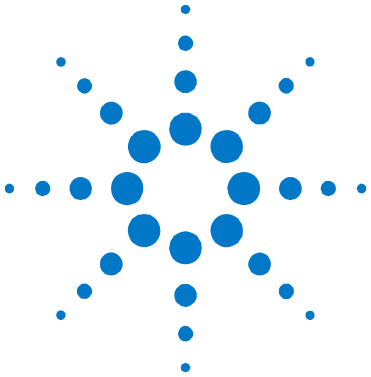

# Agilent Technologies 14585A Control and Analysis Software

## Quick Start Guide

Agilent Technologies

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Manual Part Number: 14585-90001
First Edition, June, 2010
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# Contents

# 1 Introduction



The Agilent 14585A Control and Analysis software is a Windows-based PC application that is designed to control up to four Agilent N6705 DC Power Analyzers. The Agilent 14585A application has four primary functions: scope measurements, data logging, CCDF/histogram, and arbitrary waveform generation. Additionally, the software has an instrument control pane that emulates the basic front panel controls of the Agilent N6705.

There are two preliminary steps that need to be completed in order to use the Agilent 14585A software.

- The first step is to install the Agilent IO Libraries Suite 15.5 or higher. This software is included on the Automation-Ready CD-ROM that was shipped with your N6705A mainframe. Alternately you can download it from the Web at www.agilent.com/find/iolib
- The second step is to connect an Agilent N6705 mainframe to one of the supported interfaces as explained in the Agilent N6705 User's Guide.

**NOTE**

You can contact Agilent Technologies at one of the following telephone numbers for warranty, service, or technical support information.
In the United States: (800) 829-4444
In Europe: 31 20 547 2111
In Japan: 0120-421-345
Or use our Web link for information on contacting Agilent in your country or specific location: www.agilent.com/find/assist
Or contact your Agilent Technologies Representative.

The web contains the most up to date version of the manuals. Go to http://www.agilent.com/find/14585 to get the latest version of the manuals.

# System Requirements

**Computer:**

- Pentium 2 GHz, with 2 Gbytes of RAM, 2 Gbytes disc space

**Supported Platforms:**

- Windows XP SP2 with Microsoft .NET framework version 3.5 SP1 only
- Vista SP1
- Windows 7

**Supported Interfaces:**

- Agilent 82350B GPIB Interface
- Agilent 82357A USB/GPIB Interface
- Agilent E5810A LAN/GPIB Gateway
- National Instruments GPIB card (requires NI-488.2 (Win32) version 1.6 or later)
- LAN
- USB (this interface is not recommended for long term data logging)

**Supported Libraries (requires one):**

- Agilent IO Libraries Suite 15.5 or later
  - Supplied with the Agilent N6705 on the Product Reference CD-ROM or downloadable from www.agilent.com/find/iolib
  - This must be installed before you install the Agilent 14585A application
- National Instruments VISA Run-time Engine version 2.6

**Supported Instruments:**

- From one to four Agilent N6705A or B DC Power Analyzer mainframes

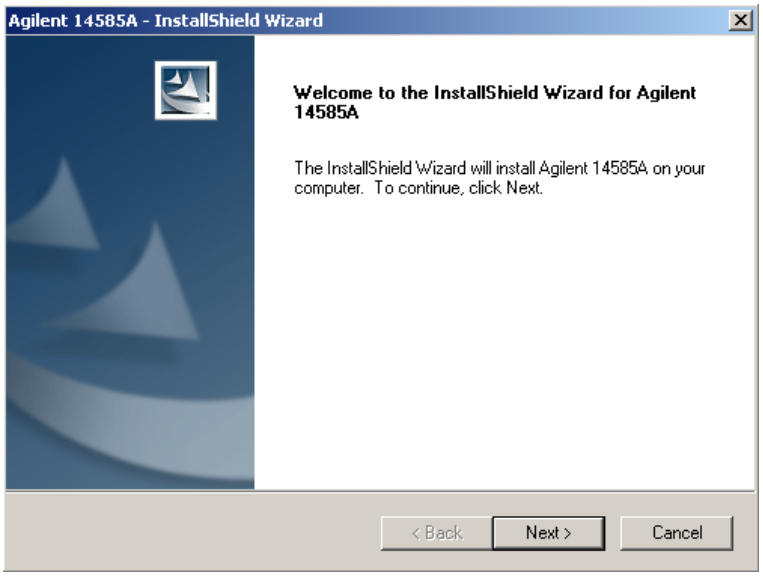
# Installation

Before running the Agilent 14585A application, you must have installed and connected the DC Power Analyzer to a computer with the appropriate interface cable. You must also have the appropriate interface card or IO libraries installed and configured. If you are using an Agilent interface card, you must have the appropriate VISA library drivers installed.

### To Install the Agilent 14585A application:

- Place the CD-ROM in the CD-ROM drive of your computer and run Agilent 14585A.exe. Note that you can download the latest version of the software at www.agilent.com/find/14585

  When the installer runs, it puts up the following dialog box:




- Follow the directions on the screen to install the software. If supplied, a readme.txt file will provide product updates or corrections that are not documented in the built-in help. Use any text editor to open and read this file.

### To Run the Agilent 14585A application:

- Click on its Desktop icon: 

You can also click on the Start button and select:
Programs | Agilent 14585A Control and Analysis Software.

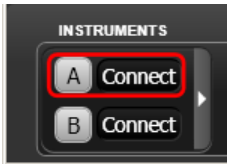
# 2
# Getting Started



This chapter shows you how to quickly get started. It describes how to connect to an Agilent N6705 DC Power Analyzer. In the example given, an output turn-on sequence is programmed and displayed using the scope function. The scope measures the actual output voltages as the outputs turn on. The scope waveforms are then saved and exported.

# Connect to the Agilent N6705 DC Power Analyzer

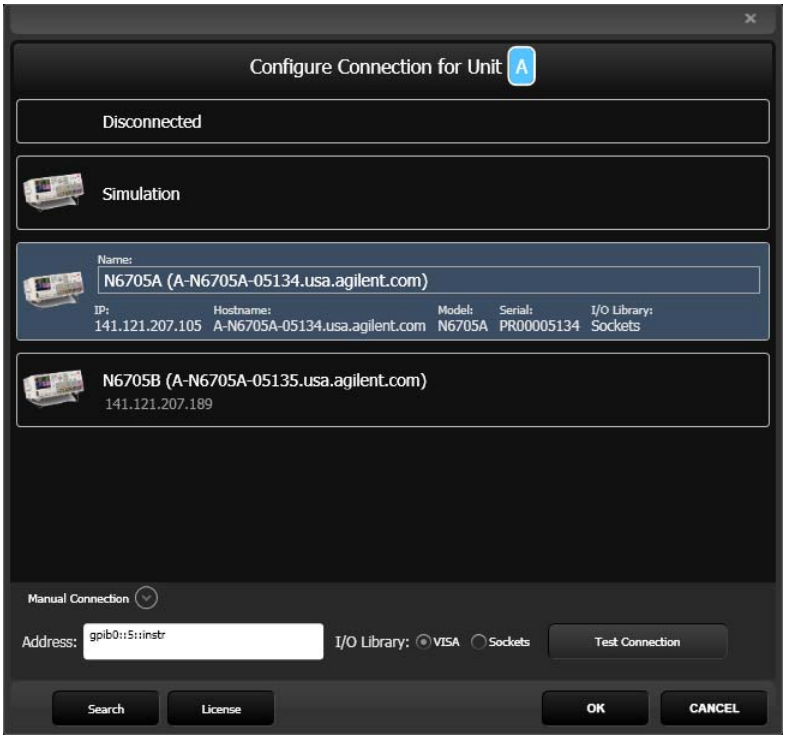
**Step 1.** Click the Connect button next to the instrument label (A, B, C, or D) that will identify the instrument to which you will be connecting. Click the right arrow to display labels C and D.




**Step 2** The application automatically searches to find all the instruments on the network and VISA resources. If the VISA resource does not appear, you may need to manually add the VISA resource using your IO library software. If you want to re-run the search, click the **Search** button.

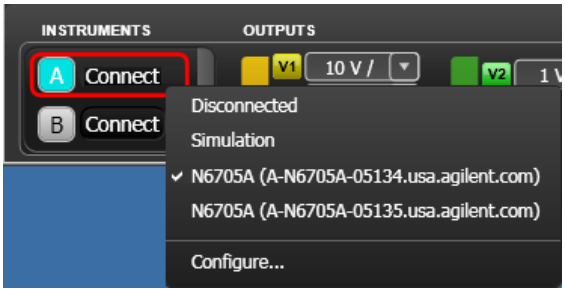
If your instrument does not appear on the list, click **Manual Connection**. If using the Sockets IO library, provide the IP address or Hostname. If using VISA, provide the VISA resource descriptor. Click Test Connection to verify the connection and add the instrument to the list.

Select your instrument and click **OK** to connect.



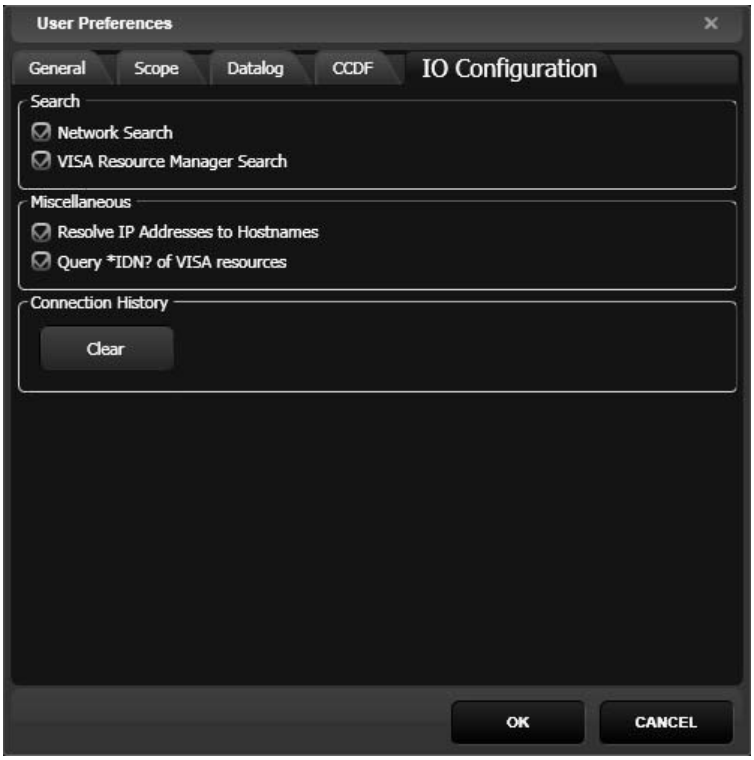

Click **Simulation** if you want to run the application in simulation mode with no instruments connected. This only provides limited functionality of the application.

**Step 3** If you have previously connected to an instrument, you can also connect to one of the N6705 units listed in the drop-down **Connect** menu shown on the bottom of the main window under Instrument **A**, **B**, **C**, or **D**.




**Step 4** Click **Configure** to access the Configure IO dialog.

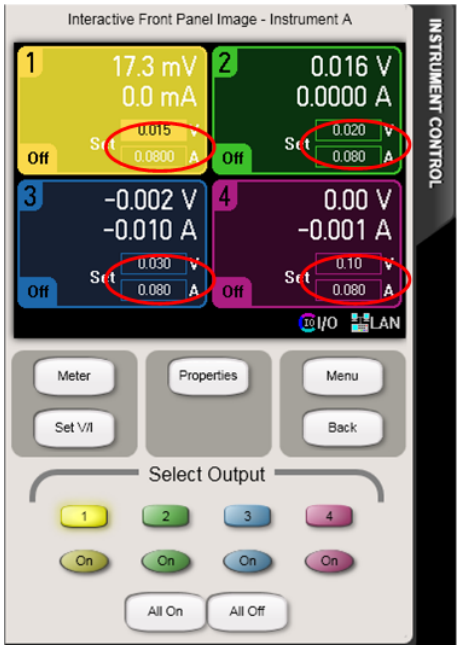
**NOTE** You can configure the connections options by selecting the **Tools** menu, **User Preferences**, **IO Configuration**.



# Set Up the DC Power Analyzer

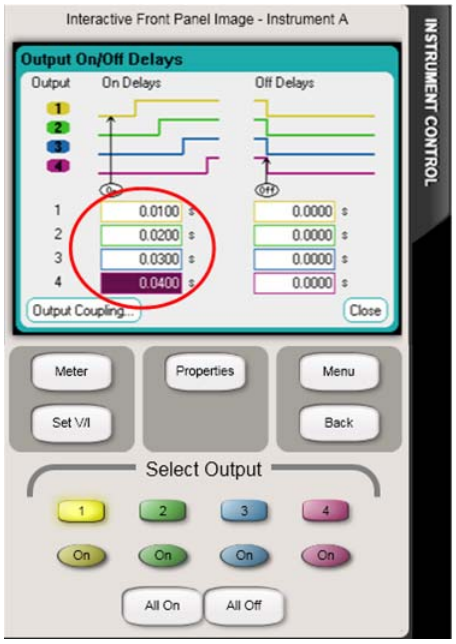
To set up the Agilent N6705A, select the **Instrument Control** tab on the left side of the display. You can directly control the instrument using the controls on this display, or use the front panel controls. Note that the changes made on either interface (the PC application or actual front panel) will be mirrored in the other interface.

**Step 1.** In Meter View, set the output voltage and currents of all four outputs of the DC Power Analyzer to 10 volts and 1 ampere.




**Step 2.** Click the Source Settings button twice. In the Output On/Off Delay area, configure the output turn-on sequence as follows. You will only need to configure the Turn-on delays, not the Turn-off delays.

Output 1: 10 ms;
Output 2: 20 ms;
Output 3: 30 ms;
Output 4: 40 m



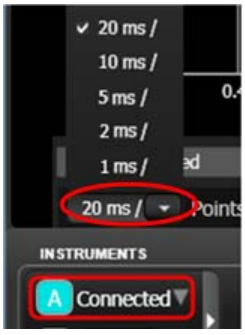
## Select and Configure the Scope Function

**Step 1.** Select the Scope function from the functions listed on top of the window.

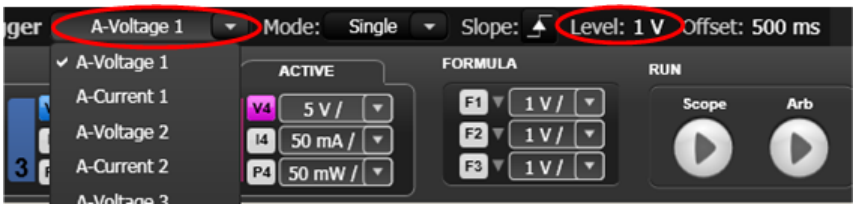

**Step 2.** Select which output traces to display (select the voltage traces for all four outputs).


**Step 3.** Configure the vertical scale for all outputs (set the vertical scale to 10 volts/division).

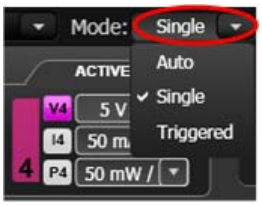

**Step 4.** Configure the horizontal scale for all outputs (set the timebase to 20 milliseconds/division).




**Step 5.** Select a voltage level on output 1 as the Scope trigger source. Set the level to 1 volt.

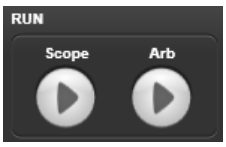



**Step 6.** Select Single mode.



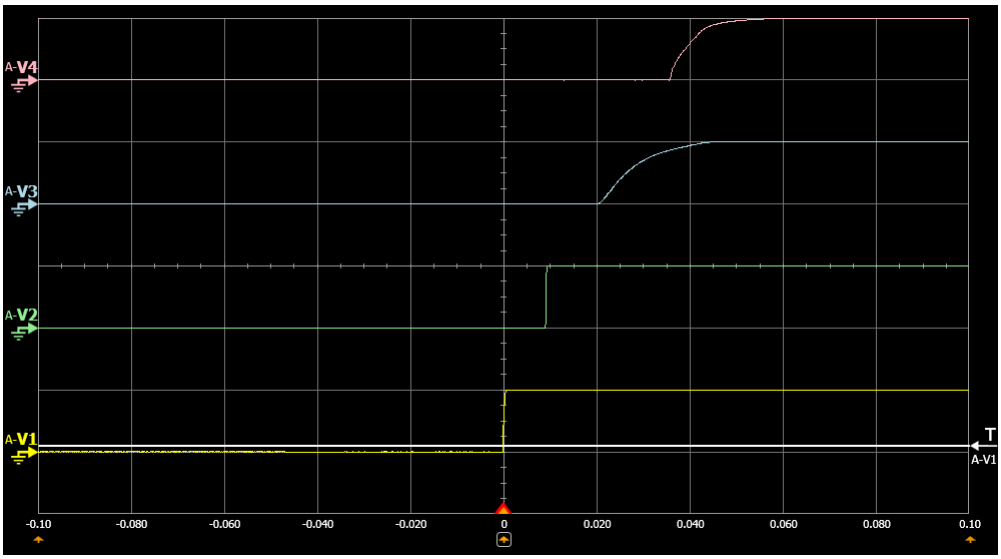
## Run the Scope and Turn on the Outputs

**Step 1.** Press the Scope button on the bottom of the screen to run the scope. The arrow icon indicates the start action.

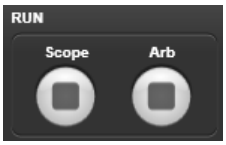



**Step 2.** In the Instrument Control area on the front panel of the instrument, press the All Outputs On button to start the output sequence.

**Step 3.** The selected waveforms will be displayed on the screen.




The Run buttons can also be used to stop the application. The square icon indicates the stop action.



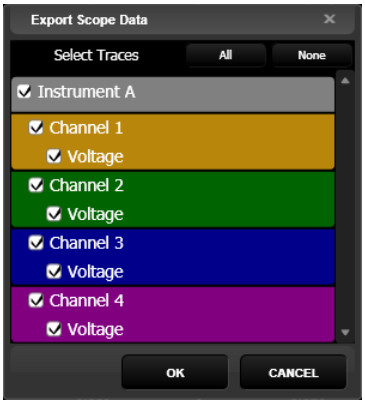

**NOTE** You can copy any display image to the clipboard by selecting the **Edit** menu, **Copy Chart Image**.

# Save and Export the Display Data

All waveforms in the measurement display can be saved to an internal file or exported to an external .csv file.

**To save the Display Data**

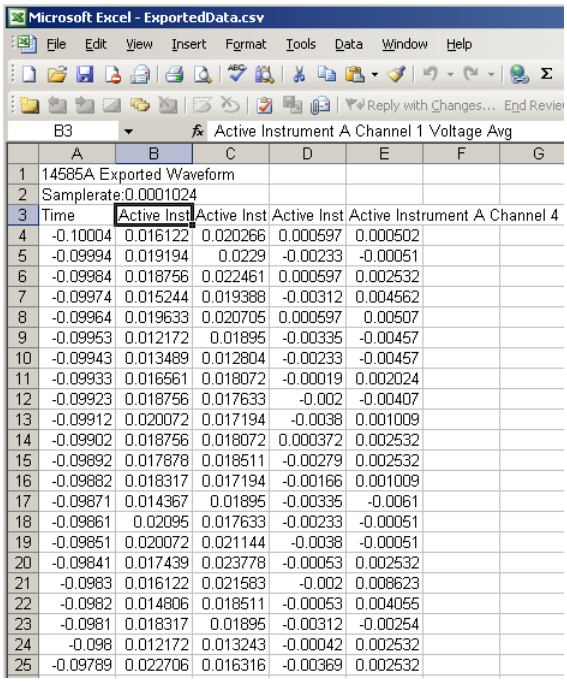
In the **File** menu, select **Save**. Specify the directory and filename in which you will save the waveform data. All Scope waveform data is saved with a .scp file extension. These Internal files can be loaded or overlayed onto an existing "active" display for waveform comparison purposes.




**To Export the Display Data**

In the **File** menu, select **Export Data**. This command lets you select the traces to export.

The data from the selected traces is written to a .csv file. This file may be opened using a number of applications such as Microsoft Excel. Each trace is assigned its own column in the file, followed by all of the data points for the trace.



Microsoft Excel - ExportedData.csv

File Edit View Insert Format Tools Data Window Help

B3 Active Instrument A Channel 1 Voltage Avg

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | 14585A Exported Waveform | | | | | | |
| 2 | Samplerate:0.0001024 | | | | | | |
| 3 | Time | Active Inst | Active Inst | Active Inst | Active Instrument A Channel 4 | | |
| 4 | -0.10004 | 0.016122 | 0.020266 | 0.000597 | 0.000502 | | |
| 5 | -0.09994 | 0.019194 | 0.0229 | -0.00233 | -0.00051 | | |
| 6 | -0.09984 | 0.018756 | 0.022461 | 0.000597 | 0.002532 | | |
| 7 | -0.09974 | 0.015244 | 0.019388 | -0.00312 | 0.004562 | | |
| 8 | -0.09964 | 0.019633 | 0.020705 | 0.000597 | 0.00507 | | |
| 9 | -0.09953 | 0.012172 | 0.01895 | -0.00335 | -0.00457 | | |
| 10 | -0.09943 | 0.013489 | 0.012804 | -0.00233 | -0.00457 | | |
| 11 | -0.09933 | 0.016561 | 0.018072 | -0.00019 | 0.002024 | | |
| 12 | -0.09923 | 0.018756 | 0.017633 | -0.002 | -0.00407 | | |
| 13 | -0.09912 | 0.020072 | 0.017194 | -0.0038 | 0.001009 | | |
| 14 | -0.09902 | 0.018756 | 0.018072 | 0.000372 | 0.002532 | | |
| 15 | -0.09892 | 0.017878 | 0.018511 | -0.00279 | 0.002532 | | |
| 16 | -0.09882 | 0.018317 | 0.017194 | -0.00166 | 0.001009 | | |
| 17 | -0.09871 | 0.014367 | 0.01895 | -0.00335 | -0.0061 | | |
| 18 | -0.09861 | 0.02095 | 0.017633 | -0.00233 | -0.00051 | | |
| 19 | -0.09851 | 0.020072 | 0.021144 | -0.0038 | -0.00051 | | |
| 20 | -0.09841 | 0.017439 | 0.023778 | -0.00053 | 0.002532 | | |
| 21 | -0.0983 | 0.016122 | 0.021583 | -0.002 | 0.008623 | | |
| 22 | -0.0982 | 0.014806 | 0.018511 | -0.00053 | 0.004055 | | |
| 23 | -0.0981 | 0.018317 | 0.01895 | -0.00312 | -0.00254 | | |
| 24 | -0.098 | 0.012172 | 0.013243 | -0.00042 | 0.002532 | | |
| 25 | -0.09789 | 0.022706 | 0.016316 | -0.00369 | 0.002532 | | |

# 3
# Using the Agilent 14585A



This chapter describes how to use the Agilent 14585A software. It describes the four primary functions: scope, data logger, CCDF, and Arb. It also discuses how to trigger the functions, how to obtain detailed measurement information using the markers, and how to export the measurement data.

Additional information on specific features and capabilities of the Agilent 14585A software are included in the built-in help, which can be accessed at any time via the Help menu.

# Controlling the DC Power Analyzer

Click the Instrument Control tab to open the instrument control window. The functions of this window emulate the front panel controls of the Agilent N6705 DC Power Analyzer.


**Meter** - Displays the meter view. Toggles between single output and multiple output views.

**Set V/I** - Displays the settings of the selected output. Toggles between source settings and output delay setting.

**Properties** - In meter view, displays the meter properties of the selected output. In source settings view, displays the N6705 ratings.

**Menu** - Displays the function menu.

**Back** - Returns to the previous view

**Select Output** 1, 2, 3, 4 - Lets you select an output to control.
On, On, On, On - Turns an output on or off.

**All On** - turns all outputs on.

**All Off** - turns all outputs off.

# Using the Scope Function

Select the Scope button from the top of the window.


## Making a Scope Measurement

**Step 1.** Select the traces (voltage V, current I, or power P) you want to capture in the Output boxes on the bottom of the display.

Note that there is a limit to the number of measurement traces that you can select.

**Step 2.** Specify the measurement setup:

**Ranges** – selects the measurement range. Select the range that is the best fit for your expected measurements.

**Points** – lets you specify the number of measurement points (this determines the sample period)

**Trigger** – lets you specify the trigger source (see “Triggering Measurements and Arbs”).

**Mode** – lets you select the measurement mode: Automatic, Single measurement, or Triggered.

**Slope/Level** - if you have specified a voltage or current level trigger source, you must also specify the signal slope and level.

**Step 3.** Use the Scope Run button on the bottom of the screen to start the measurement.

**Step 4.** Use the Scope Stop button to stop the measurement.

**NOTE** If you are running an Arb in conjunction with a scope measurement, you can configure the Arb Run button as the scope trigger source. Arm the scope by clicking the Scope Run button. Then click the Arb Run button to start the scope and the Arb.

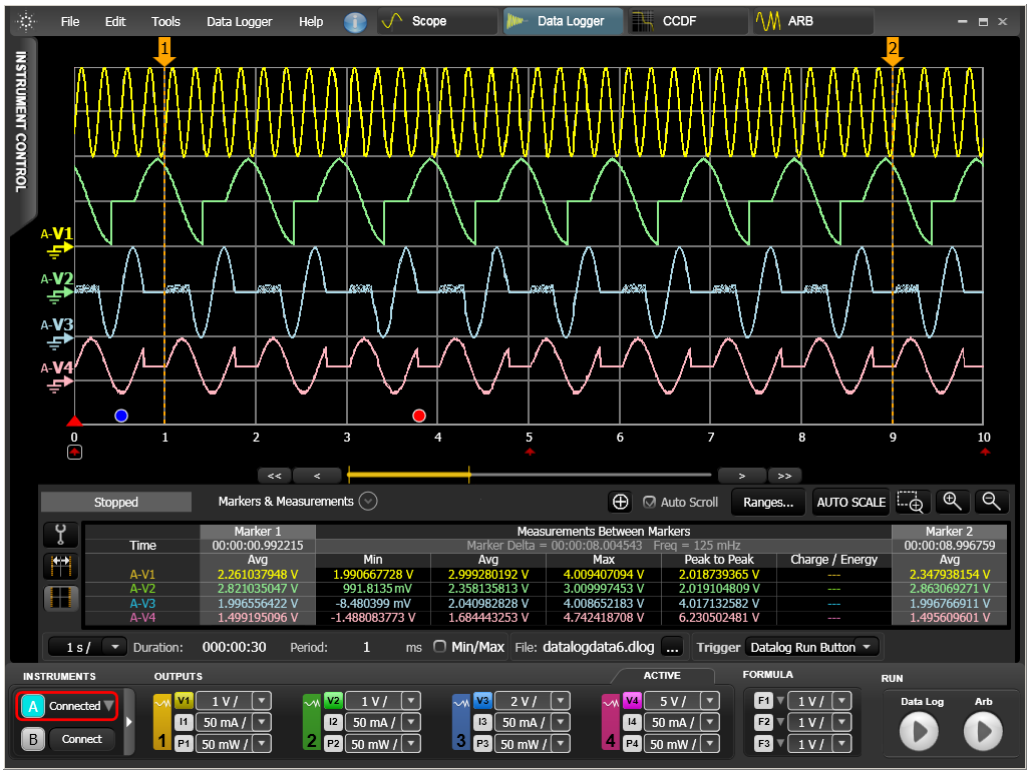
**Step 5.** After the measurement is taken, you can use the measurement markers to calculate data from specific areas of the measured waveform. Click Markers and Measurements to display the measurement markers. The Marker Delta measurements (Min, Ave, Max, RMS, Peak-to-peak, Charge/Energy) are calculated on the portion of the waveform between the marker positions. The information under Marker 1 and Marker 2 indicate the location of the markers. Click Setup to select or deselect the measurement items. See "Marker and Display Measurements" for more information.

**Step 6.** You can use the Grid controls (time/div, autoscale, zoom in, zoom out, etc.) to inspect the measurement in greater detail.

**Step 7.** You can export selected traces from the display to a .csv file. See "Export the Display Data" for more information.

## Using the Data Logger Function

Select the Data Logger button from the top of the window.



## Running the Data Logger

**Step 1.** Select the traces (voltage V, current I, or power P) you want to capture in the Output boxes on the bottom of the display.

Note that there is a limit to the number of measurement traces that you can select.

**Step 2.** Specify the data logger setup:

**Ranges** – selects the measurement range. Select the range that is the best fit for your expected measurements.

**Duration** – lets you specify the duration of the datalog in hours, minutes, and seconds.

**Sample Period** – specifies the interval between data samples in milliseconds. This is the integrated sample period.

**Log Min/Max** - logs the minimum and maximum values of each sample to the datalog file in addition to the average value.

**Filename** – specifies a filename in which to save the data. Data will be logged to this filename the **next** time the data logger runs. It is recommended to save data to a local hard drive.

**Trigger** – lets you specify the trigger source (see "Triggering Measurements and Arbs").

**Step 3.** Use the Data Log Run button on the bottom of the screen to start the measurement.

**Step 4.** Use the Data Log Stop button to stop the measurement.

**NOTE** If you are running an Arb in conjunction with the data logger, you can configure the the Arb Run button as the datalog trigger source. Arm the data logger by clicking the Data Log Run button. Then click the Arb Run button to start the data logger and the Arb.

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**Step 5.** After the data logger is finished, you can use the measurement markers to calculate data from specific areas of the logged data. Click Markers and Measurements to display the measurement markers. The Marker Delta measurements (Min, Ave, Max, Peak-to-peak, Charge/Energy) are calculated on the portion of the data between the marker positions. The information under Marker 1 and Marker 2 indicate the location of the markers. Click Setup to select or deselect the measurement items. See "Marker and Display Measurements" for more information.

**Step 6.** You can use the Grid controls (time/div, autoscale, zoom in, zoom out, etc.) to inspect the data in greater detail.

**Step 7.** You can use the Insert Tag button  to insert event tags (the round objects) to describe specific conditions or events on the datalog.

**Step 8.** You can export selected traces from the datalog to a .csv file. See "Export the Display Data" for more information.

# Using the CCDF Function

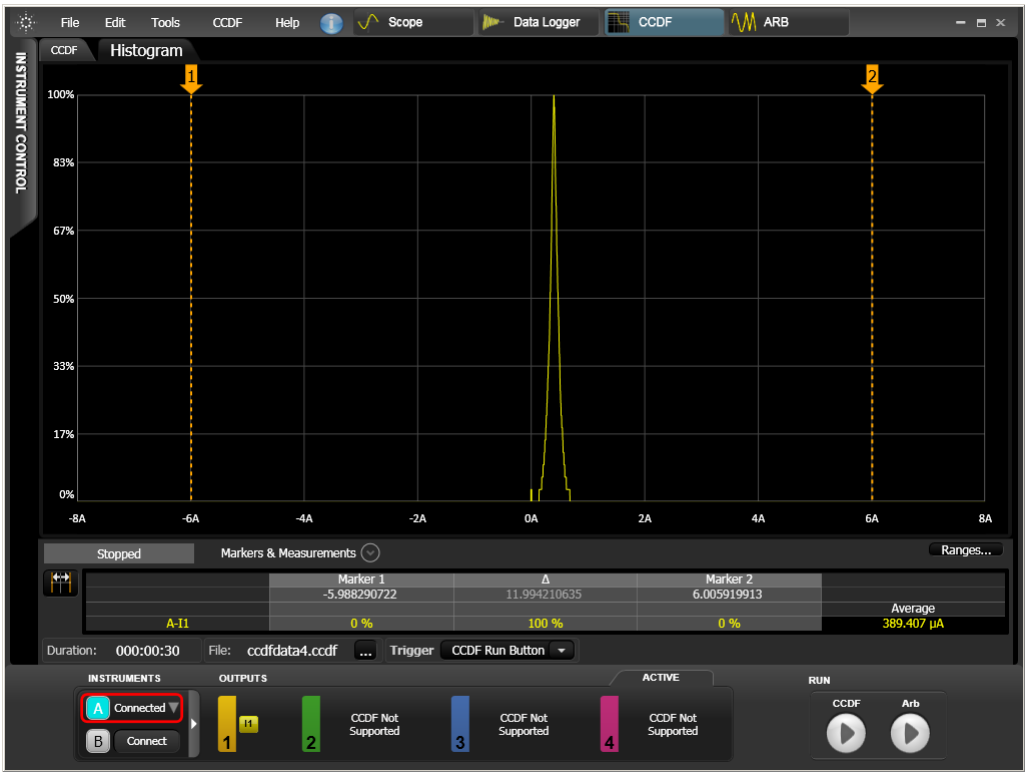
**NOTE** The CCDF and histogram functions only apply to Agilent Models N6781A and N6782A, and only for current measurements.

Select the CCDF button from the top of the window.

The CCDF or Complimentary Cumulative Distribution function concisely summarizes short and long-term battery drain measurements for analysis and comparison. It is a cumulative distribution of the amplitude versus the frequency (or percent) of occurrence. This is especially useful for analyzing signals that are random over time.


Click the Histogram tab to view the Histogram function.

The histogram function plots the frequency of measurement values in successive numeric intervals of equal size. The data collected in the histogram forms the basis for the CCDF function.




## Making a CCDF/Histogram Measurement

**Step 1.** Select the traces (voltage V, current I, or power P) you want to capture in the Output boxes on the bottom of the display

**Step 2.** Specify the measurement setup:

**Ranges** – selects the measurement range. Select the range that is the best fit for your expected measurements. Select Auto if your measurement encompasses multiple ranges.

**Duration** – lets you specify the duration of the data log in hours, minutes, and seconds.

**Filename** - specifies the filename to which the data will be saved. It is recommended to save data to a local hard drive.

**Trigger** – lets you specify the trigger source (see “Triggering Measurements and Arbs”).

**Properties** – summarized the properties that have been specified for the CCDF measurement.

**Step 3.** Use the CCDF Run button on the bottom of the screen to start the measurement.

**Step 4.** Use the CCDF Stop button to stop the measurement.

**NOTE** If you are running an Arb in conjunction with a CCDF measurement, you can configure the the Arb Run button as the CCDF trigger source. Arm the CCDF measurement by clicking the CCDF Run button. Then click the Arb Run button to start the CCDF measurement and the Arb.

---

**Step 5.** After the measurement is taken, you can use the measurement markers to calculate data from specific areas of the measured waveform. Click Markers and Measurements to display the measurement markers. The Marker Delta measurements (10%, 1%, 0.1%) are calculated on the portion of the waveform between the marker positions. The information under Marker 1 and Marker 2 indicate the location of the markers. You can select the CCDF range to display data from the combined histogram ranges, only the high range, or only the low range.

**Step 6.** You can select the Histogram tab to view the histogram data from which the CCDF plot was derived. The Marker Delta measurements are calculated on the portion of the waveform between the marker positions. The information under Marker 1 and Marker 2 indicate the location of the markers. You can select the Histogram range to display data from the combined histogram ranges, only the high range, or only the low range. See “Marker and Display Measurements” for more information.

**Step 7.** You can export selected traces from the display to a .csv file. See “Export the Display Data” for more information.

# Using the Arbitrary Waveform Function

Select the ARB button from the top of the window.


## Creating an Arb Sequence from the Built-In Waveforms

**Step 1.** Select an output function using the V or I button in one of the Output boxes on the bottom of the display.

**Step 2.** Select the Sequence type, either 64K-point Constant Dwell, 512-point Sequence, or Fixed DC Level.

**Step 3.** Click the Add button in the Navigation area to start adding sequence components.

The following steps add a sine wave to the sequence.

**Step 4.** Click the Built-in tab and select the sine wave. Use the scroll bar to display all of the components.

**Step 5.** You can modify the parameters of the sine wave in the parameter fields in the center.

**Step 6.** You can view the results of any modification in the Preview area on the right side.

**Step 7.** When you are satisfied with the edits, click Done in the Navigation area to add the sine wave to the Arb sequence.

Repeat steps 4 - 7 and add a triangle to the sequence.

**Step 8.** Select the Fixed DC trace on the bottom of the Arb Waveform window and specify a value for the fixed parameter of the output. If a voltage Arb is programmed, the current level is fixed. If a current Arb is programmed, the voltage level is fixed. The diagram on the lower left of the display indicates the range of acceptable values for the fixed voltage or current parameter.

**Step 9.** Use the Navigation controls to edit the sequence. The arrow buttons select the component. Move Left moves the component one position to the left. Move Right moves the component one position to the right. Add adds a new component. Modify lets you modify the selected component. Delete deletes the selected component.

**Step 10.** Specify the Sequence setup:

**Sequence Repeat** – lets you specify the number of times the sequence repeats: select Continuous to run the sequence continuously, or enter a specific repeat count in the Count field.

**Ranges** – lets you specify the source ranges.

**Trigger** – lets you specify the trigger source (see “Triggering Measurements and Arbs”).

You can save some or all Arb waveform sequences that were created. See “Save and Load the Waveforms” for more information.

You can also add waveform components from a formula or from an imported waveform file. “See Creating a Formula Waveform” and “Importing a Waveform File” for more information.

## Save and Load the Waveforms

### Saving the Waveform

Saved waveform information includes all Arb waveform sequences that were created. You can select which waveforms to save.

**Step 1.** Select the File menu from the top of the main window. Then select Save Waveform to save the selected waveform.

The Save Waveform command applies to the Arb function only. You can select any or all waveforms that were created in the Arb function window by checking the appropriate waveform in the "Select Traces" column.

**Step 2.** Select a directory and filename in which to save the waveform data. File format extensions include:

".wfpk" for Arb waveform sequences

### Loading a Waveform

Loading waveforms differs from importing waveforms. You can only load Arb waveform sequences that have been previously saved using the Save Waveform command. Waveforms are loaded directly into the target output channel.

Importing waveforms, on the other hand, places any number of individual internal or external waveform components into the Imported folder. From there they can be renamed, edited, and added to an Arb sequence. See Import a Waveform File.

**Step 1.** Select the File menu from the top of the main window. Select Load Waveform to load a previously saved Arb waveform sequence.

The Load Waveform command applies to the Arb function only.

**Step 2.**Select the directory and filename to load.

**Step 3.** Select the waveforms from the loaded file and assign them to an output channel.

The Arb waveforms can be assigned to an output channel, then run. Assign a waveform to an output channel by dragging it from the "Waveforms loaded from file" column to the target output channel. You can only output a voltage Arb or a current Arb on a given channel; not both.

## Creating a Formula Waveform

The following steps create three waveforms using formulas: superimposed noise, masked segment, and absolute value.

**Step 1.** Select an output function using the V or I button in one of the Output boxes on the bottom of the display.

**Step 2.** Select the Sequence type, either 64K-point Constant Dwell, 512-point Sequence, or Fixed DC Level.

**Step 3.** Click the Add button in the Navigation area to start adding sequence components.

The following steps superimpose noise on a sine wave.

**Step 4.** Click the Formula folder, select the sin(x) formula, set the duration to 1.5 seconds, and press Preview.

```
sin(2*PI*x)
```

**Step 5.** Select the + sign, then select the Random formula and press Preview.

```
sin(2*PI*x)+random(0.5)
```

The following step moves the part of the waveform between 0.15 s and 0.3 s up 1 volt.

**Step 6.** In the Formula folder, select the + sign, then select the MaskOn formula. Change the range of the MaskOn formula from 0.15 s to 0.3 s and press Preview.

```
sin(2*PI*x)+random(0.5)+MaskOn(x,0.15,0.3)
```

The following step applies the absolute value function to the formula.

**Step 7.** In the Formula field, move the text cursor all the way to the left of the formula string and type "abs(". Move the text cursor all the way to the right of the formula string and add another ")" as shown below. Press Preview.

```
abs(sin(2*PI*x)+random(0.5)+MaskOn(x,0.15,0.3))
```

**Step 8.** In the Navigation area, click Done to add the formula components to the selected output channel.

**Step 9.** Select the Fixed trace on the bottom of the Arb Waveform window and specify a value for the fixed parameter of the output. If a voltage Arb is programmed, the current level is fixed. If a current Arb is programmed, the voltage level is fixed. The diagram on the lower left of the display indicates the range of acceptable values for the fixed voltage or current parameter.

## Importing a Waveform File

The following steps import a waveform file into the Arb sequence.

**Step 1.** Select an output function using the V or I button in one of the Output boxes on the bottom of the display.

**Step 2.** Select the Sequence type, either 64K-point Constant Dwell, 512-point Sequence, or Fixed DC Level Constant Dwell Arb, an Arb Sequence, or Fixed.

**Step 3.** Click the Add button in the Navigation area to start adding sequence components.

**Step 4.** Click the Import folder and select New. Then navigate to and select a file to import. A thumbnail of the imported component will appear in the Imported folder. A Preview of the component will also appear in the Component Preview area.

**NOTE** Scope traces can be directly placed into the Imported folder. Go to the Scope function and select a trace from the display. In the Scope menu, select **Save Trace to Arb**

**Step 5.** You can modify the file by selecting Modify. This displays the Modify Waveform window.

**Step 6.** When you are satisfied with the edits, click Done in the Navigation area to add the waveform to the Arb sequence.

**Step 7.** Select the Fixed trace on the bottom of the Arb Waveform window and specify a value for the fixed parameter of the output. If a voltage Arb is programmed, the current level is fixed. If a current Arb is programmed, the voltage level is fixed.

# Triggering Measurements and Arbs

There are a number of ways to trigger measurements and Arbs. Start by selecting a trigger source. Trigger selections are located in the drop-down **Trigger** control of all functions.

## The Run buttons

The following Run buttons can be selected to trigger a measurement or an Arb, depending on which function is presently selected:


The Arb Run button can also be used to trigger a measurement for the Scope, Data Logger, and CCDF functions.

Note that the Agilent N6705 front panel Arb Run button can also be selected as the trigger source for the Arb function. After you click the Arb Run button in the Arb window, you must also press the front panel Arb Run button to start the Arb.

## Voltage or Current Levels

The Scope function lets you select a voltage or current level as the trigger source. The voltage or current level from any input channel on any connected mainframe can be selected as the trigger source. You can select only ONE current or voltage level.

**A-Current 1** for example, selects a current level on channel 1 on the "A" mainframe.

Note that after specifying a voltage or current trigger level as the trigger source, you must specify the actual trigger level on the display by moving the trigger trace up or down. Also, the **Slope** control specifies whether a rising edge or a falling edge generates the trigger when the signal edge intersects the voltage or current level.

## BNC Input

Located under "External" in the drop-down Trigger control.

The BNC input on the rear panel of the Agilent N6705 can be selected as the trigger input for the Scope, Data Logger, CCDF, and Arb functions. This requires a 5 V low-true trigger signal for a minimum of 10 microseconds.

## Digital Port Pin <n>

Located under "External" in the drop-down Trigger control.

This selects one of the seven digital port pins as the trigger source. This only applies to Scope, Data Logger, and CCDF functions. Signal specifications are the same as for the BNC input connector.

### BNC Input with Trigger Out

Located under "External" in the drop-down Trigger control.

This is a special configuration only used when trigger signals must be synchronized across multiple mainframes. This applies to the Scope, Data Logger, CCDF, and Arb functions.

## Marker and Display Measurements

Select Markers & Measurements at the bottom of the Scope, Data Logger, and CCDF display area.

Two vertical markers are available for making precise measurements on portions of the waveform traces. Use the mouse to select and move the markers on the display. The marker positions and distance between the markers is displayed in the Marker column. The marker measurements are displayed in the columns that appear in between the Marker columns.

### Scope and Data Logger measurements

**Measurements Between Markers**

| | |
|---|---|
| **Minimum** | The minimum value of the waveform segment between markers or the portion of the waveform that is displayed. |
| **Average** | The average (dc) value of the waveform segment between markers or the portion of the waveform that is displayed. The number of data points upon which the measurement is based is determined by the sample rate. |
| **Maximum** | The maximum value of the waveform segment between markers or the portion of the waveform that is displayed. |
| **RMS** (not available on Data Logger) | The RMS value of the waveform segment between markers or the portion of the waveform that is displayed. The number of data points upon which the measurement is based is determined by the sample rate |
| **Peak to Peak** | The peak to peak value of the waveform segment between markers or the portion of the waveform that is displayed. |
| **Charge(Ah/ Energy(Wh)** | For current traces, this integrates the Amp/hours of energy between markers or the portion of the waveform that is displayed.<br><br>For power traces, this integrates the Watt/hours of energy between markers or the portion of the waveform that is displayed. |

| | |
|---|---|
| **Charge(C)/ Energy(J)** | For current traces, this integrates the Coulombs/second of charge between markers or the portion of the waveform that is displayed.<br><br>For power traces, this integrates the energy in Joules between markers or the portion of the waveform that is displayed. |

### CCDF/Histogram measurements

**Measurements Between Markers**

| | |
|---|---|
| **Δ** | Indicates the time span in seconds between the markers. |
| **% between markers** | Indicates the percent occurrence of the measurement values between the markers. |

**Measurements from entire display**

| | |
|---|---|
| **10%** | Indicates the current value at the horizontal 10% decade. |
| **1%** | Indicates the current value at the horizontal 1% decade. |
| **.1%** | Indicates the current value at the horizontal 0.1% decade |
| **Average** | Indicates the average current of all measurement values |

## Exporting the Display Data

The export data function lets you information from selected measurement traces to a .csv file.

**Step 1.** Select the File menu from the top of the main window. Then select Export Data.

The Export Data command applies to the Scope, Data Logger, and CCDF functions only.

**Step 2.** Select the data traces that your wish to export.

**Step 3.** Select a directory and filename in which to save the display data. File format extensions include:

".csv" for comma-separated values

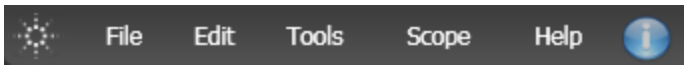
The saved .csv file may be opened using a number of applications such as Microsoft Excel or a text editor. It can also be imported into the Arb Waveform function. The first row in the file is the title. The second row indicates the sample rate in seconds for collected data. The first column indicates the time of the data points. Each trace is assigned a subsequent column in the file, with a column label followed by all of the data points for each waveform.

# 4
# Reference Information



This chapter contains reference information about the menu commands, toolbars, and navigation controls. It describes the built-in waveform parameters and how to obtain and install the Agilent 14585A software license.

# Command Menu




## File menu

| | |
|---|---|
| **Load** | Applies to the Scope, Data Logger, and CCDF functions only. Loads a display that was previously saved. |
| **Save** | Applies to the Scope and CCDF functions only. Saves the present display to a file. |
| **Load Waveform** | Applies to the Arb function only. Loads an Arb waveform sequence that was previously created and saved. |
| **Save Waveform** | Applies to the Arb function only. Saves the Arb waveforms that were created. |
| **Save Workspace** | Apples to all functions. Saves all function settings, connection settings, and Arb selections to a file. |
| **Load Workspace** | Apples to all functions. Loads all function settings, connection settings, and Arb selections that were previously saved. |
| **Export Data** | Apples to the Scope, Data Logger, and CCDF functions only. Selects the traces to export. The data from the selected traces is written to a CSV file. |
| **Print** | Displays a preview of the waveform output. The preview can then be sent to the specified printer. |
| **Exit** | Exits the application. |

## Edit menu

| | |
|---|---|
| **Copy Chart Image** | Copies the display content to the clipboard. |
| **Copy Chart Image (white background)** | Copies the display content to the clipboard with a white background. |

## Tools menu

| | |
|---|---|
| **Configure IO** | Configures the interface that will communicate with the DC Power Analyzer. |
| **Instrument Control** | Controls the DC Power Analyzer. Displays the front panel view as seen on the actual instrument. |
| **Show Errors** | Displays any errors that have occurred on any of the functions. Lets you copy and clear the error list. |
| **User Preferences** | Configures the measurement preferences and IO search parameters. |

## Scope menu

| | |
|---|---|
| **Clear Display** | Clears all scope measurement data. |
| **Deselect All Traces** | Removes all selected traces from the left side of the display. |
| **Measurement Ranges** | Specifies a measurement range for the output channel. |
| **Save Trace to Arb** | Saves a selected scope trace to the Arb Import tab. |
| **Properties** | Displays the scope properties that have been set. |

## Data Logger menu

| | |
|---|---|
| **Clear Display** | Clears all logged data. |
| **Deselect All Traces** | Removes all selected traces from the left side of the display. |
| **Measurement Ranges** | Specifies a measurement range for the output channel. |
| **Edit Event Tags** | Add/Edit/Delete event tag labels and categories to the datalog. |
| **Convert to CCDF** | Converts the opened datalog traces to CCDF. |
| **Properties** | Displays the data logger properties that have been set. |

## CCDF menu

| | |
|---|---|
| **Clear Display** | Clears all CCDF/Histogram data. |
| **Deselect All Traces** | Removes all traces that have been selected on the bottom of the display. |
| **Measurement Ranges** | Specifies a measurement range for the output channel. |
| **Properties** | Displays the CCDF properties that have been set. |

## ARB menu

| | |
|---|---|
| **Clone Trace** | Copies the selected trace to another channel or moves the trace to the alternate function of the same channel. |
| **Clear Display** | Clears all Arb sequences. |
| **Source Ranges** | Specifies an output range for the output channel. |
| **Run button** | Specifies the output state and Arb data source when the Arb runs. |
| **Statistics** | Displays all statistics about the Arb Waveform function. |

### Help menu

| | |
|---|---|
| **Help** | Displays the built-in Help in a separate window. |
| **About** | Displays information about the selected DC Power Analyzer mainframe and the installed power modules. |
| **i** | Displays the same information as **Help About**. |

## Toolbars

### Function Toolbar


**Scope** - lets you capture and display output waveforms.

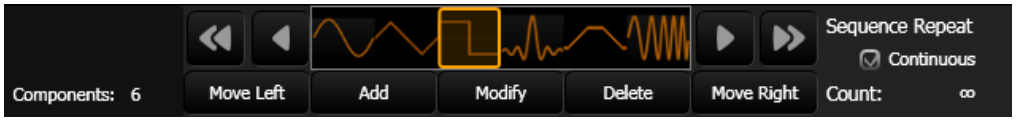
**Data Logger** - lets you log output voltage and current data for an extended time period.

**CCDF** - lets you concisely summarize short and long-term battery drain measurements for analysis and comparison.

**ARB** - lets you create complex waveforms based on combinations of basic waveforms using an interactive editor.

### Sequence Toolbar

The Sequence toolbar is located in the center of the Arb Waveform window.




Browse controls (**<<, <, >, >>**)

Browse controls let you traverse the sequence to select (activate) a component for editing. Browse controls do not reposition the components in the sequence.

Edit Controls (**Move Left, Add, Modify, Delete, Move Right**)

Edit controls let you move and edit and the selected component. **Move Left** moves the selected component one position to the left. **Move Right** moves the selected component to the right. **Add** appends or adds a component to the end of the sequence. **Modify** lets you edit the selected component. **Delete** deletes the selected component.

**Sequence Repeat** specifies how many times the entire sequence will repeat.

### Markers Toolbar

The Markers toolbar is located on the left of the marker area in the Scope and Data Logger windows.

Lets you select the measurement items.

Resets the markers to the edges of the display.

Removes the markers. Calculations will be based on the visible data in the display.

## Navigation controls

### Mouse

Click and hold down the mouse on any area of the display. The display moves horizontally or vertically as you move the mouse.

### Wheel

Moving the mouse wheel changes the horizontal time/divison of the display. If one of the traces has been selected by clicking on it, moving the wheel changes the vertical gain of the trace.

### Zoom Controls

The Zoom controls are located in the lower right of the Scope and Data Logger windows.


**AutoScale** scales the display so that all traces fit into the display area.

☐ zooms in on the selected area of the display. Use the mouse to draw a rectangle of the zoom area.

+ zooms in on the center of the display.

– zooms back out of the zoom area.

### Data Bar

The Data bar is located in the lower center of the Scope and Data Logger windows.


The yellow part indicates the portion of the data that is visible on the display.

The gray part represents the data that is not visible. Note that when you get to the end of the data, you can move all of the data off the display.

Browse controls (**<<, <, >, >>**) let you traverse the data.

## Built in Waveforms

**Exponential**

Start Amplitude - the amplitude before the waveform starts

End Amplitude - the final amplitude of the waveform

Delay - the delay after the trigger is received but before the waveform starts

Rise Time - the transition time from the start amplitude to the end amplitude

Time Constant - the time constant of the exponential curve

Repeat Count - the number of times the waveform repeats

**Gaussian**

Peak Amplitude - the peak amplitude of the waveform

Offset - the offset from zero

Peak Positive Time - the time from the start to the peak amplitude

Half Width Time - the width of the waveform at half of the peak amplitude

**Noise**

Amplitude - the amplitude or peak value

Offset - the offset from zero

Frequency - the frequency of the waveform

Start Time - the start time of the waveform

Duration - the duration of the waveform

**Pulse**

Start Amplitude - the amplitude before and after the pulse

End Amplitude - the amplitude of the pulse

Delay - the delay after the trigger is received but before the pulse starts

Pulse Time - the time (width) of the pulse

End Time - the time the output stays at the start amplitude after the pulse

Repeat Count - the number of times the pulse repeats

| | |
|---|---|
| **Ramp** | Start Amplitude - the amplitude before the ramp |
| | End Amplitude - the amplitude after the ramp |
| | Delay - the delay after the trigger is received but before the ramp starts |
| | Ramp Time - the time that the output ramps up |
| | End Time - the time the output remains at the end amplitude |
| | Repeat Count - the number of times the waveform repeats |
| **Ringing** | Delay - the delay after the trigger is received but before the waveform starts |
| | Amplitude - the amplitude or peak value |
| | Offset - the offset from zero |
| | Frequency - the frequency of the waveform |
| | Decade - the duration of the ringing in decades |
| **Sinc** | Peak Amplitude - the peak amplitude of the normalized waveform |
| | Offset - the offset from zero |
| | Peak Position Time - the time until the peak position of the waveform |
| | Zero Crossing Frequency - the zero crossing frequency of the waveform |
| **Sine** | Amplitude - the amplitude or peak value |
| | Offset - the offset from zero |
| | Frequency - the frequency of the sine wave |
| | Phase - the start phase angle of the sine wave |
| | Repeat Count - the number of times the sine wave repeats |
| **Square** | Amplitude - the amplitude or peak value |
| | Offset - the offset from zero |
| | Frequency - the frequency of the square wave |
| | Duty - the duty cycle of the square wave |
| | Phase - the start phase angle of the square wave |
| | Repeat Count - the number of times the waveform repeats |
| **Stair Step** | Start Amplitude - the amplitude before the staircase starts |
| | One Step Amplitude - the amplitude of each step |
| | Number of Steps - the total number of staircase steps |
| | Delay - the delay after the trigger is received but before the waveform starts |
| | Stair Step Time - the time to complete all of the steps |
| | End Time - the time the waveform stays at the final amplitude |
| | Repeat Count - the number of times the waveform repeats |

| | |
|---|---|
| **Step** | Start Amplitude - the amplitude before the step |
| | End Amplitude - the amplitude of the step |
| | Delay - the delay after the trigger is received but before the step occurs |
| | End Time - the time the output stays at the end amplitude |
| **Swept** | Amplitude - the amplitude or peak value |
| | Offset - the offset from zero |
| | Start Frequency - the start frequency of the waveform |
| | End Frequency - the end frequency of the waveform |
| | Duration - the duration or length of the waveform |
| **Trapezoid** | Start Amplitude - the amplitude before and after the trapezoid |
| | Delay - the delay after the trigger is received but before the trapezoid starts |
| | Peak Amplitude - the peak amplitude of the trapezoid |
| | Start Time - the time before the trapezoid ramps up |
| | Rise Time - the time that the trapezoid ramps up |
| | Peak Time - the time at the peak amplitude |
| | Fall Time - the time that the trapezoid ramps down |
| | End Time - the time the output stays at the start amplitude after the trapezoid |
| | Repeat Count - the number of times the waveform repeats |
| **Triangle** | Amplitude - the amplitude or peak value |
| | Offset - the offset from zero |
| | Frequency - the frequency of the waveform |
| | Phase - the start phase angle of the waveform |
| | Repeat Count - the number of times the waveform repeats |

# Licensing

The Agilent 14585A software requires that each connected Agilent N6705 DC Power Analyzer has a License key installed in it. The license key for the Agilent N6705 can be ordered with the instrument when you purchase the N6705A/B with Option 056. It can also be purchased separately as N6705U Option 056.

One license key is required for each N6705 DC Power Analyzer. The license key is based on the DC Power Analyzer mainframe's serial number and is installed into the specific instrument for which it was ordered. Once a license key has been redeemed, it cannot be transferred to a different instrument.

## Obtaining the License Key

**Step 1.** To obtain an Agilent 14585A license key for an Agilent N6705 DC Power Analyzer you will need:

a. The Agilent 14585A Control and Analysis Software. (This software is free to download and use for a specific time.)

b. The serial number of the Agilent N6705 DC Power Analyzer mainframe for which you will be obtaining the license key. The serial number is a 10-character string in the format MY12345678. You can obtain the serial number as follows:

- Look at the serial number tag on the rear panel of the unit.
- On the front panel, press Settings, then Properties.
- Query the power analyzer with the *IDN? Command.

c. Your email address.

d. Your Order number and Certificate number. These appear in the upper right cornet of the Software Entitlement Certificate that was provided when you ordered the Agilent N6705A/B with Option 056 or Agilent N6705U Option 056.

**Step 2.** To get the license key go to: www.agilent.com/find/softwarelicense and follow the on-screen directions.

a. Enter the Order number and Certificate number. Click Next.

b. Under Request License(s) for, check the box labeled "A single product on one or more instruments or host computers".

Under Please Select Products, select "14585A". Click Add.

c. Under Enter 10 Character Instrument ID, enter the serial number of the Agilent N6705 DC Power Analyzer you wish to license for the Agilent 14585A software. Click Next.

d. Review your selection. Click Next.

e. Enter your e-mail address, confirm and Submit.

After finishing the license request, a license key will be emailed to you shortly. When received, refer to "Installing the License Key".

## Installing the License Key

A license key was emailed to you after you completed the procedure under "Obtaining the License Key".

**To Install the license key using the Agilent 14585A software:**

**Step 1.** Run the Agilent 14585A software and select Configure IO in the Edit menu**.**

**Step 2.** From the list, select the Agilent N6705 that you wish to license. Click on the License button to display the Licensing dialog.

**Step 3.** Enter the license key from the email into the License Key field and click Enter.

**Step 4.** The license is now installed. Use a black permanent marker and check the "[ ] Add License for 14585A Control and Analysis Software" box on the Options label on the back of your Agilent N6705 instrument.

**To Install the license key using the Agilent N6705 DC Power Analyzer:**

**Step 1.** Turn on the DC Power Analyzer and select Utilities in the front panel Menu**.**

**Step 2.** Scroll to Administrative Tools and log in (refer to the Agilent N6705A User's Guide for details).

**Step 3.** When logged in, select Install Options.

**Step 4.** In the Option drop-down box, select "056 - Enable 14585A Software"

**Step 5.** Use the keypad to enter the license key from the email into the Key field and click Enter.

**Step 6.** The license is now installed. Use a black permanent marker and check the "[ ] Add License for 14585A Control and Analysis Software" box on the Options label on the back of your Agilent N6705 instrument.

# Index