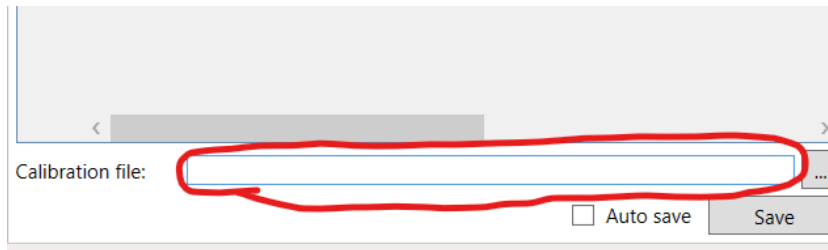


## Used SW

- Software LR-Cal LDM-COM
- LDM\_evaluation\_v4\_EN.xlsm
- MS Excel (e.g. part of Office 360)

## LR-Cal LDM-COM setup

1. Configure the devices
2. Choose the file to auto save to.



Calibration file:  ...

☐ Auto save

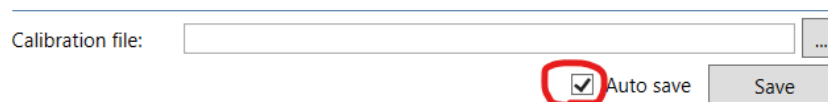
3. Turn on continuous saving by checking the "Auto save" checkbox



Calibration file:  ...

☐ Auto save

4. When checked, the file will be saved every second.



Calibration file:  ...

☒ Auto save

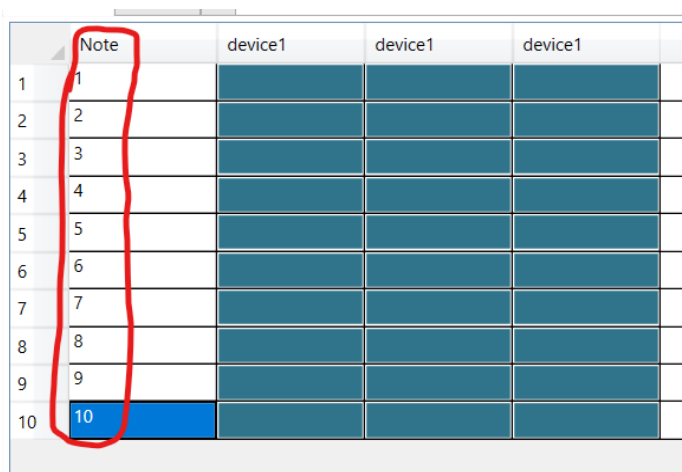
5. Set the table dimensions now (number of rows and columns). The dimensions shouldn't change during measurement.



Number of columns:

Number of lines:

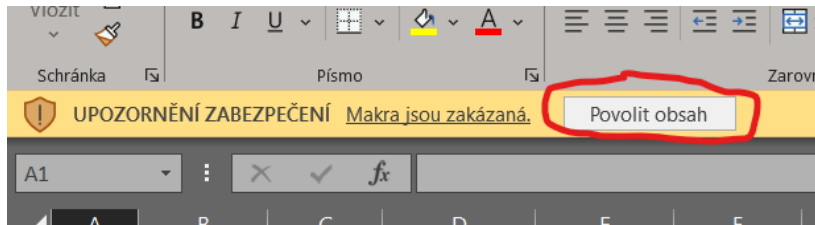
6. Fill the whole "Note" column with numbers. This is necessary for the output table to maintain its shape during measurement. Also, if doing single channel calibration, the "Note" column is used to determine the deviations.



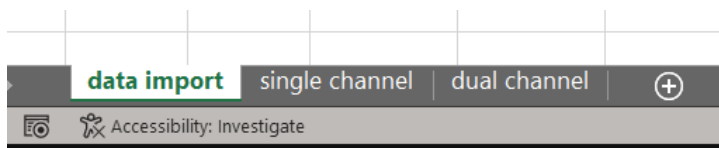
	Note	device1	device1	device1
1	1			
2	2			
3	3			
4	4			
5	5			
6	6			
7	7			
8	8			
9	9			
10	10			

# LDM\_evaluation\_v4\_EN.xlsm setup

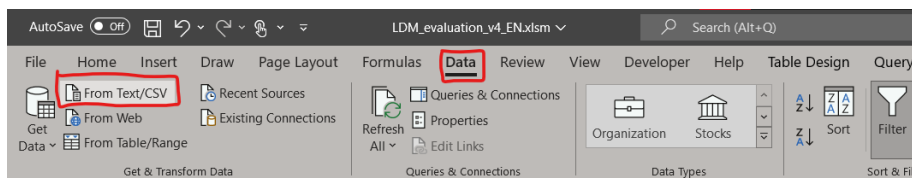
1. Open the file *LDM\_evaluation\_v4\_EN.xlsm*. For enabling continuous synchronization of data, it is necessary to allow macros.



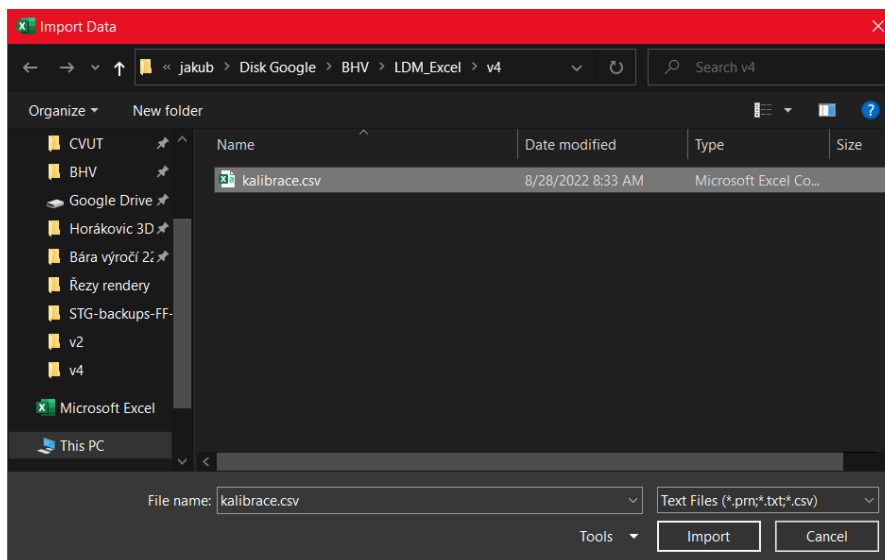
2. Activate the sheet "data import". Place the cursor to cell A1.



3. In the "Data" bookmark, select "from Text/CSV"



4. In the window that opened, select the csv file and press "Import".



5. In the next window, set:

- "File Origin" to "1250: Central European (Windows)"
- "Delimiter" to "Semicolon"
- "Data type detection" to "Based on first 200 row"

Then, hit the "Load to..." button.

kalibrace.csv

File Origin: 1250: Central European (Windows) | Delimiter: Semicolon | Data Type Detection: Based on first 200 rows

Note	device1	device2	device1_1	device2_2
-50	-50.1	3.2	-49.5	4.6
-40	-40.3	4.9	-40.5	5.4
-30	-29.5	7.2	-31	7.6
-20	-20.1	8.6	-19.6	9.3
-10	-10.4	11.4	-9.8	11
0	-0.8	11.9	-0.3	11
10	9.3	13.6	9.9	13.1
20	20.1	14.7	20.7	15.7
30	30.2	16	29.8	16.2
40	40.6	17.7	39.8	17.7
50	49.2	21	51	20.7

Buttons: Load, Transform Data, Cancel, Load To...

On the next window, select "Existing worksheet". Make sure the cell in the text field is "=\$A\$1". Then hit "OK". Now, you created a connection to the csv file.

Import Data

Select how you want to view this data in your workbook.

☒ Table  
☐ PivotTable Report  
☐ PivotChart  
☐ Only Create Connection

Where do you want to put the data?

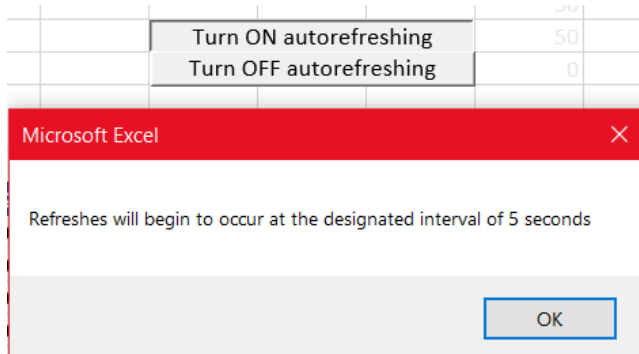
☒ Existing worksheet:  
=\$A\$1

☐ New worksheet

☐ Add this data to the Data Model

Buttons: Properties..., OK, Cancel

6. Now, select activate either "single channel" or "dual channel" sheet depending on the type of measurement you imported. To enable continuous data refreshing, hit the "Turn ON autorefreshing" button. You can turn off autorefreshing by hitting the "Turn OFF autorefreshing" button.



7. If the **"single channel"** sheet is activated, do the following:

- You can fill the first three sections with information about the measurement. You can add a note. This has no effect on the measurement evaluation.

<b>Calibration sheet number</b>	
<b>name</b>	
<b>date</b>	
<b>Etalon / Master device</b>	
units	
model, description	
<b>Etalon / Master device</b>	
units	
model, description	
manufacturer	
serial Nr.	

<b>Note:</b>			
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- Set the span of the measured device. Either select "manual" and enter "min" and "max" values, or select "automatical", which sets the span to minimal and maximal value from the "Note" column.

<b>Span</b>	min	max
<input checked="" type="radio"/> manual	0	50
<input type="radio"/> automatical	-50	50

Now, you have the relative deviation in every point.

Note	device1	device2	device1_1
-50	0.20%		-1.00%
-40	0.60%		1.00%
-30	-1.00%		2.00%
-20	0.20%		-0.80%
-10	0.80%		-0.40%
0	1.60%		0.60%
10	1.40%		0.20%
20	-0.20%		-1.40%
30	-0.40%		0.40%
40	-1.20%		0.40%
50	1.60%		-2.00%

8. If the **"dual channel"** sheet is activated, do the following:

- You can fill the first three sections with information about the measurement. You can add a note. This has no effect on the measurement evaluation.

<b>Calibration sheet number</b>	
<b>name</b>	
<b>date</b>	
<b>Etalon / Master device</b>	
units	
model, description	
<b>Transmitter (the device under test)</b>	
units	
model, description	
manufacturer	
serial Nr.	

<b>Note:</b>			
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- Set the span of the reading on the master device. Either select "manual" and enter "min" and "max" values, or select "automatical", which sets the span to minimal and maximal value from the "Note" column. Set the span of the transmitter. Enter the "min" and "max" value in the first row.

Span	reading on etalon / m. d.		transmitter	
	min	max	min	max
<input type="radio"/> manual	0	15	4	20
<input checked="" type="radio"/> automatical	-50	50	4	20

- Select, which column corresponds to the reading on the etalon / master device.

Etalon:	<input checked="" type="radio"/>	<input type="radio"/>
Note	device1	device2
-50	-50.10	-4.90%
-40	-40.30	-4.08%
-30	-29.50	-0.50%

Now, you have the relative deviation in every point.

Note	device1	device2	device1_1	device2_2
-50	-50.10	-4.90%	-49.50	3.25%
-40	-40.30	-4.08%	-40.50	-0.75%
-30	-29.50	-0.50%	-31.00	3.50%
-20	-20.10	-1.15%	-19.60	2.73%
-10	-10.40	6.65%	-9.80	3.55%
0	-0.80	0.17%	-0.30	-5.95%
10	9.30	0.70%	9.90	-3.03%
20	20.10	-3.22%	20.70	2.43%
30	30.20	-5.20%	29.80	-3.55%
40	40.60	-4.98%	39.80	-4.18%
50	49.20	7.05%	51.00	3.37%