

DIAdem2Excel

Instructions for use

Applies to version 1.3

Last Update: 22 July 2010

Description

DIAdem2Excel is a collection of (VBA and VBS) scripts to simplify the process of exporting measured data from NI DIAdem. It creates the following files for each series of shots:

- Excel files with the unmodified raw data of each shot.
- SDF (space delimited) files with the adjusted data (see below) in ASCII format.
- PDF files which contain a report with several charts for each shot.
- ZIP files which contain the Excel, SDF and PDF files that can directly be uploaded to the test database.

Several modifications of the data will be made by the script during the export process:

- Remove unnecessary data before and after the shot.
- Make all channels equidistant.
- Apply multiplication factors and offset values.
- Convert the travel curve from degrees to meters according to a specified travel polynomial.
- Smooth the travel curve.
- Remove the influence of stray inductance and resistance on the signals.

DIAdem2Excel consists of two parts which have to be executed consecutively:

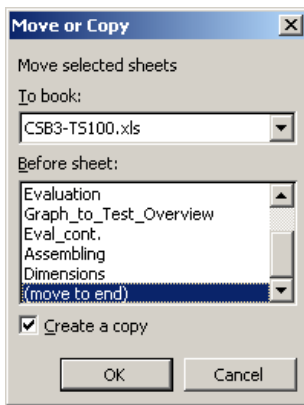
- An Excel sheet, where the settings of the channels have to be made and which creates a configuration file.
- A DIAdem script which reads in the configuration file and exports the selected shots.

Instructions

Before you start with the export procedure please make sure that you own the newest version of the scripts. These are updated automatically when you run DIAdem by the batch file DIAdem.bat.

Start with the Excel sheet Vx.xx_Export_shots.xls which is located in the folder “\DIAdem\abbext\DIAdem2Excel\Excel”:

1. Open the worksheet “Export shots” and copy it to the test report of the test shift which you want to export. Make sure that no sheet with the name “Export shots” exists in the test report before you copy it.



- Open the worksheet "Power_Test" in the test report with all shots of the test shift. Then select all shots you wish to export by typing "x" into the particular rows of the column "Export Shot". If this column does not exist, create a new column at an arbitrary position and label it "Export Shot".

For O-CO shots you only have to select the first (O-) row of the shot. The second row will be ignored by the script.

		Export Shot	Oscillogram Number	Legend Type	Operation	Time	Current										Voltage										Pressure				
							Generator Voltage	I-Shunt	I-LHV Peak	Last Half Wave Duration	Making Peak	dIdt	Current Integral	(Current)2 Integral	Charging Voltage DieI.	Charging Voltage Therm.	TRV Peak	Time to Peak	TRV Break Down	Ext Down Time After I=0	dU/dt	Recovery V After 300ms	t- Beta	Heating P at MAX	Heating P at I=0	Puffer P MAX	Puffer P at Heating MAX	Drive Condition			
						h:m	kV	kA	kA	ms	kA	A/us	As	MA2s	kV	kV	kV	us	kV	us	kV/us	kV	us	bar	bar	bar	bar				
25				T																				15	19						
26				T																											
27				T																											
28				Co																											
29																															
30	x		1365	M	O	8:55																		15	19						
31	x		1366	M	O-	9:00																									
32	x		1366	M	-CO	9:00																									
33	x		1367	M	O-	9:10																		14	19						
34	x		1367	M	-CO																			15	19						
35	x		1368	M	CO	9:15																		14	19						
36			1369	Ca																											
37			1370	Ca	local																										
38			1371	Ca	Ucal																										
39			1372	Ca	local	10:10	100%																								
40	x		1373	P	O	10:20		46.6	61	10.0		20.0							11					33	24	8					
41	x		1374	P	O	10:30		47.7	67	10.6		20.3					280				9.9			44	31	8					
42			1375	Ca	local																										
43	x		1376	P	O-	11:10		48.4	69	10.0														40	31	7.3					
44	x		1376	P	-CO			45.7	63		70													38	30	6.6					
45	x		1377	P	O-	13:10		49.4	65	9.7														37	29	7.5					

- Now switch to the worksheet “Export Shots” you have copied into the test report. There you find two tables for the settings of the exported channels for both mechanical and power shots.

The first row (Time) in each table is only for information and changes in this row will have no effect.

The SDF files will always have the same structure for mechanical and for power shots. The columns for the channels which only exist in the power shots (i.e. current, voltage) are filled with zeros for mechanical shots.

Mechanical measured Channels

Channel Name	Name in SDF File	Column	Mult Factor	Start Value	Stroke	Apply Polynom	Plot #
Time	Time_[s]:	1	1				
Travel Drive	Travel_[m]:	2	-1		75.5	TRUE	0
P-Comp	Puffer_pressure_[Pa]:	6	100000	6.00E+05			1
P-Heiz 1	Heating_pressure_[Pa]:	7	100000	6.00E+05			1

Power measured Channels

Channel Name	Name in SDF File	Column	Mult Factor	Start Value	Stroke	Apply Polynom	Plot #	Remove Inductance
Time	Time_[s]:	1	1					
Travel Drive	Travel_[m]:	2	-1		75.5	TRUE	0	
I-Shunt	Current_[A]:	3	1000				-1	
arc voltage	Arc_voltage_[V]:	4	1000				-2	TRUE
TRV	TRV_[V]:	5	1000				-3	
P-Comp	Puffer_pressure_[Pa]:	6	100000	6.00E+05			1	TRUE
P-Heiz 1	Heating_pressure_[Pa]:	7	100000	6.00E+05			1	TRUE

- First you have to define which channels you want to export for mechanical and for power shots. The green lines represent channels which are usually needed. But you can add additional channels or remove lines if you want.

Enter the name of the channels into the first column. *Please make sure that the spelling of the channel names is identical to the names in DIAdem.* Load a power shot of the test shift into DIAdem by selecting “ABB/Load test” and compare the names. If the names are not identical, the DIAdem script will fail to load channels later on and skips them.

- Define names for each channel which will be used as the title of the columns in the SDF files. Please do not use the space character in these names.
- Next define the column number for each channel which will be used for the SDF files. Columns which only exist in power shots are filled with zeros in mechanical shots. Please make sure that you use each column number only once and that you have a consistent sequence of numbers for the power shots.

7. In the column “Mult Factor” you have to define a factor for each channel. It is usually -1 for travel channels, 1000 for current and voltage channels and 100000 for pressure channels to convert them to SI units.
8. The “Start Value” can be used for offset correction. If you leave this cell empty, no offset correction will be done. You can enter a value to start the curve at a specified value. For pressure channels typically the filling pressure is entered here. The offset correction will be made after applying the multiplication factor, so you have to enter the filling pressure in Pa.

The start value has no effect on the travel channel.

4	Date:	2010-05-10
5	Aimed Rating:	252kV/50kA/50Hz
6	1st Pole to Clear:	15,13
7	Pressure [Bar]:	6.0
8	Drive:	BLK222
9	Stroke [mm]:	130
10	Stroke drive [deg]:	75.5

Power_Test

Column	Mult Factor	Start Value
1	1	
2	-1	
6	100000	6.00E+05
7	100000	6.00E+05

Export Shots

x 100,000

9. Enter the stroke of the drive *in degrees* into the column “Stroke” for the travel channel. It will be used as start value for C and CO shots.

7	Pressure [Bar]:	6.0
8	Drive:	BLK222
9	Stroke [mm]:	130
10	Stroke drive [deg]:	75.5

Power_Test

Start Value	Stroke
6.00E+05	75.5
6.00E+05	

Export Shots

10. The column “Apply polynom” is also only relevant for the travel channel. If you select “TRUE” the polynomial which is defined in the worksheet “Export Shots” will be used to convert the travel curve. Otherwise the travel curve will be exported unmodified.

The polynomial can be defined with any number of coefficients in “Export Shots”. They have to be labeled “A..”. In the cell next to the right of the label the coefficient has to be entered. The polynom generates a travel curve in mm, so the coefficients are internally divided by 1000 to generate values in meters.

Travel = A0+A1x+A2x²+A3x³+A4x⁴+A5x⁵	Open: A0: 0	A1: 0.435327151	A2: 0.021593838	A3: 0.000365682	A4: -8.70E-06
				A5: 3.46E-08	A6: 7.53E-11

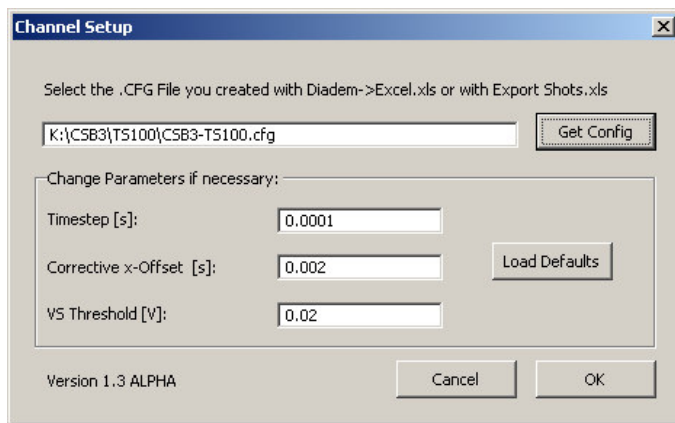
11. The column “Plot #” is relevant for the PDF reports. Generally it describes the page on which the specific channel will be plotted. So you can enter a number ≥ 1 for each channel to define the plots. Also more than one curve can be plotted on one page. That means you can use the same plot no. for more than one channel. Besides there are some special plots which are marked with plot numbers < 1 :

- 0: This channel will be plotted on the left y-axis on all pages. All other channels are plotted on the right y-axis. You should enter “0” for the travel curve only.
- -1: For power channels two special plots will be created: current and arc voltage on the y-axes and current and TRV on the y-axes. -1 has to be specified for the current channel.
- -2: Arc voltage channel.
- -3: TRV channel.

12. The column “Remove Inductance” only applies to power shots. It specifies if the influence of the high current on measured voltages shall be removed later on. You should set the value “TRUE” for the arc voltage and pressure channels.
13. After specifying all channels you wish to export you can click on the button “Write Configuration File” and define a filename that will be used in DIAdem afterwards.

This completes the first part of the procedure. Now switch to DIAdem and start the second part of the script by selecting “ABB/Developer functions/DIAdem->Excel”.

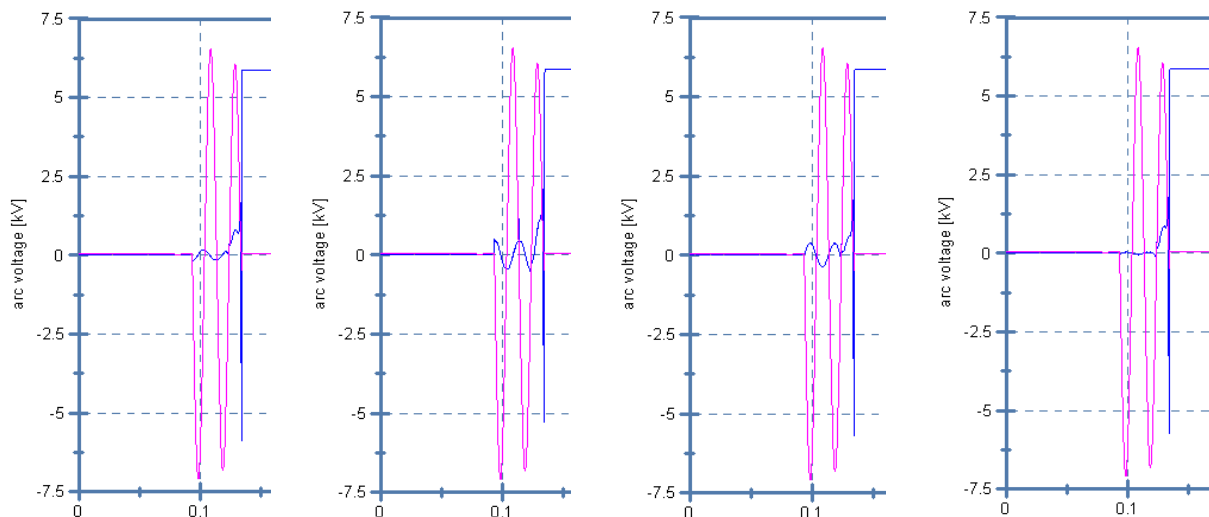
1. Click on “Get Config” and specify the configuration file you have generated in Excel before.



2. Below there are three parameters which typically do not have to be changed. Nevertheless in some cases it can be necessary to change these values:
 - Timestep: This timestep will be used for all channels in the generated Excel and SDF files.
 - Corrective x-Offset: The script will remove all data before the time when the “VS” signal exceeds “VS Threshold” for the first time. The value “Corrective x-Offset” is subtracted from this point in time. So you can adjust the period of the extracted data by changing this value.
 - The value “VS Threshold” is also important for defining the time period which will be extracted. It specifies the threshold which has to be exceeded to define the starting point of the shot. Sometimes there are some spikes on the VS channel, so the threshold is exceeded too early. In these cases you can load a sample shot in DIAdem and change the threshold to the needed value.
3. If you have selected one or more power shots for export, an example shot (the first power shot) will be loaded and arc voltage as well as current will be plotted. If you have selected only mechanical shots you can go on with step 5.

A dialog appears which asks for two values: Inductance and Resistance. You have to adjust both values until the arc voltage remains zero before the contacts start to open. Click on “Test Values” to see the effect of the entered numbers. You have to try some values until you get the correct result considering the following behavior:

- If the arc voltage has an error proportional to di/dt you have to adjust the inductance.
- If the error is proportional to the current you should adjust the resistance. The resistance is in most cases negligible low.



Inductance too low

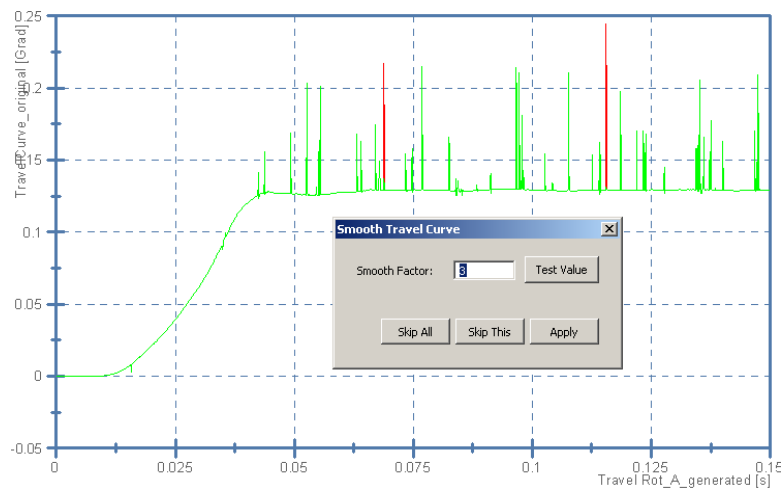
Inductance too high

Resistance too high

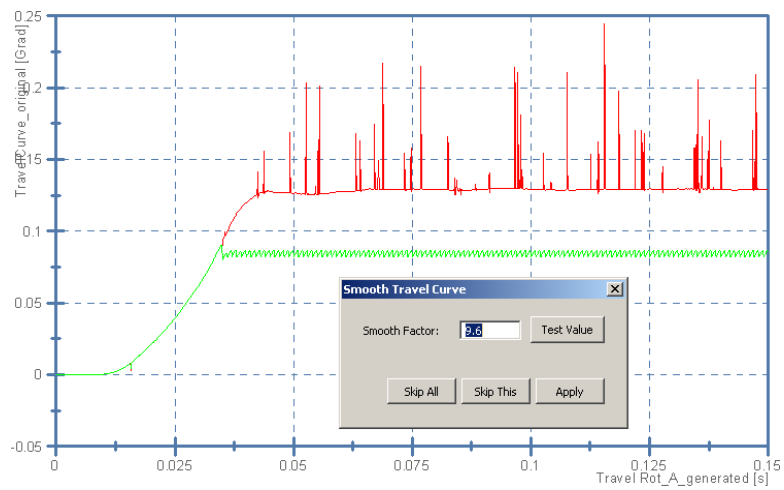
Correct values

Click on “Start” to proceed to the next step.

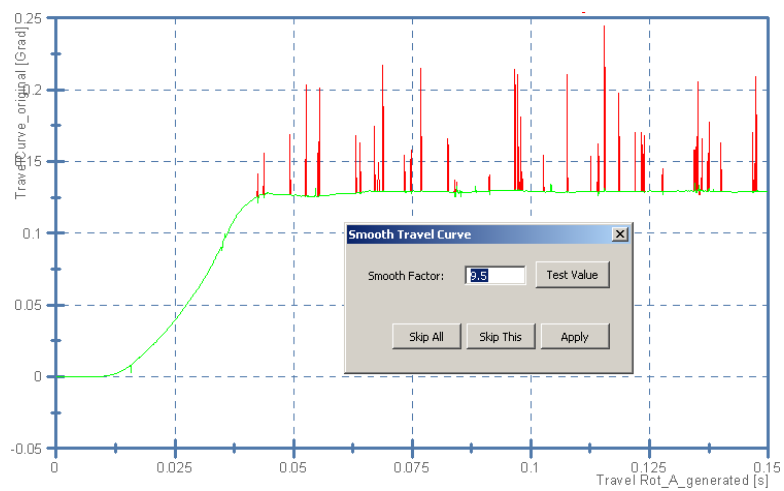
- For each power shot the travel curve will be smoothed by the script. There are often some spikes on the travel signal in power shots due to disturbances because of the high current. For this reason a plot of the original and the smoothed travel curves are shown and a dialog appears where you have to enter a smooth factor. You can enter a value between 0 and 10 into the text field. Please don't forget to click on “Test value” before you click on “Apply” to check the result of the smoothing. Find an appropriate value so that the spikes are removed but the curve is not cut. In some cases, if there are a lot of spikes on the signal it is not possible to remove all of the spikes. If the original travel curve looks already very clean you can click on “Skip this” or “Skip all” to skip the smoothing operation.



Smooth factor too low

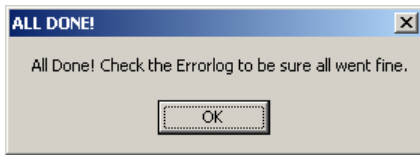


Smooth factor too high



Smooth factor correct

5. When all shots have been processed and the ZIP files have been created (a Windows dialog “Copying files” may appear during this operation) a final dialog will appear saying that the process has been completed. It may take some minutes until all shots are processed so please be patient until the dialog is shown.



After completion you will find some files and subfolders in the folder of the configuration file:

- Three subfolders Excel, SDF and PDF each with one file for every shot.
- Three ZIP files with the filename [serial no.]_[first shot no.]-[last shot no.]_[file type].zip which contain all of the created Excel, SDF and PDF files.
- A file “Error.txt” which should be empty if the process has been completed successfully.

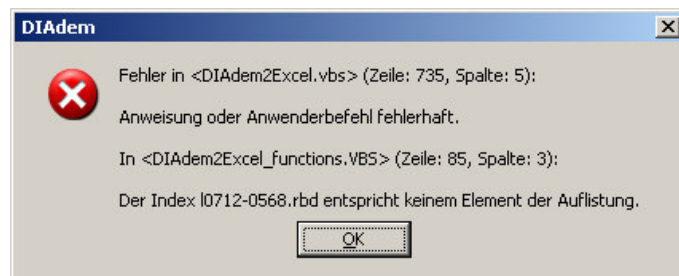
Troubleshooting

In this chapter you will find some common problems which may occur while running the scripts.

Problem: Some channels are missing in the output files and messages like this are appearing in the “Error.txt”: “Error in Shot: 12526-1289.rbd Couldn't find channel: Travel Drive”

Solution: The DIAdem script was not able to load specific channels. Please load a shot of the test series in DIAdem and check the spelling of the channel names in the Excel sheet.

Problem: An error message appears in DIAdem “Der Index 1...-....rbd entspricht keinem Element der Auflistung.”



Solution: The script could not load a specific shot because it was not able to find it on the server. You should make sure that all shots you want to export exist on the DIAdem server “acqui”.

Problem: The DIAdem script quits without exporting any files but also without displaying an error message.

Solution: Check the format of the channel names in DIAdem. Load a shot directly from the Navigator in DIAdem, not by using the function “Load Shot” in the ABB menu. The time channels must always have a name like “Name_A”, the Y channels like “Name_Y”. If the names do not end with _A and _Y the script cannot find the channels, so the channels have to be renamed first. Maybe ask Marco Mailand for assistance in this case.

Problem: The generated plots and files contain no reasonable data. The script has extracted the wrong time period.

Solution: Check the VS channel of the respective shots. If there are spikes on the curve larger than the “VS threshold” parameter, you have to adjust this parameter in the first dialog box that appears after starting the script in DIAdem. Eventually also the “corrective x-offset” has to be adjusted. See step 2 in the instructions above for details.