



ARIS .Net Scripting Tool for ArcMap User's Manual

7 March 2016

ARIS B.V.
<http://www.aris.nl/>

Table of contents

1	Introduction.....	3
2	System requirements	4
3	Installation	5
3.1	Installing .Net Scripting Tool for ArcMap.....	5
3.2	Installing ArcObjects SDK without Visual Studio	5
4	Registration	7
4.1	Trial license	7
4.2	Register	7
4.3	Unregister.....	8
4.4	Invalid license.....	8
5	Version History	9
5.1	Version 1.0	9
5.2	Version 1.0.1	9
5.3	Version 1.1	9
6	Using .Net Scripting Tool in ArcMap	10
6.1	Getting started.....	10
6.2	Edit	12
6.3	Build	12
6.4	Run.....	12
6.5	Save	12
6.6	References.....	12
6.7	Connect to ArcMap	13
6.8	Options	13
6.8.1	General options.....	13
6.8.2	Compile options	13
6.9	Windows.....	13
6.9.1	Scripts Explorer.....	13
6.9.2	Messages window.....	15
6.9.3	Debug window	15
6.9.4	Output window	15
7	Example.....	16
8	Known issues	19
	Appendix A. License Agreement	20

1 Introduction

Use your .Net code in ArcMap just as easy as you were used to work with VBA scripts. With the ARIS .Net Scripting Tool you can create, edit and run .Net code within an ArcMap session. A perfect solution to test parts of your code during application development or to switch from VBA to VB.Net.

VBA macro support is deprecated in ArcGIS 10 and ESRI plans to stop support on VBA in releases after ArcGIS 10.2. Migration of VBA code was only possible to Visual Studio or to Python, but now you can stick to scripting inside ArcGIS with the .Net Scripting Tool.

At this moment the below versions are available (check website):

- ARIS .Net Scripting tool version 1.0 is the release for ArcMap 10.0, 10.1 and 10.2.x.
- ARIS .Net Scripting tool version 1.1 can be used with ArcMap 10.3, 10.3.1 and 10.4.

This manual only describes the latest ARIS .Net Scripting tool version. For other ArcGIS versions check the .Net Scripting tool website:

http://www.aris.nl/dotnetscripting_arcmap

2 System requirements

To use the ARIS .Net Scripting Tool the following software must be installed on your computer:

- Windows XP, Vista, Windows 7 or 8.
- Microsoft .NET Framework 3.5 SP1.
- ESRI ArcGIS ArcGIS 10.3.x or ArcGIS 10.4.
- ArcObjects SDK for the Microsoft .Net Framework*.

Required is one of the following 10.3, 10.3.1 or 10.4 licenses:

- ArcView / ArcGIS for Desktop Basic
- ArcEditor / ArcGIS for Desktop Advanced
- ArcInfo / ArcGIS for Desktop Enterprise

See <http://www.aris.nl/download> for availability of ARIS .Net Scripting Tool versions.

* See Installing ArcObjects SDK without Visual Studio in Chapter 3.

3 Installation

3.1 Installing .Net Scripting Tool for ArcMap

Before installing ARIS .Net Scripting Tool for ArcMap please check the system requirements.

Installation of the ARIS .Net Scripting Tool for ArcMap is accomplished by the following steps:

1. Execute ARISDotNetScriptingToolSetup.msi. The Windows installer will guide you through the installation process.
2. In ArcMap, from the *Customize* menu choose *Extensions* and make sure there is a checkmark next to ARIS .Net Scripting Tool. Now, in the *Customize* menu the menu option *.Net Scripting* should be present.

If the *.Net Scripting* option is not present, do the following:

1. From the *Customize* menu choose *Customize mode....*
2. Select the *Commands* tab.
3. From *Categories* select ARIS .Net Scripting Tool.
4. Drag and drop *.Net Scripting* command to the *Customize* menu.

3.2 Installing ArcObjects SDK without Visual Studio

The .Net Scripting Tool requires the ArcObjects SDK for the Microsoft .Net Framework to be installed. ArcObjects SDK is an optional part of the ArcGIS Desktop setup.

The ArcObjects SDK setup requires Visual Studio to be installed because prior to the existence of the .Net Scripting Tool the installation of ArcObjects SDK for .Net was only usefull if Visual Studio was installed.

When ArcObjects SDK setup stops because Visual Studio is required during setup you can choose to install Visual Studio (e.g. Visual Studio Express) or do a minor change in the registry to let the ArcObjects SDK succeed. ArcObjects SDK and the .Net Scripting Tool do not need anything from Visual Studio.

Here is a work around to install the ArcObjects SDK without Visual Studio being installed.

Before installing the ArcObjects SDK for the Microsoft .Net Framework

Add the following registry key:

On a 32-bits operating system:

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\VisualStudio\12.0]

On a 64-bits operating system:

[HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Microsoft\VisualStudio\12.0]

Add two new string values to the key:

Value Name: InstallDir

Value Data: C:\FakeVisualStudio

Value Name: ShellFolder

Value Data: C:\FakeVisualStudio

Installing the ArcObjects SDK for the Microsoft .Net Framework

1. Use the "ArcObjects SDK for the Microsoft .NET Framework Setup" for your ArcGIS version (download from ESRI if applicable) or select "Setup for ArcObjects SDK for the Microsoft .Net Framework" if this is part of a complete "ArcGIS for Desktop Setup".
2. Start the setup.
3. Select none of the optional features for Visual Studio and VCPP to be installed. These features are of no use if you do not have Visual Studio installed.

After installing the ArcObjects SDK for the Microsoft .Net Framework

Remove the registry key you added.

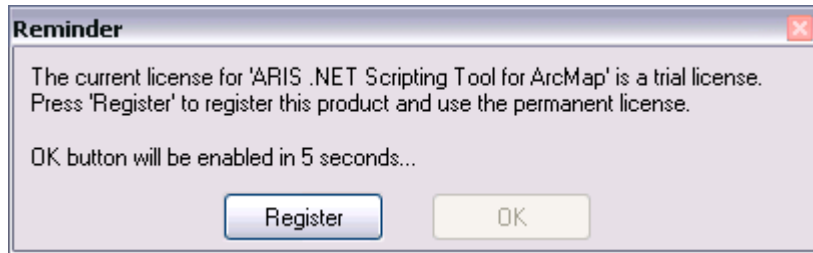
Note: If you choose to install Visual Studio after installation of ArcObjects SDK a reinstall of ArcObjects may be necessary.

4 Registration

4.1 Trial license

The distributed version of the ARIS .Net Scripting Tool for ArcMap is a full functional version with a trial license. This means it can be used for evaluation purposes for 5 days. In this period scripts can only be executed once per ArcMap session. After this period, the ARIS .Net Scripting Tool will be locked until a valid licence key is entered.

While in trial mode, each time an object is retrieved for processing a reminder message will be shown.



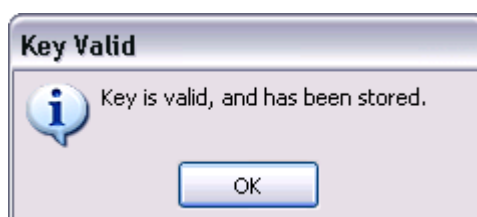
Pressing the *Register* button will present you with the following dialog, where you must enter your name and the registration key (If you want to use .Net Scripting Tool in trial mode, wait till the *OK* button comes available and press *OK*).



4.2 Register

If you do not yet have a registration key press the *Buy Now!* button. This will take you to our online store, where you can order this product. Note that you will need the hardware fingerprint of the computer where you want to install the tool, shown in the dialog above. After you complete your purchase, a personal registration key will be sent to you by email. Please store this key in a safe place.

Once you have entered a valid registration key, press *OK*. This key will be stored on your pc. The reminder message will not be shown again.



To register the .Net Scripting Tool it is also possible to run ARISDotNetScriptingToolA.exe. This executable will show the reminder message to register the tool.

Note that after registering the tool from within ArcGIS, ArcGIS should be restarted for the permanent license to be activated.

If you have the ARIS License Checker installed, the registration forms are also accessible through the ARIS License Checker. The ARIS License Checker is available without cost from <http://www.aris.nl/download>.

4.3 Unregister

When your license is not valid anymore through changes on your PC or if you want to move your license to a new PC, you can obtain a new license (fair use policy) after you unregister the license using the ARIS License Checker. The ARIS License Checker is available without cost from <http://www.aris.nl/download>.

Send an e-mail to helpdesk@aris.nl with:

- ARIS product name and version
- Original hardware fingerprint (active license, if available)
- Registration name (active license)
- License key (active license)
- Confirmation code (from unregister)
- New hardware fingerprint (from register)

If you are entitled to receive a new license key, a new key will be sent to you by e-mail as soon as possible (same day, but might also take some days as this is not an automated process).

4.4 Invalid license

When major changes to your hardware have caused the license to become invalid, you can obtain a new valid license if you provide the necessary information (fair use policy). Note that it is no longer possible to get license information using the license checker, use the information in the email you received with your license.

To verify that hardware changes are the cause of the invalid license, you need to send a 'Hardware Change Log' file with the request for a new license.

To get this Hardware Change Log, start ARIS License Checker, select the ARIS product and press the **AHCL** button, you will be asked for a location to store the file.

Send an e-mail to helpdesk@aris.nl with:

- ARIS product name
- Original hardware fingerprint (from license information sent by email)
- Registration name (from license information sent by email)
- License key (from license information sent by email)
- AHCL file (from **AHCL**)
- New hardware fingerprint (from Register/**Enter Key**)

5 Version History

5.1 Version 1.0

Version 1.0 is the first release of the ARIS .Net Scripting Tool for ArcMap and can be used with ArcGIS 10.0, ArcGIS 10.1 and ArcGIS 10.2.

5.2 Version 1.0.1

ArcGIS compatibility

- Version 1.0.1 of the ARIS .Net Scripting Tool for ArcMap can be used with ArcGIS 10.2.1 and 10.2.2 (and still ArcGIS 10.0, 10.1 and 10.2).

5.3 Version 1.1

ArcGIS compatibility

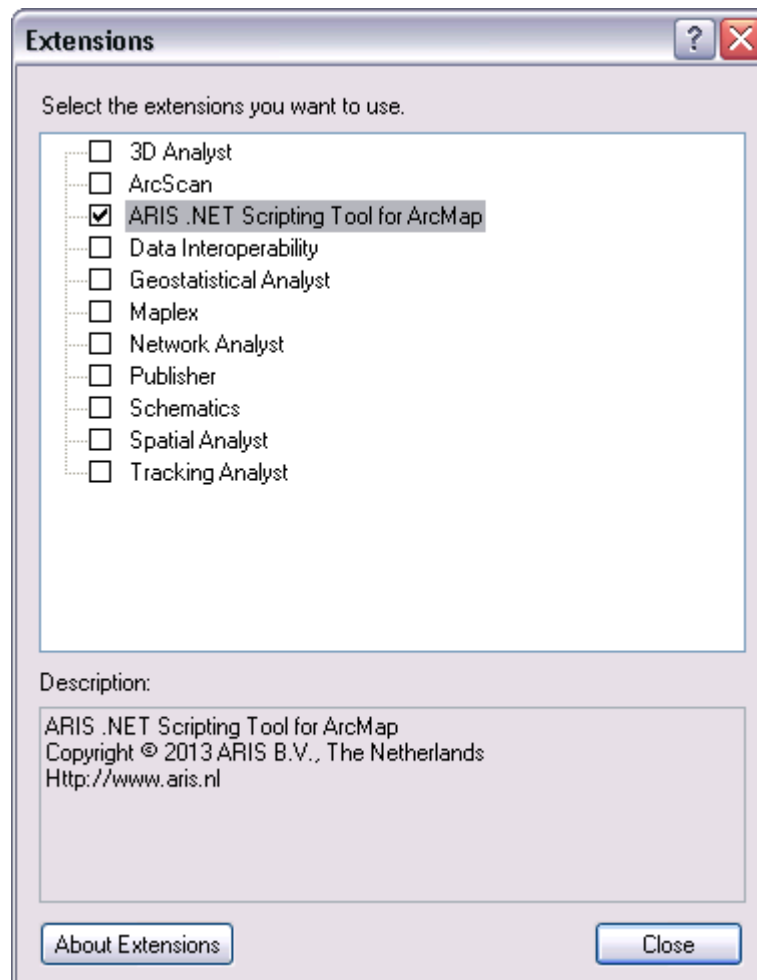
- Version 1.1 of the ARIS .Net Scripting Tool for ArcMap can be used with ArcGIS 10.3, 10.3.1 and 10.4.

6 Using .Net Scripting Tool in ArcMap

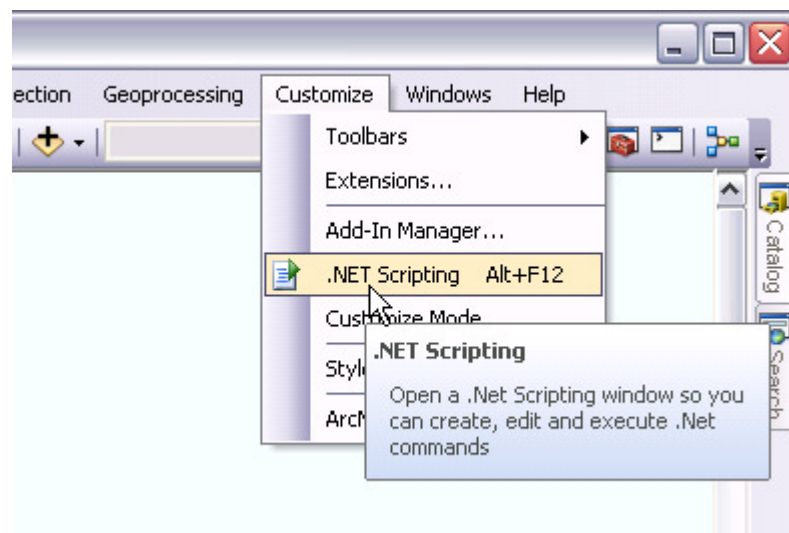
6.1 Getting started

The following walk-through shows how to get started with the .Net Scripting Tool.

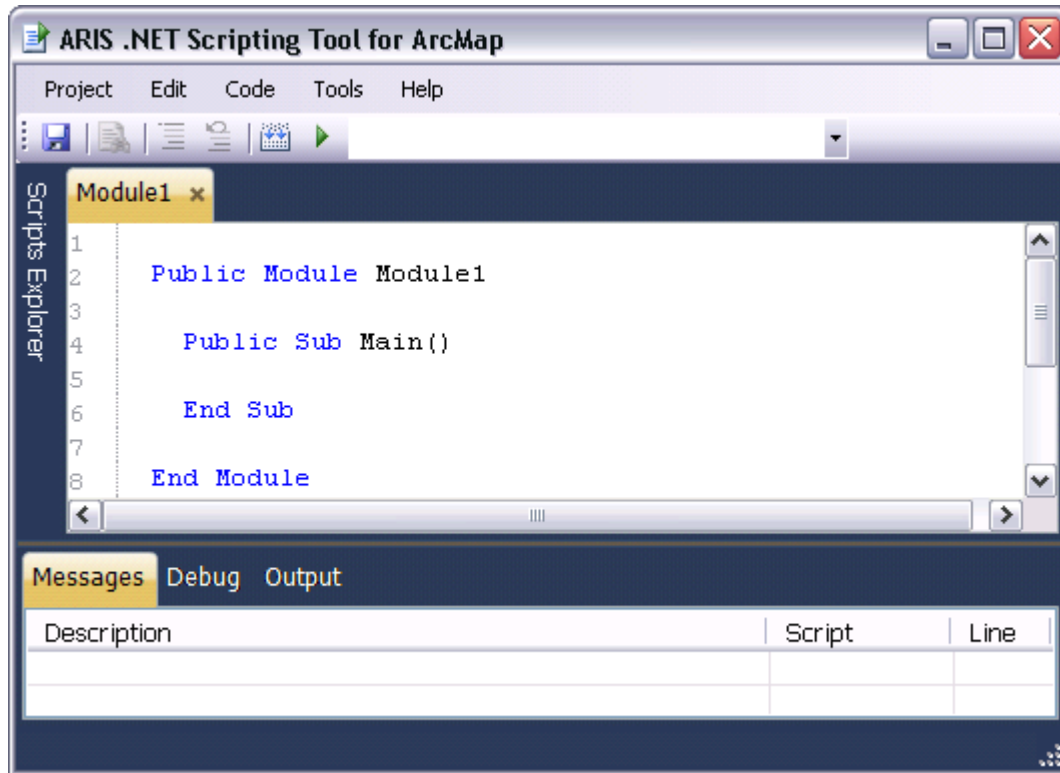
In the Customize menu of ArcMap choose *Extensions*. In the extensions dialog box check *ARIS .Net Scripting Tool for ArcMap* to enable the extension.



Now choose *.Net Scripting* in the Customize menu.



The .Net Scripting window is opened. By default a module script named Module1 is created for you.

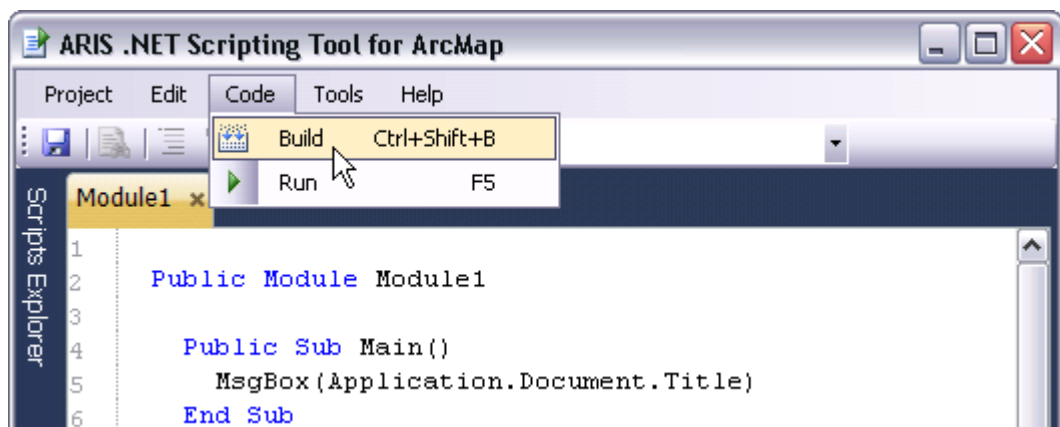


The module script contains a public sub called Main. Add the following line of code to sub Main as shown below.

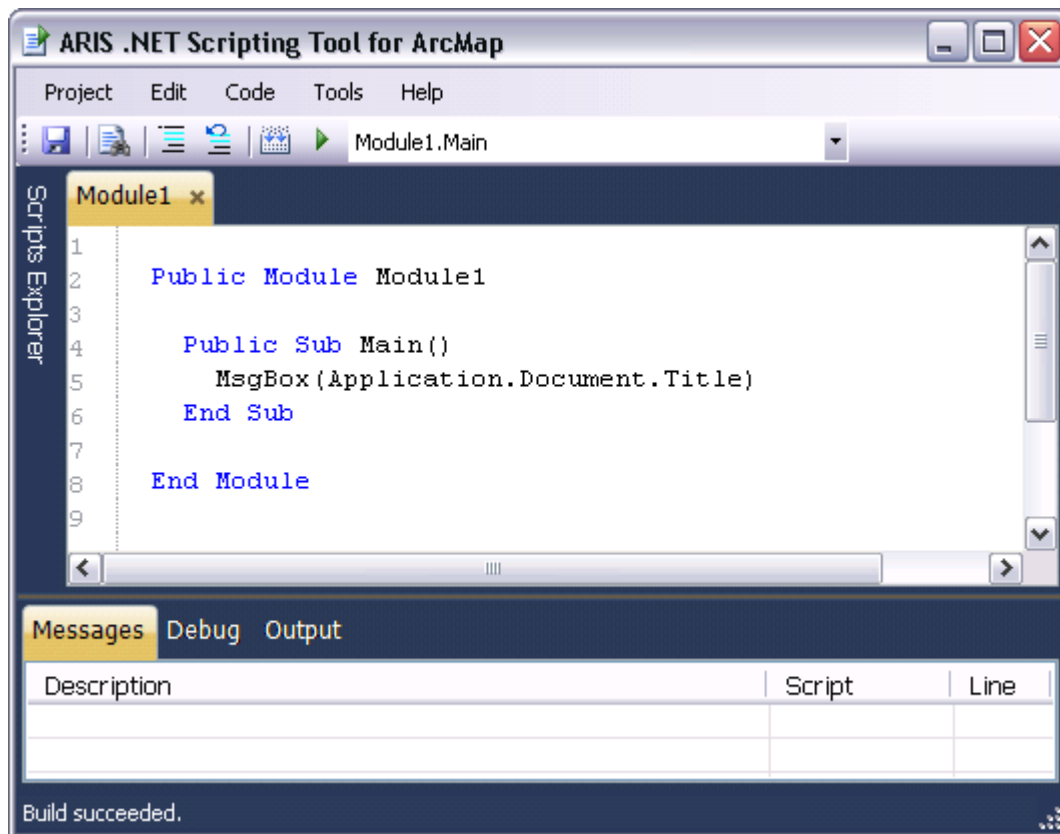
```
Public Sub Main()
    MsgBox (Application.Document.Title)
End Sub
```

Save the ArcMap document with the name GettingStarted.mxd.

In the menu select *Code | Build* to build the code.



After building the code, "Module1.Main" will appear in the dropdown list and the *Run* button will be enabled.



Finally click *Run* to run the sub `Module1.Main` and the name of the current ArcMap document will be shown.

6.2 Edit

In the .Net Scripting window you can edit your scripts in a tabbed editor. In the editor all common text editor functions are available.

6.3 Build

Building the code will check the code for errors. Note that code in all scripts will be checked. If the code was build successfully, all *public subs* without arguments will be listed in the dropdown list in the Editor toolbar.

If building failes a list of errors will be shown in the Messages tab at the bottom of the .Net Scripting window.

6.4 Run

After building the code all valid *subs* will be listed in the dropdown list. Only *public subs* without arguments will show in the list. Select the *sub* you want to run and click *Run*.

6.5 Save

Your scripts will be saved in the current ArcMap-document when you click the Save option in the File menu of the .Net Scripting Window or the Save button in ArcMap.

6.6 References

By default 5 libraries are referenced. These references are required and can not be removed. They are:

- System
- MicroSoft.VisualBasic
- ESRI.ArcGIS.ArcmapUI

- ESRI.ArcGIS.Framework
- ESRI.ArcGIS.System

You can add your own references in three ways:

- Click *References* in the *Tools* menu. The References window will be opened. Click *Add* to add a reference.
- Click *Add Reference* in the *Tools* menu.
- At the top of the module add '#Reference <Reference Name>.dll'. Defining references this way is a shortcut for the methods mentioned above.

Example:

```
'#Reference ESRI.ArcGIS.Carto.dll
```

6.7 Connect to ArcMap

To access ArcMap from your code there are two variables available. These are:

Application	of type ESRI.ArcGIS.Framework.IApplication
ThisDocument	of type ESRI.ArcGIS.ArcMapUI.IMxDocument

See the regular ESRI ArcObjects references for more detailed information about these interfaces.

6.8 Options

Click *Options* in the *Tools* menu to open the Options window. In the Options window the General and Compile options can be modified.

6.8.1 General options

In the Editor section the font size and tab size of the code editor can be set. The default font size is 10. The default tab size is 2.

In the Messages section the font size of the messages shown in the Messages, Debug and Output tabs can be set. The default font size is 10.

6.8.2 Compile options

In the Options section the settings for *Option Explicit* and *Option Strict* can be set. These settings apply to the code of all scripts. Settings specified for these compile options in the code of individual scripts are overruled.

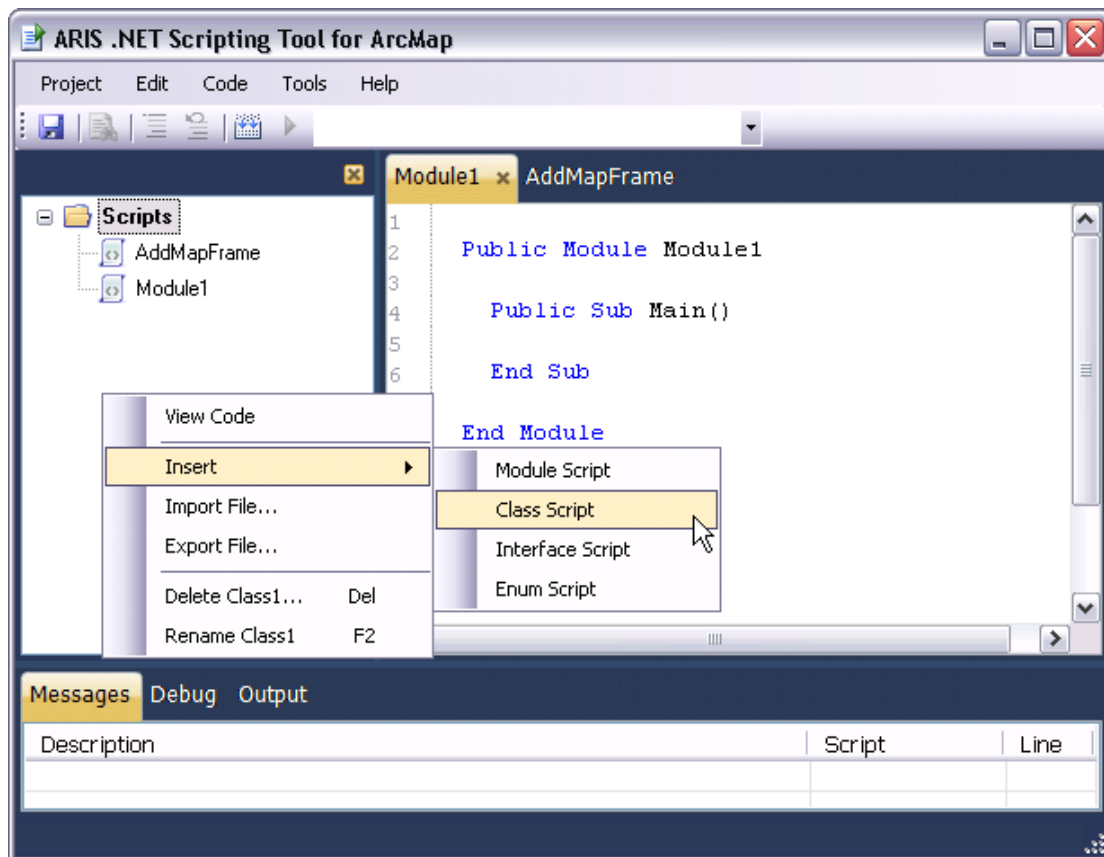
The *Treat warning as error* option can be checked to treat warnings as errors. If this option is checked, building the code will fail if warnings occur. If this option is not checked, warnings will be listed but building the code will succeed.

6.9 Windows

6.9.1 Scripts Explorer

In the .Net Scripting window you can add your own scripts. The scripts can be managed in the Scripts Explorer. To open the Scripts Explorer click the button at the left side of the .Net Scripting window. The context menu in the Scripts Explorer contains the following options:

- View Code
- Insert
- Import File...
- Export File...
- Delete
- Rename



6.9.1.1 View Code

Clicking this option will open the script in a new tab or will select the tab associated with the script if it was already open.

6.9.1.2 Insert script

The *Insert* option contains 4 sub options. You can insert a Module script, Class script, Interface script or Enum script. Depending on the type you choose, the script will contain a module, class, interface or enum declaration. The script is added to the Scripts tree with a default name which can be changed.

6.9.1.3 Import file

Another way to create a script is to import a Visual Basic file (.vb). Click the *Import File* option, browse to your vb-file and select your file. The name of the script will be the same as the filename without extension. If there is already a script with the same name, a number is added at the end of the name.

6.9.1.4 Export File...

Exporting a script will create a Visual Basic file containing the script.

6.9.1.5 Delete script

A script can be deleted with the *Delete* option. Before the script is definitely removed from the project, you can choose to export the script to a file.

6.9.1.6 Rename script

The name of a script can be renamed with the *Rename* option. All scripts should have a unique name. If you rename a script to a name the already exists, you will get a warning and will have to choose another name.

6.9.2 Messages window

In the Messages window build errors, warnings and runtime errors are listed. Double clicking on the error will jump to the line in the code in which the error occurred.

6.9.3 Debug window

The Debug window can display messages that are generated in the code by the command `Debug.Print` which is defined in the `System.Diagnostics` library.

6.9.4 Output window

The Output window can display messages that are generated in the code by the command `Console.Write` or `Console.WriteLine` which are defined in the `System` library.

7 Example

The example below shows how to add a MapFrame in an ArcMap document. The example can be found in <installation>\ExampleWorld.mxd and contains the below VB.Net code:

```
Imports System.Diagnostics
Imports Microsoft.VisualBasic
Imports ESRI.ArcGIS.ArcMapUI
Imports ESRI.ArcGIS.Carto
Imports ESRI.ArcGIS.Framework
Imports ESRI.ArcGIS.Geometry

Module AddMapFrame

    '-----
    Public Sub Main()
        AddMapFrame()
        Debug.print("Ready")
    End Sub

    '-----
    Public Sub AddMapFrame()
        Dim pMxDoc As IMxDocument
        Dim pPageLayout As IPageLayout
        Dim pGraphCont As IGraphicsContainer
        Dim pGraphContSel As IGraphicsContainerSelect
        Dim pElement As IElement
        Dim pEnv As IEnvelope
        Dim pMapFrame As IMapFrame
        Dim pMap As IMap
        Dim pLayer As ILayer

        pMxDoc = ThisDocument
        pPageLayout = pMxDoc.PageLayout
        pGraphCont = CType(pPageLayout, IGraphicsContainer)
        pGraphContSel = CType(pPageLayout, IGraphicsContainerSelect)

        ' Create a new map.
        pMap = New Map

        ' Create a new mapframe.
        pElement = New MapFrame
        If Not pElement Is Nothing Then

            ' Set the size of the mapframe (in cm.).
            pEnv = New Envelope
            pEnv.PutCoords(1, 1, 10, 6.5)
            pElement.Geometry = pEnv

            ' Set the mapframe.
            pMapFrame = CType(pElement, IMapFrame)

            ' Set the mapframe map.
            pMapFrame.Map = pMap

            ' Add the mapframe to the pagelayout.
            pGraphCont.AddElement(pElement, 0)

            ' Deselect the mapframe.
            pGraphContSel.UnselectAllElements()

            pLayer = pMxDoc.FocusMap.Layer(0)
            if pLayer IsNot Nothing then
                pMap.AddLayer(pLayer)
            End If
        End If

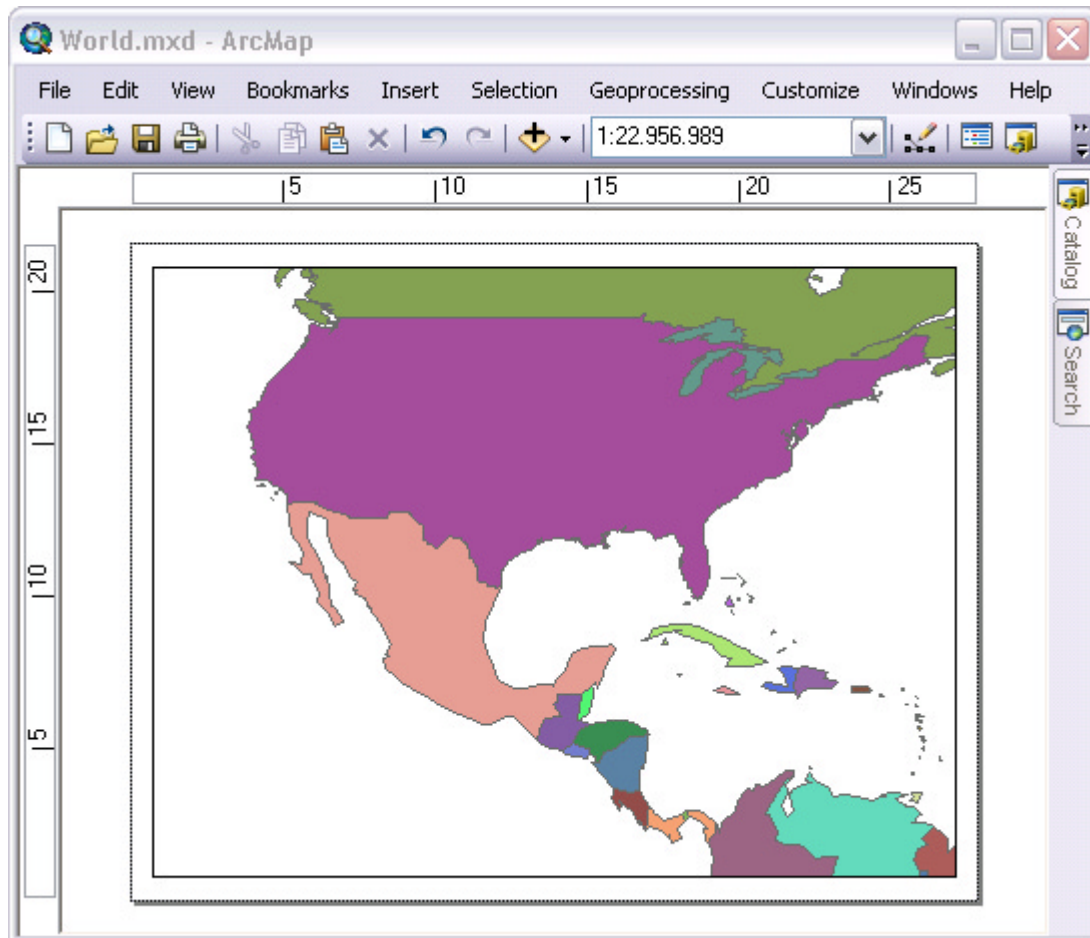
        ' Update ArcMap.
        CType(pMap, IActiveView).ContentsChanged()
        CType(pPageLayout, IActiveView).ContentsChanged()
        pMxDoc.UpdateContents()

    End Sub

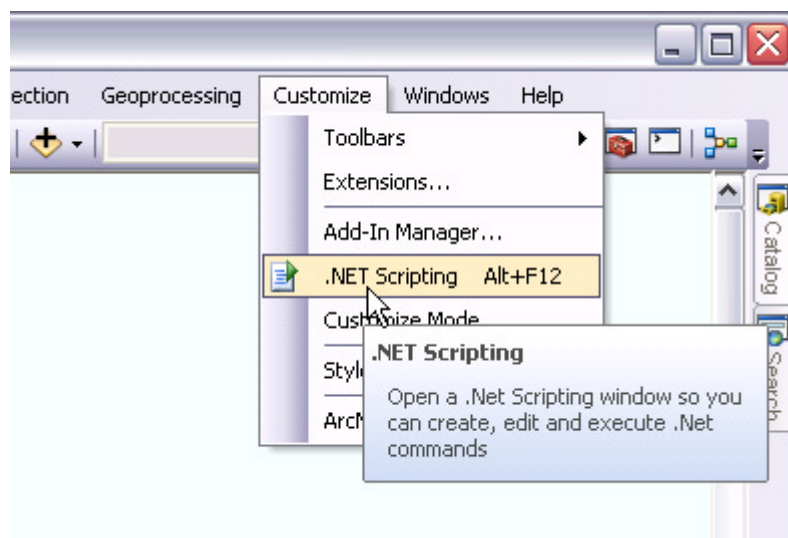
End Module
```


In the example a second MapFrame is added to the PageLayout. Try the example and see what happens.

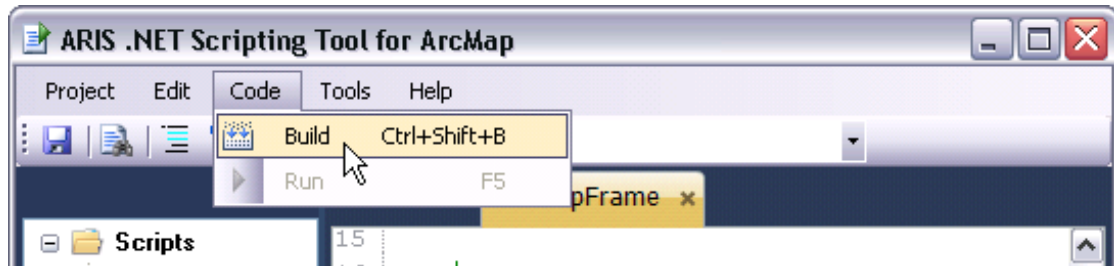
1. Open <installation>\Example\World.mxd in ArcMap.



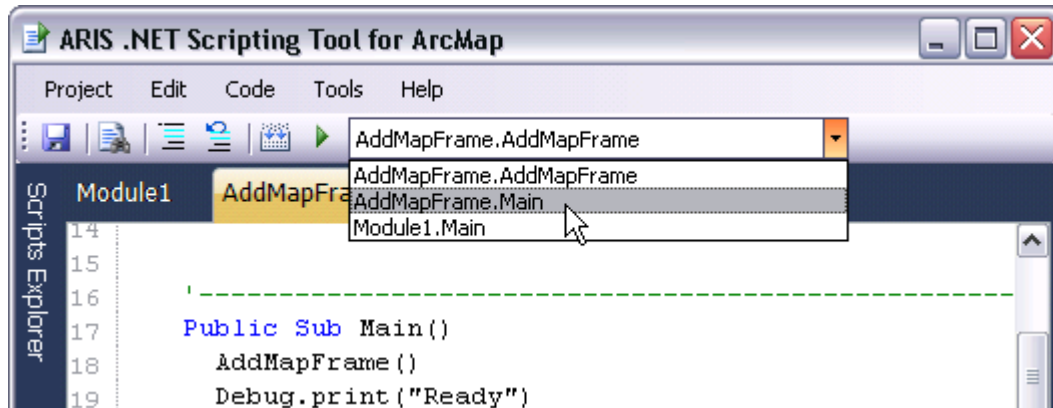
2. Open the .Net Scripting Window.



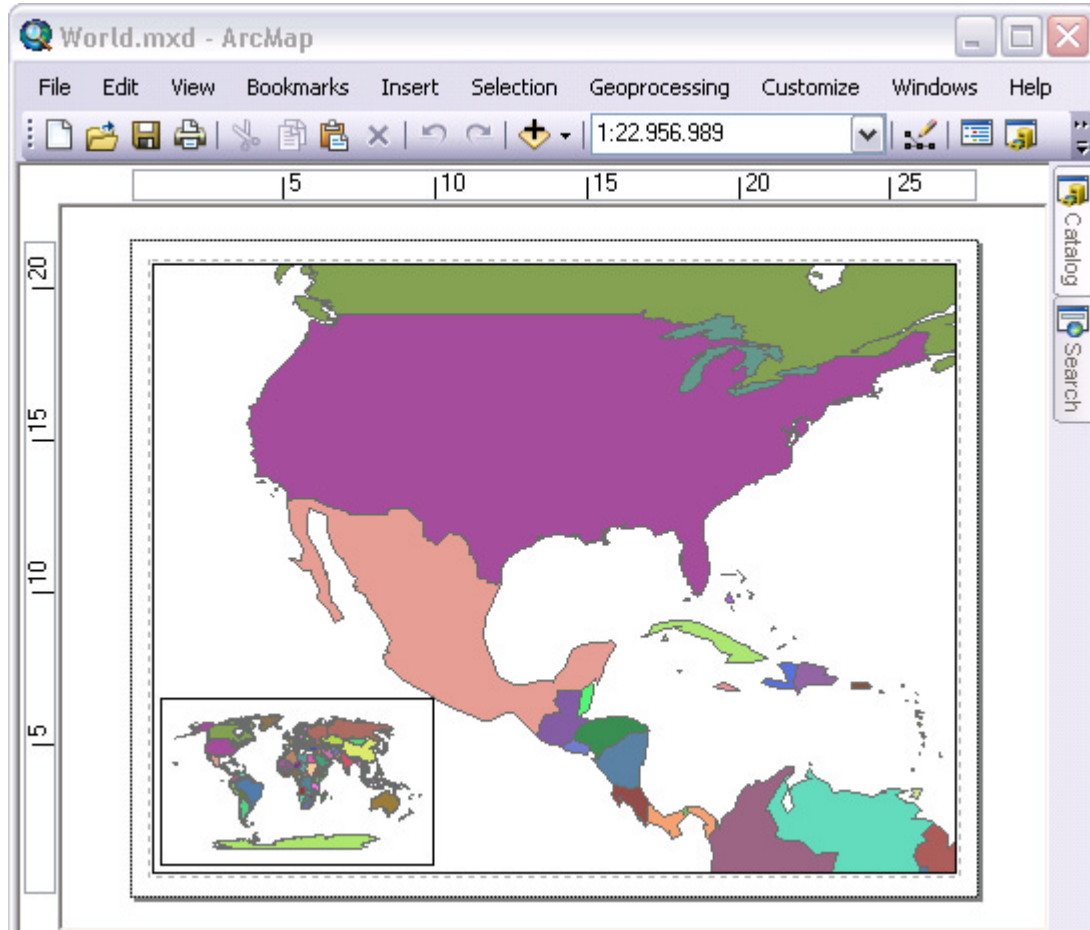
3. Build the scripts.



4. Select sub AddMapFrame.Main from the dropdown list.



5. Run the selected sub and see the result in the PageLayout.



8 Known issues

If *ARIS .Net Scripting Tool for ArcMap* is not available in Customize / Extensions after installation, deinstall the tool and try to install it again and explicitly run the setup as administrator. Note: Having administrator-privileges may not be sufficient.

After registering the .Net Scripting Tool for a permanent license it could occur that you have to enter your registration name and code every time you start up ArcGIS. Be sure to register the tool as an administrator. Note: Having administrator-privileges may not be sufficient.

Appendix A. License Agreement

ARIS Software License Agreement for ARIS .Net Scripting Tool for ArcMap

This is a license agreement and not an agreement for sale. This license agreement (hereinafter referred to as AGREEMENT) is between the end user (hereinafter referred to as LICENSEE) and ARIS b.v., The Netherlands (hereinafter referred to as ARIS), and gives the LICENSEE certain limited rights to use the proprietary ARIS software, examples, on-line and hardcopy documentation and updates (if applicable), hereinafter referred to as PRODUCT. All rights not specifically granted in this AGREEMENT are reserved to ARIS.

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ARIS .Net Scripting Tool for ArcMap - User's Manual

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ARIS warrants that the media upon which the PRODUCT is provided will be free from defects in materials and workmanship under normal use and service for a period of ninety (90) days from the date of receipt.

Except for the above express limited warranties, the PRODUCT is provided "as is", without warranty of any kind, either express or implied, including, but not limited to, the implied warranty of merchantability and fitness for a particular purpose.

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Waivers

No failure or delay by ARIS in enforcing any right or remedy under this AGREEMENT shall be construed as a waiver of any future or other exercise of such right or remedy by ARIS.

Order of Precedence

Any conflict and/or inconsistency between the terms of this AGREEMENT and any purchase order, or other terms shall be resolved in favour of the terms expressed in this AGREEMENT, subject to Dutch law, unless agreed otherwise.

Governing Law

This AGREEMENT is governed by the laws of the Netherlands without references to conflict of laws principles.

Entire Agreement

The parties agree that this constitutes the sole and entire agreement of the parties as to the matter set forth herein and supersedes any previous agreements, understandings, and arrangements between the parties relating hereto and is effective, valid, and binding upon the parties.

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