

Automating Oasys PRIMER and Oasys D3PLOT using JavaScript

Miles Thornton

Arup

Abstract

Oasys PRIMER and Oasys D3PLOT now contain JavaScript interpreters.

Adding a scripting engine allows the user to automate both pre and post processing tasks.

Extensions to the core JavaScript language allow the user to interact with the programs, create and/or manipulate data, create user interfaces, read and write files and extend the functionality of PRIMER and D3PLOT.

The syntax is quick and easy to learn.

There are several advantages in using scripts:

- *Quick turnaround – you do not have to wait for new version of PRIMER or D3PLOT*
- *You can keep your application confidential*
- *The script is under your control – you can do it yourself if you wish.*

This paper describes the scripting technology, outlines possible applications and gives demonstrations in Oasys PRIMER and Oasys D3PLOT.

Oasys PRIMER Scripting



The screenshot shows the Oasys PRIMER interface. At the top, there's a green header bar with the text "Oasys PRIMER Scripting". To the right is the Oasys PRIMER logo. Below the header is a menu bar with "Tools" selected. Under "Tools", the "Script" option is highlighted with a red box. The main workspace shows a table of keywords under the heading "Keywords". The table includes rows for AIRBAG, ALE, BOUND, CONSTR, CONTACT, CONTROL, DAMPING, DATABS, DEFINE, DEF_2_RG, ELEMENT, EOS, HOURGL, INITIAL, INTEGRN, LOAD, MAT, NODE, PARAM, PART, PERTURB, RAIL, RIGIDWALL, SECTION, SENSOR, SET, TERMIN, and Xrefs. Below the keyword table is a "Model" section with "Part tree" and "Script" buttons. At the bottom of the interface is a "JavaScript execution window" with a red border. It displays the file path "File: read_user_defined_connections_file.js" and a memory usage indicator of "Memory size (MB): 10". There are also "Run" and "Check" buttons.

• Oasys PRIMER now contains a JavaScript engine (core is the same as engine used in Oasys REPORTER).

• Scripts do not have to be compiled and the same script works on all platforms.

• JavaScript is a full-featured programming language syntactically similar to C, Java and Perl.

• Core features include variables, arrays, strings, objects, functions, regular expressions.

• Statements if, do, for, while, switch etc.

• Operators + - * ++ -- && || etc (like C and Perl)

• Core functionality can easily be extended with new classes and methods.

Oasys PRIMER Scripting



The screenshot shows the Oasys PRIMER interface. At the top, there's a green header bar with the text "Oasys PRIMER Scripting". To the right is the Oasys PRIMER logo. The main workspace contains several sections of text:

- Extensions so far**
- LS-DYNA keywords**
Beam, Curves, Discrete, Hourglass, Mass, Material, Node, NRB, Part, Section, Set, Shell, Solid, SPC
- PRIMER entities**
Blanking, Colour, Connections, Image, Model, View, Xrefs
- Other**
File (text file reading/writing)
Widget, Window (ability to create new user interfaces in PRIMER)
XMLParser (XML file reading)
Command line functions can be called from JavaScript
- Scripts can be assigned to function keys**

Oasys LS-DYNA ENVIRONMENT ARUP

- Possible applications
 - Meshing
 - Complex geometrical transformation (e.g. morphing, airbag folding)
 - Translators
 - Custom menus/user interfaces
 - Processes/Workflow
 - Dummy/seat multi-position via command line
- Future development
 - Adding support for more LS-DYNA keywords
 - Interfacing with more functions in PRIMER
- User feedback needed:
 - What tasks could scripting help you with?
 - Which Primer keywords/functions will you need to access?
- We will provide example scripts and full documentation



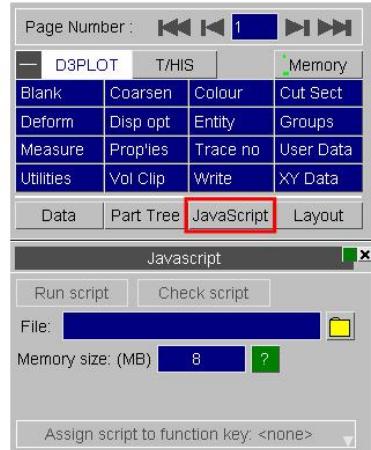
ARUP

- Advantages:
 - Quick turnaround – don't have to wait for new version of Primer
 - Can keep your application confidential
 - Under your control – can do it yourself if you wish.
- Demos:



ARUP

Oasys D3PLOT Scripting

- Oasys D3PLOT also now contains a JavaScript engine (core is the same as engine used in Oasys PRIMER and so has the same File and GUI functions).
- Runs inside D3PLOT and links with it to extract data, and generate new data for plotting or output to text files.
- Special functions added by us to access data in the d3plot (ptf) files and store user-calculated data for plotting. Can also output to text file.
- Typical applications:
 - Calculate “margin against failure”
 - Code-based checking
 - User defined data
 - Extracting/combining data from many states
- We will provide example scripts and full documentation.

Oasys LS-DYNA ENVIRONMENT ARUP

Contact Information

ARUP

www.arup.com/dyna

For more information please contact the following:

UK: Arup The Arup Campus Blythe Valley Park Solihull, West Midlands B90 8AE, UK T +44 (0)121 213 3399 F +44 (0)121 213 3302 dyna.support@arup.com	China: Arup 39/F-41/F Huai Hai Plaza Huai Hai Road (M) Shanghai China 200031 T +86 21 6126 2875 F +86 21 6126 2882 china.support@arup.com	India: nHance Engineering Solutions Pvt. Ltd (Arup) Plot 39, Ananth Info Park Opp. Oracle Campus HiTec City, Madhapur Phase II Hyderabad 500081, India T +91 40 4436 9797/98 india.support@arup.com
--	---	--

Oasys LS-DYNA ENVIRONMENT ARUP