TEXAS INSTRUMENTS

Application Report
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Using the Scripting Utility in the Code Composer Studio Integrated Development Environment

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ABSTRACT

Scripting is a new utility available for the Code Composer Studio™ integrated development environment (IDE) v2.10. It provides a library of commands that integrate into Perl or Visual Basic for Applications (VBA), to provide a batch-mode scripting capability that can be utilized in automated testing and/or validation. This application report describes how to use scripting, in collaboration with Perl and VBA scripts, that will automatically invoke Code Composer Studio and perform some simple tasks.

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1 Introduction

Scripting is an interface that provides access from Perl or Visual Basic for Applications (VBA) to basic functions within Code Composer Studio. This application report describes how to use scripting, in collaboration with Perl and VBA scripts, that will automatically invoke Code Composer Studio and perform some simple tasks. For more detailed technical information, refer to the documentation available at (*Your_Install)\ti\plugins\generic\CC_SCRIPTING.HLP*.

Using scripting, a simple Perl or VBA script can load a program, set breakpoints, run, read/write memory and registers, execute general extension language (GEL) commands, and perform various other simple debugging functions.

2 System Requirements

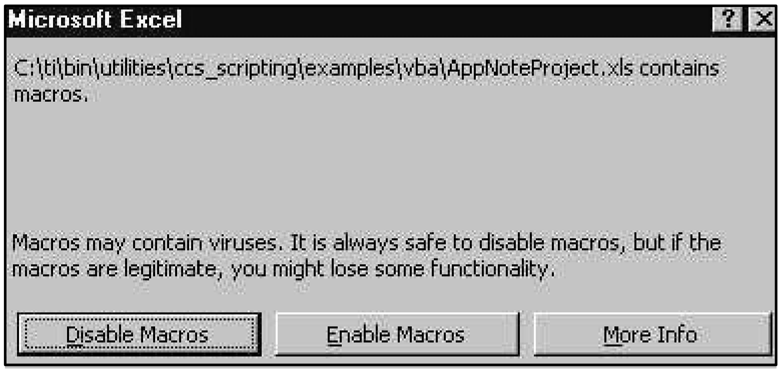
Scripting requires the following setup:

- Code Composer Studio v 2.10 for the TMS320C5000™ or TMS320C6000™ digital signal processors (DSPs), or OMAP™ DSP-based processor.
- Visual Basic for Applications capable program (e.g., MS Excel)
- Perl 5.004 is provided with Scripting.

3 Scripting Using VBA Scripts

Scripting provides VBA script examples located at *(Your_Install)*\ti\bin\utilities\ccs_scripting \examples\vba, which can be opened using Microsoft Excel. The following dialog box will appear, as it does on any Excel spreadsheet that has embedded VBA.

1. To open any one of the Excel files, double-click on the file.



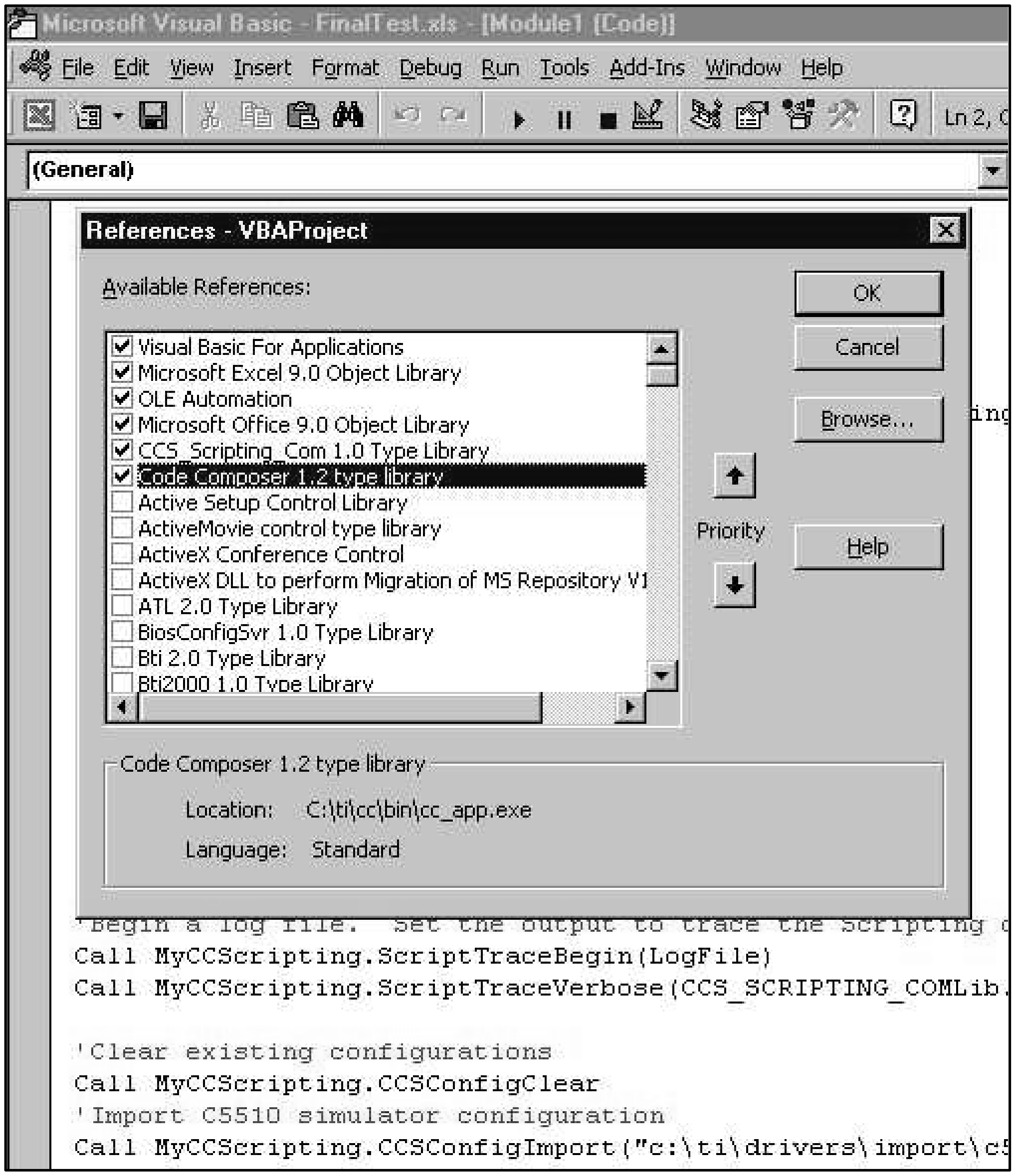
C:\ti\bin\utilities\ccs_scripting\examples\vba\AppNoteProject.xls contains macros.

Macros may contain viruses. It is always safe to disable macros, but if the macros are legitimate, you might lose some functionality.

2. Click the Enable Macros button.
3. Click on Tools –> Macro –> Visual Basic Editor to see the actual Visual Basic code. The code can be executed by using the blue triangular button on the Excel toolbar.

To create a new VBA script:

1. Open up Microsoft Excel and click on Tools –> Macro –> Macro, provide a Macro name, and click Create. If you wish, you can begin by copying and pasting the following script provided in the main module.


Microsoft Visual Basic - FinalTest.xls - [Module1 (Code)]
File Edit View Insert Format Debug Run Tools Add-Ins Window Help
Ln 2,
(General)
References - VBAProject
OK
Cancel
Browse...
Priority
Help

Available References:

- ✓ Visual Basic For Applications
- ✓ Microsoft Excel 9.0 Object Library
- ✓ OLE Automation
- ✓ Microsoft Office 9.0 Object Library
- ✓ CCS_Scripting_Com 1.0 Type Library
- ✓ Code Composer 1.2 type library
- Active Setup Control Library
- ActiveMovie control type library
- ActiveX Conference Control
- ActiveX DLL to perform Migration of MS Repository V1
- ATL 2.0 Type Library
- BiosConfigSvr 1.0 Type Library
- Bti 2.0 Type Library
- Bti2000 1.0 Type Library

Code Composer 1.2 type library

Location: C:\ti\cc\bin\cc_app.exe

Language: Standard

```
'Begin a log file.  Set the output to trace the scripting c
Call MyCCScripting.ScriptTraceBegin(LogFile)
Call MyCCScripting.ScriptTraceVerbose(CCS_SCRIPTING_COMLib.

'Clear existing configurations
Call MyCCScripting.CCSConfigClear
'Import C5510 simulator configuration
Call MyCCScripting.CCSConfigImport("c:\ti\drivers\import\c5
```

2. Make sure to create new references by clicking on Tools –> Reference, and check the CCS Scripting Com 1.0 Type and Code Composer 1.2 type libraries.
3. If you're using the following script as an example, make sure to save the newly created .xls file in *(Your_Install)*\ti\bin\utilities\ccs_scripting\examples\vba, as it uses one of the example projects in that directory.

Example 1 assumes that you have C5000™ Code Composer Studio v2.1 or higher installed along with Code Composer Studio Scripting. This script assumes that the TMS320C5510 simulator has been configured via CC_Setup. The script will load and run one of the example programs packaged with Code Composer Studio Scripting, and also will demonstrate the method for setting breakpoints and reading register values.

Example 1. VBA Script Used With Scripting

```
Sub CCStudio_Scripting()

’Declarations
’Create a new CCStudio Scripting object

Dim MyCCScripting As New CCS_SCRIPTING_COMLib.CCS_Scripting

Dim MyPath As String
Dim MyProgram As String
Dim Visible As Integer
Visible = 1

MyPath = ThisWorkbook.Path
MyProgram = MyPath + ”\hello\hello.out”
MyProject = MyPath + ”\hello\hello.pjt”

’The following test:
’Opens the currently configured CCStudio
’Opens and Builds a project
’Loads a program
’Sets a breakpoint at ”main”
’Runs to ”main”
’Reads the value of the PC
’Closes the CCStudio application

Call MyCCScripting.CCSOpenNamed(”*”, ”*”, Visible)
Call MyCCScripting.ProjectOpen(MyProject)
Call MyCCScripting.ProjectBuild
Call MyCCScripting.ProgramLoad(MyProgram)
MainVal = MyCCScripting.SymbolGetAddress(”main”)
Call MyCCScripting.BreakpointSetAddress(MainVal)
Call MyCCScripting.TargetRun
MyPCVal = MyCCScripting.RegisterRead(”PC”)
Call MyCCScripting.CCSClose

If MyPCVal = MainVal Then
   Cells(4, 4) = ”Test Passed”
End If

End Sub
```

NOTE: When a VBA program makes a Scripting call (such as TargetRun) that may take several minutes, the VBA program may show a message such as “Excel waiting for OLE Application” or “Server Busy.” To disable these warnings, place the statement “Application.DisplayAlerts = False” into your VBA script before the Scripting calls.

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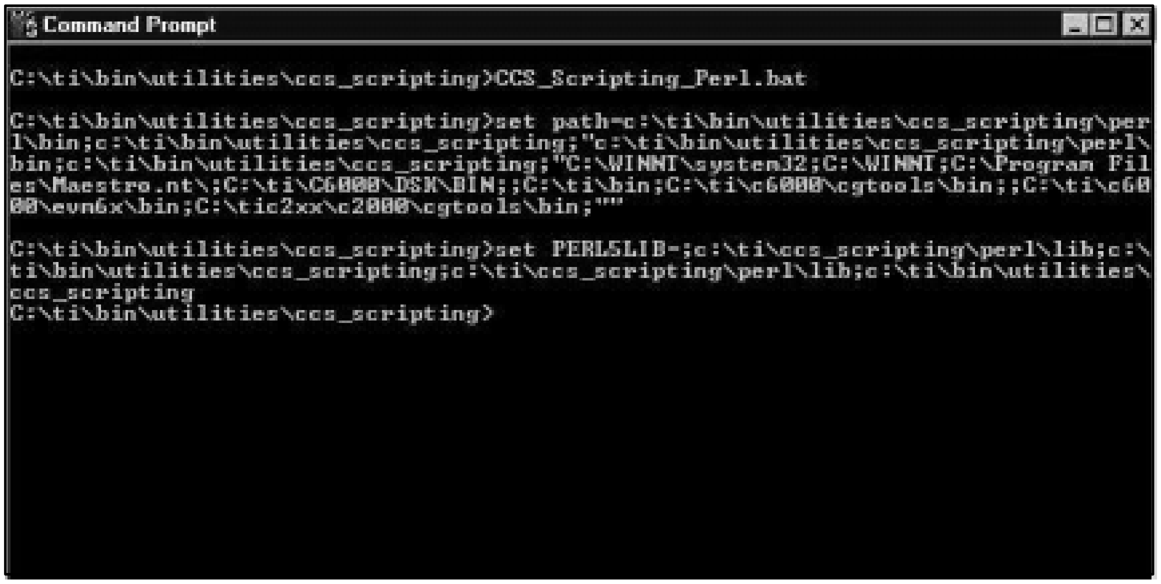
4 Scripting Using Perl Scripts

Scripting will automatically install Perl 5.004 in

`(Your_Install)\ti\bin\utilities\ccs_scripting\perl`

Perl examples, packaged with Scripting, are available in
`(Your_Install)\ti\bin\utilities\ccs_scripting\examples\perl`

To run any one of the examples:



```
C:\ti\bin\utilities\ccs_scripting>CCS_Scripting_Perl.bat

C:\ti\bin\utilities\ccs_scripting>set path=c:\ti\bin\utilities\ccs_scripting\per
l\bin;c:\ti\bin\utilities\ccs_scripting;"c:\ti\bin\utilities\ccs_scripting\perl\
bin;c:\ti\bin\utilities\ccs_scripting;"C:\WINNT\system32;C:\WINNT;C:\Program Fil
es\Maestro.nt\;C:\ti\C6000\DSK\BIN;;C:\ti\bin;C:\ti\c6000\cgtools\bin;;C:\ti\c60
00\evm6x\bin;C:\tic2xx\c2000\cgtools\bin;""

C:\ti\bin\utilities\ccs_scripting>set PERL5LIB=;c:\ti\ccs_scripting\perl\lib;c:\
ti\bin\utilities\ccs_scripting;c:\ti\ccs_scripting\perl\lib;c:\ti\bin\utilities\
ccs_scripting
C:\ti\bin\utilities\ccs_scripting>
```

1. Run the CCS_Scripting_Perl.bat file which is provided in *(Your_Install)*\ti\bin\utilities\ccs_scripting\. This will set the PATH and PERL5LIB environment variables properly for executing Perl scripts, as shown by the above image. This .bat file may be run as-is, or the paths referenced may be added to your system environment. This .bat file must be executed even if you have Perl5.004 or Perl5.005 on your machine, as it sets up your environment to include the needed Scripting files.
2. Run any of the Perl scripts using the following command. In this case, Debug.pl is the actual script being executed.

```
(Your_Install)\ti\bin\utilities\ccs_scripting\examples\perl>perl  ccs_Debug.pl
```

If you wish, you may start by copying and pasting the following script provided as a *.pl file. If you are using the following script as an example, make sure to save the newly created *.pl file in *(Your_Install)*\ti\bin\utilities\ccs_scripting\examples\perl, as it uses one of the example projects in that directory.

Example 2 assumes that you have C5000 Code Composer Studio v2.1 or higher installed along with Scripting, and also assumes that a C5510 simulator is the sole existing configuration. This will load and run one of the example programs packaged with Code Composer Studio.

Example 2. Perl Script Used With Scripting

```
#Example of a Perl script used with CCStudio Scripting:
use CCS_SCRIPTING_PERL;
#Declarations
#Create a new CCStudio Scripting object

my $MyCCScripting = new CCS_SCRIPTING_PERL::CCS_Scripting();
my $MyProgram;
my $MyPath;
my $MyPCVal;
my $MainVal;
my $LogFile;
$MyPath = ”C:\\ti\\bin\\utilities\\ccs_scripting\\examples\\perl”;
$MyProgram = ”.\\hello\\hello.out”;
$MyProject = ”.\\hello\\hello.pjt”;
$LogFile = ”.\\Test.log”;

#Begin a log file.  Set the output to trace the Scripting calls made
$MyCCScripting –> ScriptTraceBegin($LogFile);
#The following test:
#Opens the currently configured CCStudio
#Opens and Builds a project
#Loads a program
#Sets a breakpoint at ”main”
#Runs to ”main”
#Reads the value of the PC
#Closes the CCStudio application

$MyCCScripting –> CCSOpenNamed(”*”,”*”,1);
$MyCCScripting –> ProjectOpen($MyProject);
$MyCCScripting –> ProjectBuild();
$MyCCScripting –> ProgramLoad($MyProgram);
$MainVal = $MyCCScripting –> SymbolGetAddress(”main”);
$MyCCScripting –> BreakpointSetAddress($MainVal);
$MyCCScripting –> TargetRun();
$MyPCVal = $MyCCScripting –> RegisterRead(”PC”);
$MyCCScripting –> CCSClose();

if ($MyPCVal == $MainVal)
{
    $MyCCScripting –> ScriptTraceWrite(”Test Passed \n\n”);
}
```

NOTE: Any **GEL** command may be executed in Scripting via the TargetEvalExpression applications programming interface (API). For example, mapping memory from Gel in Scripting would look like the following:

```
/* Map MMR Memory */
VBA
ValResult = MyCCScripting.TargetEvalExpression(”GEL_MapAdd(0x000000u,1,0x000050u,1,1)”)
/* Map MMR Memory */
Perl
$ValResult = $MyCCScripting–>TargetEvalExpression
        (”GEL_MapAdd(0x000000u,1,0x000050u,1,1)”);
```

5 Items of Special Note

Code Composer Studio may be opened one of two ways:

- CCSOpenNamed(sBoardName, sCPUName, bVisible) will open the specific board and CPU named by the strings sBoardName and sCPUName, as they have been named in the configuration in CC_Setup.

  A wildcard character ”*” may be given for sBoardName and sCPUName. For example, CCSOpenNamed(”*”, ”*”, bVisible) will open the first or only item in the configuration.

- CCSOpen(nMajorISA, nMinorISA, nCPUIndex, nPlatform, bVisible): This opens a specific board or a simulator from the configuration list.

  CCSOpen allows the user to specify which CPU in a particular debug chain to open through the third parameter, nCPUIndex.

nCPUIndex is a zero-based index. For example, nCPUIndex = 1 specifies the second CPU of the designated type found.

Examples in VBA:

Open a c55x simulator if it is the only one in the configuration list:

```
Call MyScript.CCSOpenNamed(”*”, ”*”, true)
```

Open 2 c55x emulators from a configuration list simultaneously using CCSOpen:

```
Call MyScript.CCSOpen(CCS_SCRIPTING_COMLib.ISA_C55, 0, 0,
CCS_SCRIPTING_COMLib.PLATFORM_EMULATOR, true)

Call MyScript.CCSOpen(CCS_SCRIPTING_COMLib.ISA_C55, 0, 1,
CCS_SCRIPTING_COMLib.PLATFORM_EMULATOR, true)
```

Open 2 c55x emulators from a configuration list simultaneously using CCSOpenNamed:

```
Call MyScript.CCSOpenNamed(“C55x Texas Instruments”, “CPU_1”, true)

Call MyScript.CCSOpenNamed(“C55x Texas Instruments”, “CPU_2”, true)
```

- CCSClose takes in a parameter, nCloseAll, which default to true (1). When nCloseAll = true, CCSClose will terminate all Code Composer Studio processes that are running. When nCloseAll = false, only the current Code Composer Studio processes will be closed. It is highly recommended that CCSClose(true) be specified when all scripting functions have been completed, to avoid leaving orphaned processes running on the system.
- If a user script is interrupted by an error condition (e.g., ”ProgramLoad: file not found”), when your script shuts down, make sure that there is no cc_app.exe processes still running in the background. Having an orphaned cc_app running when the Scripting functions are called can lead to unpredictable results.

6 Reference

1. Scripting documentation