

Detailed Instructions for Installation of metRology for Microsoft Excel

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Basics

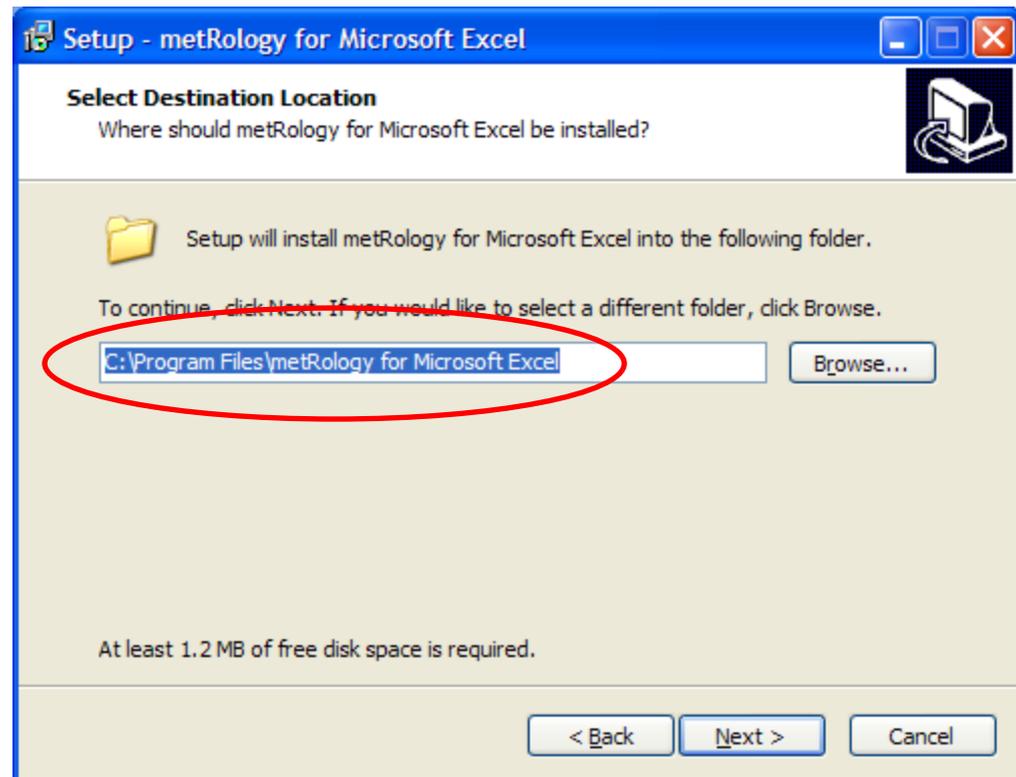
- metRology for Microsoft Excel requires the open-source statistical software R. If you do not already have R on your computer, the installation file will take you to the correct link to install it.
- Alternatively save the file at <http://cran.rstudio.com/bin/windows/base/release.htm> and then double click it to install R.
- You can accept all of the default suggestions when you run the R install script.

Basics Continued

- After installing R, double click on the file `metRology-for-Microsoft-Excel-v1-02-setup.exe` to configure R and install the user interface.
- You can generally use the defaults throughout this install as well.
- One potential exception is the choice of installation directory for `metRology for Microsoft Excel`. Make sure it is installed in `C:\Program Files\metRology for Microsoft Excel`

Potential Exception to Use of Defaults During Install

- You are most likely to find the installation script suggesting an alternative installation location if you have a 64-bit machine. If so, just **delete “(x86)”** if it appears in the directory name during the install



The directory name as it appears in the screenshot above is the correct destination for the software.

Configuring Excel

- When you install **metRology for Microsoft Excel**, the installation script will most likely open Excel during the install and a menu will appear that asks you to enable content or macros.
- Please click enable to allow installation of the Excel Add-in used to link Excel and R.
- After you enable the content, Excel will close automatically and the installation will finish.

Testing the Software

- After completing the installation first reboot your computer and then you can run a test to make sure everything is working using one of the versions of the file

[test-metRology-for-Microsoft-Excel.xls\(m\)](#).

- use the [xls](#) file if you have Excel 2003
 - use the [xlsm](#) file if you have Excel 2007 or 2010
- To complete the test open the appropriate test file with Excel, then click the button labeled “Compute Uncertainty”. You should also see a menu item named “metRology” on the menu bar.

Test File – Push Button Circled in Red

The screenshot displays the Microsoft Excel interface with the file "test-metRology-for-Microsoft-Excel.xlsm" open. The ribbon is set to "metRology". The spreadsheet contains a GUM Uncertainty Analysis template for one input. The input table is as follows:

Uncertainty Analysis Input Table	
Input Variable Name	x1
Units	mg
Input Value, x_i	1.0000
Standard Uncertainty, u_i	0.0120
Degrees of Freedom, ν_i	60.0
Type of Uncertainty Evaluation	A
Distribution	Normal
Measurement Equation	exp(x1)

The "Compute Uncertainty" button is circled in red. Below the input table is the "Uncertainty Analysis Results" section:

Output Value	Combined Standard Uncertainty	Effective Degrees of Freedom	Nominal Level of Confidence	Coverage Factor =	Expanded Uncertainty	Approximate Attained Confidence Level
$y=f(x_1, \dots, x_p)$	$u_c(y)$	ν_{eff}	100(1- α)%	k	U(y)	

Additional rows in the results section include "Contribution to $[u_c(y)]^2$, %", "Sensitivity Coefficient", and a "More" button. The status bar at the bottom shows "GUM Template 1 Input" and "Ready".

Successful Test Results

The screenshot displays the Microsoft Excel interface with the 'metRology' tab selected. The spreadsheet is titled 'test-metRology-for-Microsoft-Excel.xlsm'. The ribbon includes 'File', 'Home', 'Insert', 'Page Layout', 'Formulas', 'Data', 'Review', 'View', 'Developer', 'Acrobat', and 'metRology'. The 'metRology' ribbon contains options for 'GUM Uncertainty Analysis', 'Consensus Mean', 'Polynomial Regression', 'GUM Supplement 1', 'ASTM E691', 'Uncertainty Analysis', 'Interlaboratory Studies', and 'Regression Analysis'. The active cell is K27.

The spreadsheet content includes:

- Row 1: **metRology for Microsoft Excel GUM Uncertainty Template for 1 Input**
- Row 3: **Uncertainty Analysis Input Table**
- Rows 4-11: Input parameters for variable x_1 :
 - Input Variable Name: x_1
 - Units: mg
 - Input Value, x_1 : 1.0000
 - Standard Uncertainty, u_1 : 0.0120
 - Degrees of Freedom, ν_1 : 60.0
 - Type of Uncertainty Evaluation: A
 - Distribution: Normal
 - Measurement Equation: $\exp(x_1)$
- Row 22: **Show/Hide Options**
- Row 23: **Uncertainty Analysis Results**
- Row 24: **Compute Uncertainty** button
- Row 25: **Output Value** $y=f(x_1, \dots, x_p)$
- Row 26: **Combined Standard Uncertainty** $u_c(y)$
- Row 27: **Effective Degrees of Freedom** ν_{eff}
- Row 28: **Nominal Level of Confidence** $100(1-\alpha)\%$
- Row 29: **Coverage Factor = Student's t** k
- Row 30: **Expanded Uncertainty** $U(y)$
- Row 31: **Approximate Attained Confidence Level**
- Row 32: **Contribution to $[u_c(y)]^2$, %**
- Row 33: **Sensitivity Coefficient**
- Row 34: **No errors or warnings.**
- Row 48: **More** button
- Row 49: **Show/Hide Warnings and Error Messages**

The 'Uncertainty Analysis Results' table data is as follows:

Output Value	Combined Standard Uncertainty	Effective Degrees of Freedom	Nominal Level of Confidence	Coverage Factor = Student's t	Expanded Uncertainty	Approximate Attained Confidence Level
$y=f(x_1, \dots, x_p)$	$u_c(y)$	ν_{eff}	$100(1-\alpha)\%$	k	$U(y)$	
2.718	0.0326	60.0	95%	2.00	0.065	93.7%

More on Test Results and Final Notes

- The numbers in the output area of the test file do not need to match the screenshot exactly
- As long as there are numbers and no apparent errors, all should be well