Agilent IntuiLink for Infiniium

Software for the Agilent Technologies Infiniium-Series Oscilloscopes

Getting Started With
Agilent IntuiLink

Agilent IntuiLink for Infiniium

Software for the Agilent Infiniium Oscilloscopes

Software Overview

Agilent IntuiLink offers a set of connectivity tools that enable you to quickly and easily move data from your Agilent Infiniium Oscilloscopes to your PC. Whether you are an experienced programmer or would prefer not to program at all, Agilent IntuiLink is designed to give you a high-level of instrument control using software applications that you are probably already using on your PC.

For the Non-Programmer — A Simple Toolbar Add-In for Excel and Word

Agilent IntuiLink provides an easy-to-use toolbar that enables you to perform simple waveform data and image transfers directly into Microsoft® Excel® or Microsoft® Word®. Once installed, the toolbar is automatically loaded and operates just like any other toolbar in these applications. Use the
Tools | Add-Ins menu to add or remove the toolbar from the application. The toolbar is shown below with a brief description of each toolbar button.

NOTE: To get started with the toolbar, you will need to open Excel or Word from the Start | Agilent IntuiLink | Start Excel (Word) Toolbar Addin.

Excel Toolbar

Word Toolbar
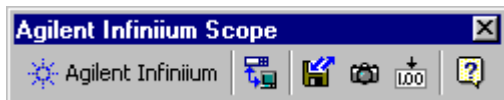
Agilent **About Agilent Scope Toolbar** Returns the software version number and allows you to select the local language for the dialog boxes and help system.

Connect to Scope Configures the remote interface connection to the oscilloscope.

Save / Load Scope Settings Stores the oscilloscope settings to a file or downloads a previously-stored settings file to the oscilloscope.

Get Waveform Data Uploads waveform time/voltage data from the oscilloscope to the active worksheet or document. (Excel only)

Get Screen Image Captures an image of the oscilloscope's display and places it in the active worksheet or document.

Get Single Measurement Acquires a single measurement (rise time, duty cycle, frequency, etc.) from the oscilloscope and places it in the active worksheet or document.

Logging Data Sets up a worksheet template, retrieves measurements at periodic intervals and inserts them in the worksheet. (Excel only)

Toolbar Help Provides step-by-step explanations to help you learn to use the toolbar.

Excel Macro Support

You can create a macro for most of the toolbar operations using the Excel macro recording feature. You can then run the macro to automatically "play back" the recorded actions.

For the Programmer — An ActiveX Custom Control

For more sophisticated programming, an ActiveX™ Custom Control is provided with Agilent IntuiLink to make it easy to program your oscilloscope using common programming environments such as Visual Basic®, Visual Basic® for Applications (Excel and Word), and Visual C++®. The **AgtInfiniium** Control gives you all of the functionality of the toolbar plus the added capability to programmatically control the operation of the oscilloscope. Within the Microsoft environment, you have complete access to all of the property pages, context-sensitive help, and persistence.

As shown in the sample below, it only takes a few lines of Visual Basic code to capture the waveform data and obtain a screen image from the oscilloscope using the **AgtInfiniium** Control.

```
With scope
    .AnalogChannels(1).Enabled = -True
    .SetAcquisitionPoints 200
    .GetWaveformData AgtInfiniium_Channel_1, xdata, ydata
    Image1.Picture = .gets
```

Digitize
Enter
GetAcquisitionPoints
GetAllWaveformData
GetScreenImage
GetWaveformData
Index
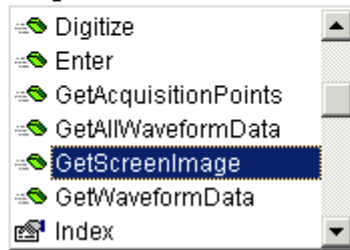
```
End With
```

The first line of code enables Channel 1 on the oscilloscope. The second and third lines of code captures the waveform time/voltage pairs (200 waveform points) from Channel 1 and stores the data in two arrays. The fourth line of code shows the use of Microsoft's "IntelliSense" feature to select the function that places the screen image into an Image control.

To help you become familiar with the structure and operation of the **AgtInfiniium** Control, we have included several programming examples with Agilent IntuiLink. These files will be loaded on your PC as part of the installation procedure. For more information, navigate to:

Start | Programs | Agilent IntuiLink | Infiniium | Examples

We have also included several getting started documents to help you become familiar with the **AgtInfiniium** Control in Excel, Visual Basic, and C++. For more information, navigate to:

Start | Programs | Agilent IntuiLink | Infiniium | IntuiLink Infiniium Automation Help

Toolbar Overview

About Agilent Infiniium Scope Toolbar

The dialog boxes and help system are available in several languages. Use the following dialog box to select the desired language.

Connect to Scope

Agilent IntuiLink makes it easy to establish an interface connection between your oscilloscope and your PC. Whether you are connecting to the oscilloscope using a GPIB port, Agilent IntuiLink does the work for you. Simply press the **Search** button (see below) and Agilent IntuiLink determines which instruments are connected to your PC.
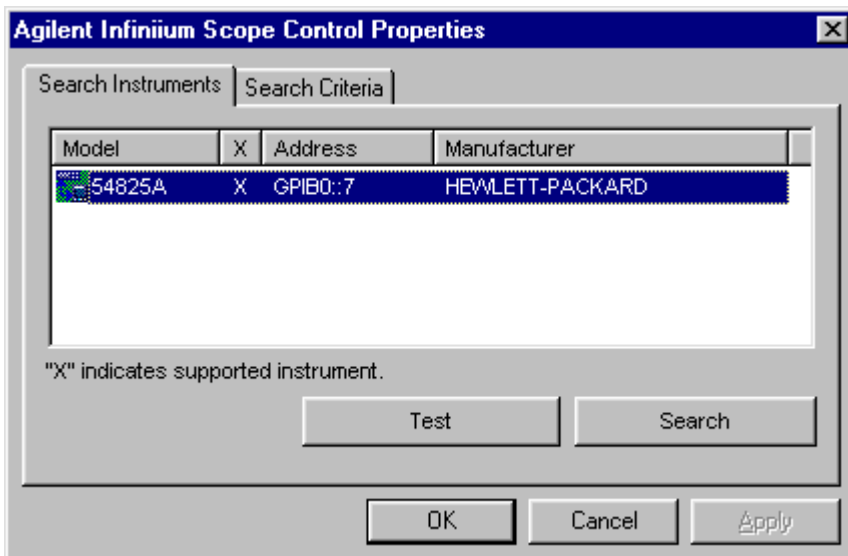
📷 Get Screen Image

For documentation purposes, you may want to capture a "snapshot" of the oscilloscope display. With Agilent IntuiLink, it just takes a few seconds to insert the image into your Excel or Word document. Note that you can also save the image to a file.

Screen image captured from oscilloscope

⊞ Get Single Measurement

For some applications, you may want to capture a single measurement (rise time, duty cycle, frequency, etc.) and place it in the active worksheet or document. From the **Function** drop-down list (see below), you can select a specific measurement or select "All Functions" to place all 12 available measurements in the active document.

Excel Dialog Box:

```
┌─────────────────────────────────────────────────────────┐
│ Get Single Measurement                              [×]  │
├─────────────────────────────────────────────────────────┤
│                                                           │
│  Scope Channel:            Function:                      │
│                                                           │
│  ┌──────────────┬──┐       ┌──────────────────────┬──┐   │
│  │ 1 - On       │▼ │       │  Rise Time           │▼ │   │
│  └──────────────┴──┘       └──────────────────────┴──┘   │
│                                                           │
│  ┌─ Insert measurement . . . ─────────────────────────┐  │
│  │                                                      │  │
│  │   In Cell:           ☑ Include Eng. Units           │  │
│  │                                                      │  │
│  │   ┌──────────────┬──┐                                │  │
│  │   │ Sheet2!$A$1  │ _│                                │  │
│  │   └──────────────┴──┘                                │  │
│  │                                                      │  │
│  └──────────────────────────────────────────────────────┘│
│                                                           │
│    ┌──────────┐   ┌──────────┐   ┌──────────┐            │
│    │    OK    │   │  Cancel  │   │  Close   │            │
│    └──────────┘   └──────────┘   └──────────┘            │
└─────────────────────────────────────────────────────────┘
```
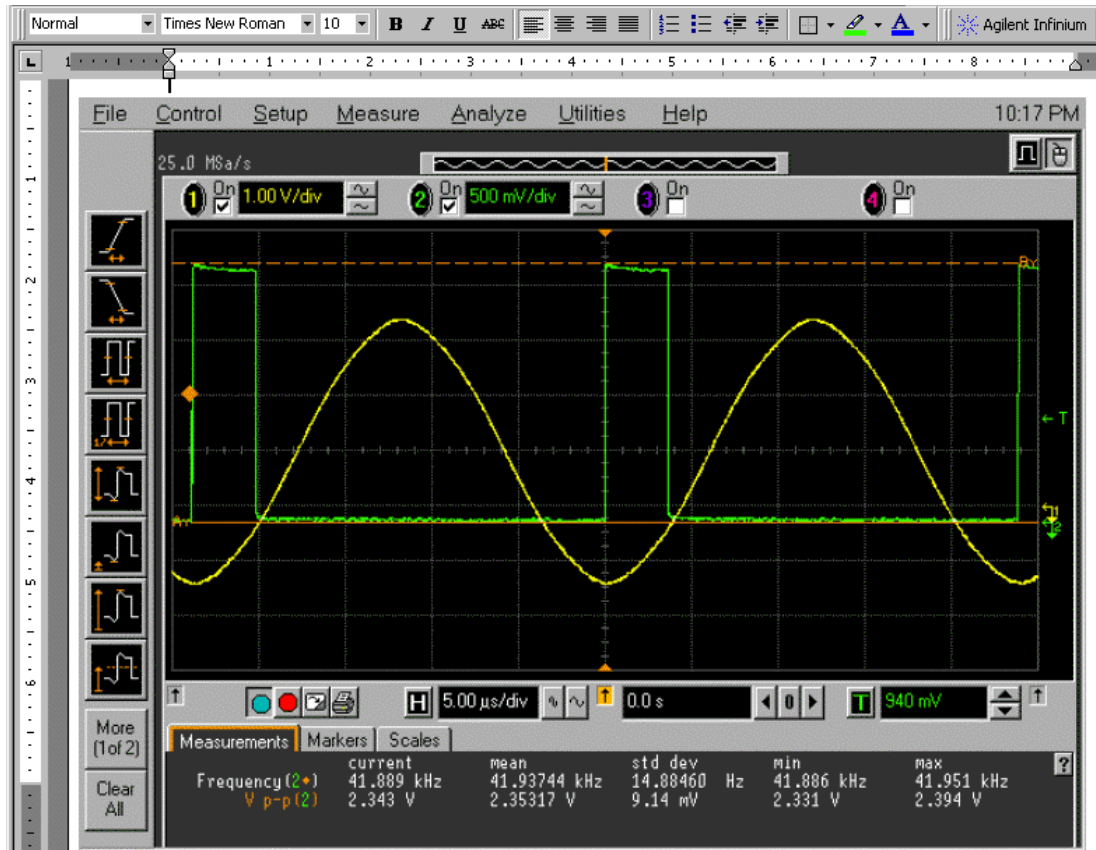
Word Dialog Box:

```
┌─────────────────────────────────────────────────────────┐
│ Get Single Measurement                              [×]  │
├─────────────────────────────────────────────────────────┤
│                                                           │
│  Scope Channel:            Function:                      │
│                                                           │
│  ┌──────────┬──┐           ┌──────────────────────┬──┐   │
│  │ 1 - On   │▼ │           │ Rise Time            │▼ │   │
│  └──────────┴──┘           └──────────────────────┴──┘   │
│                                                           │
│  ┌──────────────────────────────────────────────────────┐│
│  │                         ┌──────────────────────┬──┐   ││
│  │  ☑ Units                │ Engineering Units    │▼ │   ││
│  │                         └──────────────────────┴──┘   ││
│  │  ☑ Function label       ┌───┬─┐                       ││
│  │                         │ 3 │▲│  Decimal Places        ││
│  │                         └───┴▼┘                       ││
│  │  Sample:    ┌──────────────────────────────────────┐  ││
│  │             │ Rise Time (1) = 314.159 ns           │  ││
│  │             └──────────────────────────────────────┘  ││
│  └──────────────────────────────────────────────────────┘│
│                                                           │
│    ┌──────────┐   ┌──────────┐   ┌──────────┐            │
│    │    OK    │   │  Cancel  │   │  Close   │            │
│    └──────────┘   └──────────┘   └──────────┘            │
└─────────────────────────────────────────────────────────┘
```
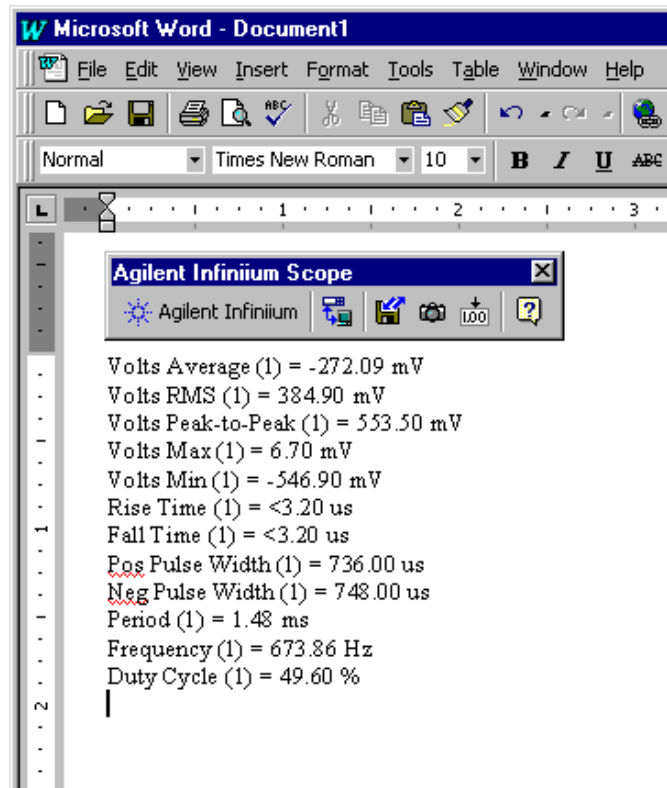
Measurement data in Excel

In Excel, the measurement is placed in the highlighted cell. If desired, you can annotate each reading (mV, kHz, etc.). The sample below shows all 12 available measurements placed in the active worksheet.

F	G	H	I	J	K	L

Agilent Infiniium Scope

798.1	mV, Volts Average(2)
2.00231	V, Volts RMS(2)
5.88	V, Volts Peak-to-Peak(2)
5.28	V, Volts Max(2)
-600	mV, Volts Min(2)
<34	ns, Rise Time(2)
<31	ns, Fall Time(2)
3.638	us, Pos Pulse Width(2)
20.201	us, Neg Pulse Width(2)
23.839	us, Period(2)
41.948	kHz, Frequency(2)
15.3	%, Duty Cycle(2)
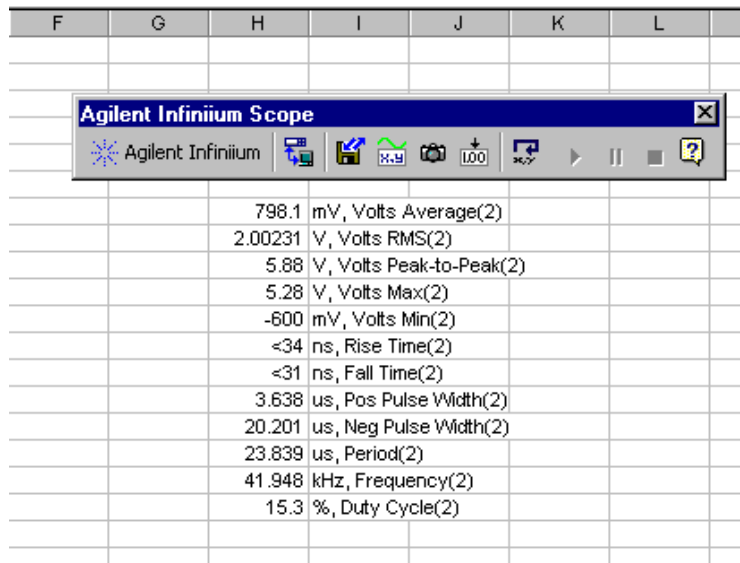
Measurement data in Word

In Word, the measurement is placed at the cursor in the active document. If desired, you can annotate each reading (mV, kHz, etc.). The sample below shows all 12 available measurements placed in the active document.

Microsoft Word - Document1

File Edit View Insert Format Tools Table Window Help

Normal   Times New Roman   10   **B** *I* U ABC

Agilent Infiniium Scope

Volts Average (1) = -272.09 mV
Volts RMS (1) = 384.90 mV
Volts Peak-to-Peak (1) = 553.50 mV
Volts Max (1) = 6.70 mV
Volts Min (1) = -546.90 mV
Rise Time (1) = <3.20 us
Fall Time (1) = <3.20 us
Pos Pulse Width (1) = 736.00 us
Neg Pulse Width (1) = 748.00 us
Period (1) = 1.48 ms
Frequency (1) = 673.86 Hz
Duty Cycle (1) = 49.60 %

⛰ Get Waveform Data

Excel only. One of the most powerful features of Agilent IntuiLink is the ability to capture waveform data (time/voltage pairs) from the oscilloscope. From Excel, the waveform data is automatically placed in rows and columns on the spreadsheet and you can also generate a graph using the captured data. From Word, the waveform data is downloaded, a graph is generated, and both are placed in the active document.

Excel Dialog Box:
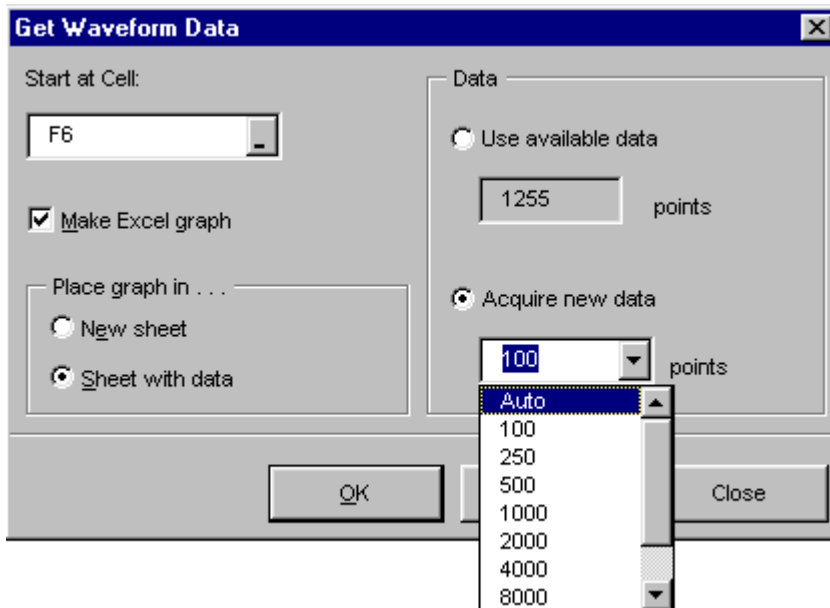
Waveform data plotted in Excel

When the waveform data is uploaded from the oscilloscope, the points are automatically plotted using Excel's built-in charting function.
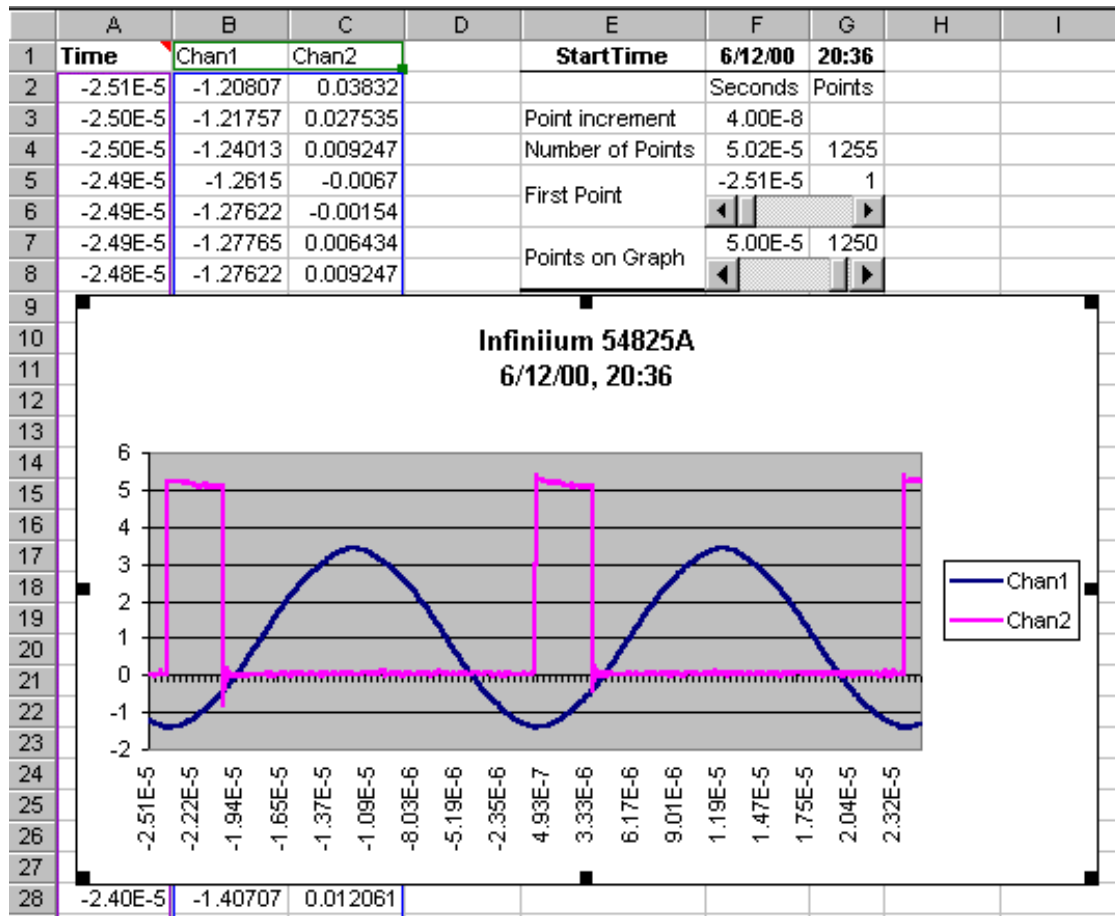
 Set Up / Run Logging Worksheet

Excel only. In Excel you can log readings to the worksheet and display the data as a graph or as a strip chart. The logging can be initiated immediately on closing the dialog, at a later time or by an external trigger at the instrument. The chart created is an Excel chart. You can modify it to suit your own requirements.
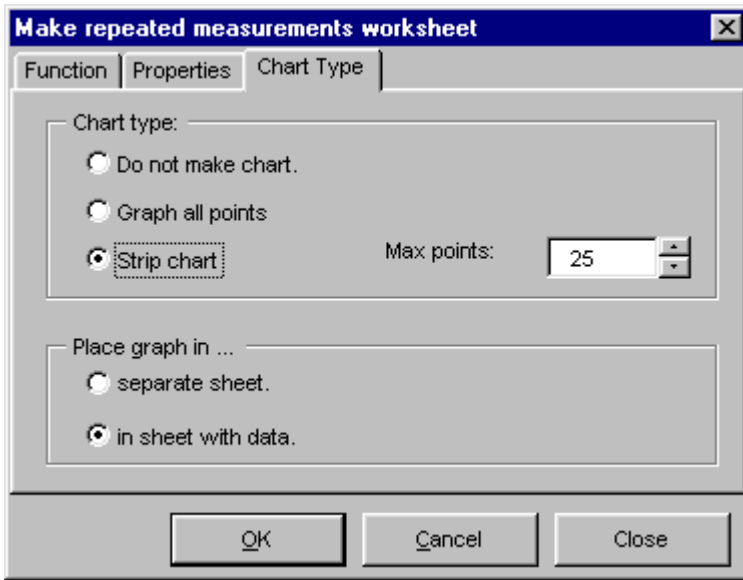
Select the channel, function, and starting location.

Select how the data will be collected.

Select how to chart the data.

Logging Data in Excel

In Excel, the time and data are placed in a spreadsheet and, if requested, a chart is created showing the logging data. Details about the logging session are also included on the spreadsheet.

	A	B	C	D	E	F	G
1	**Time**	Frequency(2	Duty Cycle(2)		**Start Time**	**12 Jun 00 20:56**	
2	20:58:10	41945	15.3		Interval	00:00:01	
3	20:58:11	41940	15.3		number of Samples	50	
4	20:58:12	41943	15.3		Last point on chart	50	
5	20:58:13	41940	15.4				
6	20:58:14	41946	15.3		Max Points on Strip chart	15	
7	20:58:15	41944	15.3				
8							

Channel: 2
6/12/00, 20:56

	A	B	C	D
27	20:58:35	41943	15.3	
28	20:58:36	41943	15.3	

11
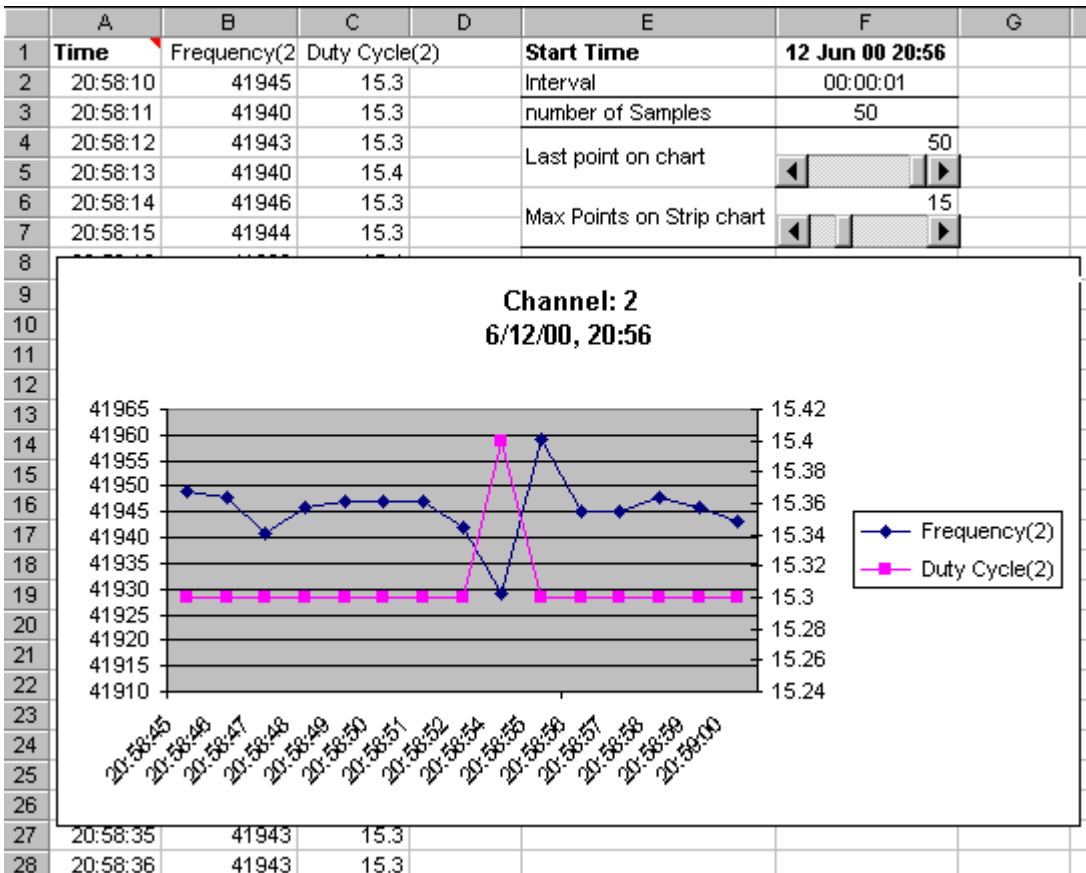
![icon] Save / Load Scope Settings

Agilent IntuiLink gives you the ability to store the current oscilloscope settings to a file on your PC or download previously-stored settings to your oscilloscope. The oscilloscope settings are stored in a binary format (.set file extension).
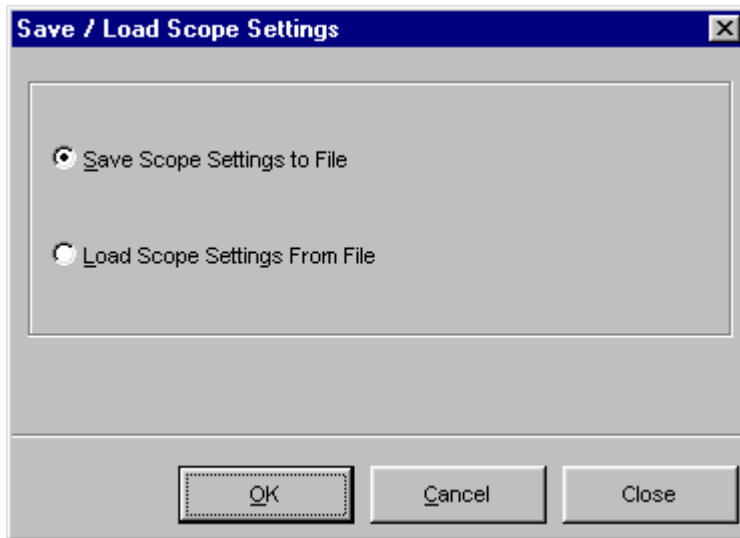
![icon] Toolbar Help

Like most PC applications, a help system is included with Agilent IntuiLink to assist you with the operation of the toolbar. The help system and all dialog boxes are available in multiple languages.

Task Reference: Toolbar for Excel

Connect to the Scope and verify communication

1. Click **Connect to Scope** on the Agilent Infiniium Scope toolbar.
2. From the **Search Instruments** tab, click **Search** to find all instruments connected to your PC. If this is your first 'Search', all interface ports on your PC will be checked. To exclude any ports or instruments from future searches, click the **Search Criteria** tab.
3. Select the desired Agilent Oscilloscope from the list.
4. Click **Test** to verify the interface connection.
5. Click **OK** to save the connection.

Note: If the dialog box shows an Agilent Oscilloscope selected, then the connection has already been established.

Insert an image of the Scope display in the document

1. Click **Get Screen Image** on the Agilent Infiniium Scope toolbar.
2. Select **Place in document at cursor** to place the image in the active document. Note that you can also save the image to a file.
3. Click **OK**.

Capture a single measurement from the Scope

1. Click **Get Single Measurement** on the Agilent Infiniium Scope toolbar.
2. From the **Scope Channel** drop-down list, select an enabled ('On') scope channel.
3. From the **Function** drop-down list, select the desired measurement (or 'All Functions').
4. Note that you can display the measurement with a variety of annotations (units, decimal places, etc.).
5. Click **OK** to place the measurement at the cursor in the active document.

Save the current Scope settings to a file

1. Click **Save / Load Scope Settings** on the Agilent Infiniium Scope toolbar.
2. Select **Save Scope Settings to File** and then click **OK**.
3. Navigate to the desired directory on your PC and enter a file name (.set file extension).
4. Click **Save** to store the file.

Download previously stored settings to the Scope

1. Click **Save / Load Scope Settings** on the Agilent Infiniium Scope toolbar.
2. Select **Load Scope Settings From File** and then click **OK**.
3. Navigate to the desired directory on your PC and open the previously stored file (.set file extension).
4. Click **Open** to open the file and download the stored settings to the Scope.

Note: The file will generate and error if used with oscilloscopes other than Agilent Infiniium-Series oscilloscopes.

Adding the toolbar in Word

You can add the toolbar to Microsoft Word from the menu "Tools | Templates and Add-Ins...". Browse to locate the template file (.dot) in the application directory.
\ Program Files \ Agilent IntuiLInk \ Infiniium \ AgtInfiniium.dot

Note: Depending upon the version of Microsoft Word you are using, you can locate the template by either using the **Browse** button or the **Add** button. In either case, you should locate the template file (.dot) named 'AgtInfiniium.dot'.

Select the local language

1. Click **About Agilent Scope** on the Agilent Infiniium Scope toolbar.
2. Click the **Select Language** tab.
3. Select the desired language. The dialog boxes and help system will appear in the selected language.
4. Click **OK**.

Task Reference: Toolbar in Word

Connect to the Scope and verify communication

1. Click **Connect to Scope** on the Agilent Infiniium Scope toolbar.
2. From the **Search Instruments** tab, click **Search** to find all instruments connected to your PC. If this is your first 'Search', all interface ports on your PC will be checked. To exclude any ports or instruments from future searches, click the **Search Criteria** tab.
3. Select the desired Agilent Oscilloscope from the list.
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5. Click **OK** to save the connection.

Note: If the dialog box shows an Agilent Oscilloscope selected, then the connection has already been established.

Insert an image of the Scope display in the document

1. Click **Get Screen Image** on the Agilent Infiniium Scope toolbar.
2. Select **Place in document at cursor** to place the image in the active document. Note that you can also save the image to a file.
3. Click **OK**.

Capture a single measurement from the Scope

1. Click **Get Single Measurement** on the Agilent Infiniium Scope toolbar.
2. From the **Scope Channel** drop-down list, select an enabled ('On') scope channel.
3. From the **Function** drop-down list, select the desired measurement (or 'All Functions').
4. Note that you can display the measurement with a variety of annotations (units, decimal places, etc.).
5. Click **OK** to place the measurement at the cursor in the active document.

Save the current Scope settings to a file

1. Click **Save / Load Scope Settings** on the Agilent Infiniium Scope toolbar.
2. Select **Save Scope Settings to File** and then click **OK**.
3. Navigate to the desired directory on your PC and enter a file name (.set file extension).
4. Click **Save** to store the file.

🖫 Download previously stored settings to the Scope

1. Click **Save / Load Scope Settings** on the Agilent Infiniium Scope toolbar.
2. Select **Load Scope Settings From File** and then click **OK**.
3. Navigate to the desired directory on your PC and open the previously stored file (.set file extension).
4. Click **Open** to open the file and download the stored settings to the Scope.
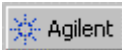
Note: The file will generate and error if used with oscilloscopes other than Agilent Infiniium-Series oscilloscopes.

Adding the toolbar in Word

You can add the toolbar to Microsoft Word from the menu "Tools | Templates and Add-Ins...". Browse to locate the template file (.dot) in the application directory.
\ Program Files \ Agilent IntuiLInk \ Infiniium \ AgtInfiniium.dot

Note: Depending upon the version of Microsoft Word you are using, you can locate the template by either using the **Browse** button or the **Add** button. In either case, you should locate the template file (.dot) named 'AgtInfiniium.dot'.

🔆 Agilent Select the local language

1. Click **About Agilent Scope** on the Agilent Infiniium Scope toolbar.
2. Click the **Select Language** tab.
3. Select the desired language. The dialog boxes and help system will appear in the selected language.
4. Click **OK**.

Technical Support

Complimentary Start-Up Assistance

Terms and Conditions

Agilent Technologies (Agilent) will provide Start-Up Assistance at no charge to resolve questions relating to the installation, operation, and use of this software product. Start-Up Assistance is available to help you install the software on your PC, establish communication with a compatible instrument, and answer questions relating to the functionality of the software components provided by Agilent. Start-Up Assistance does not support requests to modify or enhance the functionality of the software. For services not covered by Start-Up Assistance, you may be referred to fee-based services for advanced assistance.

Agilent will make reasonable efforts to respond to each customer request for Start-Up Assistance within two working days, but is under no obligation to respond within a prescribed time frame. Requests for Start-Up Assistance are handled in the order in which they were received. Agilent will make reasonable efforts to solve customer problems, but cannot guarantee success.

Agilent Technologies reserves the right to terminate Start-Up Assistance at any time without notice.

Contacting Agilent for Technical Support

Country	Telephone	Fax	E-Mail
Australia	1 800 629 485	03 9272 0749	info_tmo@agilent.com
Austria	(01) 25000-7006	(01) 25000-6558	messtechnik_vertrieb@hp.com
Bangladesh	880-2-9130480	880-2-871034	jiu@bangla.net
Belgium	32-2-778.34.13	32-2-778.34.14	---
Brazil	(+55 11) 7297-8600	(+55 11) 7297-8171	tmobrasil@hp.com
Canada	877 894-4414	(905) 206-4120	---
China	86 10 65645261	86 10 65668250	HPAcademy_China@hp.com
Czech Republic	+420 2 333 21 707	+420 2 333 20 672	haasz@htest.cz
Denmark	45 99-15-15	---	---
Europe	---	31 20 547 7700	ots_europe@hp.com
Finland	358-10-885 2100	---	---
France	01 69 29 4114	01 69 82 6535	---
Germany	---	(0180) 524-6335	messtechnik_vertrieb@hp.com
Hong Kong	(852) 2599 7889	(852) 2506 9256	---
Hungary	(36) 1 382 6006	(36) 1 382 6001	---
India	011-6906215	011-6926063	techfinance_india@hp.com
Indonesia	62-21 3800902	62-21 3518814	tmomarketing@berca.co.id
Ireland	01 205 4538	---	---
Israel	972-3-5380570	972-3-5380525	sigal_nino@agilent.com
Italy	02 9260 8484	02 9210 4069	agilent_direct@agilent.com
Japan	81-426-56-7832	81-426-56-7840	mac_support@om.jpn.hp.com
Korea	82/2-769-0800	82/2-784-5839	asia_ots-korea@agilent.com
Luxembourg	32-2-778.59.50	32-2-778.59.51	---
Malaysia	1-800-88-8848	603-298 9157	hp-direct_my@hp.com
Mexico	(5) 258-4209	---	---
Netherlands	020 547 6669	020 547 7765	sofija-van-der_Loo@agilent.com
New Zealand	0800 738 378	04 802 6881	info_hptmo@aus.hp.com
Norway	+47 2273 5759	+47 2273 5629	test_measurement@norway.hp.com
Pakistan	92-51-818-959	92-51-816-190	mushkoib@isb.compol.com
Philippines	(632) 814-1066	(632) 811-1080	HPPDirect-sales@hp.com
Poland	+48 (022) 6084554	+48 (022) 6084555	---
Portugal	(351/1) 482 8500	(351/1) 444-7077	---
Russia	+7-095-797 3628	+7-095-916 9848	julia_ovetchkina@agilent.com
Singapore	3744242	2754709	mindy-ml_chee@hp.com
South Africa	+27-11-444 8010	+27-11-444-8511	steve_alves@concilium.co.za
Spain	34 91 631.13.23	34 91 631.14.69	---
Sri Lanka	94-74-717 701	941-504 340	dayankaru@sscomp.co.ae
Sweden	(08) 444-2277	46 8 444-2525	---
Switzerland	---	(0180) 524-6335	messtechnik_vertrieb@hp.com
Taiwan	0800-47866	---	---
Thailand	(02) 661-5900	(02) 661-6420	---
Turkey	(90/312) 468 87 70	(90/312) 468 87 78	ozlem_sutlas@agilent.com
United Kingdom	01344-366666	---	---
United States	800 452 4844	888-900-8921	---
Viet Nam	844-8-229808	844-8-229553	sysco.vn@hn.vnn

Note: In all other countries, please contact your local Agilent Representative or go to the Agilent web site at www.tmo.agilent.com.

Software Installation

Installing Agilent IntuiLink Software

You can install Agilent IntuiLink from the CD-ROM included with your instrument or you can download the software from the Agilent Technologies web site (www.agilent.com/find/bi). Select 'Services and Support' and then select 'Test and Measurement / Technical Support'. Software updates and future releases will also be available from this web site.

After installing the software on your PC, go to the **Tools | Add-Ins** menu in Excel or Word to enable Agilent IntuiLink operations in the selected application. For more information on using the **AgtInfiniium** Control with Visual Basic, refer to the help file included with the ActiveX Control. Note that all of the necessary I/O functionality is also loaded when you install the software, including the ability to control your oscilloscope using both Agilent Technologies and National Instruments interface cards on your PC.

Minimum System Requirements

PC Operating System Requirements:

Windows® 95 or Windows® 98
    486DX/66
    16 MB RAM
    20 MB free disk space

Windows NT® 4.0
    Service Pack 3
    Pentium-90
    32 MB RAM
    20 MB free disk space

Environments Supported:

Applications
    Microsoft Excel 97
    Microsoft Word 97

Software Development
    Visual Basic 5.0/6.0
    VBA 5.0
    Agilent VEE 5.0 or greater
    LabVIEW 5.1 or greater
    Visual C/C++ 5.0/6.0

Supported Instruments

Oscilloscope Models Supported:

    Agilent 54810A

    Agilent 54815A

    Agilent 54820A

    Agilent 54825A

    Agilent 54835A

    Agilent 54845A

Supported PC-to-Instrument Interfaces

GPIB Interface

Supported using Agilent SICL (Standard Instrument Control Library):

    Agilent 82335B

    Agilent 82340A/B/C

    Agilent 82341A/B/C/D

    Agilent 82350A

Supported using National Instruments NI-488.2 Library:

    National Instruments AT-GPIB/TNT

    National Instruments PCI-GPIB

    National Instruments PCMCIA-GPIB