CALIBRATION PROCEDURE

B/E/M/S/X Series

For NI-DAQ™mx

This document contains instructions for calibrating National Instruments B, E, M, S, and X Series data acquisition (DAQ) devices.

This document does not discuss programming techniques or compiler configuration. The NI-DAQmx driver contains online help files that have compiler-specific instructions and detailed function explanations. You can add these help files when you install NI-DAQmx on the calibration computer.

Contents

NATIONAL INSTRUMENTS™

Conventions

The following conventions are used in this manual:

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The **»** symbol leads you through nested menu items and dialog box options to a final action. The sequence **File»Page Setup»Options** directs you to pull down the **File** menu, select the **Page Setup** item, and select **Options** from the last dialog box.

This icon denotes a note, which alerts you to important information.

This icon denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash. When this symbol is marked on

	a product, refer to the *Read Me First: Safety and Electromagnetic Compatibility* for information about precautions to take.
bold	Bold text denotes items that you must select or click in the software, such as menu items and dialog box options. Bold text also denotes parameter names and hardware labels.
italic	Italic text denotes variables, emphasis, a cross-reference, or an introduction to a key concept. Italic text also denotes text that is a placeholder for a word or value that you must supply.
`monospace`	Monospace text denotes text or characters that you should enter from the keyboard, sections of code, programming examples, and syntax examples. This font is also used for the proper names of disk drives, paths, directories, programs, subprograms, subroutines, device names, functions, operations, variables, filenames, and extensions.
`monospace italic`	Italic text in this font denotes text that is a placeholder for a word or value that you must supply.
Platform	Text in this font denotes a specific platform and indicates that the text following it applies only to that platform.

Software

Calibration requires the latest NI-DAQmx driver. NI-DAQmx includes high-level function calls to simplify the task of writing software to calibrate devices. The driver supports many programming languages, including LabVIEW, LabWindows™/CVI™, C/C++, C#, and Visual Basic .NET.

Documentation

The following documents are your primary references for writing your calibration utility with NI-DAQmx:

- The *DAQ Getting Started* guides for NI-DAQ 9.2 or later provides instructions for installing and configuring NI-DAQ devices. NI USB-621*x* users should refer to the *NI-DAQmx for USB Devices Getting Started Guide*.
- The *NI-DAQmx Help* includes information about creating applications that use the NI-DAQmx driver.
- The *NI-DAQmx C Reference Help* includes information about the functions in the driver.

- *E Series Calibration Fixture Installation Guide* provides information on installing and operating the E/M/S Series calibration hardware adapter.
- The *NI 6010 Help*, *E Series User Manual*, *M Series User Manual*, *NI USB-621x User Manual*, *S Series User Manual*, *NI 6124/6154 User Manual*, or *X Series User Manual* provides information about your DAQ device.
- The specifications document for your DAQ device provides detailed specifications.

Calibration Interval

B/E/M/S/X Series devices should be calibrated at a regular interval as defined by the measurement accuracy requirements of your application. National Instruments recommends that you routinely perform a complete calibration at least once every year (once every two years for some M/S/X Series devices). You can shorten this interval based on the accuracy demands of your application or requirements of your processes.

Password

The default password for password-protected operations is `NI`.

Test Equipment

National Instruments recommends that you use the instruments in Table 1 for calibrating a B/E/M/S/X Series device.

Caution For compliance with Electromagnetic Compatibility (EMC) requirements, this product must be operated with shielded cables and accessories. If unshielded cables or accessories are used, the EMC specifications are no longer guaranteed unless all unshielded cables and/or accessories are installed in a shielded enclosure with properly designed and shielded input/output ports.

Table 1. Recommended Equipment

Equipment	Recommended Model	Requirements
Calibrator	Fluke 5700A	If this instrument is unavailable, use a high-precision voltage source that is at least 50 ppm (0.005%) accurate for 12-bit devices, and 10 ppm (0.001%) accurate for 14-, 16-, and 18-bit devices.
DMM	NI 4070	If this instrument is unavailable, use a multiranging 6 1/2-digit DMM with an accuracy of 40 ppm.

Table 1. Recommended Equipment (Continued)

Equipment	Recommended Model	Requirements
Counter	Agilent 53131A	If this instrument is unavailable, use a counter accurate to 0.01%.
PXI chassis	NI PXI-1042, NI PXI-1042Q	Use with PXI modules.
PXI Express chassis	NI PXIe-1062Q	Use with PXI Express modules.
Low thermal copper EMF plug-in cable	Fluke 5440A-7002	Do *not* use standard banana cables.
Shielded DAQ cable	NI SH68-68-EP, NI SH68-68-EPM	Use with B/E/M/S Series devices with 68-pin SCSI II connectors.
	NI SHC68-68-EP, NI SHC68-68-EPM, NI SHC68-68	Use with E/M/S/X Series devices with 68-pin VHDCI connectors.
	NI SH1006868	Use with E Series devices with 100-pin connectors.*
	NI SH37F-37M-1	Use with B/M Series devices with 37-pin D-SUB connectors.
DAQ accessory	NI E/M/S Series calibration hardware adapter	Connects your calibration equipment to your 68-pin E/M/S/X Series device. If you programmatically control this fixture, you will not need to disconnect and reconnect cables at each step of the procedure.† **(NI 61*xx* Devices)** S Series devices *must* use revision B or later of the calibration adapter.
	NI SCC-68	I/O connector block with screw terminals, general breadboard area, bus terminals, and four expansion slots for SCC signal conditioning modules.
	NI SCB-68	Shielded I/O connector block with 68 screw terminals for easy signal connection to 68- or 100-pin DAQ devices.
	NI CB-68LP, NI CB-68LPR, NI TBX-68	Low-cost termination accessories with 68 screw terminals for easy connection of field I/O signals to 68-pin DAQ devices.
	NI BNC-2110	Desktop and DIN rail-mountable BNC adapter you can connect to DAQ devices.
	NI CB-37F-LP	Low-cost termination accessory with 37 screw terminals for easy connection of field I/O signals to 37-pin DAQ devices.

* Connect the 68-pin cable labeled MIO-16 to the accessory. The 68-pin cable labeled Extended I/O remains unconnected.

† For M/S/X Series devices with two connectors, you will need to disconnect the calibration equipment from Connector 0 and reconnect to Connector 1 midway through the verification procedure.

Test Conditions

Follow these guidelines to optimize the connections and the environment during calibration.

- Keep connections to the device as short as possible. Long cables and wires can act as antennae, which could pick up extra noise that would affect measurements.
- Use shielded copper wire for all cable connections to the device. Use twisted-pair wire to eliminate noise and thermal offsets.
- Maintain the ambient temperature between 18 and 28 °C. The device temperature will be greater than the ambient temperature. Refer to the *Calibration Procedure* section for more information about calibration temperatures and temperature drift.
- For valid test limits, maintain the device temperature within ±1 °C from the last self-calibration and ±10 °C from the last external calibration.
- Keep relative humidity below 80%.
- Allow adequate warm-up time (generally between 15 and 30 minutes for most DAQ devices) to ensure that the measurement circuitry is at a stable operating temperature. Refer to your DAQ device specifications document for the recommended warm-up time for your device.

Calibration Procedure

The calibration process has six steps.

1. *Initial Setup*—Configure your device in NI-DAQmx.
2. *Self-Calibration*—Adjust the self-calibration constants of the device.
3. *Checking Device Temperature Changes*—Verify that the current device temperature will not cause you to incorrectly calibrate your device.
4. *Verification Procedure*—Verify the existing operation of the device. This step allows you to confirm that the device was operating within its specified range prior to calibration.
5. *Adjustment Procedure*—Perform an external calibration that adjusts the device calibration constants with respect to a known voltage source.
6. Reverification—Perform another verification to ensure that the device is operating within its specifications after adjustment.

These steps are described in detail in the following sections. Although NI recommends that you verify all ranges, you can save time by checking only the ranges used in your application.

Initial Setup

The device must be configured in Measurement & Automation Explorer (MAX) to communicate with NI-DAQmx.

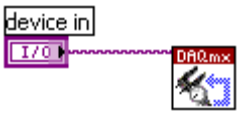
Complete the following steps to configure a device in MAX.

1. Install the NI-DAQmx driver software.
2. Power off the host computer or chassis that will hold the device and install the device.
3. Power on the computer or chassis and launch Measurement & Automation Explorer (MAX).
4. Configure the device identifier and select **Self-Test** to ensure that the device is working properly.

Note When a device is configured with MAX, it is assigned a device identifier. Each function call uses this identifier to determine which DAQ device to calibrate.

Self-Calibration

Self-calibration should be performed after the device has warmed up for the recommended time period—generally between 15 and 30 minutes for most DAQ devices. Refer to your DAQ device specifications document for the recommended warm-up time for your device. Call self-calibration before doing the first verification. This function measures the onboard reference voltage of the device and adjusts the self-calibration constants to account for any errors caused by short-term fluctuations in the environment. Disconnect all external signals when you self-calibrate a device.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxSelfCal` with the following parameter: **deviceName**: `dev1`

You also can initiate self-calibration using MAX, by completing the following steps.

1. Launch MAX.
2. Select **My System»Devices and Interfaces»*your device***.
3. Initiate self-calibration using one of the following methods:
   - Click **Self-Calibrate** in the upper right corner of MAX.
   - Right-click the name of the device in the MAX configuration tree and select **Self-Calibrate** from the drop-down menu.

Checking Device Temperature Changes

Device temperature changes (greater than ±10 °C since the previous external calibration or greater than ±1 °C since the previous self-calibration) can cause you to incorrectly calibrate your device. After self-calibrating your device (as described in the *Self-Calibration* section), complete the following steps to compare the current device temperature to the temperatures measured during the last self-calibration and external calibration.

1. Read the current temperature measured by the device by using the DevTemp property node.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxGetCalDevTemp` with the following parameter: **deviceName**: `dev1`

2. Get the temperature of the device recorded during the last self-calibration by using the SelfCal.LastTemp property node.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxGetSelfCalLastTemp` with the following parameter: **deviceName**: `dev1`

If the difference between the current temperature and the temperature from the last self-calibration is greater than 1 °C, the limits in the calibration tables are not valid.

3. Get the temperature of the device recorded during the last external calibration by using the ExtCal.LastTemp property node.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxGetExtCalLastTemp` with the following parameter: **deviceName**: `dev1`

If the difference between the current temperature and the temperature from the last external calibration is greater than 10 °C, the limits in the calibration tables are not valid.

Note The maximum temperature change for most DAQ devices is ±10 °C. To find the valid temperature drifts for your B/E/M/S/X device, refer to the Absolute Accuracy table(s) in your DAQ device specifications document.

Note You also can read the current device temperature, the temperature during the last self-calibration, and the temperature during the last external calibration in MAX. Launch MAX, select **My System»Devices and Interfaces»*your device***, and then click the **Calibration** tab.

If the device temperature is outside the maximum range, you should choose one of the following options:

- Change the test limits to include the additional error due to temperature drift. Refer to your DAQ device specifications document for more information.
- Change the system so that the temperature will be closer to the temperature recorded during the last external calibration.

Verification Procedure

Verification determines how well the DAQ device is meeting its specifications. By performing this procedure, you can see how your device has operated over time. You can use this information to help determine the appropriate calibration interval for your application.

The verification procedure is divided into the major functions of the device. Throughout the verification process, use the tables in the *Test Limits* section to determine if your device needs to be adjusted.

Analog Input Verification

Since B/E/M/S/X Series devices have many different ranges, you must check measurements for each available range.

(B/E/M/X Series [MIO] Devices) Because there is only one analog-to-digital converter (ADC) on B/E/M Series and X Series NI 632*x*/634*x*/6351/6353/6361/6363 devices, you must perform verification on all ranges of one analog input channel in differential mode. (Optional) Then, perform verification on one range of all remaining analog input channels in differential mode to verify that the device mux and analog input lines are operating properly.

(S/X Series [Simultaneous MIO] Devices) You must perform verification on all ranges of all analog input channels of S Series and X Series NI 6356/6358/6366/6368 devices in differential mode.

Note The test limits used in this document assume a maximum temperature drift of ±10 °C from the last external calibration, and a maximum temperature drift of ±1 °C from the last self-calibration. Refer to the *Calibration Procedure* section for more information and instructions on reading your device temperature and comparing it against the device temperature during the last external calibration.

Complete the following steps to check the performance of the analog input.

1. Connect the calibrator to the device. Refer to Table 2 to determine connections between the device and the calibrator.

Note If your calibrator has a guard connection, connect that terminal to AI GND. If your calibrator does not have a guard connection and has a floating output, connect the negative output to AI GND. If the calibrator output is not floating, do not make any other connections. For more information, refer to the user documentation for the device you are using. If you are using the E/M/S Series calibration hardware adapter, connect the device as described in the *E Series Calibration Fixture Installation Guide*.

Note **(NI USB-6215/6216/6218 Devices)** For isolated devices, if the calibrator outputs are truly floating, the negative output must be connected to a quiet earth ground as well as AI GND to give the entire system a ground reference.

Table 2. Analog Input Connections

Device	Calibrator		
	Positive Output*	**Negative Output***	**Guard Connection†**
B/E/M/X Series (MIO)‡	AI 0 (pin 68)**	AI 8 (pin 34)†, **	AI GND (pin 67)†, **
S/X Series (Simultaneous MIO)†† Connector 0	AI 0 + (pin 68)	AI 0 – (pin 34)†	AI 0 GND (pin 67)†
	AI 1 + (pin 33)	AI 1 – (pin 66)†	AI 1 GND (pin 32)†
	AI 2 + (pin 65)	AI 2 – (pin 31)†	AI 2 GND (pin 64)†
	AI 3 + (pin 30)	AI 3 – (pin 63)†	AI 3 GND (pin 29)†
	AI 4 + (pin 28)	AI 4 – (pin 61)†	AI 4 GND (pin 27)†
	AI 5 + (pin 60)	AI 5 – (pin 26)†	AI 5 GND (pin 59)†
	AI 6 + (pin 25)	AI 6 – (pin 58)†	AI 6 GND (pin 24)†
	AI 7 + (pin 57)	AI 7 – (pin 23)†	AI 7 GND (pin 56)†
X Series (Simultaneous MIO)‡‡ Connector 1	AI 8 + (pin 68)	AI 8 – (pin 34)†	AI 8 GND (pin 67)†
	AI 9 + (pin 33)	AI 9 – (pin 66)†	AI 9 GND (pin 32)†
	AI 10 + (pin 65)	AI 10 – (pin 31)†	AI 10 GND (pin 64)†
	AI 11 + (pin 30)	AI 11 – (pin 63)†	AI 11 GND (pin 29)†
	AI 12 + (pin 28)	AI 12 – (pin 61)†	AI 12 GND (pin 27)†
	AI 13 + (pin 60)	AI 13 – (pin 26)†	AI 13 GND (pin 59)†
	AI 14 + (pin 25)	AI 14 – (pin 58)†	AI 14 GND (pin 24)†
	AI 15 + (pin 57)	AI 15 – (pin 23)†	AI 15 GND (pin 56)†

* Pin numbers are given for 68-pin connectors only. If you are using a BNC, DAQPad/USB screw terminal, 34-pin IDC header, 50-pin IDC header, 37-pin, or 100-pin connector, refer to your device user documentation for signal connection locations.

† If your calibrator has a guard connection, connect that terminal to AI GND. If your calibrator does not have a guard connection and has a floating output, connect the negative output to AI GND. If the calibrator output is not floating, do not make any other connections. For more information, refer to the user documentation for the device you are using.

‡ NI 632*x*/634*x*/6351/6353/6361/6363 X Series MIO devices.

** You must perform verification on all ranges of one analog input channel in differential mode. (Optional) Then, perform verification on one range of all remaining analog input channels in differential mode to verify that the device mux and analog input lines are operating properly. Refer to your device user documentation for signal connection locations.

†† NI 6356/6358/6366/6368 X Series simultaneous MIO devices.

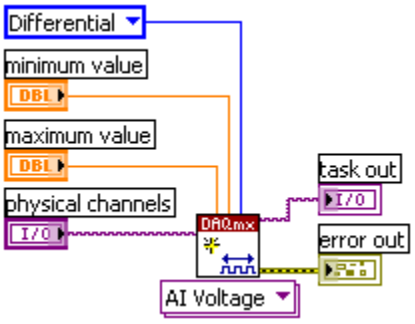
‡‡ NI 6358/6368 X Series simultaneous MIO devices.

2. Choose the table from the *Test Limits* section that corresponds with the device you are verifying. This table shows all acceptable settings for the device type. NI recommends that you verify all ranges, although you may want to save time by checking only the ranges used in your application.
3. Set the calibrator voltage to the test value indicated in the device table.
4. Create a task using `DAQmxCreateTask`.

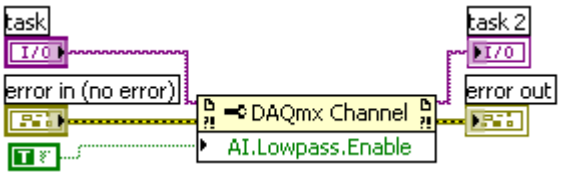
LabVIEW Block Diagram	NI-DAQmx Function Call
LabVIEW does not require this step.	Call `DAQmxCreateTask` with the following parameters: **taskName**: *`AIVerificationTask`* **taskHandle**: `&taskHandle`

5. Add a channel to the task using the DAQmx Create Virtual Channel VI and configure the channel. Use the tables in the *Test Limits* section to determine the minimum and maximum values for your device.

Note Throughout the procedure, refer to the NI-DAQmx function call parameters for the LabVIEW input values.

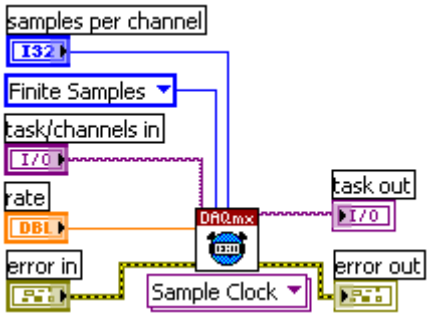
LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxCreateAIVoltageChan` with the following parameters: **taskHandle**: `taskHandle` **physicalChannel**: `dev1/ai0` **nameToAssignToChannel**: *`myVoltageChannel`* **terminalConfig**: `DAQmx_Val_Cfg_Default` **minVal**: *`-10.0`* **maxVal**: *`10.0`* **units**: `DAQmx_Val_Volts` **customScaleName**: `NULL`

6. **(NI 628*x* Devices)** Configure the lowpass filter by setting the AI.Lowpass.Enable property node to True.

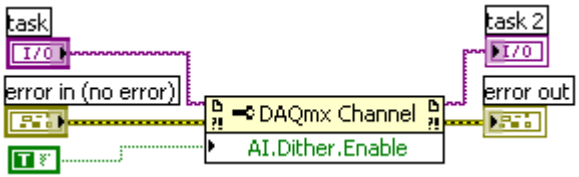
LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxSetChanAttribute` with the following parameters: **taskHandle**: `taskHandle` **Channel**: `""` **Attribute**: `DAQmx_AI_Lowpass_Enable` **Value**: `0` (filter off) or `1` (filter on)

7. Configure timing for the voltage acquisition using the DAQmx Timing VI.

   (NI 6011E [PCI-MIO-16XE-50] and NI 6115/6120 Devices) Use `20000.0` for **rate** and `20000` for **sampsPerChan**.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxCfgSampClkTiming` with the following parameters: **taskHandle**: `taskHandle` **source**: `NULL` **rate**: `100000.0` or `20000.0` **activeEdge**: `DAQmx_Val_Rising` **sampleMode**: `DAQmx_Val_FiniteSamps` **sampsPerChan**: `10000` or `20000`

8. **(NI 6023E/6024E/6025E/6040E/6062E Devices)** For 12-bit E Series devices, configure dither to be on by setting the AI.Dither.Enable property node to True.

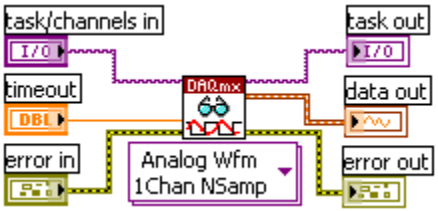
LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxSetAIDitherEnable` with the following parameters: **taskHandle**: `taskHandle` **channel []**: *`MyVoltageChannel`* **bool32**: `TRUE`

9. Start the acquisition using the DAQmx Start Task VI.

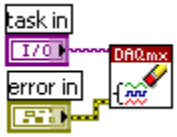
LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxStartTask` with the following parameter: **taskHandle**: `taskHandle`

10. Acquire 10,000 points of voltage data using the DAQmx Read VI.

    (NI 6011E [PCI-MIO-16XE-50] and NI 6115/6120 Devices) Acquire 20,000 points of voltage data using the DAQmx Read VI.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxReadAnalogF64` with the following parameters: **taskHandle**: `taskHandle` **numSampsPerChan**: `-1` **timeout**: `10.0` **fillMode**: `DAQmx_Val_GroupByChannel` **readArray**: `data` **arraySizeInSamples**: `10000` or `20000` **sampsPerChanRead**: `&read` **reserved**: `NULL`

11. Average the voltage values that you acquired. Compare the resulting average to the upper and lower limits listed in the table in the *Test Limits* section. If the result is between these values, the device passes the test.
12. Clear the acquisition using the DAQmx Clear Task VI.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxClearTask` with the following parameter: **taskHandle**: `taskHandle`

13. **(B/E/M/X Series [MIO] Devices)** Repeat steps 4 through 12 until all values have been verified on NI 60*xx*/60*xx*E/62*xx*/632*x*/634*x*/6351/6353/6361/6363 devices.

    (S/X Series [Simultaneous MIO] Devices) Repeat steps 4 through 12 for all channels and all values on NI 61*xx*/6356/6358/6366/6368 devices.

14. Disconnect the calibrator from the device.

You have finished verifying the analog input levels on your device.

Analog Output Verification

This procedure checks the performance of all analog output channels. Most B/E/M/S/X Series devices have two analog outputs, AO 0 and AO 1. Some M/X Series devices have four analog outputs, two on each connector. Skip this step if the device you are calibrating does not have analog output circuitry.

Note The test limits used in this document assume a maximum temperature drift of ±10 °C from the last external calibration, and a maximum temperature drift of ±1 °C from the last self-calibration. Refer to the *Calibration Procedure* section for more information and instructions on reading your device temperature and comparing it against the device temperature during the last external calibration.

Complete the following steps to check analog output measurements.

1. Connect your DMM to AO 0 as shown in Table 3.

Note **(NI USB-6215/6216/6218 Devices)** For isolated devices, you must also connect AO GND to a quiet earth ground reference or the ground reference of the DMM.

Table 3. Analog Output Connections

Analog Output	DMM	
	Positive Input*	**Negative Input***
AO 0	Connector 0, AO 0 (pin 22)	Connector 0, AO GND (pin 55)
AO 1	Connector 0, AO 1 (pin 21)	Connector 0, AO GND (pin 55)
AO 2	Connector 1, AO 2 (pin 22)	Connector 1, AO GND (pin 55)
AO 3	Connector 1, AO 3 (pin 21)	Connector 1, AO GND (pin 55)

* Pin numbers are given for 68-pin connectors only. If you are using a BNC, DAQPad/USB screw terminal, 34-pin IDC header, 50-pin IDC header, 37-pin, or 100-pin connector, refer to your device user documentation for signal connection locations.

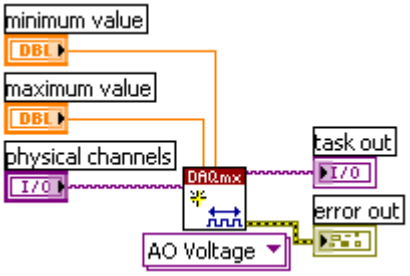
2. Choose the table from the *Test Limits* section that corresponds with the device you are verifying. This table shows all acceptable settings for the device. NI recommends that you verify all ranges, although you may want to save time by checking only the ranges used in your application.

3. Create a task using `DAQmxCreateTask`.

LabVIEW Block Diagram	NI-DAQmx Function Call
LabVIEW does not require this step.	Call `DAQmxCreateTask` with the following parameters: **taskName**: *`MyAOVoltageTask`* **taskHandle**: `&taskHandle`

4. Add an AO voltage task using the DAQmx Create Virtual Channel VI and configure the channel, AO 0. Use the tables in the *Test Limits* section to determine the minimum and maximum values for your device.

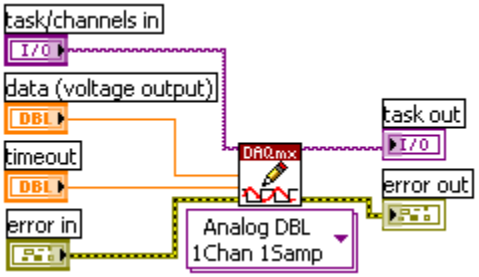
Note Throughout the procedure, refer to the NI-DAQmx function call parameters for the LabVIEW input values.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxCreateAOVoltageChan` with the following parameters: **taskHandle**: `taskHandle` **physicalChannel**: `dev1/ao0` **nameToAssignToChannel**: `AOVoltageChannel` **minVal**: *`-10.0`* **maxVal**: *`10.0`* **units**: `DAQmx_Val_Volts` **customScaleName**: `NULL`

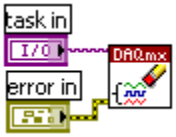
5. Start the generation using the DAQmx Start Task VI.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxStartTask` with the following parameter: **taskHandle**: `taskHandle`

6. Write a voltage to the AO channel using the DAQmx Write VI.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxWriteAnalogF64` with the following parameters: **taskHandle**: `taskHandle` **numSampsPerChan**: `1` **autoStart**: `1` **timeout**: `10.0` **dataLayout**: `DAQmx_Val_GroupByChannel` **writeArray**: `&data` **sampsPerChanWritten**: `&samplesWritten` **reserved**: `NULL`

7. Compare the resulting value shown by the DMM to the upper and lower limits in the table in the *Test Limits* section. If the value is between these limits, the device passes the test.
8. Clear the acquisition using the DAQmx Clear Task VI.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxClearTask` with the following parameter: **taskHandle**: `taskHandle`

9. Repeat steps 3 through 8 until all values have been tested.
10. Disconnect the DMM from AO 0, and reconnect it to AO 1, making the connections shown in Table 3.
11. Repeat steps 3 through 10 for all AO channels on the device.
12. Disconnect your DMM from the device.

You have finished verifying the analog output levels on your device.

Counter Verification

This procedure verifies the performance of the counter. B/E/M/S/X Series devices have only one timebase to verify, so only Counter 0 needs to be checked. It is not possible to adjust this timebase, so only verification can be performed.

Note The test limits used in this document assume a maximum temperature drift of ±10 °C from the last external calibration, and a maximum temperature drift of ±1 °C from the last self-calibration. Refer to the *Calibration Procedure* section for more information and instructions on reading your device temperature and comparing it against the device temperature during the last external calibration.

Complete the following steps to perform checks on the counter.

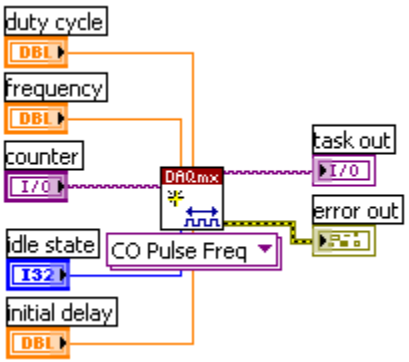
1. Connect your counter positive input to CTR 0 OUT (pin 2) and your counter negative input to D GND (pin 35).[1]
2. Create a task using `DAQmxCreateTask`.

LabVIEW Block Diagram	NI-DAQmx Function Call
LabVIEW does not require this step.	Call `DAQmxCreateTask` with the following parameters: **taskName**: *`MyCounterOutputTask`* **taskHandle**: `&taskHandle`

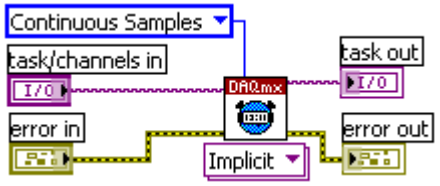
[1] Pin numbers are given for 68-pin connectors only. If you are using a BNC, DAQPad/USB screw terminal, 34-pin IDC header, 50-pin IDC header, 37-pin, or 100-pin connector, refer to your device user documentation for signal connection locations.

3. Add a counter output channel to the task using the DAQmx Create Virtual Channel VI and configure the channel.

Note Throughout the procedure, refer to the NI-DAQmx function call parameters for the LabVIEW input values.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxCreateCOPulseChanFreq` with the following parameters: **taskHandle**: `taskHandle` **counter**: `dev1/ctr0` **nameToAssignToChannel**: `CounterOutputChannel` **units**: `DAQmx_Val_Hz` **idleState**: `DAQmx_Val_Low` **initialDelay**: `0.0` **freq**: `5000000.0` **dutyCycle**: `.5`

4. Configure the counter for continuous square wave generation using the DAQmx Timing VI.

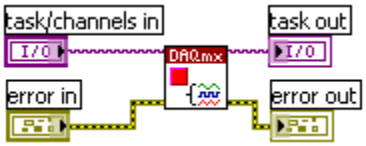
LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxCfgImplicitTiming` with the following parameters: **taskHandle**: `taskHandle` **sampleMode**: `DAQmx_Val_ContSamps` **sampsPerChan**: `10000`

5. Start the generation of a square wave using the DAQmx Start Task VI.

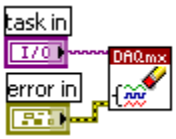
LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxStartTask` with the following parameter: **taskHandle**: `taskHandle`

The device generates a 5 MHz square wave when the VI completes execution.

6. Configure the counter to measure frequency and use a 1 MΩ impedance.
7. Take a measurement of the square wave.
8. Compare the value read by your counter to the test limits shown on the device table in the *Test Limits* section. If the value falls between these limits, the device passes the test.
9. Stop the generation using the DAQmx Stop Task VI.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxStopTask` with the following parameter: **taskHandle**: `taskHandle`

10. Clear the generation using the DAQmx Clear Task VI.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxClearTask` with the following parameter: **taskHandle**: `taskHandle`

11. Disconnect the counter from your device.

You have verified the counter on your device.

Adjustment Procedure

Use the B/E/M/S/X Series adjustment procedure to adjust the analog input and output calibration constants. At the end of each calibration procedure, these new constants are stored in the external calibration area of the EEPROM. These values are password-protected, which prevents the accidental access or modification of any calibration constants adjusted by the metrology laboratory. The default password is `NI`.

Complete the following steps to perform device adjustment with a calibrator:

1. Connect the calibrator to the device. Refer to Table 4 to determine connections between the device and the calibrator. The calibrator connections depend on the resolution of the device you are calibrating.

Note If you are using the E/M/S Series calibration hardware adapter, connect the device as described in the *E Series Calibration Fixture Installation Guide*.

Table 4. Calibrator Connections

Device	Calibrator			Additional Connections
	Positive Output*	Negative Output*	Guard Connection†	
12-Bit E Series	AI 8 (pin 34)	AI SENSE (pin 62)†	AI GND (pin 67)†	Connect AO 0 (pin 22) line to AI 0 (pin 68)
16-Bit E Series, M/X Series (MIO)‡	AI 0 (pin 68)	AI 8 (pin 34)†	AI GND (pin 67)†	—
S/X Series (Simultaneous MIO)**	AI 0 + (pin 68)	AI 0 – (pin 34)†	AI 0 GND (pin 67)†	—

* Pin numbers are given for 68-pin connectors only. If you are using a BNC, DAQPad/USB screw terminal, 34-pin IDC header, 50-pin IDC header, 37-pin, or 100-pin connector, refer to your device user documentation for signal connection locations.

† If your calibrator does not have a guard connection and has a floating output, connect the negative output to AI GND. If the calibrator output is not floating, do not make any other connections. For more information, refer to your DAQ device user documentation.

‡ NI 632*x*/634*x*/6351/6353/6361/6363 X Series MIO devices.

** NI 6356/6358/6366/6368 X Series simultaneous MIO devices.

2. Set your calibrator to output a voltage of 7.5 V.

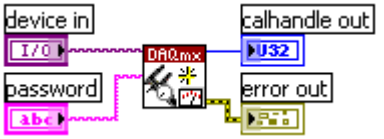
   (NI 6010 Devices) Set your calibrator to output a voltage of 3.75 V.

   (NI 6115/6120 Devices) Set your calibrator to output a voltage of 5.0 V.

   (NI 6143 Devices) Set your calibrator to output a voltage of 4.5 V.

3. Open a calibration session on your device using the DAQmx Initialize External Calibration VI. The default password is `NI`.

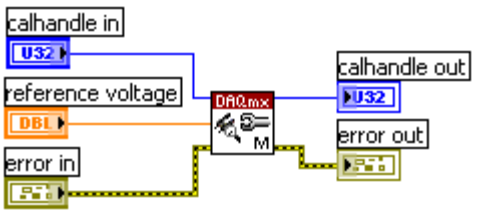
Note Throughout the procedure, refer to the NI-DAQmx function call parameters for the LabVIEW input values.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxInitExtCal` with the following parameters: **deviceName**: `dev1` **password**: `NI` **calHandle**: `&calHandle`

4. Perform an external calibration adjustment using the DAQmx Adjust *Y*-Series Calibration VI, where *Y* is the letter of the device series.

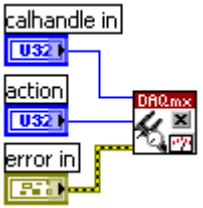
Note **(NI 6010 Devices)** Use the DAQmx Adjust M-Series Calibration VI (`DAQmxMSeriesCalAdjust`).

Note **(NI 6013/6014/6015/6016 Devices)** Use the DAQmx Adjust E-Series Calibration VI (`DAQmxESeriesCalAdjust`).

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxYSeriesCalAdjust` with the following parameters: **calHandle**: `calHandle` **referenceVoltage**: `7.5`, `3.75`, `5`, or `4.5` (based on calibrator output from step 2)

5. Save the adjustment to the EEPROM, using the DAQmx Close External Calibration VI. This VI also saves the date, time, and temperature of the adjustment to the onboard memory.

Note If an error occurs during adjustment, no constants will be written to the EEPROM.

LabVIEW Block Diagram	NI-DAQmx Function Call
	Call `DAQmxCloseExtCal` with the following parameters: **calHandle**: `calHandle` **action**: `DAQmx_Val_Action_Commit`

6. Disconnect the calibrator from the device.

The device is now calibrated with respect to your external source.

After calibrating the device, you may want to verify the analog input and output operation. To do this, repeat the *Verification Procedure* section.

Test Limits

The tables in this section list the specifications for B/E/M/S/X Series devices. The specifications are divided into analog input, analog output, and counter/timer tables of values.

The following definitions describe how to use the information from the tables in this section:

- **Range**—*Range* refers to the maximum allowable voltage range of an input or output signal.
- **Test Point**—The *Test Point* is the voltage value that is input or output for verification purposes. This value is broken down into two columns—*Location* and *Value*. *Location* refers to where the test value fits within the test range. *Value* refers to the voltage value to be verified and is in volts. *Pos FS* stands for positive full-scale and *Neg FS* stands for negative full-scale.

- **24-Hour Limits**—The values shown in the 24-hour tables are the valid specifications when a device has been calibrated with an external source. The *24-Hour Limits* column contains the *Upper Limits* and *Lower Limits* for the test point value. That is, when the device is within its 24-hour calibration interval, the test point value should fall between the upper and lower limit values. Upper and lower limits are expressed in volts or amps, depending on the device.

Note Some devices only have 1-year limits specifications.

- **1-Year Limits**—The 1-year limits display the specifications that the devices should meet if it has been one year between calibrations. The *1-Year Limits* column contains the *Upper Limits* and *Lower Limits* for the test point value. That is, when the device is within its one year calibration interval, the test point value should fall between the upper and lower limit values. Upper and lower limits are expressed in volts or amps, depending on the device.

Note (NI 6122/6123/625*x*/628*x*/6351/6353/6361/6363 Devices)
NI 6122/6123/625*x*/628*x*/6351/6353/6361/6363 devices have 2-year and 24-hour calibration intervals.

- **Counters**—It is not possible to adjust the resolution of the counters. Therefore, these values do not have a 1-year or 24-hour calibration period. However, the test point and upper and lower limits are provided for verification purposes.

B Series Test Limits

NI 6010—16-Bit Resolution

Tables 5 through 7 include values for the PCI-6010.

Table 5. NI 6010 Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–5	5	Pos FS	4.990000	4.986551	4.993449	4.984929	4.995071
–5	5	0.000000	0.000000	–0.002327	0.002327	–0.002327	0.002327
–5	5	Neg FS	–4.990000	–4.993449	–4.986551	–4.995071	–4.984929
–1	1	Pos FS	0.998000	0.997214	0.998786	0.996889	0.999111
–1	1	0.000000	0.000000	–0.000508	0.000508	–0.000508	0.000508
–1	1	Neg FS	–0.998000	–0.998786	–0.997214	–0.999111	–0.996889
–0.2	0.2	Pos FS	0.199600	0.199382	0.199818	0.199317	0.199883
–0.2	0.2	0.000000	0.000000	–0.000156	0.000156	–0.000156	0.000156
–0.2	0.2	Neg FS	–0.199600	–0.199818	–0.199382	–0.199883	–0.199317

Table 6. NI 6010 Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–5	5	Pos FS	4.990000	4.986244	4.993756	4.984623	4.995377
–5	5	0.000000	0.000000	–0.001615	0.001615	–0.001615	0.001615
–5	5	Neg FS	–4.990000	–4.993756	–4.986244	–4.995377	–4.984623

Table 7. NI 6010 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99975	5.00025

NI 6013/6014/6015/6016—16-Bit Resolution

Tables 8 through 10 include values for the PCI-6013 (analog input only), PCI-6014, DAQPad-6015, and DAQPad-6016.

Table 8. NI 6013/6014/6015/6016 Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.8	9.791572	9.808428	9.791160	9.808840
–10	10	0	0	–0.001980	0.001980	–0.001980	0.001980
–10	10	Neg FS	–9.8	–9.808428	–9.791572	–9.808840	–9.791160
–5	5	Pos FS	4.9	4.898225	4.901776	4.898019	4.901981
–5	5	0	0	–0.001001	0.001001	–0.001001	0.001001
–5	5	Neg FS	–4.9	–4.901776	–4.898225	–4.901981	–4.898019
–0.5	0.5	Pos FS	0.49	0.489557	0.490443	0.489536	0.490464
–0.5	0.5	0	0	–0.000121	0.000121	–0.000121	0.000121
–0.5	0.5	Neg FS	–0.49	–0.490443	–0.489557	–0.490464	–0.489536
–0.05	0.05	Pos FS	0.049	0.048933	0.049067	0.048931	0.049069
–0.05	0.05	0	0	–0.000034	0.000034	–0.000034	0.000034
–0.05	0.05	Neg FS	–0.049	–0.049067	–0.048933	–0.049069	–0.048931

Table 9. NI 6014/6015/6016 Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.8	9.795069	9.804931	9.794236	9.805764
–10	10	0	0	–0.002461	0.002461	–0.002461	0.002461
–10	10	Neg FS	–9.8	–9.804931	–9.795069	–9.805764	–9.794236

Table 10. NI 6013/6014/6015/6016 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

E Series Test Limits

NI 6011E—16-Bit Resolution

Tables 11 through 13 include values for the NI 6011E (PCI-MIO-16XE-50).

Table 11. NI 6011E Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.98	9.978978	9.981022	9.978559	9.981441
–10	10	0	0	–0.000443	0.000443	–0.000443	0.000443
–10	10	Neg FS	–9.98	–9.981022	–9.978978	–9.981441	–9.978559
–5	5	Pos FS	4.99	4.988739	4.991261	4.988529	4.991471
–5	5	0	0	–0.000224	0.000224	–0.000224	0.000224
–5	5	Neg FS	–4.99	–4.991261	–4.988739	–4.991471	–4.988529
–1	1	Pos FS	0.998	0.997745	0.998255	0.997703	0.998297
–1	1	0	0	–0.000048	0.000048	–0.000048	0.000048
–1	1	Neg FS	–0.998	–0.998255	–0.997745	–0.998297	–0.997703
–0.1	0.1	Pos FS	0.0998	0.099751	0.099849	0.099746	0.099854
–0.1	0.1	0	0	–0.000009	0.000009	–0.000009	0.000009
–0.1	0.1	Neg FS	–0.0998	–0.099849	–0.099751	–0.099854	–0.099746
0	10	Pos FS	9.98	9.979154	9.980846	9.978735	9.981266
0	10	0	0.02	0.019731	0.020269	0.019731	0.020270
0	5	Pos FS	4.99	4.988826	4.991174	4.988617	4.991383

Table 11. NI 6011E Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
0	5	0	0.01	0.009862	0.010138	0.009862	0.010138
0	1	Pos FS	0.998	0.997762	0.998238	0.997720	0.998280
0	1	0	0.002	0.001969	0.002031	0.001969	0.002031
0	0.1	Pos FS	0.0998	0.099752	0.099848	0.099748	0.099852
0	0.1	0	0.0002	0.000193	0.000207	0.000193	0.000207

Table 12. NI 6011E Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.9800000	9.973195	9.986805	9.972796	9.987204
–10	10	0	0.0000000	–0.005408	0.005408	–0.005408	0.005408
–10	10	Neg FS	–9.9800000	–9.986805	–9.973195	–9.987204	–9.972796
0	10	Pos FS	9.9800000	9.975637	9.984363	9.975238	9.984762
0	10	0	0.0200000	0.017031	0.022969	0.017030	0.022970

Table 13. NI 6011E Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI 6023E/6024E/6025E—12-Bit Resolution

Tables 14 through 16 include values for the PCI-6023E (analog input only), PCI-6024E, PCI-6025E, and PXI-6025E.

Table 14. NI 6023E/6024E/6025E Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.800	9.7841	9.8159	9.7837	9.8163
–10	10	0	0.000	–0.0074	0.0074	–0.0074	0.0074
–10	10	Neg FS	–9.800	–9.8159	–9.7841	–9.8163	–9.7837
–5	5	Pos FS	4.900	4.8950	4.9050	4.8948	4.9052
–5	5	0	0.000	–0.0037	0.0037	–0.0037	0.0037
–5	5	Neg FS	–4.900	–4.9050	–4.8950	–4.9052	–4.8948
–0.5	0.5	Pos FS	0.490	0.48918	0.49082	0.48916	0.49084
–0.5	0.5	0	0.000	–0.00039	0.00039	–0.00039	0.00039
–0.5	0.5	Neg FS	–0.490	–0.49082	–0.48918	–0.49084	–0.48916
–0.05	0.05	Pos FS	0.049	0.048897	0.049103	0.048895	0.049105
–0.05	0.05	0	0.000	–0.000060	0.000060	–0.000060	0.000060
–0.05	0.05	Neg FS	–0.049	–0.049103	–0.048897	–0.049105	–0.048895

Table 15. NI 6024E/6025E Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.800000	9.792335	9.807665	9.791924	9.808076
–10	10	0	0.0000000	–0.005930	0.005930	–0.005930	0.005930
–10	10	Neg FS	–9.800000	–9.807665	–9.792335	–9.808076	–9.791924

Table 16. NI 6023E/6024E/6025E Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI DAQCard-6024E—12-Bit Resolution

Tables 17 through 19 include values for the DAQCard-6024E.

Table 17. NI DAQCard-6024E Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.800	9.7816	9.8184	9.7812	9.8188
–10	10	0	0.000	–0.0099	0.0099	–0.0099	0.0099
–10	10	Neg FS	–9.800	–9.8184	–9.7816	–9.8188	–9.7812
–5	5	Pos FS	4.900	4.8937	4.9063	4.8935	4.9065
–5	5	0	0.000	–0.0049	0.0049	–0.0049	0.0049
–5	5	Neg FS	–4.900	–4.9063	–4.8937	–4.9065	–4.8935
–0.5	0.5	Pos FS	0.490	0.48906	0.49094	0.48904	0.49096
–0.5	0.5	0	0.000	–0.00051	0.00051	–0.00051	0.00051
–0.5	0.5	Neg FS	–0.490	–0.49094	–0.48906	–0.49096	–0.48904
–0.05	0.05	Pos FS	0.049	0.048884	0.049116	0.048882	0.049118
–0.05	0.05	0	0.000	–0.000073	0.000073	–0.000073	0.000073
–0.05	0.05	Neg FS	–0.049	–0.049116	–0.048884	–0.049118	–0.048882

Table 18. NI DAQCard-6024E Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.8000000	9.789895	9.810105	9.789484	9.810516
–10	10	0	0.0000000	–0.008370	0.008370	–0.008370	0.008370
–10	10	Neg FS	–9.8000000	–9.810105	–9.789895	–9.810516	–9.789484

Table 19. NI DAQCard-6024E Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI 6030E/6031E/6032E/6033E—16-Bit Resolution

Tables 20 through 22 include values for the PCI-6030E (PCI-MIO-16XE-10), PXI-6030E, PCI-6031E, PXI-6031E, PCI-6032E, and PCI-6033E.

Table 20. NI 6030E/6031E/6032E/6033E Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.98	9.979027	9.980973	9.978857	9.981143
–10	10	0	0	–0.000534	0.000534	–0.000534	0.000534
–10	10	Neg FS	–9.98	–9.980973	–9.979027	–9.981143	–9.978857
–5	5	Pos FS	4.99	4.988012	4.991988	4.987928	4.992072
–5	5	0	0	–0.000271	0.000271	–0.000271	0.000271
–5	5	Neg FS	–4.99	–4.991988	–4.988012	–4.992072	–4.987928
–2	2	Pos FS	1.996	1.995200	1.996800	1.995166	1.996834
–2	2	0	0	–0.000113	0.000113	–0.000113	0.000113
–2	2	Neg FS	–1.996	–1.996800	–1.995200	–1.996834	–1.995166
–1	1	Pos FS	0.998	0.997596	0.998404	0.997579	0.998421
–1	1	0	0	–0.000061	0.000061	–0.000061	0.000061
–1	1	Neg FS	–0.998	–0.998404	–0.997596	–0.998421	–0.997579
–0.5	0.5	Pos FS	0.499	0.498794	0.499206	0.498785	0.499215
–0.5	0.5	0	0	–0.000035	0.000035	–0.000035	0.000035
–0.5	0.5	Neg FS	–0.499	–0.499206	–0.498794	–0.499215	–0.498785

Table 20. NI 6030E/6031E/6032E/6033E Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–0.2	0.2	Pos FS	0.1996	0.199502	0.199698	0.199499	0.199701
–0.2	0.2	0	0	–0.000019	0.000019	–0.000019	0.000019
–0.2	0.2	Neg FS	–0.1996	–0.199698	–0.199502	–0.199701	–0.199499
–0.1	0.1	Pos FS	0.0998	0.099741	0.099859	0.099739	0.099861
–0.1	0.1	0	0	–0.000015	0.000015	–0.000015	0.000015
–0.1	0.1	Neg FS	–0.0998	–0.099859	–0.099741	–0.099861	–0.099739
0	10	Pos FS	9.98	9.979198	9.980802	9.979028	9.980972
0	10	0	0.02	0.019636	0.020364	0.019636	0.020364
0	5	Pos FS	4.99	4.988098	4.991902	4.988013	4.991987
0	5	0	0.01	0.009811	0.010189	0.009811	0.010189
0	2	Pos FS	1.996	1.995234	1.996766	1.995200	1.996800
0	2	0	0.004	0.003920	0.004080	0.003920	0.004080
0	1	Pos FS	0.998	0.997613	0.998387	0.997596	0.998404
0	1	0	0.002	0.001956	0.002044	0.001956	0.002044
0	0.5	Pos FS	0.499	0.498802	0.499198	0.498793	0.499207
0	0.5	0	0.001	0.000973	0.001027	0.000973	0.001027
0	0.2	Pos FS	0.1996	0.199505	0.199695	0.199502	0.199698
0	0.2	0	0.0004	0.000384	0.000416	0.000384	0.000416

Table 20. NI 6030E/6031E/6032E/6033E Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
0	0.1	Pos FS	0.0998	0.099743	0.099857	0.099741	0.099859
0	0.1	0	0.0002	0.000187	0.000213	0.000187	0.000213

Table 21. NI 6030E/6031E/6032E/6033E Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.9800000	9.978738	9.981262	9.978568	9.981432
–10	10	0	0.0000000	–0.000813	0.000813	–0.000813	0.000813
–10	10	Neg FS	–9.9800000	–9.981262	–9.978738	–9.981432	–9.978568
0	10	Pos FS	9.9800000	9.978967	9.981033	9.978797	9.981203
0	10	0	0.0200000	0.019415	0.020585	0.019415	0.020585

Table 22. NI 6030E/6031E/6032E/6033E Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI 6034E/6035E/6036E—16-Bit Resolution

Tables 23 through 26 include values for the PCI-6034E (analog input only), PCI-6035E, and PCI-6036E.

Table 23. NI 6034E/6035E/6036E Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.900	9.8929	9.9071	9.8925	9.9075
–10	10	0	0.000	–0.0017	0.0017	–0.0017	0.0017
–10	10	Neg FS	–9.900	–9.9071	–9.8929	–9.9075	–9.8925
–5	5	Pos FS	4.950	4.9484	4.9516	4.9482	4.9518
–5	5	0	0.000	–0.0009	0.0009	–0.0009	0.0009
–5	5	Neg FS	–4.950	–4.9516	–4.9484	–4.9518	–4.9482
–0.5	0.5	Pos FS	0.495	0.49462	0.49538	0.49460	0.49540
–0.5	0.5	0	0.000	–0.00011	0.00011	–0.00011	0.00011
–0.5	0.5	Neg FS	–0.495	–0.49538	–0.49462	–0.49540	–0.49460
–0.05	0.05	Pos FS	0.0495	0.049441	0.049559	0.049439	0.049561
–0.05	0.05	0	0.000	–0.000032	0.000032	–0.000032	0.000032
–0.05	0.05	Neg FS	–0.0495	–0.049559	–0.049441	–0.049561	–0.049439

Table 24. NI 6035E Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.9000000	9.892315	9.907685	9.891899	9.908101
–10	10	0	0.0000000	–0.005933	0.005933	–0.005933	0.005933
–10	10	Neg FS	–9.9000000	–9.907685	–9.892315	–9.908101	–9.891899

Table 25. NI 6036E Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.9000000	9.898009	9.901991	9.897603	9.902397
–10	10	0	0.0000000	–0.001100	0.001100	–0.001100	0.001100
–10	10	Neg FS	–9.9000000	–9.901991	–9.898009	–9.902397	–9.897603

Table 26. NI 6034E/6035E/6036E Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI DAQCard-6036E—16-Bit Resolution

Tables 27 through 29 include values for the DAQCard-6036E.

Table 27. NI DAQCard-6036E Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.900	9.8918	9.9082	9.8914	9.9086
–10	10	0	0.000	–0.0027	0.0027	–0.0027	0.0027
–10	10	Neg FS	–9.900	–9.9082	–9.8918	–9.9086	–9.8914
–5	5	Pos FS	4.950	4.9479	4.9521	4.9477	4.9523
–5	5	0	0.000	–0.0014	0.0014	–0.0014	0.0014
–5	5	Neg FS	–4.950	–4.9521	–4.9479	–4.9523	–4.9477
–0.5	0.5	Pos FS	0.495	0.49457	0.49543	0.49455	0.49545
–0.5	0.5	0	0.000	–0.00016	0.00016	–0.00016	0.00016
–0.5	0.5	Neg FS	–0.495	–0.49543	–0.49457	–0.49545	–0.49455
–0.05	0.05	Pos FS	0.0495	0.049436	0.049564	0.049434	0.049566
–0.05	0.05	0	0.000	–0.000037	0.000037	–0.000037	0.000037
–0.05	0.05	Neg FS	–0.0495	–0.049564	–0.049436	–0.049566	–0.049434

Table 28. NI DAQCard-6036E Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.9000000	9.897879	9.902121	9.897463	9.902537
–10	10	0	0.0000000	–0.001220	0.001220	–0.001220	0.001220
–10	10	Neg FS	–9.9000000	–9.902121	–9.897879	–9.902537	–9.897463

Table 29. NI DAQCard-6036E Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI 6040E—12-Bit Resolution

Tables 30 through 32 include values for the PCI-MIO-16E-4 and PXI-6040E.

Table 30. NI 6040E Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.96507	9.99493	9.96465	9.99535
–10	10	0	0.000000	–0.00823	0.00823	–0.00823	0.00823
–10	10	Neg FS	–9.980000	–9.99493	–9.96507	–9.99535	–9.96465
–5	5	Pos FS	4.99	4.98452	4.99548	4.98431	4.99569
–5	5	0	0.000000	–0.00412	0.00412	–0.00412	0.00412
–5	5	Neg FS	–4.99	–4.99548	–4.98452	–4.99569	–4.98431
–2.5	2.5	Pos FS	2.495000	2.49125	2.49875	2.49115	2.49885
–2.5	2.5	0	0.000000	–0.00207	0.00207	–0.00207	0.00207
–2.5	2.5	Neg FS	–2.495000	–2.49875	–2.49125	–2.49885	–2.49115
–1	1	Pos FS	0.998000	0.99649	0.99951	0.99645	0.99955
–1	1	0	0.000000	–0.00084	0.00084	–0.00084	0.00084
–1	1	Neg FS	–0.998000	–0.99951	–0.99649	–0.99955	0.99645
–0.5	0.5	Pos FS	0.499000	0.49823	0.49977	0.49821	0.49979
–0.5	0.5	0	0.000000	–0.00043	0.00043	–0.00043	0.00043
–0.5	0.5	Neg FS	–0.499000	–0.49977	–0.49823	–0.49979	–0.49821
–0.25	0.25	Pos FS	0.249500	0.24911	0.24989	0.24910	0.24990

Table 30. NI 6040E Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–0.25	0.25	0	0.000000	–0.00023	0.00023	–0.00023	0.00023
–0.25	0.25	Neg FS	–0.249500	–0.24989	–0.24911	–0.24990	–0.24910
–0.1	0.1	Pos FS	0.099800	0.09963	0.09997	0.09962	0.09998
–0.1	0.1	0	0.000000	–0.00011	0.00011	–0.00011	0.00011
–0.1	0.1	Neg FS	–0.099800	–0.09997	–0.09963	–0.09998	–0.09962
–0.05	0.05	Pos FS	0.049900	0.04980	0.05000	0.04980	0.05000
–0.05	0.05	0	0.000000	–0.00006	0.00006	–0.00006	0.00006
–0.05	0.05	Neg FS	–0.049900	–0.05000	–0.04980	–0.05000	–0.04980
0	10	Pos FS	9.980000	9.97316	9.98684	9.97274	9.98726
0	10	0	0.020000	0.01587	0.02413	0.01587	0.02413
0	5	Pos FS	4.990000	4.98458	4.99542	4.98437	4.99563
0	5	0	0.010000	0.00792	0.01208	0.00792	0.01208
0	2	Pos FS	1.996000	1.99382	1.99818	1.99373	1.99827
0	2	0	0.004000	0.00316	0.00484	0.00316	0.00484
0	1	Pos FS	0.998000	0.99690	0.99910	0.99686	0.99914
0	1	0	0.002000	0.00157	0.00243	0.00157	0.00243
0	0.5	Pos FS	0.499000	0.49844	0.49956	0.49842	0.49958
0	0.5	0	0.001000	0.00077	0.00123	0.00077	0.00123

Table 30. NI 6040E Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
0	0.2	Pos FS	0.199600	0.199361	0.199839	0.199352	0.199848
0	0.2	0	0.000400	0.000295	0.000505	0.000295	0.000505
0	0.1	Pos FS	0.099800	0.099669	0.099931	0.099665	0.099935
0	0.01	0	0.000200	0.000136	0.000264	0.000136	0.000264

Table 31. NI 6040E Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.98	9.972304	9.987696	9.971884	9.988116
–10	10	0	0	–0.005930	0.005930	–0.005930	0.005930
–10	10	Neg FS	–9.98	–9.987696	–9.972304	–9.988116	–9.971884
0	10	Pos FS	9.98	9.974744	9.985256	9.974324	9.985676
0	10	0	0.02	0.016506	0.023494	0.016506	0.023494

Table 32. NI 6040E Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI 6052E—16-Bit Resolution

Tables 33 through 35 include values for the PCI-6052E and PXI-6052E.

Table 33. NI 6052E Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.800	9.7955	9.8045	9.7953	9.8047
–10	10	0	0.00	–0.0010	0.0010	–0.0010	0.0010
–10	10	Neg FS	–9.800	–9.8045	–9.7955	–9.8047	–9.7953
–5	5	Pos FS	4.900	4.8992	4.9008	4.8991	4.9009
–5	5	0	0.000	–0.0005	0.0005	–0.0005	0.0005
–5	5	Neg FS	–4.900	–4.9008	–4.8992	–4.9009	–4.8991
–2.5	2.5	Pos FS	2.450	2.44887	2.45113	2.44883	2.45117
–2.5	2.5	0	0.000	–0.00026	0.00026	–0.00026	0.00026
–2.5	2.5	Neg FS	–2.450	–2.45113	–2.44887	–2.45117	–2.44883
–1	1	Pos FS	0.980	0.9795	0.9805	0.9795	0.9805
–1	1	0	0.000	–0.0001	0.0001	–0.0001	0.0001
–1	1	Neg FS	–0.980	–0.9805	–0.9795	–0.9805	–0.9795
–0.5	0.5	Pos FS	0.490	0.48977	0.49023	0.48976	0.49024
–0.5	0.5	0	0.000	–0.00006	0.00006	–0.00006	0.00006
–0.5	0.5	Neg FS	–0.490	–0.49023	–0.48977	–0.49024	–0.48976
–0.25	0.25	Pos FS	0.245	0.2449	0.2451	0.2449	0.2451

Table 33. NI 6052E Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–0.25	0.25	0	0.000	–0.0000316	0.0000316	–0.0000316	0.0000316
–0.25	0.25	Neg FS	–0.245	–0.2451	–0.2449	–0.2451	–0.2449
–0.1	0.1	Pos FS	0.098	0.09794	0.09806	0.09794	0.09806
–0.1	0.1	0	0.000	–0.0000165	0.0000165	–0.0000165	0.0000165
–0.1	0.1	Neg FS	–0.098	–0.09806	–0.09794	–0.09806	–0.09794
–0.05	0.05	Pos FS	0.049	0.048966	0.049034	0.048965	0.049035
–0.05	0.05	0	0.000	–0.000012	0.000012	–0.000012	0.000012
–0.05	0.05	Neg FS	–0.049	–0.049034	–0.048966	–0.049035	–0.048965
0	10	Pos FS	9.8	9.798951	9.801049	9.798785	9.801215
0	10	0	0.0098	0.009280	0.010320	0.009280	0.010320
0	5	Pos FS	4.9	4.898003	4.901997	4.897919	4.902081
0	5	0	0.0098	0.009534	0.010066	0.009534	0.010066
0	2	Pos FS	1.96	1.959198	1.960802	1.959165	1.960835
0	2	0	0.0098	0.009689	0.009911	0.009688	0.009912
0	1	Pos FS	0.98	0.979547	0.980453	0.979530	0.980470
0	1	0	0.0098	0.009739	0.009861	0.009739	0.009861
0	0.5	Pos FS	0.49	0.489746	0.490254	0.489738	0.490262
0	0.5	0	0.0098	0.009764	0.009836	0.009764	0.009836

Table 33. NI 6052E Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
0	0.2	Pos FS	0.196	0.195895	0.196105	0.195891	0.196109
0	0.2	0	0.0098	0.009779	0.009821	0.009779	0.009821
0	0.1	Pos FS	0.098	0.097944	0.098056	0.097942	0.098058
0	0.1	0	0.0098	0.009784	0.009816	0.009784	0.009816

Table 34. NI 6052E Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.8000000	9.798771	9.801229	9.798604	9.801396
–10	10	0	0.0000000	–0.000798	0.000798	–0.000798	0.000798
–10	10	Neg FS	–9.8000000	–9.801229	–9.798771	–9.801396	–9.798604
0	10	Pos FS	9.8000000	9.799000	9.801000	9.798833	9.801167
0	10	0	0.0098000	0.009231	0.010369	0.009230	0.010370

Table 35. NI 6052E Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI DAQCard-6062E—12-Bit Resolution

Tables 36 through 38 include values for the DAQCard-6062E.

Table 36. NI DAQCard-6062E Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.80000	9.7802	9.8198	9.7797	9.8203
–10	10	0	0.000000	–0.0108	0.0108	–0.0108	0.0108
–10	10	Neg FS	–9.80000	–9.8198	–9.7802	–9.8203	–9.7797
–5	5	Pos FS	4.900000	4.9826	4.9074	4.8924	4.9076
–5	5	0	0.000000	–0.0054	0.0054	–0.0054	0.0054
–5	5	Neg FS	–4.900000	–4.9074	–4.8926	–4.9076	–4.8924
–2.5	2.5	Pos FS	2.450000	2.44503	2.45497	2.44492	2.45508
–2.5	2.5	0	0.000000	–0.00271	0.00271	–0.00271	0.00271
–2.5	2.5	Neg FS	–2.450000	–2.45497	–2.44503	–2.45508	–2.44492
–1	1	Pos FS	0.980000	0.977997	0.982003	0.977956	0.982044
–1	1	0	0.000000	–0.001099	0.001099	–0.001099	0.001099
–1	1	Neg FS	–0.980000	–0.982003	–0.977997	–0.982044	–0.977956
–0.5	0.5	Pos FS	0.490000	0.4890	0.4910	0.4890	0.4910
–0.5	0.5	0	0.000000	–0.0006	0.0006	–0.0006	0.0006
–0.5	0.5	Neg FS	–0.490000	–0.49051	–0.48949	–0.49053	–0.48947
–0.25	0.25	Pos FS	0.245000	0.2445	0.2455	0.2445	0.2455

Table 36. NI DAQCard-6062E Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–0.25	0.25	0	0.000000	–0.0003	0.0003	–0.0003	0.0003
–0.25	0.25	Neg FS	–0.245000	–0.2455	–0.2445	–0.2455	–0.2445
–0.1	0.1	Pos FS	0.098000	0.09778	0.09822	0.09777	0.09823
–0.1	0.1	0	0.000000	–0.00013	0.00013	–0.00013	0.00013
–0.1	0.1	Neg FS	–0.098000	–0.09822	–0.09778	–0.09823	–0.09777
–0.05	0.05	Pos FS	0.049000	0.048877	0.049123	0.048875	0.049125
–0.05	0.05	0	0.000000	–0.000078	0.000078	–0.000078	0.000078
–0.05	0.05	Neg FS	–0.049000	–0.049123	–0.048877	–0.049125	–0.048875
0	10	Pos FS	9.800000	9.7907	9.8093	9.7903	9.8097
0	10	0	0.020000	0.0146	0.0254	0.0146	0.0254
0	5	Pos FS	4.900000	4.8928	4.9072	4.8926	4.9074
0	5	0	0.010000	0.0073	0.0127	0.0073	0.0127
0	2	Pos FS	1.996000	1.9571	1.9629	1.9570	1.9630
0	2	0	0.004000	0.0029	0.0051	0.0029	0.0051
0	1	Pos FS	0.980000	0.97854	0.98146	0.97850	0.98150
0	1	0	0.002000	0.00144	0.00256	0.00144	0.00256
0	0.5	Pos FS	0.490000	0.48925	0.49075	0.48923	0.49077
0	0.5	0	0.001000	0.000704	0.001296	0.000704	0.001296

Table 36. NI DAQCard-6062E Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
0	0.2	Pos FS	0.199600	0.195688	0.196312	0.195680	0.196320
0	0.2	0	0.000400	0.000269	0.000531	0.000269	0.000531
0	0.01	Pos FS	0.099800	0.0978	0.0982	0.0978	0.0982
0	0.01	0	0.000200	0.0001	0.0003	0.0001	0.0003

Table 37. NI DAQCard-6062E Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.8000000	9.789895	9.810105	9.789484	9.810516
–10	10	0	0	–0.008370	0.008370	–0.008370	0.008370
–10	10	Neg FS	–9.8000000	–9.810105	–9.789895	–9.810516	–9.789484

Table 38. NI DAQCard-6062E Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI 6070E/6071E—12-Bit Resolution

Tables 39 through 41 include values for the PCI-MIO-16E-1, PCI-6070E, PXI-6070E, PCI-6071E, and PXI-6071E.

Table 39. NI 6070E/6071E Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.96607	9.99393	9.96565	9.99435
–10	10	0	0.00000	–0.00723	0.00723	–0.00723	0.00723
–10	10	Neg FS	–9.980000	–9.99393	–9.96607	–9.99435	–9.96565
–5	5	Pos FS	4.990000	4.98502	4.99498	4.98481	4.99519
–5	5	0	0.00000	–0.00362	0.00362	–0.00362	0.00362
–5	5	Neg FS	–4.990000	–4.99498	–4.98502	–4.99519	–4.98481
–2.5	2.5	Pos FS	2.495000	2.49150	2.49850	2.49140	2.49860
–2.5	2.5	0	0.00000	–0.00182	0.00182	–0.00182	0.00182
–2.5	2.5	Neg FS	–2.495000	–2.49850	–2.49150	–2.49860	–2.49140
–1	1	Pos FS	0.998000	0.99659	0.99941	0.99655	0.99945
–1	1	0	0.00000	–0.00074	0.00074	–0.00074	0.00074
–1	1	Neg FS	–0.998000	–0.99941	–0.99659	–0.99945	–0.99655
–0.5	0.5	Pos FS	0.499000	0.49829	0.49971	0.49827	0.49973
–0.5	0.5	0	0.00000	–0.00038	0.00038	–0.00038	0.00038
–0.5	0.5	Neg FS	–0.499000	–0.49971	–0.49829	–0.49973	–0.49827

Table 39. NI 6070E/6071E Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–0.25	0.25	Pos FS	0.249500	0.24913	0.24987	0.24912	0.24988
–0.25	0.25	0	0.00000	–0.00020	0.00020	–0.00020	0.00020
–0.25	0.25	Neg FS	–0.249500	–0.24987	–0.24913	–0.24988	–0.24912
–0.1	0.1	Pos FS	0.099800	0.09964	0.09996	0.09964	0.09996
–0.1	0.1	0	0.00000	–0.00009	0.00009	–0.00009	0.00009
–0.1	0.1	Neg FS	–0.099800	–0.09996	–0.09964	–0.09996	–0.09964
–0.05	0.05	Pos FS	0.049900	0.04981	0.04999	0.04981	0.04999
–0.05	0.05	0	0.00000	–0.00006	0.00006	–0.00006	0.00006
–0.05	0.05	Neg FS	–0.049900	–0.04999	–0.04981	–0.04999	–0.04981
0	10	Pos FS	9.980000	9.97366	9.98634	9.97324	9.98676
0	10	0	0.020000	0.01637	0.02363	0.01637	0.02363
0	5	Pos FS	4.990000	4.98483	4.99517	4.98462	4.99538
0	5	0	0.010000	0.00817	0.01183	0.00817	0.01183
0	2	Pos FS	1.996000	1.99392	1.99808	1.99384	1.99816
0	2	0	0.004000	0.00326	0.00474	0.00326	0.00474
0	1	Pos FS	0.998000	0.99695	0.99905	0.99691	0.99909
0	1	0	0.002000	0.00162	0.00238	0.00162	0.00238
0	0.5	Pos FS	0.499000	0.49846	0.49954	0.49844	0.49956

Table 39. NI 6070E/6071E Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
0	0.5	0	0.001000	0.00080	0.00120	0.00080	0.00120
0	0.2	Pos FS	0.199600	0.199374	0.199826	0.199365	0.199835
0	0.2	0	0.000400	0.000308	0.000492	0.000308	0.000492
0	0.1	Pos FS	0.099800	0.099677	0.099923	0.099673	0.099927
0	0.1	0	0.000200	0.000144	0.000256	0.000144	0.000256

Table 40. NI 6070E/6071E Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.98	9.972304	9.987696	9.971884	9.988116
–10	10	0	0	–0.005930	0.005930	–0.005930	0.005930
–10	10	Neg FS	–9.98	–9.987696	–9.972304	–9.988116	–9.971884
0	10	Pos FS	9.98	9.974744	9.985256	9.974324	9.985676
0	10	0	0.02	0.016506	0.023494	0.016506	0.023494

Table 41. NI 6070E/6071E Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

M Series Test Limits

NI USB-6210/6211/6215/6218—16-Bit Resolution

Tables 42 through 44 include values for all USB-6210 (analog input only), USB-6211, USB-6215, and USB-6218 variants.

Table 42. NI USB-6210/6211/6215/6218 Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.978209	9.981791	9.977311	9.982689
–10	10	0.000000	0.000000	–0.001369	0.001369	–0.001369	0.001369
–10	10	Neg FS	–9.980000	–9.981791	–9.978209	–9.982689	–9.977311
–5	5	Pos FS	4.990000	4.989044	4.990956	4.988595	4.991405
–5	5	0.000000	0.000000	–0.000695	0.000695	–0.000695	0.000695
–5	5	Neg FS	–4.990000	–4.990956	–4.989044	–4.991405	–4.988595
–1	1	Pos FS	0.998000	0.997780	0.998220	0.997690	0.998310
–1	1	0.000000	0.000000	–0.000158	0.000158	–0.000158	0.000158
–1	1	Neg FS	–0.998000	–0.998220	–0.997780	–0.998310	–0.997690
–0.2	0.2	Pos FS	0.199600	0.199530	0.199670	0.199512	0.199688
–0.2	0.2	0.000000	0.000000	–0.000050	0.000050	–0.000050	0.000050
–0.2	0.2	Neg FS	–0.199600	–0.199670	–0.199530	–0.199688	–0.199512

Table 43. NI USB-6211/6215/6218 Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.977391	9.982609	9.976493	9.983507
–10	10	0.000000	0.000000	–0.002000	0.002000	–0.002000	0.002000
–10	10	Neg FS	–9.980000	–9.982609	–9.977391	–9.983507	–9.976493

Table 44. NI USB-6210/6211/6215/6218 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99975	5.00025

NI USB-6212/6216—16-Bit Resolution

Tables 45 through 47 include values for all USB-6212 and USB-6216 variants.

Table 45. NI USB-6212/6216 Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.978189	9.981811	9.977291	9.982709
–10	10	0.000000	0.000000	–0.001389	0.001389	–0.001389	0.001389
–10	10	Neg FS	–9.980000	–9.981811	–9.978189	–9.982709	–9.977291
–5	5	Pos FS	4.990000	4.989034	4.990966	4.988585	4.991415
–5	5	0.000000	0.000000	–0.000705	0.000705	–0.000705	0.000705
–5	5	Neg FS	–4.990000	–4.990966	–4.989034	–4.991415	–4.988585
–1	1	Pos FS	0.998000	0.997778	0.998222	0.997688	0.998312
–1	1	0.000000	0.000000	–0.000160	0.000160	–0.000160	0.000160
–1	1	Neg FS	–0.998000	–0.998222	–0.997778	–0.998312	–0.997688
–0.2	0.2	Pos FS	0.199600	0.199529	0.199671	0.199511	0.199689
–0.2	0.2	0.000000	0.000000	–0.000050	0.000050	–0.000050	0.000050
–0.2	0.2	Neg FS	–0.199600	–0.199671	–0.199529	–0.199689	–0.199511

Table 46. NI USB-6212/6216 Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.980000	9.977391	9.982609	9.976493	9.983507
–10	10	0.000000	0.000000	–0.002000	0.002000	–0.002000	0.002000
–10	10	Neg FS	–9.980000	–9.982609	–9.977391	–9.983507	–9.976493

Table 47. NI USB-6212/6216 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5.00000	4.99975	5.00025

NI 6220/6221/6224/6225/6229—16-Bit Resolution

Tables 48 through 50 include values for the PCI-6220 (analog input only), PXI-6220 (analog input only), PCI-6221 (37-pin), PCI-6221 (68-pin), PXI-6221, all USB-6221 variants, PCI-6224 (analog input only), PXI-6224 (analog input only), PCI-6225, PXI-6225, all USB-6225 variants, PCI-6229, PXI-6229, and all USB-6229 variants.

Table 48. NI 6220/6221/6224/6225/6229 Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.980000	9.977798	9.982202	9.976900	9.983100
–10	10	0	0.000000	–0.001603	0.001603	–0.001603	0.001603
–10	10	Neg FS	–9.980000	–9.982202	–9.977798	–9.983100	–9.976900
–5	5	Pos FS	4.990000	4.988834	4.991166	4.988385	4.991615
–5	5	0	0.000000	–0.000817	0.000817	–0.000817	0.000817
–5	5	Neg FS	–4.990000	–4.991166	–4.988834	–4.991615	–4.988385
–1	1	Pos FS	0.998000	0.997731	0.998269	0.997641	0.998359
–1	1	0	0.000000	–0.000189	0.000189	–0.000189	0.000189
–1	1	Neg FS	–0.998000	–0.998269	–0.997731	–0.998359	–0.997641
–0.2	0.2	Pos FS	0.199600	0.199506	0.199694	0.199488	0.199712
–0.2	0.2	0	0.000000	–0.000070	0.000070	–0.000070	0.000070
–0.2	0.2	Neg FS	–0.199600	–0.199694	–0.199506	–0.199712	–0.199488

Table 49. NI 6221/6225/6229 Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.980000	9.977671	9.982329	9.976773	9.983227
–10	10	0	0.000000	–0.001730	0.001730	–0.001730	0.001730
–10	10	Neg FS	–9.980000	–9.982329	–9.977671	–9.983227	–9.976773

Table 50. NI 6220/6221/6224/6225/6229 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99975	5.00025

NI 6250/6251/6254/6255/6259—16-Bit Resolution

Tables 51 through 53 include values for the PCI-6250 (analog input only), PXI-6250 (analog input only), PCI-6251, NI PCIe-6251, PXI-6251, NI PXIe-6251, all USB-6251 variants, PCI-6254 (analog input only), PXI-6254 (analog input only), PCI-6255, PXI-6255, all USB-6255 variants, PCI-6259, NI PCIe-6259, PXI-6259, NI PXIe-6259, and all USB-6259 variants.

Table 51. NI 6250/6251/6254/6255/6259 Analog Input Values

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.978447	9.981553	9.978078	9.981922
–10	10	0	0.000000	–0.001094	0.001094	–0.001094	0.001094
–10	10	Neg FS	–9.980000	–9.981553	–9.978447	–9.981922	–9.978078
–5	5	Pos FS	4.990000	4.989174	4.990826	4.988989	4.991011
–5	5	0	0.000000	–0.000547	0.000547	–0.000547	0.000547
–5	5	Neg FS	–4.990000	–4.990826	–4.989174	–4.991011	–4.988989
–2	2	Pos FS	1.996000	1.995663	1.996337	1.995589	1.996411
–2	2	0	0.000000	–0.000225	0.000225	–0.000225	0.000225
–2	2	Neg FS	–1.996000	–1.996337	–1.995663	–1.996411	–1.995589
–1	1	Pos FS	0.998000	0.997818	0.998182	0.997781	0.998219
–1	1	0	0.000000	–0.000117	0.000117	–0.000117	0.000117
–1	1	Neg FS	–0.998000	–0.998182	–0.997818	–0.998219	–0.997781
–0.5	0.5	Pos FS	0.499000	0.498889	0.499111	0.498870	0.499130
–0.5	0.5	0	0.000000	–0.000073	0.000073	–0.000073	0.000073

Table 51. NI 6250/6251/6254/6255/6259 Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–0.5	0.5	Neg FS	–0.499000	–0.499111	–0.498889	–0.499130	–0.498870
–0.2	0.2	Pos FS	0.199600	0.199533	0.199667	0.199526	0.199674
–0.2	0.2	0	0.000000	–0.000044	0.000044	–0.000044	0.000044
–0.2	0.2	Neg FS	–0.199600	–0.199667	–0.199533	–0.199674	–0.199526
–0.1	0.1	Pos FS	0.099800	0.099752	0.099848	0.099748	0.099852
–0.1	0.1	0	0.000000	–0.000035	0.000035	–0.000035	0.000035
–0.1	0.1	Neg FS	–0.099800	–0.099848	–0.099752	–0.099852	–0.099748

Table 52. NI 6251/6255/6259 Analog Output Values

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.978291	9.981709	9.977922	9.982078
–10	10	0	0.000000	–0.001060	0.001060	–0.001060	0.001060
–10	10	Neg FS	–9.980000	–9.981709	–9.978291	–9.982078	–9.977922
–5	5	Pos FS	4.990000	4.989141	4.990859	4.988956	4.991044
–5	5	0	0.000000	–0.000530	0.000530	–0.000530	0.000530
–5	5	Neg FS	–4.990000	–4.990859	–4.989141	–4.991044	–4.988956

Table 53. NI 6250/6251/6254/6255/6259 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99975	5.00025

NI 6280/6281/6284/6289—18-Bit Resolution

Tables 54 through 57 include values for the PCI-6280 (analog input only), PXI-6280 (analog input only), PCI-6281, PXI-6281, all USB-6281 variants, PCI-6284 (analog input only), PXI-6284 (analog input only), PCI-6289, PXI-6289, and all USB-6289 variants.

Table 54. NI 6280/6281/6284/6289 Analog Input Values (Filter On)

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.979393	9.980607	9.979023	9.980977
–10	10	0	0.000000	–0.000308	0.000308	–0.000308	0.000308
–10	10	Neg FS	–9.980000	–9.980607	–9.979393	–9.980977	–9.979023
–5	5	Pos FS	4.990000	4.989671	4.990329	4.989487	4.990513
–5	5	0	0.000000	–0.000154	0.000154	–0.000154	0.000154
–5	5	Neg FS	–4.990000	–4.990329	–4.989671	–4.990513	–4.989487
–2	2	Pos FS	1.996000	1.995865	1.996135	1.995791	1.996209
–2	2	0	0.000000	–0.000066	0.000066	–0.000066	0.000066
–2	2	Neg FS	–1.996000	–1.996135	–1.995865	–1.996209	–1.995791
–1	1	Pos FS	0.998000	0.997913	0.998087	0.997876	0.998124
–1	1	0	0.000000	–0.000042	0.000042	–0.000042	0.000042
–1	1	Neg FS	–0.998000	–0.998087	–0.997913	–0.998124	–0.997876
–0.5	0.5	Pos FS	0.499000	0.498946	0.499054	0.498928	0.499072
–0.5	0.5	0	0.000000	–0.000031	0.000031	–0.000031	0.000031
–0.5	0.5	Neg FS	–0.499000	–0.499054	–0.498946	–0.499072	–0.498928

Table 54. NI 6280/6281/6284/6289 Analog Input Values (Filter On) (Continued)

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–0.2	0.2	Pos FS	0.199600	0.199568	0.199632	0.199561	0.199639
–0.2	0.2	0	0.000000	–0.000019	0.000019	–0.000019	0.000019
–0.2	0.2	Neg FS	–0.199600	–0.199632	–0.199568	–0.199639	–0.199561
–0.1	0.1	Pos FS	0.099800	0.099775	0.099825	0.099772	0.099828
–0.1	0.1	0	0.000000	–0.000014	0.000014	–0.000014	0.000014
–0.1	0.1	Neg FS	–0.099800	–0.099825	–0.099775	–0.099828	–0.099772

Table 55. NI 6280/6281/6284/6289 Analog Input Values (Filter Off)

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.979320	9.980680	9.978950	9.981050
–10	10	0	0.000000	–0.000331	0.000331	–0.000331	0.000331
–10	10	Neg FS	–9.980000	–9.980680	–9.979320	–9.981050	–9.978950
–5	5	Pos FS	4.990000	4.989635	4.990365	4.989450	4.990550
–5	5	0	0.000000	–0.000166	0.000166	–0.000166	0.000166
–5	5	Neg FS	–4.990000	–4.990365	–4.989635	–4.990550	–4.989450
–2	2	Pos FS	1.996000	1.995850	1.996150	1.995776	1.996224
–2	2	0	0.000000	–0.000071	0.000071	–0.000071	0.000071

Table 55. NI 6280/6281/6284/6289 Analog Input Values (Filter Off) (Continued)

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–2	2	Neg FS	–1.996000	–1.996150	–1.995850	–1.996224	–1.995776
–1	1	Pos FS	0.998000	0.997905	0.998096	0.997868	0.998132
–1	1	0	0.000000	–0.000046	0.000046	–0.000046	0.000046
–1	1	Neg FS	–0.998000	–0.998096	–0.997905	–0.998132	–0.997868
–0.5	0.5	Pos FS	0.499000	0.498941	0.499059	0.498923	0.499077
–0.5	0.5	0	0.000000	–0.000034	0.000034	–0.000034	0.000034
–0.5	0.5	Neg FS	–0.499000	–0.499059	–0.498941	–0.499077	–0.498923
–0.2	0.2	Pos FS	0.199600	0.199565	0.199635	0.199558	0.199642
–0.2	0.2	0	0.000000	–0.000021	0.000021	–0.000021	0.000021
–0.2	0.2	Neg FS	–0.199600	–0.199635	–0.199565	–0.199642	–0.199558
–0.1	0.1	Pos FS	0.099800	0.099773	0.099827	0.099769	0.099831
–0.1	0.1	0	0.000000	–0.000016	0.000016	–0.000016	0.000016
–0.1	0.1	Neg FS	–0.099800	–0.099827	–0.099773	–0.099831	–0.099769

Table 56. NI 6281/6289 Analog Output Values

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.980000	9.978831	9.981169	9.978462	9.981538
–10	10	0	0.000000	–0.000740	0.000740	–0.000740	0.000740
–10	10	Neg FS	–9.980000	–9.981169	–9.978831	–9.981538	–9.978462
–5	5	Pos FS	4.990000	4.989365	4.990635	4.989181	4.990819
–5	5	0	0.000000	–0.000395	0.000395	–0.000395	0.000395
–5	5	Neg FS	–4.990000	–4.990635	–4.989365	–4.990819	–4.989181
–2	2	Pos FS	1.996000	1.995670	1.996330	1.995596	1.996404
–2	2	0	0.000000	–0.000204	0.000204	–0.000204	0.000204
–2	2	Neg FS	–1.996000	–1.996330	–1.995670	–1.996404	–1.995596
–1	1	Pos FS	0.998000	0.997778	0.998222	0.997741	0.998259
–1	1	0	0.000000	–0.000139	0.000139	–0.000139	0.000139
–1	1	Neg FS	–0.998000	–0.998222	–0.997778	–0.998259	–0.997741

Table 57. NI 6280/6281/6284/6289 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99975	5.00025

S Series Test Limits

NI 6110/6111—12-Bit Resolution

Tables 58 through 60 include values for the PCI-6110 and PCI-6111.

Table 58. NI 6110/6111 Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–42	42	Pos FS	41.58	41.3301	41.8299	41.3294	41.8306
–42	42	0	0	–0.0391	0.0391	–0.0391	0.0391
–42	42	Neg FS	–41.58	–41.8299	–41.3301	–41.8306	–41.3294
–20	20	Pos FS	19.8	19.6780	19.9220	19.6776	19.9224
–20	20	0	0	–0.0216	0.0216	–0.0216	0.0216
–20	20	Neg FS	–19.8	–19.9220	–19.6780	–19.9224	–19.6776
–10	10	Pos FS	9.9	9.8828	9.9172	9.8826	9.9174
–10	10	0	0	–0.0066	0.0066	–0.0066	0.0066
–10	10	Neg FS	–9.9	–9.9172	–9.8828	–9.9174	–9.8826
–5	5	Pos FS	4.95	4.94376	4.95624	4.94368	4.95632
–5	5	0	0	–0.00341	0.00341	–0.00341	0.00341
–5	5	Neg FS	–4.95	–4.95624	–4.94376	–4.95632	–4.94368
–2	2	Pos FS	1.95	1.94744	1.95256	1.94741	1.95259
–2	2	0	0	–0.00145	0.00145	–0.00145	0.00145
–2	2	Neg FS	–1.95	–1.95256	–1.94744	–1.95259	–1.94741

Table 58. NI 6110/6111 Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–1	1	Pos FS	0.99	0.98865	0.99135	0.98863	0.99137
–1	1	0	0	–0.00079	0.00079	–0.00079	0.00079
–1	1	Neg FS	–0.99	–0.99135	–0.98865	–0.99137	–0.98863
–0.5	0.5	Pos FS	0.495	0.494256	0.495744	0.494248	0.495752
–0.5	0.5	0	0	–0.000461	0.000461	–0.000461	0.000461
–0.5	0.5	Neg FS	–0.495	–0.495744	–0.494256	–0.495752	–0.494248
–0.2	0.2	Pos FS	0.198	0.197648	0.198352	0.197645	0.198355
–0.2	0.2	0	0	–0.000239	0.000239	–0.000239	0.000239
–0.2	0.2	Neg FS	–0.198	–0.198352	–0.197648	–0.198355	–0.197645

Table 59. NI 6110/6111 Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.99	9.982299	9.997701	9.981879	9.998121
–10	10	0	0	–0.005933	0.005933	–0.005933	0.005933
–10	10	Neg FS	–9.99	–9.997701	–9.982299	–9.998121	–9.981879

Table 60. NI 6110/6111 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI 6115—12-Bit Resolution

Tables 61 through 63 include values for the PCI-6115 and PXI-6115.

Table 61. NI 6115 Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–42	42	Pos FS	41.16	40.980986	41.339014	40.980163	41.339837
–42	42	0	0	–0.036600	0.036600	–0.036600	0.036600
–42	42	Neg FS	–41.16	–41.339014	–40.980986	–41.339837	–40.980163
–20	20	Pos FS	19.6	19.532484	19.667516	19.532092	19.667908
–20	20	0	0	–0.014400	0.014400	–0.014400	0.014400
–20	20	Neg FS	–19.6	–19.667516	–19.532484	–19.667908	–19.532092
–10	10	Pos FS	9.8	9.790032	9.809968	9.789836	9.810164
–10	10	0	0	–0.007420	0.007420	–0.007420	0.007420
–10	10	Neg FS	–9.8	–9.809968	–9.790032	–9.810164	–9.789836
–5	5	Pos FS	4.9	4.895456	4.904544	4.895358	4.904642
–5	5	0	0	–0.003760	0.003760	–0.003760	0.003760
–5	5	Neg FS	–4.9	–4.904544	–4.895456	–4.904642	–4.895358
–2	2	Pos FS	1.96	1.957834	1.962166	1.957795	1.962205
–2	2	0	0	–0.001460	0.001460	–0.001460	0.001460
–2	2	Neg FS	–1.96	–1.962166	–1.957834	–1.962205	–1.957795
–1	1	Pos FS	0.98	0.978809	0.981191	0.978789	0.981211

Table 61. NI 6115 Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–1	1	0	0	–0.000770	0.000770	–0.000770	0.000770
–1	1	Neg FS	–0.98	–0.981191	–0.978809	–0.981211	–0.978789
–0.5	0.5	Pos FS	0.49	0.489305	0.490695	0.489295	0.490705
–1	1	0	0	–0.000411	0.000411	–0.000411	0.000411
–1	1	Neg FS	–0.49	–0.490695	–0.489305	–0.490705	–0.489295
–0.2	0.2	Pos FS	0.196	0.195609	0.196391	0.195605	0.196395
–0.2	0.2	0	0	–0.000189	0.000189	–0.000189	0.000189
–0.2	0.2	Neg FS	–0.196	–0.196391	–0.195609	–0.196395	–0.195605

Table 62. NI 6115 Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.8	9.786817	9.813183	9.786651	9.813349
–10	10	0	0	–0.008900	0.008900	–0.008900	0.008900
–10	10	Neg FS	–9.8	–9.813183	–9.786817	–9.813349	–9.786651

Table 63. NI 6115 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI 6120—16-Bit Resolution

Tables 64 through 66 include values for the PCI-6120 and PXI-6120.

Table 64. NI 6120 Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–42	42	Pos FS	41.16	41.086432	41.233568	41.085732	41.234268
–42	42	0	0	–0.008906	0.008906	–0.008906	0.008906
–42	42	Neg FS	–41.16	–41.233568	–41.086432	–41.234268	–41.085732
–20	20	Pos FS	19.6	19.569232	19.630768	19.568899	19.631101
–20	20	0	0	–0.003563	0.003563	–0.003563	0.003563
–20	20	Neg FS	–19.6	–19.630768	–19.569232	–19.631101	–19.568899
–10	10	Pos FS	9.8	9.795013	9.804987	9.794846	9.805154
–10	10	0	0	–0.001783	0.001783	–0.001783	0.001783
–10	10	Neg FS	–9.8	–9.804987	–9.795013	–9.805154	–9.794846
–5	5	Pos FS	4.9	4.897360	4.902640	4.897276	4.902724
–5	5	0	0	–0.000906	0.000906	–0.000906	0.000906
–5	5	Neg FS	–4.9	–4.902640	–4.897360	–4.902724	–4.897276
–2	2	Pos FS	1.96	1.958832	1.961168	1.958801	1.961199
–2	2	0	0	–0.000397	0.000397	–0.000397	0.000397
–2	2	Neg FS	–1.96	–1.961168	–1.958832	–1.961199	–1.958801
–1	1	Pos FS	0.98	0.978951	0.981049	0.978934	0.981066

Table 64. NI 6120 Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–1	1	0	0	–0.000294	0.000294	–0.000294	0.000294
–1	1	Neg FS	–0.98	–0.981049	–0.978951	–0.981066	–0.978934
–0.5	0.5	Pos FS	0.49	0.489316	0.490684	0.489307	0.490693
–0.5	0.5	0	0	–0.000194	0.000194	–0.000194	0.000194
–0.5	0.5	Neg FS	–0.49	–0.490684	–0.489316	–0.490693	–0.489307
–0.2	0.2	Pos FS	0.196	0.195661	0.196339	0.195658	0.196342
–0.2	0.2	0	0	–0.000098	0.000098	–0.000098	0.000098
–0.2	0.2	Neg FS	–0.196	–0.196339	–0.195661	–0.196342	–0.195658

Table 65. NI 6120 Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.8	9.793128	9.806872	9.792961	9.807039
–10	10	0	0	–0.001864	0.001864	–0.001864	0.001864
–10	10	Neg FS	–9.8	–9.806872	–9.793128	–9.807039	–9.792961

Table 66. NI 6120 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI 6122/6123—16-Bit Resolution

Tables 67 and 68 include values for the PCI-6122, PXI-6122, PCI-6123, and PXI-6123 (analog input only).

Table 67. NI 6122/6123 Analog Input Values

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.95	9.945926	9.954074	9.945647	9.954353
–10	10	0	0	–0.002880	0.002880	–0.002880	0.002880
–10	10	Neg FS	–9.95	–9.954074	–9.945926	–9.954353	–9.945647
–5	5	Pos FS	4.95	4.947896	4.952104	4.947757	4.952243
–5	5	0	0	–0.001510	0.001510	–0.001510	0.001510
–5	5	Neg FS	–4.95	–4.952104	–4.947896	–4.952243	–4.947757
–2.5	2.5	Pos FS	2.45	2.448836	2.451164	2.448768	2.451232
–2.5	2.5	0	0	–0.000858	0.000858	–0.000858	0.000858
–2.5	2.5	Neg FS	–2.45	–2.451164	–2.448836	–2.451232	–2.448768
–1.25	1.25	Pos FS	1.2	1.199386	1.200614	1.199353	1.200647
–1.25	1.25	0	0	–0.000464	0.000464	–0.000464	0.000464
–1.25	1.25	Neg FS	–1.2	–1.200614	–1.199386	–1.200647	–1.199353

Table 68. NI 6122/6123 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI PXIe-6124—16-Bit Resolution

Tables 69 through 71 include values for the NI PXIe-6124.

Table 69. NI PXIe-6124 Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.95	9.947151	9.952849	9.946863	9.953137
–10	10	0	0	–0.001217	0.001217	–0.001217	0.001217
–10	10	Neg FS	–9.95	–9.952849	–9.947151	–9.953137	–9.946863
–5	5	Pos FS	4.975	4.973513	4.976487	4.973369	4.976631
–5	5	0	0	–0.000621	0.000621	–0.000621	0.000621
–5	5	Neg FS	–4.975	–4.976487	–4.973513	–4.976631	–4.973369
–2	2	Pos FS	1.99	1.989346	1.990654	1.989289	1.990711
–2	2	0	0	–0.000268	0.000268	–0.000268	0.000268
–2	2	Neg FS	–1.99	–1.990654	–1.989346	–1.990711	–1.989289
–1	1	Pos FS	0.995	0.994638	0.995362	0.994609	0.995391
–1	1	0	0	–0.000149	0.000149	–0.000149	0.000149
–1	1	Neg FS	–0.995	–0.995362	–0.994638	–0.995391	–0.994609

Table 70. NI PXIe-6124 Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.95	9.946739	9.953261	9.946451	9.953550
–10	10	0	0	–0.001460	0.001460	–0.001460	0.001460
–10	10	Neg FS	–9.95	–9.953261	–9.946739	–9.953550	–9.946451

Table 71. NI PXIe-6124 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99975	5.00025

NI 6132/6133—14-Bit Resolution

Tables 72 and 73 include values for the PCI-6132, PXI-6132, PCI-6133, and PXI-6133 (analog input only).

Table 72. NI 6132/6133 Analog Input Values

Range (V)		Test Point		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.8	9.7958	9.8042
–10	10	0	0	–0.0024	0.0024
–10	10	Neg FS	–9.8	–9.8042	–9.7958
–5	5	Pos FS	4.9	4.8978	4.9022
–5	5	0	0	–0.0012	0.0012
–5	5	Neg FS	–4.9	–4.9022	–4.8978
–2.5	2.5	Pos FS	2.45	2.44875	2.45125
–2.5	2.5	0	0	–0.00067	0.00067
–2.5	2.5	Neg FS	–2.45	–2.45125	–2.44875
–1.25	1.25	Pos FS	1.225	1.22432	1.22568
–1.25	1.25	0	0	–0.00036	0.00036
–1.25	1.25	Neg FS	–1.225	–1.22568	–1.22432

Table 73. NI 6132/6133 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

NI 6143—16-Bit Resolution

Tables 74 and 75 include values for the PCI-6143 and PXI-6143 (analog input only).

Table 74. NI 6143 Analog Input Values

Range (V)		Test Point		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–5	5	Pos FS	4.95	4.946455	4.953545
–5	5	0	0	–0.000708	0.000708
–5	5	Neg FS	–4.95	–4.953545	–4.946455

Table 75. NI 6143 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99950	5.00050

X Series Test Limits

NI 632*x*—16-Bit Resolution

Tables 76 through 78 include values for the NI PCIe-6320 (analog input only), NI PCIe-6321, and NI PCIe-6323 X Series MIO devices.

Table 76. NI 6320/6321/6323 Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.978701	9.981299	9.977803	9.982197
–10	10	0.000000	0.000000	–0.000977	0.000977	–0.000977	0.000977
–10	10	Neg FS	–9.980000	–9.981299	–9.978701	–9.982197	–9.977803
–5	5	Pos FS	4.990000	4.989310	4.990690	4.988861	4.991139
–5	5	0.000000	0.000000	–0.000494	0.000494	–0.000494	0.000494
–5	5	Neg FS	–4.990000	–4.990690	–4.989310	–4.991139	–4.988861
–1	1	Pos FS	0.998000	0.997840	0.998160	0.997750	0.998250
–1	1	0.000000	0.000000	–0.000115	0.000115	–0.000115	0.000115
–1	1	Neg FS	–0.998000	–0.998160	–0.997840	–0.998250	–0.997750
–0.2	0.2	Pos FS	0.199600	0.199549	0.199651	0.199531	0.199669
–0.2	0.2	0.000000	0.000000	–0.000036	0.000036	–0.000036	0.000036
–0.2	0.2	Neg FS	–0.199600	–0.199651	–0.199549	–0.199669	–0.199531

Table 77. NI 6321/6323 Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.980000	9.977630	9.982370	9.976732	9.983268
–10	10	0.000000	0.000000	–0.001858	0.001858	–0.001858	0.001858
–10	10	Neg FS	–9.980000	–9.982370	–9.977630	–9.983268	–9.976732

Table 78. NI 6320/6321/6323 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99975	5.00025

NI 634*x*—16-Bit Resolution

Tables 79 through 81 include values for the NI PCIe-6341, NI PXIe-6341, NI USB-6341, NI PCIe-6343, and NI USB-6343 X Series MIO devices.

Table 79. NI 6341/6343 Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.980000	9.978710	9.981290	9.977811	9.982189
–10	10	0.000000	0.000000	–0.000968	0.000968	–0.000968	0.000968
–10	10	Neg FS	–9.980000	–9.981290	–9.978710	–9.982189	–9.977811
–5	5	Pos FS	4.990000	4.989320	4.990680	4.988871	4.991129
–5	5	0.000000	0.000000	–0.000484	0.000484	–0.000484	0.000484
–5	5	Neg FS	–4.990000	–4.990680	–4.989320	–4.991129	–4.988871
–1	1	Pos FS	0.998000	0.997851	0.998149	0.997761	0.998239
–1	1	0.000000	0.000000	–0.000104	0.000104	–0.000104	0.000104
–1	1	Neg FS	–0.998000	–0.998149	–0.997851	–0.998239	–0.997761
–0.2	0.2	Pos FS	0.199600	0.199560	0.199640	0.199542	0.199658
–0.2	0.2	0.000000	0.000000	–0.000025	0.000025	–0.000025	0.000025
–0.2	0.2	Neg FS	–0.199600	–0.199640	–0.199560	–0.199658	–0.199542

Table 80. NI 6341/6343 Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	**Maximum**	**Location**	**Value (V)**	**Lower Limit (V)**	**Upper Limit (V)**	**Lower Limit (V)**	**Upper Limit (V)**
–10	10	Pos FS	9.980000	9.977630	9.982370	9.976732	9.983268
–10	10	0.000000	0.000000	–0.001858	0.001858	–0.001858	0.001858
–10	10	Neg FS	–9.980000	–9.982370	–9.977630	–9.983268	–9.976732

Table 81. NI 6341/6343 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99975	5.00025

NI 6351/6353—16-Bit Resolution

Tables 82 through 84 include values for the NI PCIe-6351, NI USB-6351, NI PCIe-6353, and NI USB-6353 X Series MIO devices.

Table 82. NI 6351/6353 Analog Input Values

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.978852	9.981148	9.978483	9.981517
–10	10	0.000000	0.000000	–0.000808	0.000808	–0.000808	0.000808
–10	10	Neg FS	–9.980000	–9.981148	–9.978852	–9.981517	–9.978483
–5	5	Pos FS	4.990000	4.989391	4.990609	4.989207	4.990793
–5	5	0.000000	0.000000	–0.000404	0.000404	–0.000404	0.000404
–5	5	Neg FS	–4.990000	–4.990609	–4.989391	–4.990793	–4.989207
–2	2	Pos FS	1.996000	1.995750	1.996250	1.995677	1.996323
–2	2	0.000000	0.000000	–0.000168	0.000168	–0.000168	0.000168
–2	2	Neg FS	–1.996000	–1.996250	–1.995750	–1.996323	–1.995677
–1	1	Pos FS	0.998000	0.997858	0.998142	0.997821	0.998179
–1	1	0.000000	0.000000	–0.000091	0.000091	–0.000091	0.000091
–1	1	Neg FS	–0.998000	–0.998142	–0.997858	–0.998179	–0.997821
–0.5	0.5	Pos FS	0.499000	0.498924	0.499076	0.498905	0.499095
–0.5	0.5	0.000000	0.000000	–0.000049	0.000049	–0.000049	0.000049
–0.5	0.5	Neg FS	–0.499000	–0.499076	–0.498924	–0.499095	–0.498905

Table 82. NI 6351/6353 Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–0.2	0.2	Pos FS	0.199600	0.199558	0.199642	0.199550	0.199650
–0.2	0.2	0.000000	0.000000	–0.000026	0.000026	–0.000026	0.000026
–0.2	0.2	Neg FS	–0.199600	–0.199642	–0.199558	–0.199650	–0.199550
–0.1	0.1	Pos FS	0.099800	0.099772	0.099828	0.099768	0.099832
–0.1	0.1	0.000000	0.000000	–0.000019	0.000019	–0.000019	0.000019
–0.1	0.1	Neg FS	–0.099800	–0.099828	–0.099772	–0.099832	–0.099768

Table 83. NI 6351/6353 Analog Output Values

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.978481	9.981519	9.978112	9.981888
–10	10	0.000000	0.000000	–0.000990	0.000990	–0.000990	0.000990
–10	10	Neg FS	–9.980000	–9.981519	–9.978481	–9.981888	–9.978112
–5	5	Pos FS	4.990000	4.989251	4.990749	4.989066	4.990934
–5	5	0.000000	0.000000	–0.000495	0.000495	–0.000495	0.000495
–5	5	Neg FS	–4.990000	–4.990749	–4.989251	–4.990934	–4.989066

Table 84. NI 6351/6353 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99975	5.00025

NI 6356/6358/6366/6368—16-Bit Resolution

Tables 85 through 87 include values for the NI PXIe-6356, NI USB-6356, NI PXIe-6358, NI PXIe-6366, NI USB-6366, and NI PXIe-6368 X Series simultaneous MIO devices.

Table 85. NI 6356/6358/6366/6368 Analog Input Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.978404	9.981596	9.977506	9.982495
–10	10	0.000000	0.000000	–0.000968	0.000968	–0.000968	0.000968
–10	10	Neg FS	–9.980000	–9.981596	–9.978404	–9.982495	–9.977506
–5	5	Pos FS	4.990000	4.989162	4.990838	4.988713	4.991287
–5	5	0.000000	0.000000	–0.000489	0.000489	–0.000489	0.000489
–5	5	Neg FS	–4.990000	–4.990838	–4.989162	–4.991287	–4.988713
–2	2	Pos FS	1.996000	1.995652	1.996348	1.995473	1.996527
–2	2	0.000000	0.000000	–0.000208	0.000208	–0.000208	0.000208
–2	2	Neg FS	–1.996000	–1.996348	–1.995652	–1.996527	–1.995473
–1	1	Pos FS	0.998000	0.997799	0.998201	0.997710	0.998290
–1	1	0.000000	0.000000	–0.000113	0.000113	–0.000113	0.000113
–1	1	Neg FS	–0.998000	–0.998201	–0.997799	–0.998290	–0.997710

Table 86. NI 6356/6358/6366/6368 Analog Output Values

Range (V)		Test Point		24-Hour Limits		1-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.977832	9.982168	9.976934	9.983066
–10	10	0.000000	0.000000	–0.001300	0.001300	–0.001300	0.001300
–10	10	Neg FS	–9.980000	–9.982168	–9.977832	–9.983066	–9.976934
–5	5	Pos FS	4.990000	4.988926	4.991074	4.988477	4.991523
–5	5	0.000000	0.000000	–0.000650	0.000650	–0.000650	0.000650
–5	5	Neg FS	–4.990000	–4.991074	–4.988926	–4.991523	–4.988477

Table 87. NI 6356/6358/6366/6368 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99975	5.00025

NI 6361/6363—16-Bit Resolution

Tables 88 through 90 include values for the NI PCIe-6361, NI PXIe-6361, NI USB-6361, NI PCIe-6363, NI PXIe-6363, and NI USB-6363 X Series MIO devices.

Table 88. NI 6361/6363 Analog Input Values

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.978711	9.981289	9.978342	9.981658
–10	10	0.000000	0.000000	–0.000949	0.000949	–0.000949	0.000949
–10	10	Neg FS	–9.980000	–9.981289	–9.978711	–9.981658	–9.978342
–5	5	Pos FS	4.990000	4.989321	4.990679	4.989136	4.990864
–5	5	0.000000	0.000000	–0.000475	0.000475	–0.000475	0.000475
–5	5	Neg FS	–4.990000	–4.990679	–4.989321	–4.990864	–4.989136
–2	2	Pos FS	1.996000	1.995722	1.996278	1.995648	1.996352
–2	2	0.000000	0.000000	–0.000196	0.000196	–0.000196	0.000196
–2	2	Neg FS	–1.996000	–1.996278	–1.995722	–1.996352	–1.995648
–1	1	Pos FS	0.998000	0.997844	0.998156	0.997807	0.998193
–1	1	0.000000	0.000000	–0.000105	0.000105	–0.000105	0.000105
–1	1	Neg FS	–0.998000	–0.998156	–0.997844	–0.998193	–0.997807
–0.5	0.5	Pos FS	0.499000	0.498917	0.499083	0.498898	0.499102
–0.5	0.5	0.000000	0.000000	–0.000056	0.000056	–0.000056	0.000056
–0.5	0.5	Neg FS	–0.499000	–0.499083	–0.498917	–0.499102	–0.498898
–0.2	0.2	Pos FS	0.199600	0.199555	0.199645	0.199547	0.199653

Table 88. NI 6361/6363 Analog Input Values (Continued)

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–0.2	0.2	0.000000	0.000000	–0.000029	0.000029	–0.000029	0.000029
–0.2	0.2	Neg FS	–0.199600	–0.199645	–0.199555	–0.199653	–0.199547
–0.1	0.1	Pos FS	0.099800	0.099771	0.099829	0.099767	0.099833
–0.1	0.1	0.000000	0.000000	–0.000020	0.000020	–0.000020	0.000020
–0.1	0.1	Neg FS	–0.099800	–0.099829	–0.099771	–0.099833	–0.099767

Table 89. NI 6361/6363 Analog Output Values

Range (V)		Test Point		24-Hour Limits		2-Year Limits	
Minimum	Maximum	Location	Value (V)	Lower Limit (V)	Upper Limit (V)	Lower Limit (V)	Upper Limit (V)
–10	10	Pos FS	9.980000	9.978481	9.981519	9.978112	9.981888
–10	10	0.000000	0.000000	–0.000990	0.000990	–0.000990	0.000990
–10	10	Neg FS	–9.980000	–9.981519	–9.978481	–9.981888	–9.978112
–5	5	Pos FS	4.990000	4.989251	4.990749	4.989066	4.990934
–5	5	0.000000	0.000000	–0.000495	0.000495	–0.000495	0.000495
–5	5	Neg FS	–4.990000	–4.990749	–4.989251	–4.990934	–4.989066

Table 90. NI 6361/6363 Counter Values

Set Point (MHz)	Lower Limit (MHz)	Upper Limit (MHz)
5	4.99975	5.00025

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