GETTING STARTED GUIDE
NI Picture Quality Analysis

National Instruments Picture Quality Analysis (NI PQA) software provides customizable analysis of streaming video and audio. You can configure and run NI PQA tests using NI PQA Executive, NI TestStand, or LabVIEW.

When configuring NI PQA tests using TestStand or LabVIEW, you can use the NI PQA Configuration panel within the application environment to configure your test. The NI PQA Configuration panel functions similarly to NI PQA Executive, except your purpose in using each differs.

- Use the NI PQA Configuration panel within TestStand or LabVIEW with the purpose of configuring tests and checking and testing your configurations. You will then run the tests in TestStand or LabVIEW.
- Use NI PQA Executive with the purpose of completing the entire process, from configuration to running tests to reporting and analysis, within NI PQA Executive.

You can configure the following analysis components using NI PQA.

- A provider, which is also known as the test stream source
- A media reference stream or data reference stream to compare with your test stream
- A trigger to synchronize the test stream and the reference stream
- One or more processors to calculate metrics, such as blockiness or total harmonic distortion (THD), or to perform functions on the test stream, such as channeling a test stream to a `.avi` file or to the output channels of an NI-DAQ™mx-compatible device
- Output of one or more metrics calculated by the selected processors

Refer to the *NI Picture Quality Analysis Help* for more information about the features available in NI PQA.

NATIONAL INSTRUMENTS™

Contents

Conventions

The following conventions are used in this manual:

»	The **»** symbol leads you through nested menu items and dialog box options to a final action. The sequence **Options»Settings»General** directs you to pull down the **Options** menu, select the **Settings** item, and select **General** from the last dialog box.
	This icon denotes a tip, which alerts you to advisory information.
	This icon denotes a note, which alerts you to important information.
bold	Bold text denotes items that you must select or click in the software, such as buttons, menu items, tab names, listbox names, and dialog box options. Bold text also denotes parameter names.
Data reference stream	This NI PQA component is a prerecorded set of calculations that allows you to perform calculations relative to a test stream without using the bandwidth for streaming the reference media or duplicating calculations on the reference stream for each test.
italic	Italic text denotes variables, emphasis, or a cross-reference. Italic text also denotes text that is a placeholder for a word or value that you must supply.
Media reference stream	This NI PQA component is a prerecorded media stream to which you can compare your test stream.
Metric	This NI PQA component is a measurement, calculated by a processor, that you can use to evaluate your test stream.
Multipoint metric	This NI PQA component is a measurement that contains multiple data points per video frame.
`monospace`	Text in this font 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.
NI PQA Configuration panel	Similar in appearance and functionality to NI PQA Executive, this is a configuration panel used within TestStand or LabVIEW to create and test new NI PQA configurations for use in test sequences and applications.
NI PQA Executive	This is a standalone application for acquiring and analyzing video and audio test streams.

Platform	Text in this font denotes a specific platform and indicates that the text following it applies only to that platform.
Processor	This NI PQA component processes the acquired test stream during an NI PQA analysis session. The processor either calculates metrics or performs a task.
Provider	This NI PQA component provides the test stream for an NI PQA analysis session.
Reference stream	This NI PQA component is a stream, either a media reference stream or a data reference stream, to which NI PQA can compare the test stream for analysis.
Session	This NI PQA component is a grouping of information related to an NI PQA test, including any files generated by that test.
Single-point metric	This NI PQA component is a measurement that contains one data point per video frame.
Trigger	This NI PQA component is a condition that you specify NI PQA must match in the test stream before processing and/or streaming to disk starts.

1. Verifying System Requirements

Verify that your system meets the minimum or recommended system requirements to use NI PQA. Also verify that you have a valid serial number to activate NI PQA. For more information about NI PQA requirements, refer to the *NI Picture Quality Analysis Readme*, which is available on the NI PQA media.

2. Verifying the Kit Contents

Verify that the kit contains the following items:

☐ NI Picture Quality Analysis software media, which includes the following documents:

 – *NI Picture Quality Analysis Help*–Contains instructions for using NI PQA software. This help file also contains information about programming and fundamentals. Select **Start»All Programs»National Instruments»NI Picture Quality Analysis»Documentation»NI Picture Quality Analysis Help** to view this document after installing NI PQA.

 – *NI Picture Quality Analysis Readme*–Contains system and hardware requirements, file names and locations, and information about new features, known issues, and bug fixes. Select **Start»All Programs»National Instruments»NI Picture Quality Analysis»Documentation»NI PQA Readme** to view this document after installing NI PQA. You can also view the readme prior to installation by selecting **View Readme** from the NI PQA installation splash screen.

☐ *NI Picture Quality Analysis Getting Started Guide* (this document)–In addition to the printed copy shipped with NI PQA, you can also view a PDF on your computer. Select **Start»All Programs»National Instruments»NI Picture Quality Analysis»Documentation»NI Picture Quality Analysis Getting Started Guide** to view this document after installing NI PQA.

Other Required Items

In addition to the items contained in the kit, you need any hardware, drivers, and cables required for the provider you plan to use. You also need software media for any application environments you plan to use to automate NI PQA tests. Refer to the *NI Picture Quality Analysis Readme* for supported application environments and hardware, driver, and cable requirements.

3. Installing the Software

Complete the following steps to install NI PQA:

1. Install any application environments in which you will use NI PQA. You can use NI PQA in LabVIEW or TestStand.

2. Insert the NI PQA media. The NI PQA installer should open automatically. If not, select **Start»Run**, and enter `x:\setup.exe`, where *x* is the letter of the media drive.

3. Follow the instructions in the installation prompts.

   (Windows 7/Vista) You might see access and security messages during installation. Accept the prompts to complete the installation.

4. Activating the Software

If you have not already activated NI PQA from the installer, complete the following steps to activate NI PQA:

1. Launch the NI License Manager at **Start»All Programs»National Instruments» NI License Manager**.

2. Navigate in the product tree to NI PQA, which is located at **Local Licenses»Picture Quality Analysis *X.X*»NI PQA**.

3. Right-click **NI PQA** and select **Activate** to launch the NI Activation Wizard.

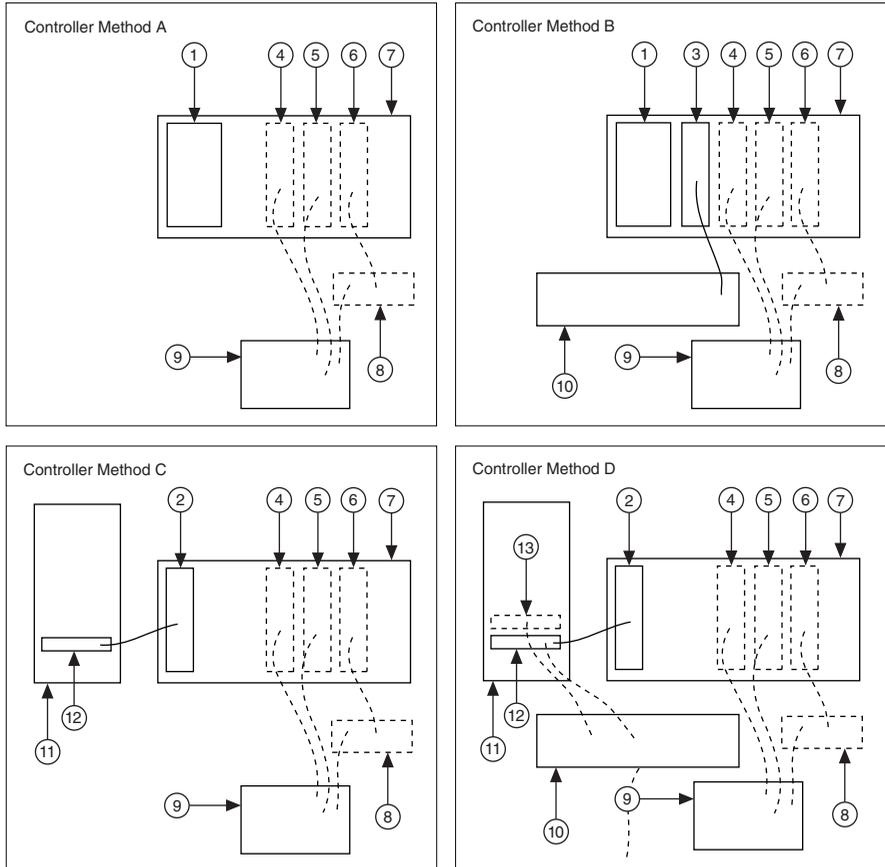4. Follow the instructions in the NI Activation Wizard to activate NI PQA.

Refer to the *NI Picture Quality Analysis Help* for additional information about software activation.

5. Installing and Configuring the Hardware

Refer to Figure 1 and complete the following steps to set up a recommended system using all of the hardware that you determined that you need in section *2. Verifying the Kit Contents*.

Figure 1 illustrates four methods for setting up the controller for your NI PQA test system. You can control your system using an embedded controller or a computer, and you can connect a redundant array of independent disks (RAID) to either controller method for additional memory.

Figure 1. NI PQA Hardware Setup Using Four Different Controller Methods

1	Embedded NI PXI Express Controller	8	(Optional) NI CB-2180/2181 Digital Audio Accessory
2	NI PXIe-8371/8372/8375 MXI Express Interface	9	Device Under Test
3	NI PXIe-8262 Expansion Module	10	Redundant Array of Independent Disks (RAID)
4	(Optional) NI PXIe-1491 Module	11	Computer
5	(Optional) NI-DAQmx Device	12	NI PCI-8371/8372/8375 MXI Express Interface
6	(Optional) NI PXI-7813R Device	13	(Optional) NI PCI-8371 MXI Express Interface
7	NI PXI Express Chassis		

1. Power off and unplug all hardware, including the chassis, computer, PXI Express controller, and/or RAIDs.

2. Set up the chassis controller and/or RAID using one of the following methods:

   - **Controller Method A**—To use an embedded controller, install the PXI Express controller in Slot 1 of the PXI Express chassis.

   - **Controller Method B**—To use an embedded controller with an NI HDD-8265 or similar external RAID, complete the following steps to set up the controller and the RAID:

     1) Install the PXI Express controller in Slot 1 of the PXI Express chassis.

     2) Install the NI PXIe-8262 in an express slot in the chassis.

     3) Use the copper cable connected to the RAID to connect it to the NI PXIe-8262.

   - **Controller Method C**—To use a computer, install the PCI Express and PXI Express modules of the NI PCI/PXIe-8371/8372/8375 in any express slot in the computer and in Slot 1 of the PXI Express chassis, respectively.

   - **Controller Method D**—To use a computer with an NI HDD-8265 or similar external RAID, complete the following steps to set up the controller and the RAID:

     1) Install the PCI Express and PXI Express modules of the NI PCI/PXIe-8371/8372/8375 in any express slot in the computer and in Slot 1 of the PXI Express chassis, respectively.

     2) Use the copper cable connected to the RAID to connect it to the second port in the NI PCI-8372 module in the computer or to a separate NI PCI-8371 installed in a second PCI Express slot in the computer.

3. (Optional) If you are testing video or HDMI audio, install the NI PXIe-1491 in any PXI Express slot in the chassis, then connect the HDMI input connector on the NI PXIe-1491 to the HDMI output connector on the device under test (DUT) using an HDMI cable.

4. (Optional) If you are testing S/PDIF audio, install the NI PXI-7813R in any PXI slot in the chassis, then connect the NI PXI-7813R to your DUT using one of the following methods:

   - To connect one or more DUTs that have BNC or TOSLINK connectors, complete the following steps:

     1) Connect any DIO connector on the NI PXI-7813R to the NI CB-2180 or NI CB-2181 using an SHS68-C68-S cable.

     2) Connect the NI CB-2180/2181 to the DUT(s) using the appropriate cable(s) for your DUT(s). You can connect up to four NI CB-2180/2181 accessories to one NI PXI-7813R.

   - To connect one or more DUTs that have XLR connectors, complete the following steps:

     1) Connect any DIO connector on the NI PXI-7813R to the NI CB-2181 using an SHS68-C68-S cable.

     2) Connect the NI CB-2181 to the DUT(s) using the appropriate cable(s) for your DUT(s). You can connect up to four NI CB-2181 accessories to one NI PXI-7813R.

   - To connect one DUT that has a VHDCI connector or that can be converted to connect to a VHDCI connector using a cable, connect any DIO connector on the NI PXI-7813R to your DUT using the appropriate cable for your DUT.

5. (Optional) If you are testing analog audio, install the NI-DAQmx device in any compatible slot in the chassis, then connect the NI-DAQmx device to the DUT using the appropriate cable for your NI-DAQmx device.

6. Power on the chassis.

7. Power on the computer.

8. Configure all hardware according to the hardware documentation.

6. Deciding Whether to Automate NI PQA Tests

If you plan to monitor your NI PQA tests closely from configuration until the final analysis of results, iterating on your configuration to adjust it to your testing needs, you can configure and run NI PQA tests manually using NI PQA Executive. To use NI PQA Executive to configure and run your NI PQA tests manually, proceed to section *7. Launching NI PQA Executive*.

If you plan to run several NI PQA tests, and especially if you plan to run existing configurations that require less interaction, you can save time and reduce repetition by automating tests using TestStand or LabVIEW. When automating tests, you can define new configurations using VIs in LabVIEW, load existing configurations within TestStand or LabVIEW, or create new configurations using the NI PQA Configuration panel within TestStand or LabVIEW. To automate NI PQA tests using TestStand or LabVIEW, proceed to section *14. Running or Automating NI PQA Tests*.

7. Launching NI PQA Executive

After installing NI PQA and any necessary hardware and software, you can use NI PQA Executive to configure analysis of video and audio test streams. If you plan to configure and run tests in NI PQA Executive instead of automating NI PQA tests using TestStand or LabVIEW, launch NI PQA Executive at **Start»All Programs»National Instruments»NI Picture Quality Analysis»NI PQA Executive**.

8. (Optional) Selecting or Creating a Session

After launching the NI PQA software, decide whether to use a session for your NI PQA test. NI PQA uses sessions to organize information related to an NI PQA test, including any files generated by that test. You can create a new session, use an existing session, or run NI PQA without saving session information.

Creating a New NI PQA Session

To create a new session, complete the following steps:

1. Select the **Refs and disk tab**.

2. Specify a directory to save session files to in the **Output directory** field.

3. Select the **Session info** checkbox to enable the creation of a session and the recording of information about the session the next time you run NI PQA.

4. (Optional) To also record a media stream and/or a data stream as part of the session, check the **Media stream** and/or **Data stream** checkboxes, respectively.

Selecting an Existing NI PQA Session to View Recorded Data

To view recorded data from an existing session, complete the following steps:

1. Select the **Session** tab.
2. Specify a directory to read session files from in the **Session directory** field.
3. Select the session to analyze from the **Available sessions** list. The **Media file**, **Data file**, and **Series file** fields will populate with the file paths for any files associated with the session.

> **Tip** You can change which files are associated with the selected session by specifying a different file in the **Media file**, **Data file**, and **Series file** fields.

> **Note** If you change any NI PQA settings after selecting an existing session, NI PQA displays a ⚠ warning symbol above the **Session** tab and next to one or more of the file controls and indicators within the tab to indicate that the NI PQA settings no longer match those of one or more files associated with the session. Move the cursor over each warning symbol to view a tooltip with additional information about the cause of the warning.

9. Configuring a Provider

Select and configure a provider to source the test stream. NI PQA has the following three classes of providers, which are based on the type of data they stream.

- Video providers stream video data.
- Audio providers stream audio data.
- Combined audio/video providers stream both video and audio data.

Within each class of provider, there are multiple providers that stream audio and/or video in different formats. Refer to the *NI Picture Quality Analysis Help* for more information about NI PQA providers.

Complete the following steps to select and configure a provider:

1. Select the **Provider** tab in NI PQA.
2. Select the provider to use from the **Provider** listbox in the **Provider** tab. Selecting a provider reveals a set of provider-specific controls in the **Provider** tab.
3. Use the provider-specific controls in the **Provider** tab to configure the source of your test stream.

10. (Optional) Configuring a Trigger

To compare an acquired test stream to a reference stream, you must use a trigger to synchronize the test stream and reference stream to ensure an accurate comparison. NI PQA has a set of predefined triggers that you can configure, or you can write your own trigger algorithm to create a custom trigger using the User trigger. Refer to the *NI Picture Quality Analysis Help* for more information about NI PQA triggers and defining a custom trigger.

To configure a trigger, complete the following steps:

1. Verify that you have configured the source of the stream to record in the **Provider** tab.
2. Click the **Play** button to run NI PQA and load the test stream.
3. Select the **Video/Audio** tab.
4. Use the slider control to locate the region of the test stream that contains the frame to use for the trigger.
5. Use the **Current frame** control to locate the frame to use for the trigger.
6. Select a trigger from the **Trigger** listbox in the **Trigger options** section of the **Video/Audio** tab. Selecting a trigger reveals a set of trigger-specific controls in the **Trigger options** section.
7. Use the trigger-specific controls in the **Trigger options** section to configure the trigger.
8. Specify the number of seconds after which the session will time out if the trigger does not assert in the time period specified in the **Timeout (s)** control.
9. Use the rectangle tool next to the Test stream display in the **Video/Audio** tab to draw a search area on the Test stream display. NI PQA will search for the trigger characteristics within this search area in each frame of the test stream until the trigger asserts.
10. Use the slider control to scroll through the test stream to verify that the **Trigger asserted** indicator turns green only when you select the frame containing the trigger and not on any previous frames.

11. (Optional) Selecting a Reference Stream

To compare the acquired test stream to a media reference stream or a data reference stream, you must specify a reference stream for your NI PQA test. To specify the reference stream, complete the following steps:

1. Verify that you have set the video trigger, which will define the start of the reference stream.
2. Select the **Refs and disk** tab in NI PQA.
3. (Optional) Record a data and/or media stream to use as a data reference stream or media reference stream, respectively, by completing the following steps:
    a. Specify a directory for saving the data and/or media stream file in the **Output directory** control.
    b. Select the **Data stream** checkbox to record a data stream, select the **Media stream** checkbox to record a media stream, or select both checkboxes to record both types of streams.
    c. (Optional) To record the data and/or media stream as part of the current session, also select the **Session info** checkbox.
    d. Verify that you have configured the source of the stream to record in the **Provider** tab.
    e. Click ▶ to run NI PQA and record the data and/or media stream.
4. Specify the data stream or media stream file to use in the **Data ref stream** or **Media ref stream** control, respectively, then select the associated **On** checkbox.

12. Configuring a Processor

Select and configure a processor to analyze the acquired test stream. NI PQA has the following three classes of processors, which are based on the function they perform.

- Video metric processors calculate video metrics on a video test stream.
- Audio metric processors calculate audio metrics on an audio test stream.
- Nonmetric processors perform a task on the test stream rather than calculating metrics.

Within each class of processor, there are multiple processors that calculate different metrics or perform different tasks. You can also write your own processor algorithm to create a custom processor using the User processor. Refer to the *NI Picture Quality Analysis Help* for more information about NI PQA processors and defining a custom processor.

To select and configure a processor, complete the following steps:

1. Select the **Processors** tab in NI PQA.
2. Select one or more processors from the **Processors** listbox in the **Processors** tab. Selecting a processor reveals a set of processor-specific controls in the **Processors** tab.
3. Use the processor-specific controls to configure the processor.

13. Configuring the Metrics to View

If you are using an audio or video metric processor, select the calculated metrics to view after running NI PQA. NI PQA calculates all possible metrics for the selected processor in any test session, but you can specify which metrics you want to view.

To select and configure the metrics to view, complete the following steps:

1. Select the **Metrics** tab.
2. Select **Single metrics** to view metric results as a single data point per frame or **Multipoint metrics** to view metric results as a multipoint result for each frame.
3. Select one or more metrics to view in the **Display selection** listbox. Hold down <Ctrl> while selecting metrics to select multiple metrics.
4. (Optional) Configure the limit test array to the right of the **Display selection** listbox to specify error criteria to test on the available metrics.

> 💡 **Tip** If you would like to run NI PQA without limit tests but still retain the limit tests you have previously defined, you can select **Continue on error** in the **Metrics** tab before running.

   a. Click the **+/-** button to add a limit entry.
   b. Select the metric to define a limit for in the **Metric** listbox.
   c. Specify values in the **Upper limit** and/or **Lower limit** controls to define a maximum value that the metric cannot exceed or a minimum value that the metric cannot fall below, respectively.

d. If you specified a value in the **Upper limit** control for a multipoint metric, specify in the **Count over** control the number of points within the vector that can exceed that value without causing an error. If you specified a value in the **Lower limit** control, specify in the **Count under** control the number of points that can fall below that value without causing an error.

e. Specify in the **Frame errors** control the number of errors allowed for the limit test for NI PQA to pass the metric. If the number of errors exceeds this value, NI PQA fails the metric.

f. Specify the beginning and end of the interval in which to apply the limit criteria in the **Start frame** and **End frame** controls, respectively.

g. Repeat steps a through f for each limit test you want to define. You can define multiple limit tests for the same metric.

14. Running or Automating NI PQA Tests

Depending on whether you chose to automate NI PQA tests in section *6. Deciding Whether to Automate NI PQA Tests*, run or automate and run your NI PQA test(s) using the environment you selected.

> **Note** Memory availability for running NI PQA tests differs depending on your OS and application environment. Refer to the *NI Picture Quality Analysis Readme* for information about memory availability in NI PQA systems.

Running Tests in NI PQA Executive

To run the test you configured in NI PQA Executive, click ▶.

> **Tip** Click **Video** on the **Video/Audio** tab before you run a test to view incoming video and/or audio test streams in a separate window during the test.

Automating and Running Tests Using the NI PQA Configuration Panel or a Saved Configuration in TestStand

You can automate NI PQA tests in NI TestStand by combining a series of tests into a test sequence, running the test sequence, then reporting the results. You can configure the tests to automate by launching the NI PQA Configuration panel within TestStand, by loading previously saved tests, or by using the last configuration accepted in the NI PQA Configuration panel.

To configure a test sequence in TestStand to automate your NI PQA tests, complete the following steps:

1. Select **Start»All Programs»National Instruments TestStand** to launch TestStand.

2. Add an NI PQA step, located in the Insertion palette at **Step Types»NI-PQA»NI PQA**.

3. Click **Configure NI PQA** in the **NI PQA** tab of the Step Settings pane to launch the NI PQA Configuration panel.

Note The NI PQA Configuration panel has the same appearance and functionality as NI PQA Executive. However, while you use NI PQA Executive with the purpose of performing all tasks related to the tests from configuration to running and analysis, you use the NI PQA Configuration panel with the purpose of configuring and checking tests that you will ultimately run and analyze in TestStand.

4. Configure your NI PQA test using one of the following methods:
   - To configure your NI PQA test using the NI PQA Configuration panel, complete the NI PQA Executive steps, which also apply to using the NI PQA Configuration panel, in sections *9. Configuring a Provider* through *13. Configuring the Metrics to View*.
   - To use the last accepted configuration in the NI PQA Configuration panel, click **Set from previous** in the **Refs and disk** tab in the NI PQA Configuration panel.

   Tip To accept a configuration, click **OK** in the NI PQA Configuration panel. This closes the configuration panel and retains the configuration settings for temporary use within TestStand, overwriting the previously accepted configuration. To close the NI PQA Configuration panel without accepting the configuration, click **Cancel**.

   - To use a configuration saved in a previous NI PQA test session, complete the following steps:
     1) Click **Load config** in the **Refs and disk** tab in the NI PQA Configuration panel.
     2) Select the configuration file to load.
     3) Click **OK**.

5. Click **OK** in the NI PQA Configuration panel to accept the configuration and close the configuration panel.

6. Repeat steps 2 through 5 for every NI PQA test you would like to run in the test sequence. All steps are independent of each other by default. After configuring each step, you can execute the sequence in TestStand to test it.

7. Add steps to your test sequence to fit your automated test needs, including setting up any custom analysis of NI PQA test results. Refer to *Appendix A: NI PQA Programming Examples*, the *Using TestStand* manual, and the *NI TestStand Help* for information about setting up your NI PQA test sequence in TestStand.

8. Configure a report for your test sequence. Refer to the *NI Picture Quality Analysis Help* for information about configuring reports for NI PQA in TestStand.

9. Click ▶ to run the test sequence.

Automating and Running Tests Using the NI PQA Configuration Panel, the niPQA Configurations VI, or a Saved Configuration in LabVIEW

You can automate NI PQA tests in LabVIEW by incorporating your NI PQA tests into a test application, running the application, then returning results. You can configure the tests to automate by launching the NI PQA Configuration panel within LabVIEW, by loading a previously saved configuration, or by configuring the tests programmatically.

To configure a VI in LabVIEW to automate your NI PQA tests, complete the following steps:

1. Select **Start»All Programs»National Instruments LabVIEW** to launch LabVIEW.

2. Open a blank VI.

3. Configure your NI PQA tests using one of the following methods:

   - To configure your NI PQA tests using the NI PQA Configuration panel within LabVIEW, complete the following steps:

     1) Navigate to the niPQA GUI VI, located on the Functions palette at **Functions»Multimedia Test»NI PQA»GUI**, then select and place the VI on the block diagram.

     2) Click **Run** to launch the NI PQA Configuration panel within LabVIEW.

   📝 **Note** The NI PQA Configuration panel has the same appearance and functionality as NI PQA Executive. However, while you use NI PQA Executive with the purpose of performing all tasks related to the tests from configuration to running and analysis, you use the NI PQA Configuration panel with the purpose of configuring and checking tests that you will ultimately run and analyze in LabVIEW.

     3) Complete the NI PQA Executive steps, which also apply to using the NI PQA Configuration panel, in sections *9. Configuring a Provider* through *13. Configuring the Metrics to View* to configure your test using the NI PQA Configuration panel.

     4) Click **OK** to accept the configuration and close the NI PQA Configuration panel.

   - To configure your NI PQA tests using the niPQA Configurations VI, complete the following steps:

     1) Navigate to the niPQA Configurations VI, located on the Functions palette at **Functions»Multimedia Test»NI PQA»Configurations**, then select and place the VI on the block diagram.

     2) Use the Polymorphic VI Selector on the VI to select the NI PQA component to configure.

     3) Use the VI parameters to configure the selected NI PQA component.

     4) Repeat steps 1 through 3 and wire the VIs together to configure every component of your NI PQA test.

   - To use a configuration saved in a previous NI PQA test session, use the Read from Binary File VI, located in the Functions palette at **Functions»Programming»File I/O»Read from Binary File**, to load a configuration saved in a previous NI PQA test session into the configuration panel. Refer to *Appendix A: NI PQA Programming Examples* and the *LabVIEW Help* for additional information about loading an existing NI PQA configuration in LabVIEW.

4. Configure your VI to fit your automated test needs, including setting up any custom analysis of NI PQA test results and customizing the display of NI PQA results in the VI front panel. Refer to the *NI Picture Quality Analysis Help*, *Appendix A: NI PQA Programming Examples* and the *LabVIEW Help* for information about configuring your NI PQA test and programming in LabVIEW.

5. (Optional) If you used the niPQA GUI VI to configure your NI PQA tests in step 3 and you want to save your configuration when running tests, use the Write to Binary File VI, located in the Functions palette at **Functions»Programming»File I/O»Write to Binary File**, to program your VI to save your NI PQA configuration. Refer to *Appendix A: NI PQA Programming Examples* and the *LabVIEW Help* for additional information about programming your VI to save your NI PQA configuration.

6. Click ⬇ to run the VI.

15. Viewing Results

After running your NI PQA test(s), you can view test results in the environment in which you ran the test(s).

Viewing Results in NI PQA Executive

To view test results in NI PQA Executive, complete the following steps:

1. Select the **Metrics** tab.

2. Select one or more metrics to view in the **Display selection** control. You can select multiple metrics by holding down the <Ctrl> key as you select the metrics.

3. Select the display mode by selecting either **Single metrics** or **Multipoint metrics**.

4. Use the graph controls below the graph to manipulate the graph for analysis including moving the X and Y cursors, highlighting a frame, and zooming in or out on the graph. Refer to the *NI Picture Quality Analysis Help* for information about each graph control.

5. (Optional) If you specified error criteria to test for any of the metrics in the Limit test array control, use the slider control beneath the graph to highlight frames that contain errors in the **Frames containing errors** control.

6. If the test did not complete, notice whether the Single metrics or Multipoint metrics indicators are red, indicating that a stop condition occurred in that display mode.

📝 **Note** A stop condition in the Single metrics or Multipoint metrics display mode indicates that the DUT does not meet the specifications of your limit test. If a stop condition occurs, use the metrics from the test session to analyze where the problem occurred and why.

Viewing Results in NI TestStand

Viewing NI PQA test results in TestStand varies depending on how you configure your report in step 8 of the *Automating and Running Tests Using the NI PQA Configuration Panel or a Saved Configuration in TestStand* section of this document.

Viewing Results in LabVIEW

Viewing NI PQA test results in LabVIEW varies depending on how you configure your VI to automate the display of results in step 4 of the *Automating and Running Tests Using the NI PQA Configuration Panel, the niPQA Configurations VI, or a Saved Configuration in LabVIEW* section in this document.

16. (Optional) Saving the Configuration, Test Sequence, or VI

Save the configuration, test sequence, or VI if you plan to reuse it.

Saving in NI PQA Executive

You can save the settings that you have specified in NI PQA Executive for later use. Complete the following steps to save the NI PQA Executive settings:

1. Click **Save config** in the **Session** tab to save the settings you have specified in NI PQA Executive.

2. In the **Choose or enter path of file** dialog box, navigate to the directory in which you would like to save the configuration file and specify a filename in the **File Name** field.

3. Click **OK**.

You can later reuse this configuration file by clicking **Load config** in the **Session** tab.

Saving in TestStand

Refer to the *Using TestStand* manual for instructions for saving the sequence file that you have created to automate NI PQA tests in TestStand. Saving the sequence file in TestStand saves any NI PQA configurations used in the test sequence.

Saving in LabVIEW

Refer to the *LabVIEW Help* for additional information about saving the VI you created to automate NI PQA tests. If you used the niPQA GUI VI to create your NI PQA configuration and you want to save your NI PQA configuration when running the VI, verify that you have programmed your VI to save the configuration in step 5 of the *Automating and Running Tests Using the NI PQA Configuration Panel, the niPQA Configurations VI, or a Saved Configuration in LabVIEW* section in this document, as saving the VI does not save the NI PQA configuration.

Appendix A: NI PQA Programming Examples

NI PQA programming examples are instructional tools that demonstrate picture quality analysis functionality. NI PQA programming examples are available for both LabVIEW and TestStand. For example locations and supported application environment versions, refer to the *NI Picture Quality Analysis Readme*.

Appendix B: Where to Go for Support

The National Instruments Web site is your complete resource for technical support. At `ni.com/support` you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

National Instruments corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. National Instruments also has offices located around the world to help address your support needs. For telephone support in the United States, create your service request at `ni.com/support` and follow the calling instructions or dial 512 795 8248. For telephone support outside the United States, visit the Worldwide Offices section of `ni.com/niglobal` to access the branch office Web sites, which provide up-to-date contact information, support phone numbers, email addresses, and current events.