pins, shown in the following table.

Counter/Timer Signal	Default Terminal Name
CTR 0 SRC	PFI 8
CTR 0 GATE	PFI 9
CTR 0 AUX	PFI 10
CTR 0 OUT	PFI 12
CTR 0 A	PFI 8
CTR 0 Z	PFI 9
CTR 0 B	PFI 10
CTR 1 SRC	PFI 3
CTR 1 GATE	PFI 4
CTR 1 AUX	PFI 11
CTR 1 OUT	PFI 13
CTR 1 A	PFI 3
CTR 1 Z	PFI 4
CTR 1 B	PFI 11
CTR 2 SRC	PFI 0
CTR 2 GATE	PFI 1
CTR 2 AUX	PFI 2
CTR 2 OUT	PFI 14
CTR 2 A	PFI 0
CTR 2 Z	PFI 1
CTR 2 B	PFI 2
CTR 3 SRC	PFI 5
CTR 3 GATE	PFI 6
CTR 3 AUX	PFI 7
CTR 3 OUT	PFI 15
CTR 3 A	PFI 5
CTR 3 Z	PFI 6
CTR 3 B	PFI 7
FREQ OUT	PFI 14

LEDs

USB-634*x*/635*x*/636*x* OEM devices have two LEDs that reflect the device state. The ACTIVE LED (at reference designator DS4) indicates activity over the bus. The READY LED (at reference designator DS3) indicates whether or not the device is configured. Refer to the *X Series User Manual* for more information about LED behavior on the USB-634*x*/635*x*/636*x* OEM devices.

If you are putting the USB-634*x*/635*x*/636*x* OEM device in an enclosure, you can either seat the supplied lightpipe in the holes (at reference designators DS3 and DS4) on the device, as shown in Figure 11, or attach external LEDs, as described in the *Attaching External LEDs* section. When the lightpipe is attached, the top LED is the ACTIVE LED, and the bottom LED is the READY LED.

Attaching External LEDs

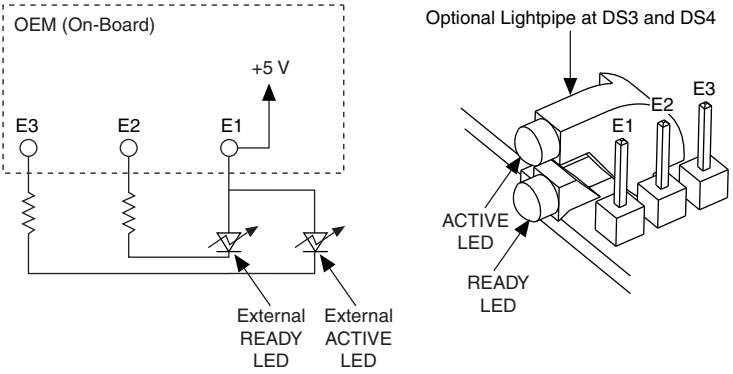
Three connectors on the device—E1, E2, and E3—allow you to connect an external LED circuit to the device, as shown in Figure 11.

To connect an external READY LED, use E1 as the positive connection (+5 V) and E2 as the negative connection.

To connect an external ACTIVE LED, use E1 as the positive connection and E3 as the negative connection.

NI recommends that you limit the current to 10 mA per LED. You can limit this current by using external resistors, as shown in Figure 11.

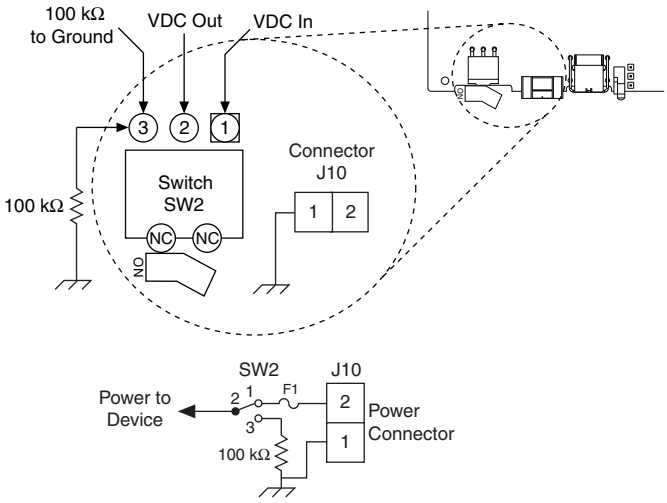
Figure 11. Schematic for External LED Circuits



Power Switch

The power switch on the USB-634*x*/635*x*/636*x* OEM device powers the device on and off. Figure 12 shows the pins on the power switch and power circuitry.

Figure 12. Schematic for the Power Switch (Switch Shown in ON Position)



Pin 1, VDC In, is connected to VDC through a non-user-replaceable fuse (reference designator F1). The VDC is the voltage provided by the power supply through pin 2 of the power connector (reference designator J10) and must be 11 V DC to 30 V DC, 30 W.

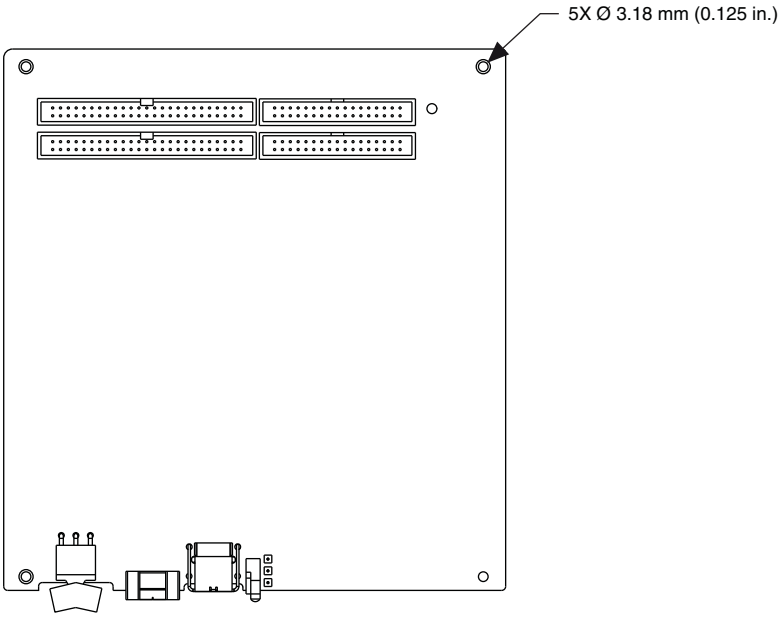
Pin 2, VDC Out, provides power to the circuitry on the device. When the switch is in the ON position, the VDC power supply from pin 1 is routed to pin 2.

Pin 3, 100 kΩ to Ground, connects pin 2 to ground through a 100 kΩ resistor when the switch is in the OFF position.

Connecting the USB-634*x*/635*x*/636*x* OEM Device to Your Chassis

The USB-634*x*/635*x*/636*x* OEM device features five mounting holes, shown in Figure 13. Three of the mounting holes are plated for customer grounded connections.

Figure 13. Customer Mounting Holes (USB-6343/6361/6366 OEM Shown)



Device Components

Table 1 contains information about the components used for interfacing and interacting with the USB-634*x*/635*x*/636*x* OEM devices.

Table 1. USB-634*x*/635*x*/636*x* OEM Components

Component(s)	Reference Designator(s) on PCB	Manufacturer	Manufacturer Part Number
LEDs	DS3, DS4, DS1*, DS2*	SunLED	XZBB54W-1TN
Lightpipe	—	Dialight	515-1061F
34-pin connector(s)	**(USB-6341/6356/6361/6366)** J3	3M	N2534-6002RB
	(USB-6343/6363) J3, J4		
50-pin connector(s)	**(USB-6341/6356/6361/6366)** P1	3M	N2550-6002UB
	(USB-6343/6363) P1, P2		
USB connector	J9	AMP	292304-1
Power connector	J10	Phoenix Contact	1727566

Table 1. USB-634*x*/635*x*/636*x* OEM Components (Continued)

Component(s)	Reference Designator(s) on PCB	Manufacturer	Manufacturer Part Number
Power switch	SW2	C&K	E101J1AQE2
68-pin connector(s)†	**(USB-6341/6356/6361/6366)** J12	Molex	71430-0013
	(USB-6343/6363) J11, J12		

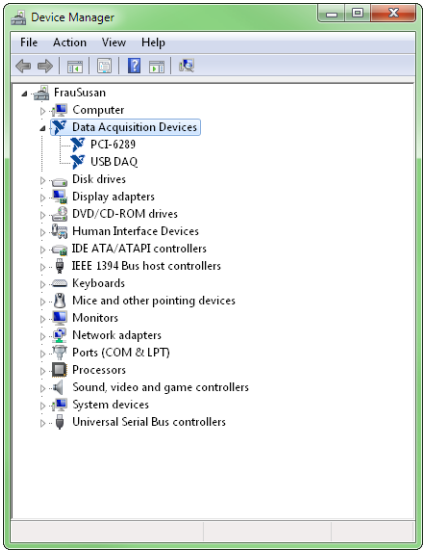
* Optional LED locations near the mass termination connectors. These are not populated by default.
† Optional mass termination connectors. These are not populated by default.

Modifying the OEM Device Name in Microsoft Windows

You can change how the USB-634*x*/635*x*/636*x* OEM device name appears in the Windows Device Manager[1] in Microsoft Windows when users install the device, as shown in Figure 14. Complete the following steps.

Note You *must* have NI-DAQmx 9.5 or later installed on your PC.

Figure 14. USB-6363 OEM Device "USB DAQ" in the Windows Device Manager (Windows 7 Shown)



[1] **(Windows XP)** You can change how the USB-634*x*/635*x*/636*x* OEM device name appears when users install the device in both the Found New Hardware Wizard that appears when the device is initially installed and in the Windows Device Manager.

1. Locate the `OEMx.inf` file in the `y:\WINDOWS\inf\` directory, where *x* is the random number assigned to the INF file by Windows, and `y:\` is the root directory where Windows is installed.

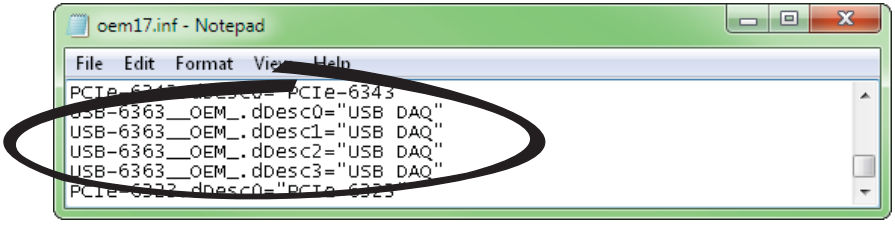
   Security updates to Microsoft Windows and NI-DAQmx create random INF files for NI hardware. Windows assigns random file numbers to all INF files, which causes the user to search through several INF files until the correct file is located.

   If you want to revert back, save a copy of this file as `OEMx_original.inf` in a different location.

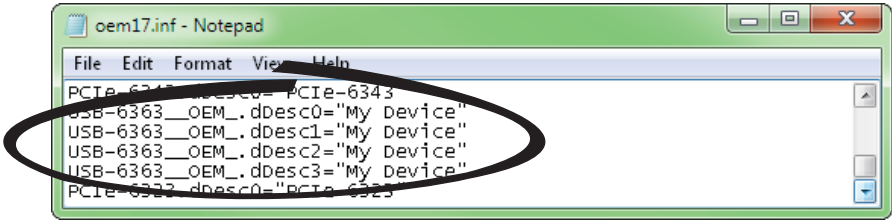
2. Edit the device INF file by opening `OEMx.inf` with a text editor.

   At the bottom of this file, in the *[Strings]* section, are the descriptors where Windows looks to identify the device. Locate the four lines of text that contain in quotes the descriptors for the device name you are modifying. Change the descriptor on *all four* lines to the new device name, as shown in Figure 15.

Figure 15. INF File Descriptors Changed to “My Device” (Windows 7 Shown)



Original File

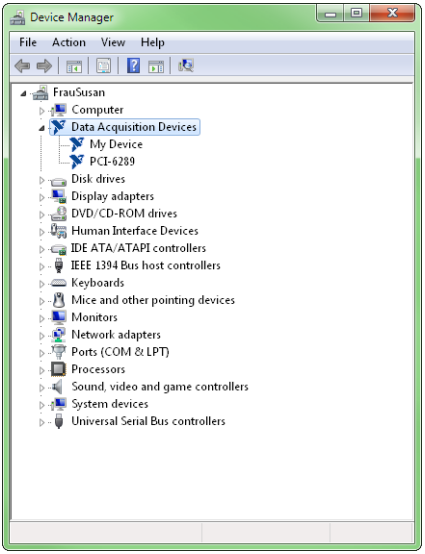


Modified File

3. Save and close the INF file.
4. Open the Windows Device Manager. In the Device Manager, notice that the OEM device now appears as `My Device`, as shown in Figure 16.[1]

[1] **(Windows XP)** In the Device Manager, right-click the OEM device under Data Acquisition Devices, and select **Uninstall**. Power down the OEM device and disconnect the USB cable from your PC. When you reconnect and power on the device, it appears as `My Device` in Windows Device Manager

Figure 16. “My Device” in the Windows Device Manager (Windows 7 Shown)



Note When the device is initially installed, Windows may display the following messages: **`USB DAQ detected!`**, and then **`USB DAQ: Device driver software installed successfully`**. These alert messages cannot be changed.

Note Modifying the INF file will *not* change the USB-634*x*/635*x*/636*x* OEM device name in Measurement & Automation Explorer (MAX).

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