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# DASYLab Techniques

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## *DASYLab DDE Examples*

### **Introduction**

Working with DASYLab DDE functions requires some knowledge of how DDE (dynamic data exchange) works. This obsolete Windows function allows DASYLab to send and receive data to an external program, and to send and receive commands from an external program.

Microsoft has advised that the DDE technology is obsolete and should not be used. They recommend that programmers move to the Microsoft Automation (OLE) model. DASYLab 13 supports the ActiveX/OLE automation model in the Script module. Several Excel examples have been published for the Script module.

However, many DASYLab users prefer to continue to use the DDE functions. This technical note describes several examples for using the DDE functions with DASYLab 13. Most of these techniques will work with earlier versions, but the examples were created with V13 and will work with future versions of DASYLab until Microsoft completely removes DDE from the operating system.

The examples that are described in this technical note are:

[Write to Excel at 1 samples/second](#)

[Read from Excel sheet at high speed](#)

[Write to Excel sheet at high speed](#)

[Send Commands to Excel](#)

[Send Global Strings and Variables to Excel](#)

[Start Excel with a filename](#)

All of the examples require Microsoft Excel 2003 or later. They were created and tested with DASYLab 13 and Excel 2007 on a Windows 7 64-bit operating system.

Note that the Excel program must be open prior to operating and configuring the examples. Some examples include the Excel sheet.

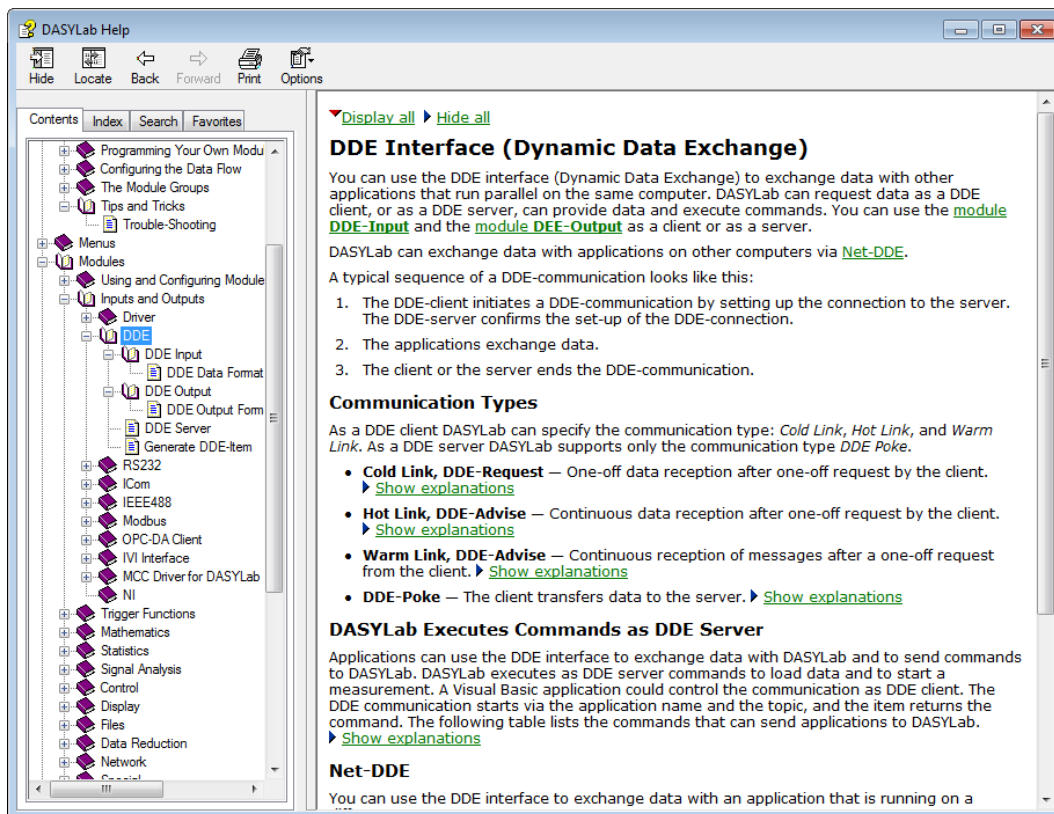
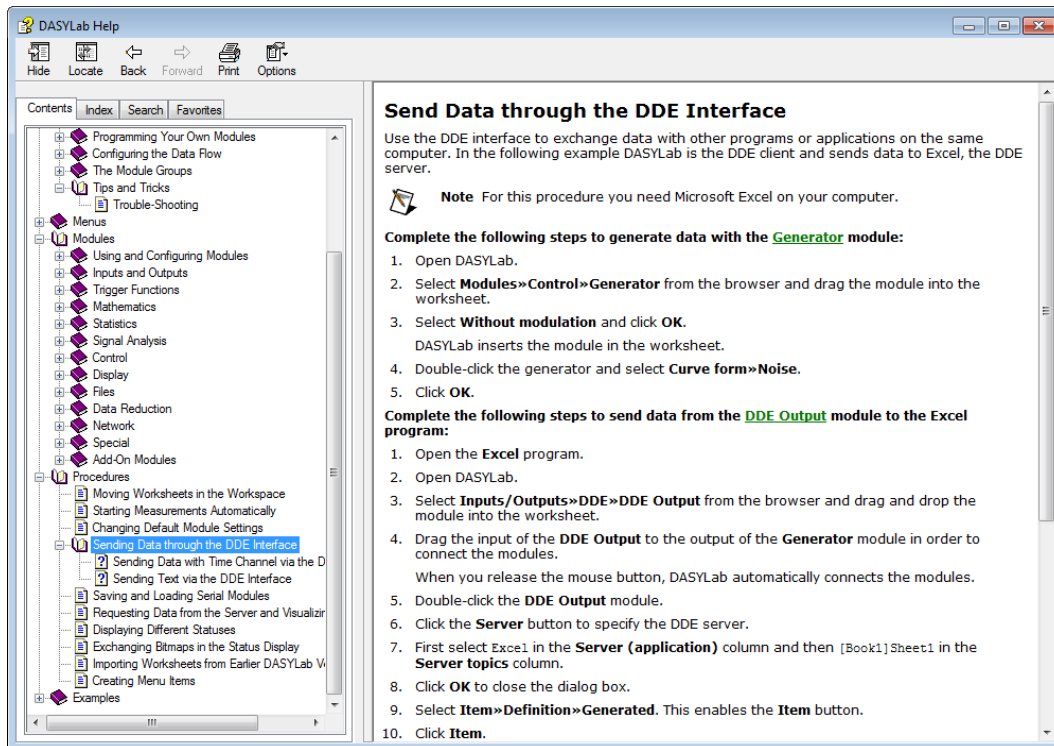
These examples are based on the DASYLab DDE functions. Prior to using them, review the DASYLab Help and these articles in the Measurement Computing Knowledge Base, kb.mccdaq.com.

[DDE in DASYLab writing to Excel](#)

[Transferring Text from DASYLab to Microsoft Excel](#)

[Using DASYLab to Read Data from Microsoft Excel](#)

The DASyLab Help includes both the help for the DDE functions and the DDE Input and Output modules. There is a complete example shown in the Procedures section of the Help.



## Examples

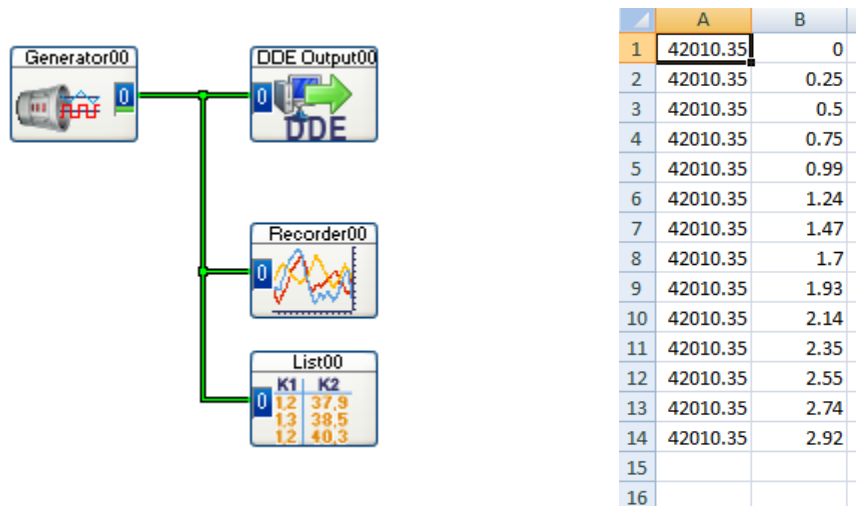
The following examples can be found at

[ftp://ftp.mccdaq.com/downloads/example\\_programs/DASyLab\\_App\\_and\\_App\\_Notes/](ftp://ftp.mccdaq.com/downloads/example_programs/DASyLab_App_and_App_Notes/)

### ***Write to Excel at 1 samples/second***

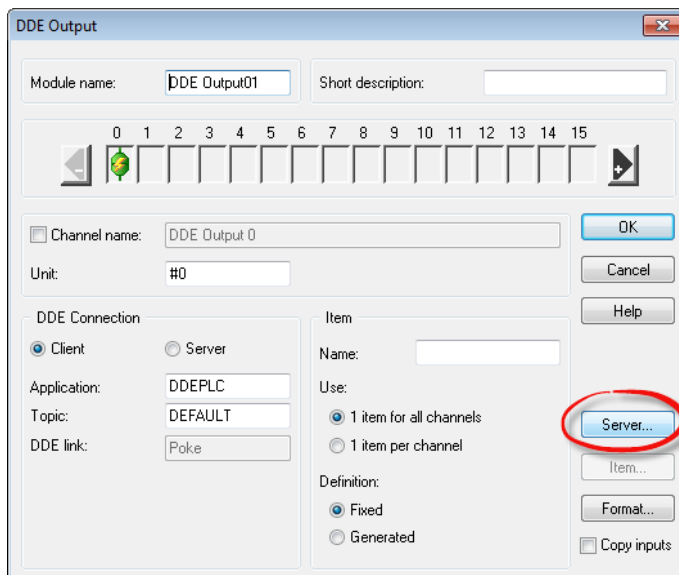
V13 Write to DDE 1s-second.dsb

This worksheet is the straightforward example for writing to Excel. It stores two columns of data, row by row. Column 1 ("A") is the time, and Column 2 ("B") is the data value. Each DDE Output module can write up to 16 columns. Use more than one module for additional channels.

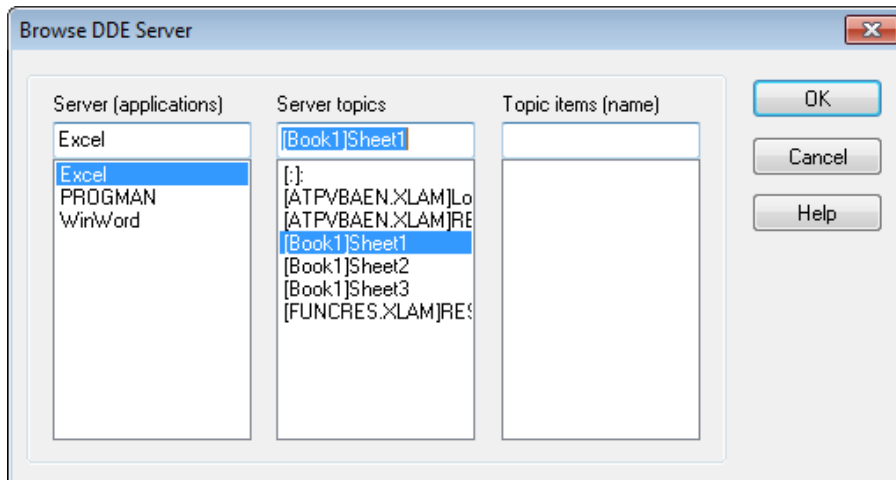


To set this up, create the Input/Output -> DDE -> DDE Output module.

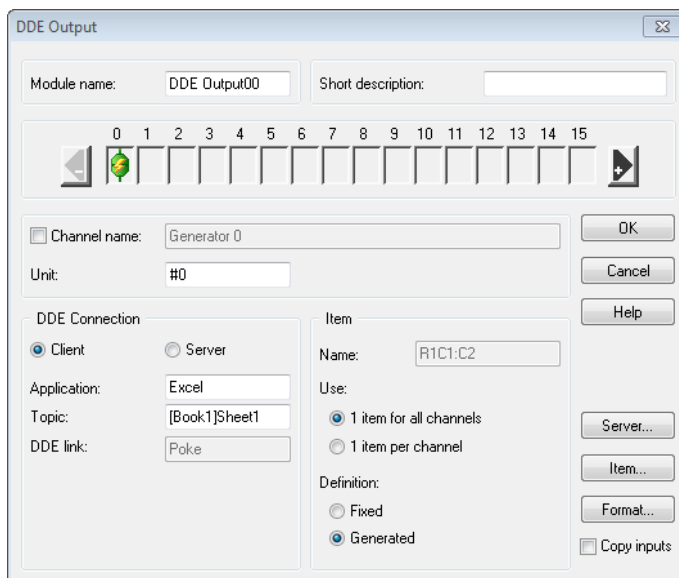
Configure the module to use Excel as the Server. Do this by clicking on the Server Button.



In the Browse DDE Server dialog, select Excel (it must be open), and then select the sheet. I have chosen to use a new workbook with the default names.



Next, select Generated for the definition field. This setting allows you to create a variable item name.

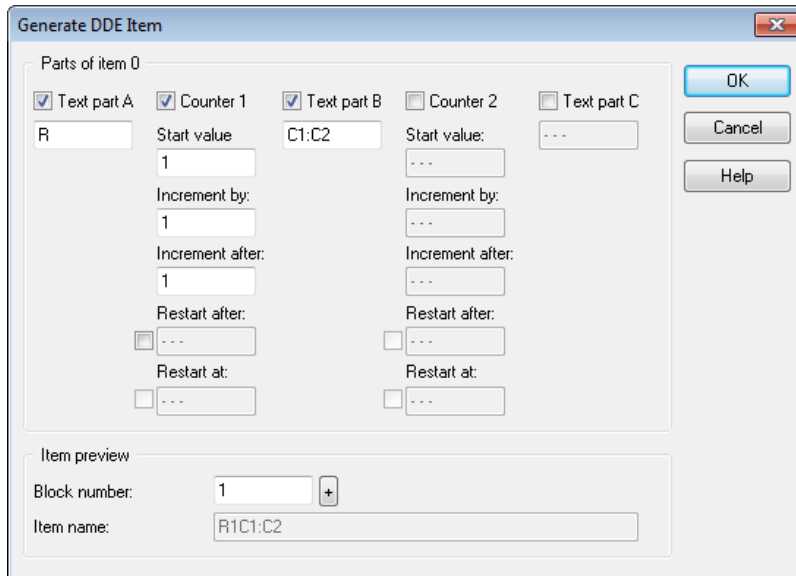


Click on the Item... button. To save two columns of data, row by row, enter the following

Text part A: R

Counter 1: Start value 1, Increment by 1, Increment after 1, no restart.

Text part B: C1:C2



**Generate DDE Item**

Parts of item 0

☒ Text part A   ☒ Counter 1   ☒ Text part B   ☐ Counter 2   ☐ Text part C

R   Start value: C1:C2   Start value: ---

1   Increment by: 1   Increment by: ---

1   Increment after: 1   Increment after: ---

Restart after: ☐ ---   Restart after: ☐ ---

Restart at: ☐ ---   Restart at: ☐ ---

Item preview

Block number: 1

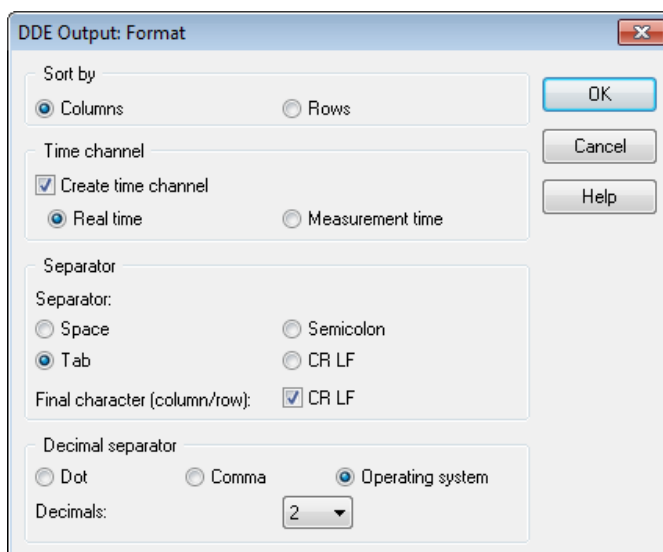
Item name: R1C1:C2

OK   Cancel   Help

These settings will create a valid Excel cell location, R1C1:C2, which would look like A1:B1 in normal Excel notation. DASyLab cannot easily iterate on the A1:B1 notation, but can easily iterate on the Row/column notation, R1C1.

To include time, click Ok to close the Item properties, and click on the Format... button on the main DDE Output properties dialog box.

Check the Time channel setting to select Real time. This will put the current clock time into the first column. If you only want the Measurement time, select that to store the number of seconds since the start of measurement.



**DDE Output: Format**

Sort by

☒ Columns   ☐ Rows

Time channel

☒ Create time channel

☒ Real time   ☐ Measurement time

Separator

Separator:

☐ Space   ☐ Semicolon

☒ Tab   ☐ CR LF

Final character (column/row): ☒ CR LF

Decimal separator

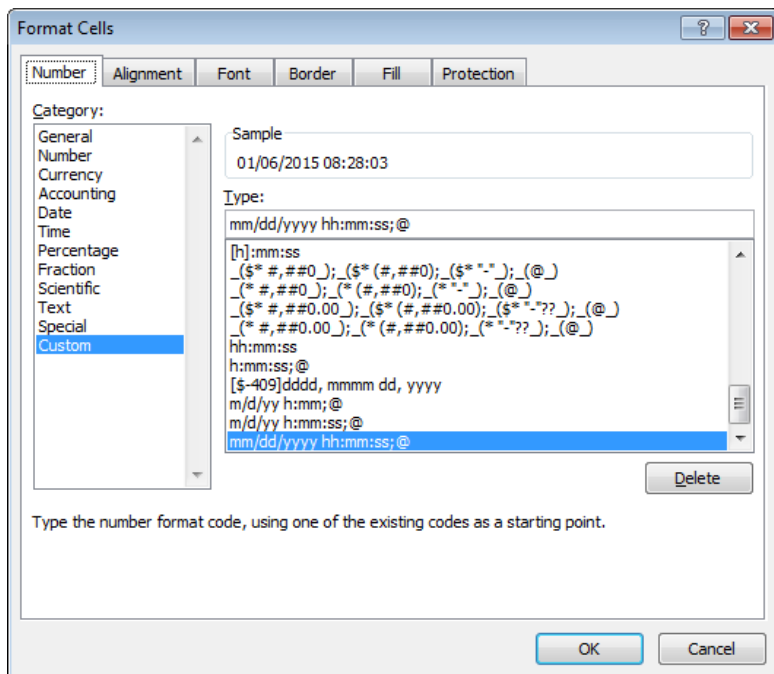
☐ Dot   ☐ Comma   ☒ Operating system

Decimals: 2

OK   Cancel   Help

Click OK to close both dialog boxes. Make sure that the worksheet is wired, and that the sample rate is slow (1 sample/second). Start the measurement, and observe the data being stored.

Note that the time value stored in the Excel sheet is a number, not a date or time. You will need to format the entire column to use a date/time format. The value does include the date, so you will need to use a custom Excel format to show both date and time with seconds. The format mm/dd/yyyy hh:mm:ss will yield a complete date - 01/06/2015 08:28:03 using a 24 hour clock.



Some important notes on this worksheet - it will always start at the beginning, possibly overwriting your data. You must remember to save the worksheet by a new name, and reopen the original worksheet.

See the example below to send commands to Excel to automatically save the Excel sheet, or see the example Script that is posted at the [kb.mccdaq.com](http://kb.mccdaq.com) to use a Script module to open your Excel sheet before the measurement starts. The example includes a module that you can import and use without understanding the Script module.

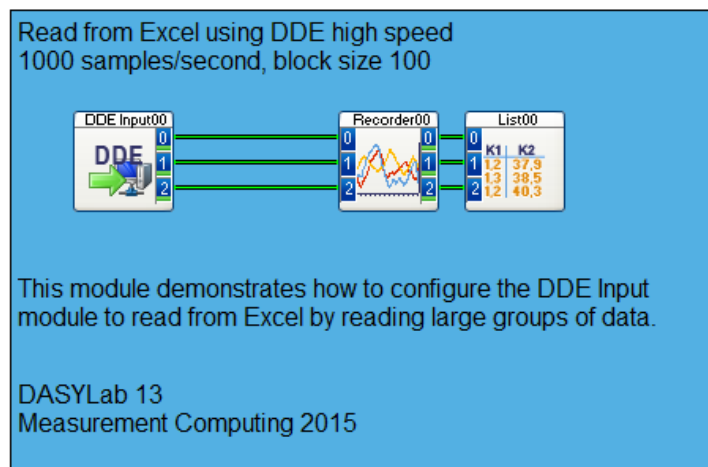
Search [kb.mccdaq.com](http://kb.mccdaq.com) for DASyLab+DDE+Script or click on this link <http://kb.mccdaq.com/KnowledgebaseArticle50492.aspx>

## *Read from Excel sheet at high speed*

### **V13 DDE Input 1000s-s 100b.dsb**

This worksheet is configured to read from an Excel sheet at 1000 samples/second with a block size of 100. Treats DDE file as a table, where the row is the data. Uses DDE Cold Link to read at specified rate.

The DDE Input module uses a generated item list to read from Excel in blocks of 100. By using a large range, rather than reading one cell at a time, DASYLab can acquire the data from Excel at an effective sample rate of 1000 samples/second.



The DDE connection is a "Cold Link", so that DASYLab can control the timing of the read.

DDE connection

☒ Client ☐ Server

Application: Excel

Topic: [DDEBigExample.xls]

DDE link:

☐ Hot Link ☐ Warm Link

☒ Cold Link ☐ Poke-Link

☒ Repeat data request

Time interval [s]: 0.10

Item

Name: R2C1:R101C3

Use:

☒ 1 item for all channels

☐ 1 item per channel

Definition:

☐ Fixed

☒ Generated

The DDE Input item generation is configured to read in blocks of 100.

Generate DDE item

Parts of item 0-2

☒ Text part A ☒ Counter 1 ☒ Text part B ☒ Counter 2 ☒ Text part C

R Start value 2 Increment by: 100 Increment after: 1 Restart after: ... Restart at: ...

C1:R Start value 101 Increment by: 100 Increment after: 1 Restart after: ... Restart at: ...

C3

Item preview

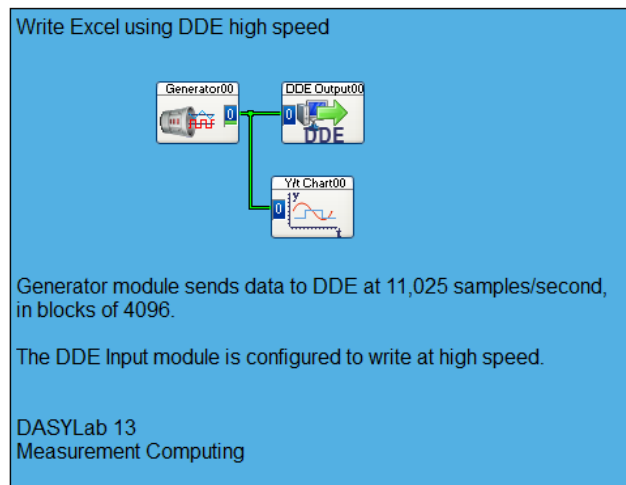
OK Cancel Help

## ***Write to Excel sheet at high speed***

### **V13 BigDDE.dsb**

This worksheet is configured to write to DDE in blocks of 4096, writing the entire block as 4096 rows. The sample rate is 11.025Ks/sec (using the Sound card driver) with a block size of 4096.

Note - ensure that you have created an Excel sheet that is not saved in Compatibility mode which limits the sheet to 65K rows. The maximum worksheet size for a current version of Microsoft Excel is 1,048,576 rows by 16,384 columns.<sup>i</sup>



This example works because the item generation creates a large range for DASYLab to write into.

Generate DDE Item

Parts of item 0

<input checked="" type="checkbox"/> Text part A	<input checked="" type="checkbox"/> Counter 1	<input checked="" type="checkbox"/> Text part B	<input checked="" type="checkbox"/> Counter 2	<input checked="" type="checkbox"/> Text part C
R	Start value: 1	C1:R	Start value: 4096	C1
	Increment by: 4096		Increment by: 4096	
	Increment after: 1		Increment after: 1	
	Restart after: <input type="checkbox"/> ...		Restart after: <input type="checkbox"/> ...	
	Restart at: <input type="checkbox"/> ...		Restart at: <input type="checkbox"/> ...	

Item preview

Block number: 1 +

Item name: R1C1:R4096C1

OK Cancel Help

The 'Generate DDE Item' dialog box is shown. It has a title bar with a close button. The main area is divided into 'Parts of item 0' and 'Item preview'. Under 'Parts of item 0', there are five checked checkboxes: 'Text part A', 'Counter 1', 'Text part B', 'Counter 2', and 'Text part C'. Below these are input fields for 'Start value', 'Increment by', 'Increment after', 'Restart after', and 'Restart at'. For 'Text part A', the start value is 'R'. For 'Counter 1', the start value is '1', increment by is '4096', and increment after is '1'. For 'Text part B', the start value is 'C1:R'. For 'Counter 2', the start value is '4096', increment by is '4096', and increment after is '1'. For 'Text part C', the start value is 'C1'. The 'Restart after' and 'Restart at' options are currently unchecked. The 'Item preview' section shows 'Block number: 1' with a '+' button and 'Item name: R1C1:R4096C1'. On the right side, there are three buttons: 'OK', 'Cancel', and 'Help'.

As noted in the Item name field at the bottom of the dialog box, the initial range is R1C1:R4096C1. It then increments by 4096, and the second block is R4097C1:R8192C1, and so on.



## Send Commands to Excel

### DDE Messages.dsb

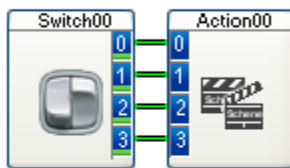
This example uses the Action and Message modules from DASyLab Full and Pro.

Use DASyLab and the Message module to send commands to Excel using the DDE command interface. Shows Minimize Excel Window, Restore Excel Window, as well as Save and Save As to the specified filename.

In setting up this example, I found that the syntax of the Excel commands was a bit finicky, and I had trouble finding a good description of available Excel commands. These commands were determined to work by trial and error. Some commands are to Excel itself (minimize, restore) and some are

#### DASyLab Example for sending DDE Commands to Excel

Excel must be open with file named ddeexample.xls  
User is prompted for the Save As filename



Action module sends commands to the Message module.  
[APP.MINIMIZE()]  
[APP.RESTORE()]  
[SAVE()]  
[SAVE.AS("\${STR\_1}")] - name is in the global string #1



Message00 is the Excel SYSTEM topic for the minimize / restore commands



Message01 is the EXCEL specific worksheet topic for the save/ save as commands.  
Change filename in this module (TOPIC)

Created by Measurement Computing with DASyLab 13, Dec-2014

## Send Global Strings and Variables to Excel

V13 Message\_DDE\_String.dsb

This example uses the Action and Message modules from DASyLab Full and Pro.

Use DASyLab and the Message module to send Global Strings and variables to a computed Excel cell range. This example concatenates variables and strings together and sends a single line with tab separated values.

DASyLab Example for sending DDE data to Excel using Global Strings and Variables

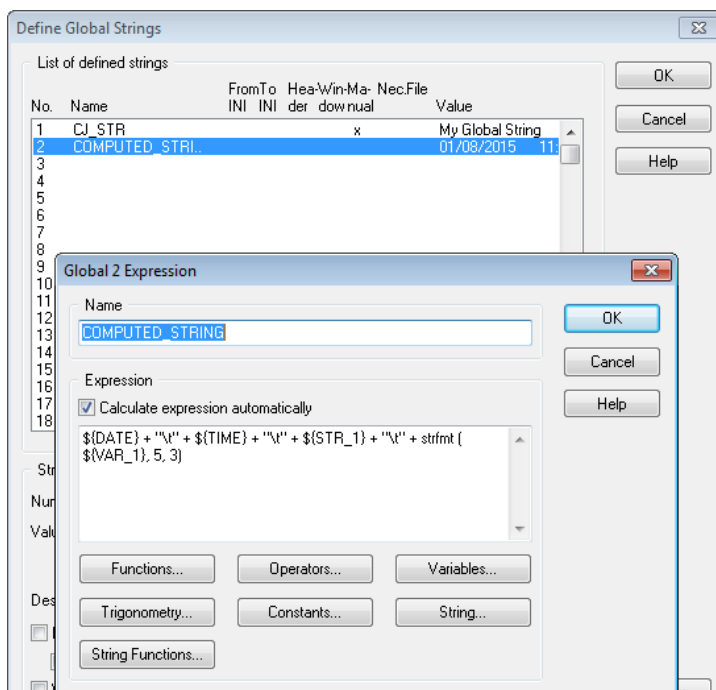
Data will be saved to the [Sheet1] of the open workbook



The Action tells the Message module to send  $\$(STR\_2)$   
The Message module uses DDE POKE to send the message using the computed TAB separated string  
Message uses a generated ITEM to determine the cells



This examples uses a Slider to save data to a variable.  
Review  $\$(STR\_2)$  to see how the date, time, string and value are combined into one string



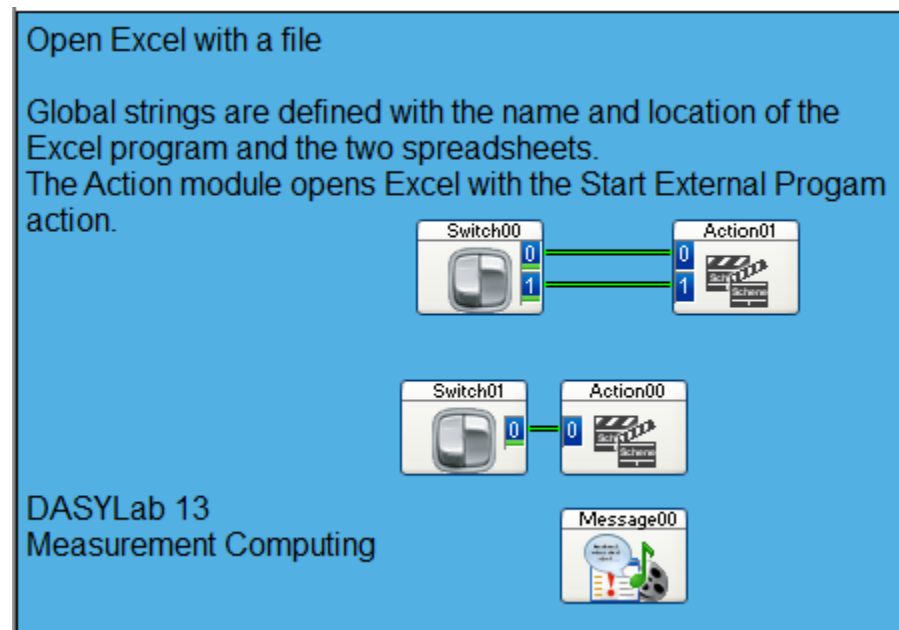
## ***Start Excel with a filename***

V13 DDE Startup for Win7-64.DSB

This example uses the Action and Message modules from DASyLab Full and Pro.

Start Excel with specific filename using the Action module, Start External Program. This must be run prior to starting a worksheet with DDE. Also has an Action to Quit Excel.

This worksheet could be the first in a series of worksheets run by the Control Sequencer, where the this worksheet does the setup, starts up Excel, etc., and subsequent worksheets then use DDE to write to Excel.



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<sup>i</sup> <https://support.office.com/en-nz/article/Excel-specifications-and-limits-1672b34d-7043-467e-8e27-269d656771c3>