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USER GUIDE NI USB-622*x*/625*x*/628*x* OEM

M Series USB-6221/6225/6229/6251/6255/6259/6281/6289 OEM Devices

This document provides dimensions, pinouts, and information about the connectors, switch, LEDs, and chassis ground of the National Instruments USB-6221 OEM, USB-6225 OEM, USB-6229 OEM, USB-6251 OEM, USB-6255 OEM, USB-6259 OEM, USB-6281 OEM, and USB-6289 OEM devices. It also explains how to modify the USB device name in Microsoft Windows.

Caution There are no product safety, electromagnetic compatibility (EMC), or CE marking compliance claims made for the USB-622x/625x/628x OEM devices. Conformity to any and all compliance requirements rests with the end product supplier.



Caution (USB-628x Devices) Exercise caution when placing USB-628x OEM devices inside an enclosure. Auxiliary cooling may be necessary to keep the device under the maximum ambient temperature rating of 45 °C, as specified in the *NI* 628x Specifications.

Figure 1 shows the USB-6221/6251/6281 OEM and USB-6225/6229/6255/6259/6289 OEM devices.

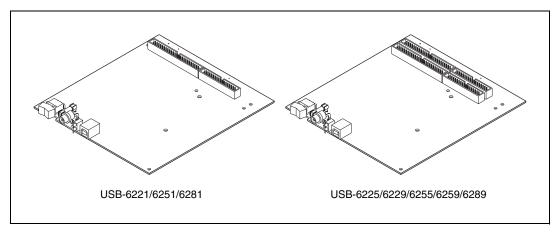


Figure 1. USB-622x/625x/628x OEM Devices



Refer to the *NI 622x Specifications* document for USB-6221/6225/6229 specifications, the *NI 625x Specifications* document for USB-6251/6255/6259 specifications, and the *NI 628x Specifications* document for USB-6281/6289 specifications. Refer to the *M Series User Manual* for more information about USB-622x/625x/628x devices. You can find all documentation at ni.com/manuals.

Dimensions

Figure 2 shows the dimensions of the USB-6221/6251/6281 OEM device.

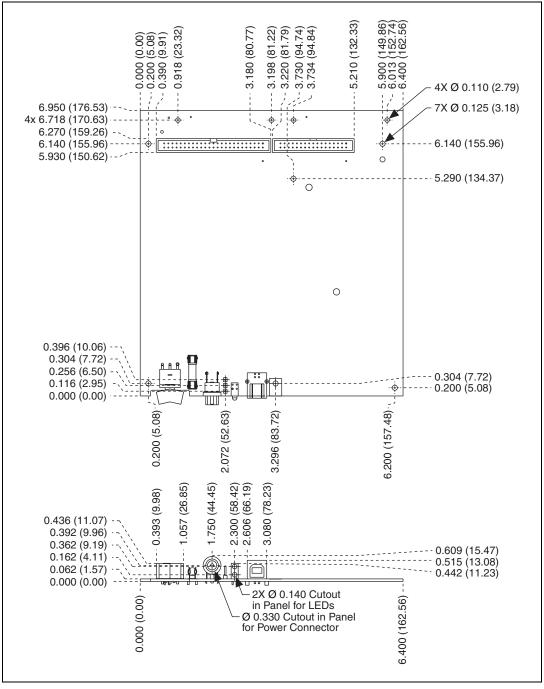


Figure 2. USB-6221/6251/6281 OEM Dimensions in Inches (Millimeters)

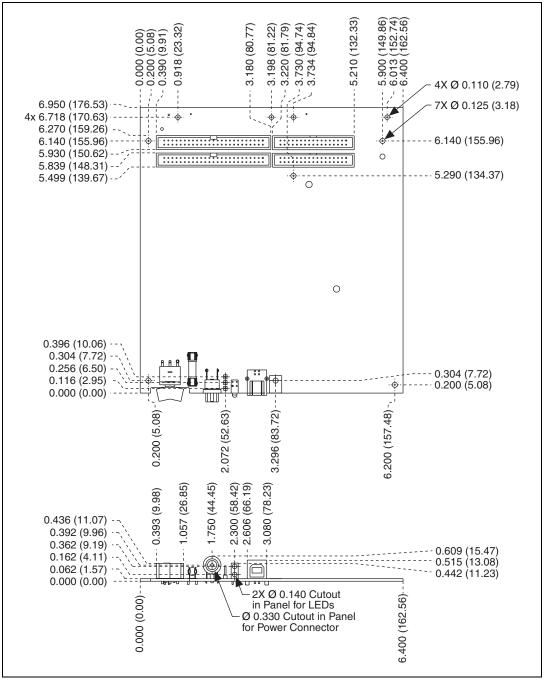


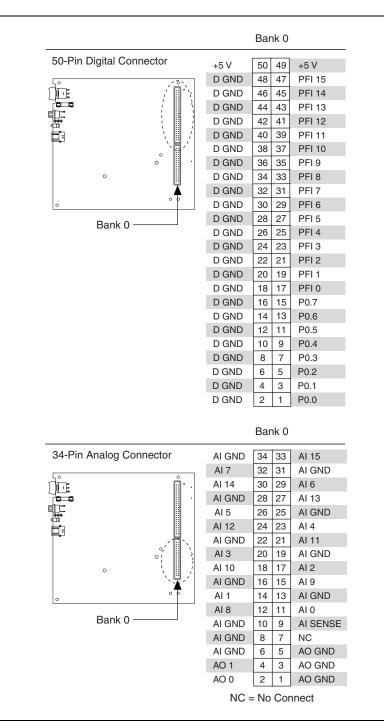
Figure 3 shows the dimensions of the USB-6225/6229/6255/6259/6289 OEM device.

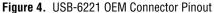
Figure 3. USB-6225/6229/6255/6259/6289 OEM Dimensions in Inches (Millimeters)

I/O Connector Pinouts

Figures 4 through 9 show the connector pinouts for the USB-6221 OEM, USB-6225 OEM, USB-6229 OEM, USB-6251 OEM, USB-6255 OEM, USB-6259 OEM, USB-6281 OEM, and USB-6289 OEM devices.

Refer to the *M Series User Manual* at ni.com/manuals for more information about USB-622x/625x/628x signals and how to connect them.



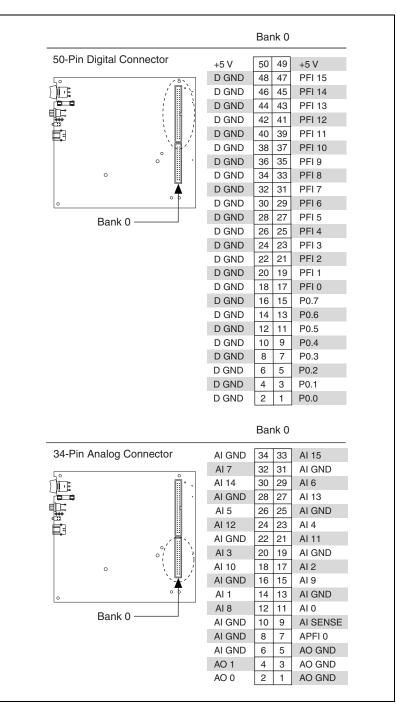


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0 0 0 0 44 43 PFI 13 AI 77 44 4 0 0 0 0 0 9 PFI 13 AI 67 40 3 0 0 0 0 9 PFI 11 AI 67 40 3 0 0 0 39 9 PFI 10 AI 73 34 3 0 0 0 34 33 PFI 8 AI 60 36 37 9 34 33 34 3 34 33 34 33 0 0 30 29 PFI 6 AI 55 30 2 2 2 16 16 28 2	onnectors	D GND	48 47	PFI 15	AI 78	48 47	AI 70
0 0 0 0 42 41 PF112 A168 42 44 0 GND 42 41 PF112 A168 42 44 0 GND 38 37 PF110 A174 38 3 0 GND 36 33 PF18 A173 34 33 34 37 34 34 32 33 PF18 A173 34 32 33 20 A164 32 33 20 A164 32 33 20 A164 32 33 20 A161 24 22 22 20 A161 24 22 22 2 20 A161 24 22 22 22 2 20 A161 24 22 27 215 A161 24 21 <td< td=""><td></td><td>D GND</td><td>46 45</td><td>PFI 14</td><td>AI GND</td><td>46 45</td><td>AI 69</td></td<>		D GND	46 45	PFI 14	AI GND	46 45	AI 69
0 GND 42 41 PFI 12 A1 68 42 4 0 GND 40 39 PFI 11 A1 67 40 3 0 GND 36 35 PFI 9 A1 68 42 4 0 GND 36 35 PFI 9 A1 68 42 3 0 GND 36 35 PFI 9 A1 68 36 3<		D GND	44 43	PFI 13	AI 77	44 43	AI 76
0 0 38 37 PFI 10 AI 74 38 3 0 0 36 35 PFI 9 AI GND 36 3 0 0 34 33 PFI 8 AI 73 34 3 34 3 9 D GND 32 31 PFI 7 AI 53 32 3 3 AI 64 32 31 PFI 7 D GND 36 32 31 PFI 7 D GND 36 32 31 PFI 7 D GND 32 31 PFI 7 D GND 32 31 PFI 7 D GND 32 32 PFI 3 D GND 28 27 PF1 3 D GND 26 28 27 PF1 2 D GND 20 19 PF1 1 D GND 16 15 20 10 20 10 10 10 11 13 12 11 13 12 11 13 11 14 12 11 10 14 13 10 14 13 10 14 13 10 14 13 10 14 <td></td> <td>D GND</td> <td>42 41</td> <td>PFI 12</td> <td>AI 68</td> <td>42 41</td> <td>AI GND</td>		D GND	42 41	PFI 12	AI 68	42 41	AI GND
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o O O O O A A A C Z Z PFI 5 A A C Z Z Z PFI 5 A A C Z Z Z PFI 5 A A C Z Z Z PFI 3 A A C Z	°	D GND	32 31	PFI 7	AI 64	32 31	AI GND
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D GND 20 19 PFI 1 AI 51 20 1 D GND 18 17 PFI 0 AI 58 18 1 D GND 16 15 P0.7 AI GND 16 1 D GND 14 13 P0.6 AI 57 14 1 D GND 12 11 P0.5 AI 48 12 1 D GND 10 9 P0.4 AI 39 10 5 D GND 6 5 P0.2 AI 46 8 7 D GND 2 1 P0.0 AI 44 2 1 D GND 2 1 P0.0 AI 44 2 1 AI GND 2 1 P0.0 AI 44 2 1 Bank 1 14 30 29 AI 6 AI 43 34 3 AI GND 24 23 AI 4 AI 43 34 3 AI 14 30 29 AI 6 AI 60D AI 32 26 2 AI GND		D GND	24 23	PFI 3	AI 61	24 23	AI 60
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AI 7 32 31 AI GND 32 3 AI 14 30 29 AI 6 AI 42 30 2 AI 14 30 29 AI 6 AI 42 30 2 AI 5 26 25 AI GND AI 32 26 2 AI 12 24 23 AI 4 AI 31 24 2 AI 6ND 22 21 AI 11 AI 30 20 1 AI 30 20 19 AI GND AI 22 2 AI 10 18 17 AI 2 AI 2 AI 30 20 1 AI 30 20 19 AI GND AI 21 18 1 AI 30 20 19 AI GND AI 21 18 1 AI 30 16 15 AI 9 AI 28 16 1 AI 31 14 13 AI GND AI 28 16 1 AI 30 16 15 AI 9 AI 28 16 1 AI 31 14 13			Bank	1		Bank ()
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Al GND 28 27 Al 13 Al 33 28 2 Al GND 28 27 Al 13 Al 33 28 2 Al 5 26 25 Al GND Al 32 26 2 Al 12 24 23 Al 4 Al 31 24 2 Al 12 24 23 Al 4 Al 31 24 2 Al 30 20 19 Al GND Al 30 20 1 Al 3 20 19 Al GND Al 30 20 1 Al 3 20 19 Al GND Al 30 20 1 Al 3 20 19 Al GND Al 30 20 1 Al 3 20 19 Al GND Al 2 Al 30 20 1 Al 3 16 15 Al 9 Al 28 16 1 Al 3 10 9 Al SENSE Al 26 10 9 Al GND 10 9 Al SENSE Al GND 8 7 Al		AI 14	30 29	AI 6	AI 42	30 29	AI 41
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Al 12 24 23 Al 4 Al 31 24 2 Al 12 24 23 Al 4 Al 31 24 2 Al GND 22 21 Al 11 Al GND 22 2 Al 30 20 19 Al GND Al 30 20 1 Al 3 20 19 Al GND Al 2 Al 30 20 1 Al 30 10 18 17 Al 2 Al 21 18 1 Al 30 16 15 Al 9 Al 28 16 1 Al 1 14 13 Al GND Al 30 14 1 Al 30 16 15 Al 9 Al 28 16 1 Al 30 10 9 Al SENSE Al 26 10 9 Al GND 8 7 NC Al GND 8 7 Al GND 6 5 AO GND Al 17 6 5		AI 5	26 25	AI GND	AI 32	26 25	AI 40
AI GND 22 21 AI 11 AI GND 22 2 AI 3 20 19 AI GND AI 20 11 AI 3 20 19 AI SENSE AI GND 8 7 NC AI 3 GND AI 17 6 5		AI 12	24 23	AI 4	AI 31	24 23	AI 23
Al 10 18 17 Al 2 Al 21 18 1 Al GND 16 15 Al 9 Al 28 16 1 Al 1 14 13 Al GND Al 6 10 14 13 Bank 1 Al 3 12 11 Al 0 Al 19 12 1 Al GND 10 9 Al SENSE Al 26 10 9 Al GND 8 7 NC Al GND 8 7 Al GND 6 5 AO GND Al 17 6 5	➡ ╱╢╢╲│	AI GND	22 21	AI 11	AI GND	22 21	AI 22
AI GND 16 15 AI 9 AI 28 16 1 AI 1 14 13 AI GND AI GND 14 1 Bank 1 AI 8 12 11 AI 0 AI 19 12 1 AI GND 10 9 AI SENSE AI 26 10 9 AI GND 8 7 NC AI GND 8 7 AI GND 6 5 AO GND AI 17 6 5		AI 3	20 19	AI GND	AI 30	20 19	AI 29
AI 1 14 13 AI GND AI GND 14 13 Bank 1 Bank 0 AI 8 12 11 AI 0 AI 19 12 1 AI GND 10 9 AI SENSE AI 2 10 9 AI SENSE AI 00 8 7 AI GND 6 5 AO GND AI 17 6 5	• \ III /	AI 10	18 17	AI 2	AI 21	18 17	AI GND
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AI GND 8 7 NC AI GND 8 7 AI GND 6 5 AO GND AI 17 6 5		AI GND	10 9	AI SENSE	AI 26	10 9	AI 18
	Banko	AI GND	8 7	NC	AI GND	8 7	AI 25
	-	AI GND	6 5	AO GND	AI 17	6 5	AI GND
AUT 4 3 AUGND A124 4 3		AO 1	4 3	AO GND	AI 24	4 3	AI 16
			2 1	AO GND	AI GND	2 1	AI SENSE 2

Figure 5. USB-6225 OEM Connector Pinout

50-Pin Digital Connectors							
	+5 V		49	+5 V	+5 V	50 49	+5 V
	D GND		47	P0.31	D GND	48 47	PFI 15
	D GND		45	P0.30	D GND	46 45	PFI 14
	D GND		43	P0.29	D GND	44 43	PFI 13
	D GND		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
• U	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
Bank 1	D GND	28	27	P0.21	D GND	28 27	PFI 5
Bank 0	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
		Bank	k 1			Bank 0	
34-Pin Analog Connectors	AI GND	34	33	AI 31	AI GND	34 33	AI 15
٥ ٥	AI 23	32	31	AI GND	AI 7	32 31	AI GND
	AI 30	30	29	AI 22	AI 14	30 29	AI 6
	AI GND	28	27	AI 29	AI GND	28 27	AI 13
			0 E	AI GND	AI 5	26 25	AI GND
	AI 21	26	25				AI 4
	AI 21 AI 28		25 23	AI 20	AI 12	24 23	
		24		AI 20 AI 27	AI 12 AI GND	24 23 22 21	AI 11
	AI 28	24 22	23				AI 11 AI GND
	AI 28 AI GND	24 22 20	23 21	AI 27	AI GND	22 21	1
	AI 28 AI GND AI 19	24 22 20 18	23 21 19	AI 27 AI GND	AI GND AI 3	22 21 20 19	AI GND
	AI 28 AI GND AI 19 AI 26 AI GND AI 17	24 22 20 18 16 14	23 21 19 17 15 13	AI 27 AI GND AI 18	AI GND AI 3 AI 10	222120191817	AI GND AI 2
	AI 28 AI GND AI 19 AI 26 AI GND	24 22 20 18 16	23 21 19 17 15 13	AI 27 AI GND AI 18 AI 25	AI GND AI 3 AI 10 AI GND	2221201918171615	AI GND AI 2 AI 9
Bank 1	AI 28 AI GND AI 19 AI 26 AI GND AI 17	24 22 20 18 16 14 12	23 21 19 17 15 13	AI 27 AI GND AI 18 AI 25 AI GND	AI GND AI 3 AI 10 AI GND AI 1	22 21 20 19 18 17 16 15 14 13	AI GND AI 2 AI 9 AI GND AI 0
	AI 28 AI GND AI 19 AI 26 AI GND AI 17 AI 24	24 22 20 18 16 14 12	23 21 19 17 15 13 11	AI 27 AI GND AI 18 AI 25 AI GND AI 16	AI GND AI 3 AI 10 AI GND AI 1 AI 8	222120191817161514131211	AI GND AI 2 AI 9 AI GND AI 0
Bank 1	AI 28 AI GND AI 19 AI 26 AI GND AI 17 AI 24 AI GND	24 2 22 2 18 16 14 12 10	23 21 19 17 15 13 11 9	AI 27 AI GND AI 18 AI 25 AI GND AI 16 AI SENSE 2	AI GND AI 3 AI 10 AI GND AI 1 AI 8 AI GND	22 21 20 19 18 17 16 15 14 13 12 11 10 9	AI GND AI 2 AI 9 AI GND AI 0 AI SENSE
Bank 1	AI 28 AI GND AI 19 AI 26 AI GND AI 17 AI 24 AI GND AI GND	24 22 20 18 16 14 12 10 8	23 21 19 17 15 13 11 9 7	AI 27 AI GND AI 18 AI 25 AI GND AI 16 AI SENSE 2 NC	AI GND AI 3 AI 10 AI GND AI 1 AI 8 AI GND AI GND	22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7	AI GND AI 2 AI 9 AI GND AI 0 AI SENSE NC

Figure 6. USB-6229 OEM Connector Pinout





		Bank 1			Bank	0
50-Pin Analog/Digital	+5 V	50 49	+5 V	AI 71	50 4	9 AI 79
Connectors	D GND	48 47	PFI 15	AI 78		7 AI 70
	D GND	46 45	PFI 14	AI GND	46 4	5 AI 69
	D GND	44 43	PFI 13	AI 77	44 4	3 AI 76
	D GND	42 41	PFI 12	AI 68		1 AI GND
	D GND	40 39	PFI 11	AI 67	40 3	9 AI 75
	D GND	38 37	PFI 10	AI 74	38 3	7 AI 66
	D GND	36 35	PFI 9	AI GND	36 3	5 AI 65
• •	D GND	34 33	PFI 8	AI 73	34 3	3 AI 72
•	D GND	32 31	PFI 7	AI 64	32 3	1 AI GND
	D GND	30 29	PFI 6	AI 55	30 2	9 AI 63
<u>ه</u>	D GND	28 27	PFI 5	AI 62	28 2	7 AI 54
Bank 1	D GND	26 25	PFI 4	AI GND	26 2	5 AI 53
Bank 0 —	D GND	24 23	PFI 3	AI 61		3 AI 60
	D GND	22 21	PFI 2	AI 52	22 2	AI GND
	D GND	20 19	PFI 1	AI 51	20 1	9 AI 59
	D GND	18 17	PFI 0	AI 58	18 1	7 AI 50
	D GND	16 15	P0.7	AI GND	16 1	5 AI 49
	D GND	14 13	P0.6	AI 57	14 1	3 AI 56
	D GND	12 11	P0.5	AI 48	12 1	1 AI GND
	D GND	10 9	P0.4	AI 39	10 9	9 AI 47
	D GND	8 7	P0.3	AI 46	8	7 AI 38
	D GND	6 5	P0.2	AI GND	6 !	5 AI 37
	D GND	4 3	P0.1	AI 45	4 ;	3 AI GND
	D GND	2 1	P0.0	AI 44	2	1 AI 36
	D GND	2 1 Bank 1	P0.0	AI 44	2 Bank	
34-Pin Analog Connectors	D GND		P0.0 Al 15	AI 44 AI 43	Bank	
-		Bank 1			Bank	0 3 AI 35
34-Pin Analog Connectors	AI GND	Bank 1	AI 15	AI 43	Bank 34 3 32 3	0 3 AI 35
	AI GND AI 7	Bank 1 34 33 32 31	AI 15 AI GND	AI 43 AI GND	Bank 34 3 32 3	0 3 AI 35 1 AI 34 9 AI 41
	AI GND AI 7 AI 14	Bank 1 34 33 32 31 30 29	AI 15 AI GND AI 6	AI 43 AI GND AI 42	Bank 34 3 32 3 30 2	0 3 AI 35 1 AI 34 9 AI 41 7 AI GND
	AI GND AI 7 AI 14 AI GND	Bank 1 34 33 32 31 30 29 28 27	Al 15 Al GND Al 6 Al 13	AI 43 AI GND AI 42 AI 33	Bank 34 3 32 3 30 2 28 2	0 3 AI 35 1 AI 34 9 AI 41 7 AI GND 5 AI 40
	AI GND AI 7 AI 14 AI GND AI 5	Bank 1 34 33 32 31 30 29 28 27 26 25	AI 15 AI GND AI 6 AI 13 AI GND	AI 43 AI GND AI 42 AI 33 AI 32	Bank 34 3 32 3 30 2 28 2 26 2 24 2	0 3 AI 35 1 AI 34 9 AI 41 7 AI GND 5 AI 40
	AI GND AI 7 AI 14 AI GND AI 5 AI 12	Bank 1 34 33 32 31 30 29 28 27 26 25 24 23	AI 15 AI GND AI 6 AI 13 AI GND AI 4	AI 43 AI GND AI 42 AI 33 AI 32 AI 31	Bank 34 3 32 3 30 2 28 2 26 2 24 2 22 2	0 3 AI 35 1 AI 34 9 AI 41 7 AI GND 5 AI 40 3 AI 23
	AI GND AI 7 AI 14 AI GND AI 5 AI 12 AI GND	Bank 1 34 33 32 31 30 29 28 27 26 25 24 23 22 21	AI 15 AI GND AI 6 AI 13 AI GND AI 4 AI 11	AI 43 AI GND AI 42 AI 33 AI 32 AI 31 AI GND	Bank 34 3 32 3 30 2 28 2 26 2 24 2 22 2 20 1	0 3 AI 35 1 AI 34 9 AI 41 7 AI GND 5 AI 40 3 AI 23 1 AI 22
	AI GND AI 7 AI 14 AI GND AI 5 AI 12 AI GND AI 3	Bank 1 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19	AI 15 AI GND AI 6 AI 13 AI GND AI 4 AI 11 AI GND	AI 43 AI GND AI 42 AI 33 AI 32 AI 31 AI GND AI 30	Bank 34 3 32 3 30 2 28 2 26 2 24 2 22 2 20 1 18 1	0 3 AI 35 1 AI 34 9 AI 41 7 AI GND 5 AI 40 3 AI 23 1 AI 22 9 AI 29
	AI GND AI 7 AI 14 AI GND AI 5 AI 12 AI GND AI 3 AI 10	Bank 1 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17	AI 15 AI GND AI 6 AI 13 AI GND AI 4 AI 11 AI GND AI 2	AI 43 AI GND AI 42 AI 33 AI 32 AI 31 AI GND AI 30 AI 21	Bank 34 3 32 3 30 2 28 2 26 2 24 2 22 2 20 1 18 1 16 1	0 3 AI 35 1 AI 34 9 AI 41 7 AI GND 5 AI 40 3 AI 23 1 AI 22 9 AI 29 7 AI GND
	AI GND AI 7 AI 14 AI GND AI 5 AI 12 AI GND AI 3 AI 10 AI GND	Bank 1 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15	AI 15 AI GND AI 6 AI 13 AI GND AI 4 AI 11 AI GND AI 2 AI 9	AI 43 AI GND AI 42 AI 33 AI 32 AI 31 AI GND AI 30 AI 21 AI 28	Bank 34 3 32 3 30 2 28 2 26 2 24 2 22 2 20 1 18 1 16 1	0 3 AI 35 1 AI 34 9 AI 41 7 AI GND 5 AI 40 3 AI 23 1 AI 22 9 AI 29 7 AI GND 5 AI 20 3 AI 27
Bank 1	AI GND AI 7 AI 14 AI GND AI 5 AI 12 AI GND AI 3 AI 10 AI GND AI 1	Bank 1 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13	AI 15 AI GND AI 6 AI 13 AI GND AI 4 AI 11 AI GND AI 2 AI 9 AI GND	AI 43 AI GND AI 42 AI 33 AI 32 AI 31 AI GND AI 30 AI 21 AI 28 AI GND	Bank 34 3 32 3 30 2 28 2 26 2 24 2 20 1 18 1 16 1 14 1 12 1	0 3 AI 35 1 AI 34 9 AI 41 7 AI GND 5 AI 40 3 AI 23 1 AI 22 9 AI 29 7 AI GND 5 AI 20 3 AI 27
	AI GND AI 7 AI 14 AI GND AI 5 AI 12 AI GND AI 3 AI 10 AI GND AI 1 AI 8	Bank 1 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11	AI 15 AI GND AI 6 AI 13 AI GND AI 4 AI 11 AI GND AI 2 AI 9 AI GND AI 0	AI 43 AI GND AI 42 AI 33 AI 32 AI 31 AI GND AI 30 AI 21 AI 28 AI GND AI 19	Bank 34 3 32 3 30 2 28 2 26 2 24 2 20 1 18 1 16 1 14 1 12 1 10 5	0 3 AI 35 1 AI 34 9 AI 41 7 AI GND 5 AI 40 3 AI 23 1 AI 22 9 AI 29 7 AI GND 5 AI 20 3 AI 27 1 AI GND
Bank 1	AI GND AI 7 AI 14 AI GND AI 5 AI 12 AI GND AI 3 AI 10 AI GND AI 1 AI 8 AI GND	Bank 1 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9	AI 15 AI GND AI 6 AI 13 AI GND AI 4 AI 11 AI GND AI 2 AI 9 AI GND AI 0 AI SENSE	AI 43 AI GND AI 42 AI 33 AI 32 AI 31 AI GND AI 30 AI 21 AI 28 AI GND AI 19 AI 26	Bank 34 3 32 3 30 2 28 2 26 2 22 2 20 1 18 1 16 1 12 1 10 9 8 5	0 3 AI 35 1 AI 34 9 AI 41 7 AI GND 5 AI 40 3 AI 23 1 AI 22 9 AI 29 7 AI GND 5 AI 20 3 AI 27 1 AI GND 9 AI 18
Bank 1	AI GND AI 7 AI 14 AI GND AI 5 AI 12 AI GND AI 3 AI 10 AI GND AI 1 AI 8 AI GND AI GND AI GND	Bank 1 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7	AI 15 AI GND AI 6 AI 13 AI GND AI 4 AI 11 AI GND AI 2 AI 9 AI GND AI 0 AI SENSE APFI 0	AI 43 AI GND AI 42 AI 33 AI 32 AI 31 AI GND AI 20 AI 21 AI 28 AI GND AI 19 AI 26 AI GND	Bank 34 3 32 3 30 2 28 2 24 2 20 1 18 1 16 1 14 1 12 1 10 5 8 5 6 5	0 3 AI 35 1 AI 34 9 AI 41 7 AI GND 5 AI 40 3 AI 23 1 AI 22 9 AI 29 7 AI GND 5 AI 20 3 AI 27 1 AI GND 5 AI 20 3 AI 27 1 AI GND 9 AI 18 7 AI 25

Figure 8. USB-6255 OEM Connector Pinout

		Bank	k 1			Bank 0	
50-Pin Digital Connectors	+5 V	50 4	49	+5 V	+5 V	50 49	+5 V
٥	D GND	48 4	47	P0.31	D GND	48 47	PFI 15
	D GND	46 4	45	P0.30	D GND	46 45	PFI 14
	D GND	44 4	43	P0.29	D GND	44 43	PFI 13
	D GND	42 4	41	P0.28	D GND	42 41	PFI 12
	D GND	40 3	39	P0.27	D GND	40 39	PFI 11
	D GND	38 3	37	P0.26	D GND	38 37	PFI 10
o .	D GND	36 3	35	P0.25	D GND	36 35	PFI 9
o	D GND	34 3	33	P0.24	D GND	34 33	PFI 8
	D GND	32 3	31	P0.23	D GND	32 31	PFI 7
°	D GND	30 2	29	P0.22	D GND	30 29	PFI 6
Bank 1	D GND	28	27	P0.21	D GND	28 27	PFI 5
Bank 0	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
		Bank	k 1			Bank 0	
34-Pin Analog Connectors	AI GND	34 3	33	AI 31	AI GND	34 33	AI 15
	AI 23	32 3	31	AI GND	AI 7	32 31	AI GND
	AI 30	30 2	29	AI 22	AI 14	30 29	AI 6
	AI GND	28 2	27	AI 29	AI GND	28 27	AI 13
	AI 21	26 2	25	AI GND	AI 5	26 25	AI GND
	AI 28	24 2	23	AI 20	AI 12	24 23	AI 4
	AI GND	22 2	21	AI 27	AI GND	22 21	AI 11
	AI 19	20	19	AI GND	AI 3	20 19	AI GND
	AI 26	18	17	AI 18	AI 10	18 17	AI 2
• ` "	AI GND	16	15	AI 25	AI GND	16 15	AI 9
	41 17	14	13	AI GND	AI 1	14 13	AI GND
	AI 17	10	11	AI 16	AI 8	12 11	AI 0
	AI 17 AI 24	12			AI GND	10 9	AI SENSE
Bank 1			9	AI SENSE 2	AIGND		
	AI 24	10	9 7	AFFI 1	AI GND	8 7	APFI 0
Bank 1	AI 24 AI GND	10 8	_				
Bank 1	AI 24 AI GND AI GND	10 8 6	7	APFI 1	AI GND	8 7	APFI 0

Figure 9. USB-6259/6289 OEM Connector Pinout

Default Counter/Timer Pinouts

By default, NI-DAQmx routes the counter/timer inputs and outputs to the PFI pins, shown in Table 1.

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
FREQ OUT	PFI 14

 Table 1.
 NI-DAQmx Default Counter/Timer Pins

Attaching External LEDs

USB-622*x*/625*x*/628*x* OEM devices have two LEDs that reflect the device state. The green READY LED indicates when the device is powered on and configured as a USB device. The yellow ACTIVE LED indicates USB bus activity.

Three connectors on the device allow you to connect an external LED circuit to the device, as shown in Figure 10. To connect an external READY LED, use E1 as the positive connection (+3.3 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. E1 is current limited with a 100 Ω resistor to the 3.3 V internal supply. This configuration limits the current to approximately 16 mA into a single external LED or approximately 8 mA each when both LEDs are lit. You also can limit this current further by using external resistors, also shown in Figure 10.

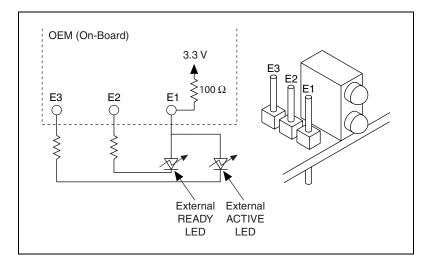


Figure 10. Schematic for External LED Circuits

The power switch on the USB-622x/625x/628x OEM device powers the device on and off. Figure 11 shows the pins on the power switch and circuitry.

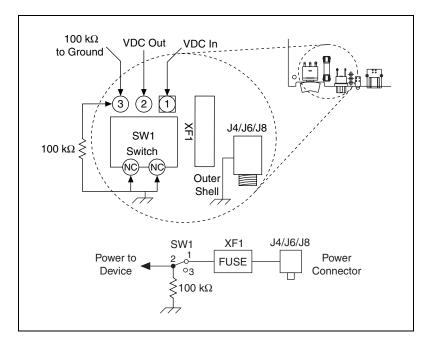


Figure 11. Schematic for the Power Switch

Pin 1, VDC In, is connected to VDC through the fuse (reference designator XF1). The VDC is the voltage provided by the power supply through the power connector (reference designator J4/J6/J8¹) and must be 11–30 VDC, 20 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 k Ω to Ground, connects pin 2 to ground through a 100 k Ω resistor when the switch is in the Off position.

¹ The power connector is designated as J4 on USB-6225/6255 OEM devices, J6 on USB-6221/6229 OEM devices, and J8 on USB-6251/6259/6281/6289 OEM devices.

Connecting the USB-622*x*/625*x*/628*x* OEM Device to Your Chassis

The USB-622x/625x/628x OEM device includes several plated mounting holes that are designed for customer grounded connections, as shown in Figure 12.



Caution Do not use the holes labeled A in Figure 12 as mounting holes.

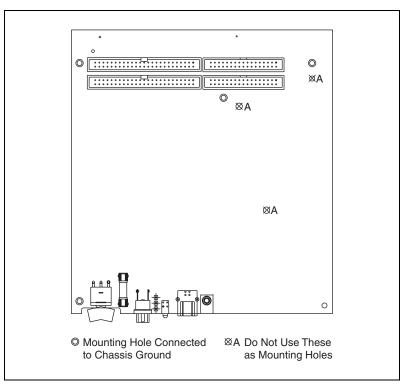


Figure 12. Customer Mounting Holes (USB-6225/6229/6255/6259/6289 OEM Shown)



Caution (USB-628x Devices) Exercise caution when placing USB-628x OEM devices inside an enclosure. Auxiliary cooling may be necessary to keep the device under the maximum ambient temperature rating of 45 °C, as specified in the *NI* 628x Specifications.

Replacing Fuses

USB-622*x*/625*x*/628*x* OEM devices have a replaceable T 2A 250V $(5 \times 20 \text{ mm})$ fuse that protects the device from overcurrent through the power connector.

(USB-628x Devices Only) USB-628x OEM devices also have a replaceable F 2A 125V fuse that protects the device from overcurrent through the +5 V terminal(s).

Replacement fuse information can be found in Table 2. To replace a broken fuse in USB-622*x*/625*x*/628*x* OEM devices, complete the following steps.

- 1. Power down and unplug the device.
- 2. Replace the broken fuse while referring to Figure 13 for the fuse locations.

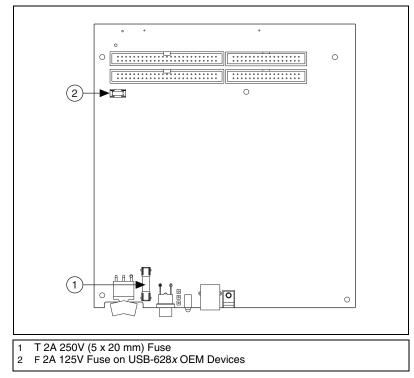


Figure 13. USB-622*x*/625*x*/628*x* OEM Fuse Locations

Device Components

Table 2 contains information about the components used for interfacing and interacting with the USB-622x/625x/628x OEM device.

Component	Reference Designator(s) on PCB	Manufacturer	Manufacturer Part Number
LEDs	DS1	Dialight	553-0332
34-pin connectors	(USB-6221/6251/6281 OEM) J1	3M	N2534-6002RB
	(USB-6225/6229/6255/6259/6289 OEM) J1, J2		
50-pin connectors	(USB-6221/6251/6281 OEM) P1	3M	N2550-6002UB
	(USB-6225/6229/6255/6259/6289 OEM) P1, P2		
USB connector	J3	AMP	787780-1
Power connector	(USB-6221/6229 OEM) J6	Switchcraft	722RA
	(USB-6225/6255 OEM) J4		
	(USB-6251/6259/6281/6289 OEM) J8		
Power switch	SW1	ITT Industries, Cannon	E101J1A3QE2
T 2A 250V fuse	XF1	Littelfuse	218.002XP
F 2A 125V fuse	(USB-6281/6289 OEM) F1	Littelfuse	0453002
68-pin	(USB-6221 OEM) J8	Honda	PCS-E68RLMD1+
connectors*	(USB-6225/6229/6255 OEM) J7, J8	1	
	(USB-6251/6281 OEM) J7		
	(USB-6259/6289 OEM) J6, J7	1	
* Optional mass terminat	ion connectors. These are not populated by def	ault.	

Table 2.	USB-622x/625x/628x OEM	Components
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Modifying the USB Device Name in Microsoft Windows

You can change how the USB-622x/625x/628x 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.

Windows Vista/XP Users

Figure 14 depicts how a USB-6251 OEM device name appears in the Found New Hardware Wizard and Windows Device Manager.

Found New Hardware Wizard	Buevice Manager □ ☑ X File Action View Help ← → III ∰ 12 10
It is wizard helps you install software for: USB-6251 (DEM) If your hardware came with an installation CD of floppy disk, inset it now. What do you want the wizard to do? Install the software automatically [Recommended] Install from a list or specific location (Advanced) Click Next to continue. </th <th>BEEZEE Computer Data Acquisition Devices UsB-6251 (OEM) Disk drives D</th>	BEEZEE Computer Data Acquisition Devices UsB-6251 (OEM) Disk drives D

Figure 14. USB-6251 OEM Device in the Found New Hardware Wizard and Device Manager (Windows Vista/XP)

To modify the device name in the Found New Hardware Wizard and Windows Device Manager in Microsoft Windows Vista/XP, complete the following steps.



Note You must have NI-DAQmx 8.7 or later installed on your PC.

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.



Note New security updates to Microsoft Vista and NI-DAQ 8.6 or later 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 are the descriptors where Windows looks to identify the device. Locate the two lines of text that contain in quotes the descriptors for the device name you are modifying. Change the descriptor on *both* lines to the new device name, as shown in Figure 15.

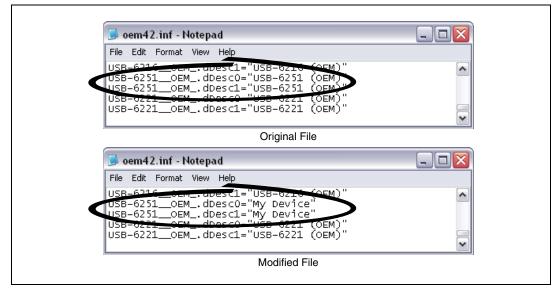


Figure 15. INF File Descriptors Changed to "My Device" (Windows Vista/XP)

- 3. Save and close the INF file.
- 4. Go to the Windows Device Manager.

(Windows Vista) In the Device Manager, notice that the OEM device now appears as My Device, as shown in Figure 16.

(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 the Found New Hardware Wizard and Windows Device Manager, as shown in Figure 16.

Note When the device is initially installed, the Windows alert message may display the following: Found New Hardware: M Series USB 62xx (OEM). This message appears for a few seconds until the custom name appears and the Found New Hardware Wizard is launched. This alert message device name cannot be changed.

Found New Hardware W	· 4	Bevice Manager
Found New Hardware W	Izard	
	This wizard helps you install software for: My Device If your hardware came with an installation CD or floppy disk, insert it now. What do you want the wizard to do? Install the software automatically (Recommended) Install from a list or specific location (Advanced) Click Next to continue.	

Figure 16. "My Device" in the Found New Hardware Wizard and Device Manager (Windows Vista/XP)

M

Note Modifying the INF file will *not* change the USB-622x/625x/628x OEM device name in Measurement & Automation Explorer (MAX).

Windows 2000 Users

Figure 17 depicts how a USB-6251 OEM device name appears in the Found New Hardware Wizard and Windows Device Manager.

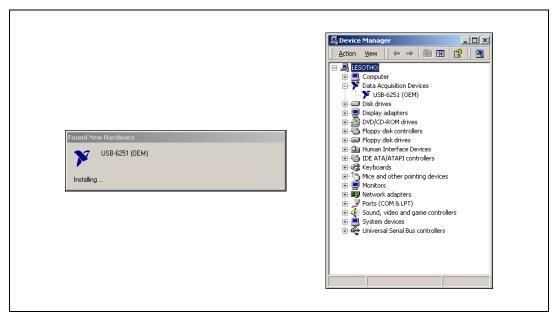


Figure 17. USB-6251 OEM Device in the Found New Hardware Wizard and Device Manager (Windows 2000)

To modify the device name in the Found New Hardware Wizard and Windows Device Manager in Windows 2000, complete the following steps.

Note You *must* have NI-DAQmx 8.7 or later installed on your PC.

1. Locate the nimioxsu.inf file in the x:\WINNT\inf\ directory, where x:\ is the root directory where Windows is installed.

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

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

At the bottom of this file are the descriptors where Windows looks to identify the device. Locate the two lines of text that contain in quotes the descriptors for the device name you are modifying. Change the descriptor on *both* lines to the new device name, as shown in Figure 18.

🌌 nimioxsu.inf - Notepad	
File Edit Format Help	
USB-6216SEMdDesc1="USB-6215_(OEM)" USB-6251OEMdDesc0="USB-6251_(OEM)" USB-6251OEMdDesc1="USB-6251_(OEM)" USB-6221OEMdDesc0="USB-6221_(OEM)" USB-6221OEMdDesc1="USB-6221_(OEM)"	• •
Original File	
Onginai File	
🜌 nimioxsu.inf - Notepad	<u> </u>
File Edit Format Help	
USB-6216CEMdDesc1="USB-0216_(OEM)" USB-6251OEMdDesc0="My Device" USB-6251OEMdDesc1="My Device" USB-6221OEMdDesc0="USB-6221_(OEM)" USB-6221OEMdDesc1="USB-6221_(OEM)"	•
OSD-OZZI_OEMuDesci= OSD-OZZI (OEM)	
Modified File	

Figure 18. INF File Descriptors Changed to "My Device" (Windows 2000)

- 3. Save and close the INF file.
- 4. Go to the Windows Device Manager, right-click the OEM device under Data Acquisition Devices, and select **Uninstall**.
- 5. 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 the Found New Hardware Wizard and Windows Device Manager, as shown in Figure 19.

Note When the device is initially installed, the Windows alert message may display the following: Found New Hardware: M Series USB 62xx (OEM). This message appears for a few seconds until the custom name appears and the Found New Hardware Wizard is launched. This alert message device name cannot be changed.

Found New Hardware Image:

Figure 19. "My Device" in the Found New Hardware Wizard and Device Manager (Windows 2000)

Note Modifying the INF file will *not* change the USB-622*x*/625*x*/628*x* OEM device name in Measurement & Automation Explorer (MAX).

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