DIAdem™ Advanced Course Manual

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Creating and Editing Scripts

Introduction

The easiest way to create a script is to enable the recording mode. You also can create scripts manually. This requires considerable knowledge of DIAdem commands and variables. You can edit or start scripts at any time.

Contents

A. Creating a Script

Recording a Script

To create a script in the recording mode, complete the following four steps:

1. Enable the recording mode.

   In the dialog box that opens, select your recording settings and enter comments for the script.

2. Carry out the functions and operations you want to automate in the script.

   DIAdem registers the relevant actions you have performed, and stores the associated commands in the script.

   The status bar shows that DIAdem is recording.

3. Disable the recording mode.

4. Save the script.

   The specified command sequence is only temporary in the editor. You must save the created script to be able to reuse the script later.

Channel References in Scripts

When you enable the recording mode, you define how DIAdem records channel references in a script. You can use channel names or channel numbers to access channels.

If you use channel names, DIAdem records the channel names when recording the script, otherwise DIAdem records the channel numbers.

```
Call ChnSmooth("Speed","Y_smooth",17,"maxNumber")
```

or

```
Call ChnSmooth(2,5,17,"maxNumber")
```

File References in Scripts

When you enable the recording mode, you define how DIAdem records file references in a script. If you select the **Record absolute path** checkbox, DIAdem stores a complete path for each filename you use. This ensures that the script always works with the files you want, irrespective of which folders are currently set as user paths.

Editing and Expanding Scripts

Save a script with the filename extension `.vbs` in the script user folder.

Scripts contain all commands that DIAdem processes step-by-step while the script runs. The script is an ASCII file that you can view, modify, and expand in a script editor.

You can edit scripts to include loops and branches, which control the sequence of commands. You also can edit scripts to enable the user to interact with the script while the script is running.

B. Starting and Stopping a Script

Starting a Script

Start a script in one of the following ways:

- Click **Run Script From File** on the toolbar to start a script without loading the script into the script editor. The dialog box that appears displays the scripts available in the current script path. You can modify the user path here.

- Click **Run Script** on the toolbar to start the script currently displayed in the script editor.
- Click the respective button to start a script that is assigned to one of the buttons on the bottom two DIAdem SCRIPT function bars. You can use the scripts assigned to the bottom function bar in every DIAdem panel.
- Use a keyboard shortcut to start a script from the bottom function bar. For example, if the script is assigned to the second button in the function bar, you can start the script with <Shift-F2>.
- Use program parameters to start a script when DIAdem launches. Refer to *Launching DIAdem with Start Parameters* in Lesson 9, *Customizing DIAdem*, for more information.
- Use the commands `ScriptStart` and `ScriptInclude` to start a script when another script starts.

After you start a script, the script runs automatically.

Stopping a Script

Press <Esc> to abort a script. The script might not stop immediately. You might have to press <Esc> several times to stop graphics functions or measurements.

Note The `AutoAbort` button determines the abort behavior. The button enables/disables <Esc> to stop the script. The default setting is `AutoAbort="Yes"`, which stops a script when you press the <Esc> key before the script finishes.

The script ends automatically after executing all commands. You can add the `AutoQuit` command to stop the script prematurely. When DIAdem reaches this command, the script aborts and a message displays.

If you use `AutoQuit` in a subscript, you stop the subscript and the main script. You also abort both scripts if you assign the command to a button in a user dialog box.

Example

```
If not FileX(MyFile) Then
  Call AutoQuit("File "& MyFile &" not found!")
End If
```

If the file that has the name stored in `MyFile` does not exist, the script ends with an error message.

C. Integrating a Script in the DIAdem Interface

If you use a script frequently, integrate this script in the DIAdem interface. You can then click a button to start complex scripts. In the DIAdem SCRIPT group bar you can assign scripts to two function bars with a total of 18 buttons.

Select **Default Setting** from the shortcut menu of the **DIAdem scripts** function bar to assign a script to a button. Select the script you want. Then you can start the selected script with this button. The ToolTip of the button displays the name of the assigned script.

The bottom function bar is the same in all DIAdem panels. You can start a script from this function bar in any of the panels. You do not have to switch to DIAdem SCRIPT. You also can assign scripts to this bar in any of the panels.

You also can use the keyboard to activate scripts in this cross-panel function bar. For example, press <Shift-F3> to start the script assigned to the third button.

Exercise 3-1 Creating a Script

Goal

Use a script to automate a sequence that involves functions from several DIAdem panels, integrate the script in the DIAdem interface, and press a key to run the script.

Scenario

Create a script that loads the `Vibration.tdm` data file, smooths the data in the second channel, and displays the result in the `Smooth_1.tdr` layout. Assign the script to a button in a function bar to make the script easier to start. Press the key to start the script.

Design

Create the script for the described sequence in the recording mode. Integrate the script into the DIAdem interface to start the script at the press of a button.

- ❑ Create the script in the recording mode.
- ❑ Integrate the script into the DIAdem interface.

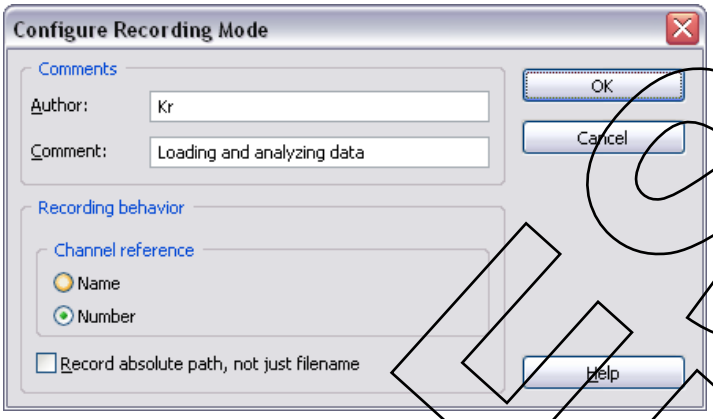
Implementation

Creating the Script

Create a script that loads the `Vibration.tdm` data file, smooths the data in the second channel, and displays the result in the `Smooth_1.tdr` layout.

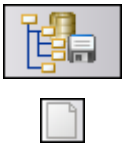
1. Select **DIAdem SCRIPT**.
2. Click **Enable Recording Mode** on the toolbar.

3. Comment the script in the **Configure Recording Mode** dialog box.



   a. Enter an **Author** and a **Comment**.
   b. Select **Number** as the channel reference, so the recording mode records the channel numbers and not the channel names when it accesses channels.
   c. Click **OK**.

   The editor displays the temporary file `TeachIn(2).vbs`. DIAdem indicates in the status bar that the recording mode is enabled.



4. Select **DIAdem NAVIGATOR**.

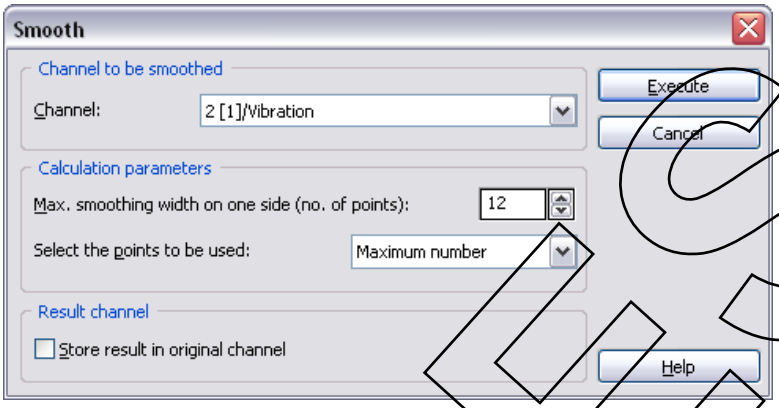
5. Click **Delete Internal Data** on the toolbar to delete the data in the Data Portal without saving the data.

6. Navigate to the `Vibration.tdm` data file in the `C:\Exercises\DIAdem Advanced\` folder and drag and drop the file into the Data Portal.

7. Select **DIAdem ANALYSIS**.

8. Open the **Curve Fitting** function bar and select **Smooth**.

9. Set the smoothing parameters.



   a. Select `Vibration` as the **Channel** to be smoothed.
   b. Enter `12` as the **Smoothing width**.
   c. Click **Execute**.

   The DIAdem ANALYSIS workspace displays a record of the calculation.

10. Select **DIAdem REPORT**.

11. Click **Load Layout** without saving the current layout.

    Navigate to the `Smooth_1.tdr` layout in the `C:\Exercises\DIAdem Advanced\` folder and load the layout.

    This layout displays the original data and the smoothed values.

12. Select **DIAdem SCRIPT**.

    The actions you have executed have recorded the entire process.

13. Click **Disable Recording Mode** on the toolbar.

14. Click **Save File As** on the toolbar to save the script you recorded.

    Open the `C:\Exercises\DIAdem Advanced\` folder and save the script as `Training.vbs`.

15. Click **Run Script** to test the `Training.vbs` script in the editor.

When the script is complete, DIAdem displays a report similar to Figure 3-1.

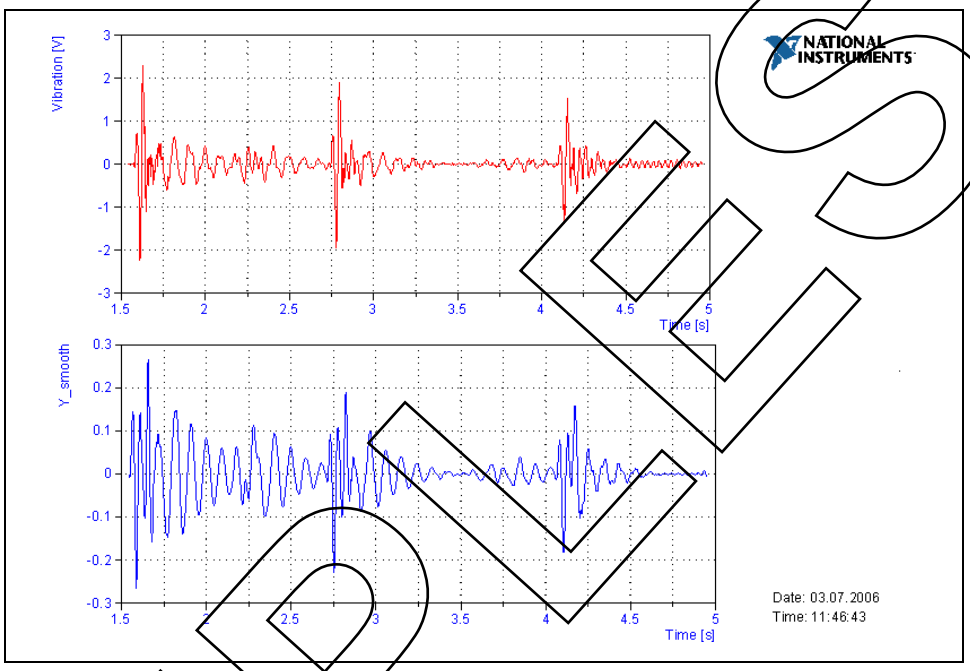


Figure 3-1. Smoothed Data

The `Training.vbs` script contains the following statements:

```
Option Explicit
Call DataDelAll(1)
Call DataFileLoad("Vibration.tdm","","")
Call ChnSmooth(2,3,12,"maxNumber")

Call PicLoad("Smooth_1")
Call PicUpdate(0)
```

Note The training manual does not include a display of the comment lines in the script.

Integrating the Script in the DIAdem Interface

Assign the script to a button in a function bar to make the script easier to start. Press the key to start the script.

1. Select **DIAdem SCRIPT**.

2. Open the **DIAdem Scripts (Start With <Shift>)** function bar, right-click the third button, and select **Default Setting** from the shortcut menu.
   a. Navigate to the `Training.vbs` script in the `C:\Exercises\DIAdem Advanced\` folder and select the script.
   b. Click **Open** to assign the script to the third button.

3. Open the **DIAdem Scripts (Start With<Shift>)** function bar again and idle the mouse cursor over the third button.

   The ToolTip displays the name of the assigned script.

4. Click the **VBS script: Training** button to start the `Training.vbs` script.

   You also can use keys to start the script. Press <Shift-F3> to start the script you assigned to the third button.

End of Exercise 3-1

The `Script_03_01.vbs` script in the `C:\Solutions\DIAdem Advanced\` folder contains the solution for this exercise.

D. Tools that Help You to Create Scripts

You can use the recording mode, the shortcut <Ctrl-A>, and the *DIAdem Help* to create scripts.

The Recording Mode

In the recording mode DIAdem can record all commands and some variables, which facilitates creating scripts. The initial script is the basis for your script.

The recording mode records the following functions in the respective panels:

- **DIAdem NAVIGATOR**
  - Loading, saving, importing, and finding data
  - Operations in the Data Portal
- **DIAdem VIEW**
  - Block operations such as deleting or inserting channel contents
  - Setting and deleting flags
- **DIAdem ANALYSIS**
  - All calculations

    In rare cases, the recording mode also records variable assignments.
- **DIAdem REPORT**
  - Opening, saving, displaying, and printing layouts.

    The recording mode does not register interactive actions such as inserting, moving, or configuring REPORT objects.

The Keyboard Shortcut <Ctrl-A>

When you create a script in the recording mode, DIAdem does not generally record variable assignments. If you change axis, curve, or text parameters in the recording mode, DIAdem displays these actions on the screen, but does not save the related variable assignments in the script file.

To record dialog box parameters and variables in the recording mode, press the <Ctrl-A> shortcut in the open dialog box.

If the recording mode is not enabled, press <Ctrl-A> in an open dialog box to copy the variables and their contents to the clipboard. You can paste these variable assignments to the script editor.

The DIAdem Help

Refer to the *DIAdem Help* to find variable names and command names.

- In the script editor

  If you select a DIAdem term in the script editor, press <F1> to access the help page for this variable or command.

  When the cursor idles on a selected command or variable in the script editor, the ToolTip appears with information on the command parameters or on the type and value range of the variable.

- In dialog boxes

  Every DIAdem dialog box has a **Help** button to open the *DIAdem Help* page that contains the commands and variables for the dialog box. You can click terms underscored in green to display the variable for a dialog box parameter, or the syntax for including the variable in the script.

- Command and variable overview in the *DIAdem Help*

  In the help tree, the **Programming Reference** folder has an alphabetical list of all the DIAdem commands and variables.

- DIAdem SCRIPT help

  In the help tree, select **Getting Started»DIAdem SCRIPT** for a general description of DIAdem SCRIPT, and select **Procedures»Working with DIAdem SCRIPT** and **Creating Scripts** for step-by-step instructions on how to create and to edit scripts.

Exercise 3-2 Using the Recording Mode to Extend a Script

Goal

Add statements to the script.

Scenario

You need to make additions to the existing script. You want to take the existing script `Training.vbs` and determine the five local maximum values in the smoothed data, and display the values in a diagram. You save the results of all the calculations as `Results.tdm`. You then display the maximum values in the existing layout `Smooth_1.tdr` and save the new layout as `Smooth_2.tdr`. Finally, you include the additional steps in the `Training.vbs` script.

Design

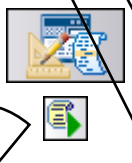
Create a temporary script in the recording mode that calculates five maximum values for the smoothed signal and saves the data. Insert this script into the existing script. Expand the layout for DIAdem to display the maximum values as circles in the bottom axis system.

- ❑ Create the temporary script.
- ❑ Insert the temporary script into the existing script.
- ❑ Extend the layout.

Implementation

Creating the Script

Create a temporary script in the recording mode that calculates five maximum values for the smoothed signal and saves the data.



1. Select **DIAdem SCRIPT**.

2. The extensions are based on the instructions in the `Training.vbs` script. Click **Run Script** to execute the `Training.vbs` script in the editor.

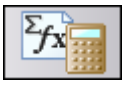
   The script sets the parameters and creates the necessary channels. DIAdem REPORT appears when the script is complete.

3. Select **DIAdem SCRIPT**.

4. Click **Enable Recording Mode** on the toolbar.

   Because the script you want to create is a temporary file, you do not have to enter a comment in the dialog box.

   Click **OK**.

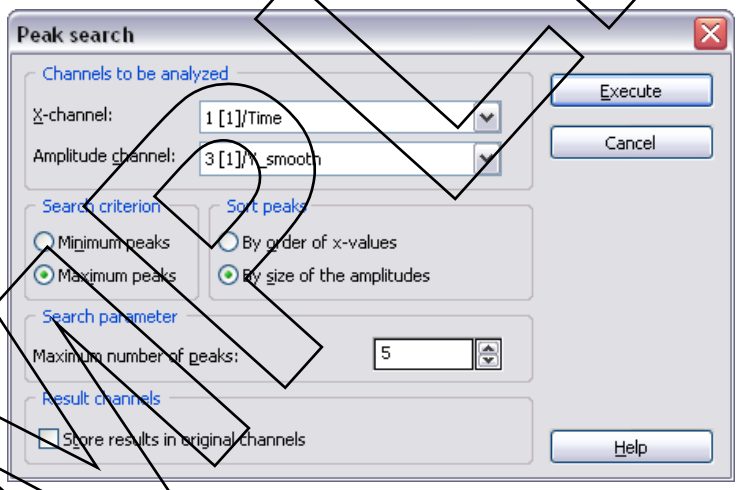


5. Select **DIAdem ANALYSIS**.

6. Open the **Channel Functions** function bar and select **Peak Search**.

   You use this function to locate local minimum values and local maximum values in a signal.

7. When you set the parameters for the peak search, specify that DIAdem check the values of the smoothed channel and save the `5` highest determined amplitudes with the associated x-values in new result channels.



   a. Select `Time` as the **X-channel**.

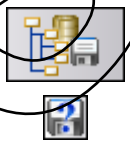
   b. Select `Y_smooth` as the **Amplitude channel**.

   c. Search for **Maximum peaks**, and sort **By size of the amplitudes**.

   d. Set `5` as the **Maximum number of peaks**.

   e. Click **Execute**.

   The DIAdem ANALYSIS workspace displays a record of the calculation.



8. Select **DIAdem NAVIGATOR**.

9. Click **Save TDM File As** on the toolbar.

   Open the `C:\Exercises\DIAdem Advanced\` folder and save the Data Portal data as `Results.tdm`.

The executed steps reflect the complete work sequence.

10. Select **DIAdem SCRIPT**.

11. Click **Disable Recording Mode** on the toolbar.

    The `TeachIn(3).vbs` script appears in the script editor.

Integrating the Temporary Script into the Existing Script

Copy the statements of the temporary script and paste the statements into the existing script.

1. Select the recorded instructions. Click the beginning of the line that contains the first statement and drag the cursor over all the statements.

2. Copy the selected statements.
3. Click the tab at the bottom of the script editor to switch to the `Training.vbs` script.

4. Paste the copied commands after the `Call ChnSmooth` command, which calculates the smoothing function.

   You get the following statement sequence:

```
Option Explicit

Call DataDelAll(1)
Call DataFileLoad("Vibration.tdm","","")

Call ChnSmooth(2,3,12,"maxNumber")
Call ChnPeakFind(1,3,4,5,5,"Max.Peaks","Amplitude")

Call DataFileSave("Results.tdm","TDM")

Call PicLoad("Smooth_1")
Call PicUpdate()
```

   The smoothing function first must create the channel with the number 3 (`Y_smooth`), before the function for calculating the maximum values can access the channel.

5. Replace the `Smooth_1` layout in the command

   `Call PicLoad("Smooth_1")`

   with the prepared `Smooth_2` layout.

   `Call PicLoad("Smooth_2")`

   The `Smooth_2` layout shows the calculated local maximum values of the smoothed signal as small circles. You will create this layout in a later step.

6. Click **Save File As**.

   Open the `C:\Exercises\DIAdem Advanced\` folder and save the modified script as `Training.vbs`. You also can press <Ctrl-S> to save the script.

7. Right-click the `TeachIn(3).vbs` tab and select **Close File** in the shortcut menu.

   You no longer require the temporary script `TeachIn(3).vbs`, so do not save the contents of this file.

Extending the Layout

Display the maximum values as circles in the existing layout `Smooth_1.tdr`. Save the modified script as `Smooth_2.tdr`.

1. Select **DIAdem REPORT**.
2. Select the channels `X_Peak` and `Y_Peak` in the Data Portal and drag and drop the selected channels into the bottom axis system.
3. Change the display mode for the curve.
   a. Double-click the bottom axis system to open the dialog box for curve and axis definition.
   b. Select **Type** for the channel pair `X_Peak` and `Y_Peak`.
      - Change the **Line style** entry to no line.
      - Click the **Marker** tab and select `Circle` as the **Marker style**.
      - Enter `3` as the **Size**.
      - Select a **Marker color** and a **Filling color**.
      - Select `Every n points` for **Repeat marker** and enter `1` as **n**.
   c. Click **OK** to close the dialog boxes.
4. Click **Save Layout As**.

   Open the `C:\Exercises\DIAdem Advanced\` folder and save the layout as `Smooth_2.tdr`.
5. Open the **DIAdem Scripts** function bar and select the **VBS Script: Training** button to start the `Training.vbs` script.

When the script is complete, DIAdem displays a report similar to Figure 3-2.

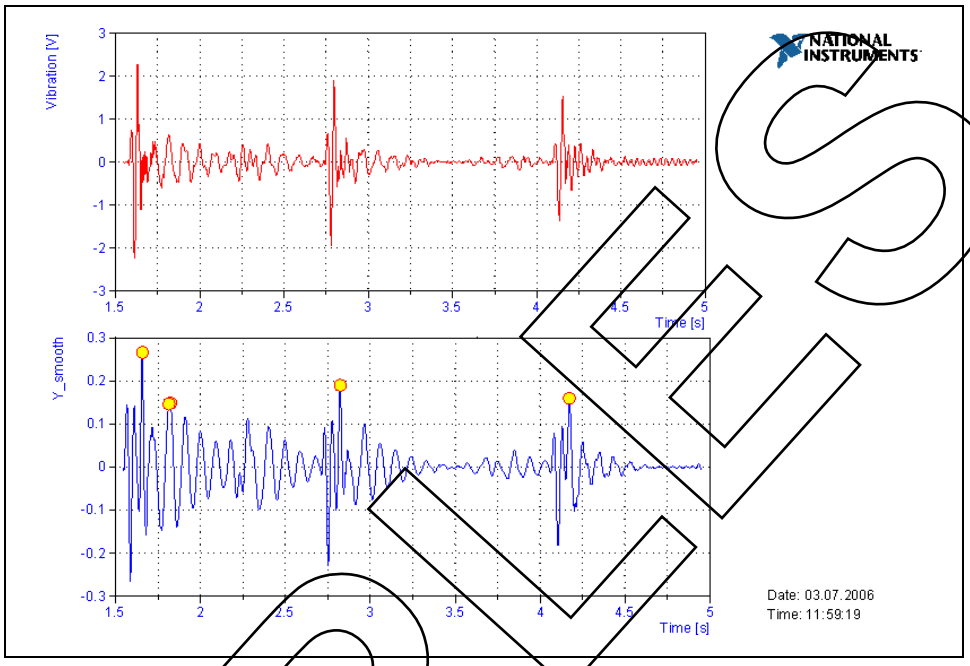


Figure 3-2. Maximum Value Display

The `Training.vbs` script contains the following statements:

```
Option Explicit

Call DataDelAll(1)
Call DataFileLoad("Vibration.tdm","","")

Call ChnSmooth(2,3,12,"maxNumber")
Call ChnPeakFind(1,3,4,5,5,"Max.Peaks","Amplitude")

Call DataFileSave("Results.tdm","TDM")

Call PicLoad("Smooth_2")
Call PicUpdate()
```

Challenge

Modify the `Smooth_2.tdr` layout so that DIAdem displays the y-coordinates of the calculated maximum values with two places after the decimal point.

End of Exercise 3-2

The `Script_03_02.vbs` script in the `C:\Solutions\DIAdem Advanced\` folder contains the solution for this exercise.

Summary

- To create a script in the recording mode, complete the following four steps:
  - Enable the recording mode
  - Carry out the work sequence
  - Disable the recording mode
  - Save the script
- When you enable the recording mode a dialog box opens. Specify under **Channel reference** whether DIAdem records numbers or names when it accesses channels.
- Press the <Esc> key to abort a script.
- Select **Default Setting** from the shortcut menu of the DIAdem SCRIPT function bars to assign a script to a button.
- The easiest way to extend an existing script is to record the sequence of commands in recording mode. You can then add the recorded commands and variables to the existing script.
- To record dialog box parameters and variables in the recording mode, press <Ctrl-A> in the open dialog box.

  If the recording mode is disabled, DIAdem copies all variables including their contents to the clipboard.
- If you select a DIAdem term in the script editor, press <F1> to open the help page on this variable or command.