

Detailed Instructions for Installation of metRology for Microsoft Excel

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2014-02-07

Basics

- metRology for Microsoft Excel requires the open-source statistical software R. If you do not already have R on your computer, the **metRology for Microsoft Excel** installation file will take you to the correct link to install it. **Then be sure to come back to complete running the metRology for Microsoft Excel installation file.**
- 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. You should install both the 32-bit and 64-bit versions of R, which is the default configuration.

Basics Continued

- After installing R, double click on the file `metRology-for-Microsoft-Excel-v1-03-setup.exe` to configure R and install the user interface.
- This installation requires internet access to run successfully.
- You should use the defaults throughout this install as well, but you can override the suggested installation directory, if desired.

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 following details:

- Title Bar:** test-metRology-for-Microsoft-Excel.xlsm - Microsoft Excel
- File Tab:** metRology
- Formulas Tab:** Polynomial Regression
- Worksheet Name:** GUM Template 1 Input
- Cell Selection:** E10
- Worksheet Content:**
 - Row 1: metRology for Microsoft Excel GUM Uncertainty Template for 1 Input
 - Row 3: **Uncertainty Analysis Input Table**
 - Row 4: Input Variable Name: x1
 - Row 5: Units: mg
 - Row 6: Input Value, x_1 : 1.0000
 - Row 7: Standard Uncertainty, u_1 : 0.0120
 - Row 8: Degrees of Freedom, ν_1 : 60.0
 - Row 9: Type of Uncertainty Evaluation: A
 - Row 10: Distribution: Normal
 - Row 11: Measurement Equation: exp(x1)
 - Row 22: Show/Hide Options
 - Row 23: **Uncertainty Analysis Results**
 - Row 24: Output Value
 - Row 25: Combined Standard Uncertainty
 - Row 26: Effective Degrees of Freedom
 - Row 27: Nominal Level of Confidence
 - Row 28: Coverage Factor =
 - Row 29: Expanded Uncertainty
 - Row 30: Approximate Attained Confidence Level
 - Row 31: Contribution to $[u_c(y)]^2$, %
 - Row 32: Sensitivity Coefficient
 - Row 48: More
 - Row 49: Show/Hide Warnings and Error Messages

The button labeled "Compute Uncertainty" in row 27, column A, is circled in red.

Successful Test Results

The screenshot displays the Microsoft Excel interface for the 'metRology' GUM Uncertainty Analysis template. The 'metRology' tab is highlighted with a red circle. The spreadsheet is divided into several sections:

- Input Table (Rows 4-11):** Contains input parameters for the uncertainty analysis, such as Input Variable Name (x1), Units (mg), Input Value (1.0000), Standard Uncertainty (0.0120), Degrees of Freedom (60.0), Type of Uncertainty Evaluation (A), Distribution (Normal), and Measurement Equation (exp(x1)).
- Uncertainty Analysis Results (Rows 24-32):** A table summarizing the results of the analysis. This section is circled in red. It includes the Output Value (2.718), Combined Standard Uncertainty (0.0326), Effective Degrees of Freedom (60.0), Nominal Level of Confidence (95%), Coverage Factor (2.00), Expanded Uncertainty (0.065), and Approximate Attained Confidence Level (93.7%).
- Contribution and Sensitivity (Rows 30-31):** Shows the contribution to the uncertainty (100.0%) and the sensitivity coefficient (2.7183).
- Warnings (Row 33):** A message box indicating 'No errors or warnings'.

Output Value	Combined Standard Uncertainty	Effective Degrees of Freedom	Nominal Level of Confidence	Coverage Factor = Student's t	Expanded Uncertainty	Approximate Attained Confidence Level
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