

# MATLAB® Production Server™

## Excel® Client Guide



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*MATLAB® Production Server™ Excel® Client Guide*

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# Integrating With MATLAB Production Server

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## Create and Install a Deployable Archive with Excel Integration For MATLAB Production Server

**Supported platform:** Windows®

This example shows how to create a deployable archive with Excel integration from a MATLAB function. You can then give the generated archive to a system administrator to deploy on MATLAB Production Server.

### Create Function In MATLAB

In MATLAB, examine the MATLAB program that you want to package.

For this example, write a function `mymagic.m` as follows.

```
function y = mymagic(x)
```

```
y = magic(x);
```

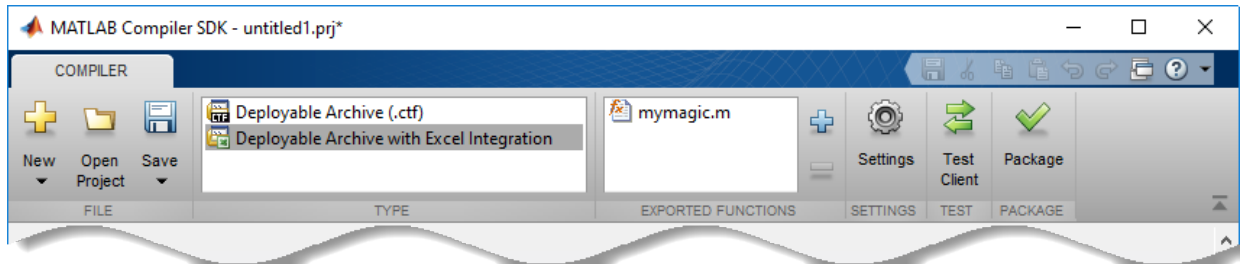
At the MATLAB command prompt, enter `mymagic(3)`.

The output is:

```
ans =  
     8     1     6  
     3     5     7  
     4     9     2
```


### Create Deployable Archive with Excel Integration Using Production Server Compiler App

- 1 On the **MATLAB Apps** tab, on the far right of the **Apps** section, click the arrow. In **Application Deployment**, click **Production Server Compiler**. In the **MATLAB Compiler SDK** project window, click **Deployable Archive with Excel integration**.



Alternatively, you can open the **Production Server Compiler** app by entering `productionServerCompiler` at the MATLAB prompt.

- 2 In the **MATLAB Compiler SDK** project window, specify the files of the MATLAB application that you want to deploy.

- 1 In the **Exported Functions** section, click .
- 2 In the **Add Files** window, browse to the example folder, and select the function you want to package.

Click **Open**.

The function `mymagic.m` is added to the list of main files.

## Customize the Application and Its Appearance

You can customize your deployable archive with Excel integration, and add more information about the application as follows:

- **Archive information** — Editable information about the deployed archive with Excel integration.
- **Client configuration** — Configure the MATLAB Production Server client. Select the **Default Server URL**, decide wait time-out, and maximum size of response for the client, and provide an optional self-signed certificate for `https`.
- **Additional files required for your archive to run** — Additional files required by the generated archive to run. These files are included in the generated archive installer. See “Manage Required Files in Compiler Project” (MATLAB Compiler SDK).
- **Files installed with your archive** — Files that are installed with your archive on the client and server. The files installed on the server include:

- Generated deployable archive (.ctf)
- Generated `readme.txt`

The files installed on the client include:

- `mymagic.bas`
- `mymagic.dll`
- `mymagic.xla`
- `readme.txt`
- `ServerConfig.dll`

See “Specify Files to Install with Application” (MATLAB Compiler SDK).

- **Options** — The option **Register the resulting component for you only on the development machine** exclusively registers the packaged component for one user on the development machine.



**Archive information**

Class Name	Method Name	
Class1	[y] = mymagic (x)	+

**Client configuration**

**Default Server URL**

None

MATLAB Production Server URL: Protocol:  Host:  Port:

Provide your own URL:

**Advanced Options**

Time the client waits before it times out:  Seconds

Maximum size of the response the client accepts:  MB

Provide an optional self-signed certificate for https:

**Additional files required for your archive to run (Server only)**

+

**Files installed with your archive**

**Server**

mymagic.ctf

readme.txt

+

**Client**

mymagic.bas

mymagic.dll

mymagic.xla

readme.txt

ServerConfig.dll

+

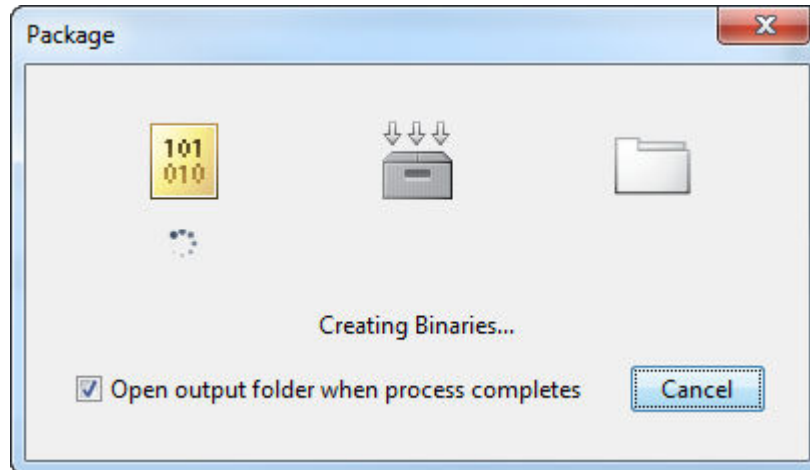
**Options**

Register the resulting component for you only on the development machine

## Package the Application

- 1 To generate the packaged application, click **Package**.

In the Save Project dialog box, specify the location to save the project.



- 2 In the **Package** dialog box, verify that **Open output folder when process completes** is selected.

When the deployment process is complete, examine the generated output.

- `for_redistribution` — Folder containing the installer to distribute the archive on the MATLAB Production Server client and server
- `for_redistribution_files_only` — Folder containing the files required for redistributing the application on the MATLAB Production Server client and server
- `for_testing` — Folder containing the raw generated files to create the installer
- `PackagingLog.txt` — Log file generated by MATLAB Compiler™

## Install the Deployable Archive with Excel Integration

The archive must be deployed to a MATLAB Production Server instance before the add-in works.

To install the deployable archive on a server instance:

- 1 Locate the archive in the `for_redistribution_files_only\server\` folder.  
The file name is similar to `archiveName.ctf`.
- 2 Copy the archive file to the `auto_deploy` folder of the server instance. The server instance automatically deploys it and makes it available to interested clients.

For more information, see “MATLAB Production Server” documentation.

## See Also

`deploytool` | `mcc` | `productionServerCompiler`

## More About

- Production Server Compiler

## Install the Excel Add-In

The **Production Server Compiler** app is used to “Create and Install a Deployable Archive with Excel Integration For MATLAB Production Server” on page 1-2. You can install the add-in and configure it to connect to a MATLAB Production Server instance using the generated installer or raw files.

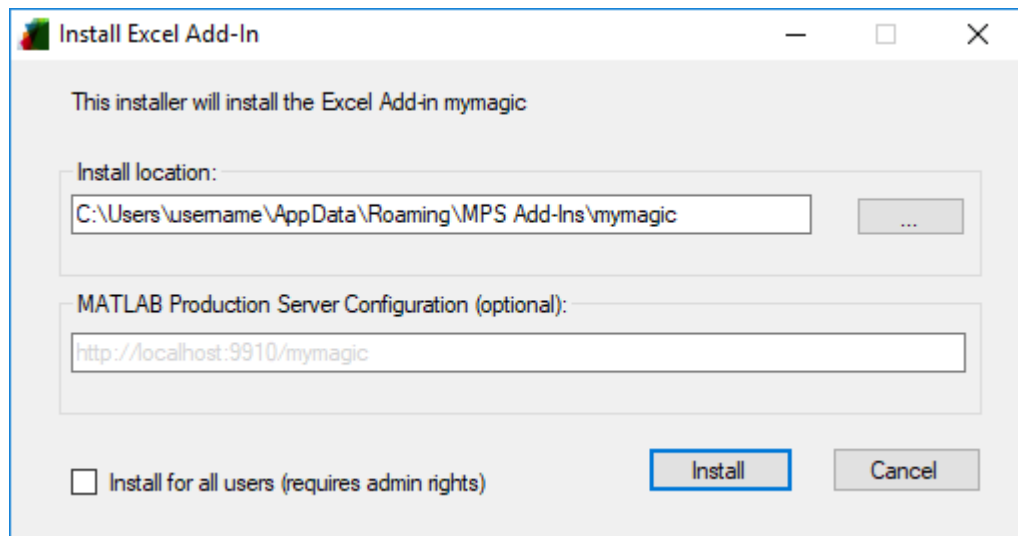
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**Note** The client installer installs under user's local profile, which does not require administrative privileges.

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### Install with the Generated Installer

- 1 Double-click the installer in the `for_redistribution\client` folder.



- 2 In the **Install location** field, enter the location where the Excel add-in is installed.
- 3 In the **MATLAB Production Server Configuration** field, specify the URL of the deployable archive that contains the Excel add-in.

Click **Install**.

## Install with the Raw Files

In the `client\for_redistribution_files_only` folder, you find the following files:

- `projName.dll`— Dynamic library required by the add-in
- `projName.bas` — VBA module file created for the add-in
- `serverconfig.dll`- Excel add-in that manages the server configuration
- `projName.xla` — Excel add-in file

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**Note** The compiler might not generate the `projName.xla` file for various reasons, including that Excel is not configured to trust access to the VBA project object model.

When this happens, you can install the add-in by importing the `projName.bas` file into the Visual Basic project of the workbook.

---

On the machine running the add-in, you must register the following DLLs with the `regAsm /codebase` command:

- `mymagic.dll`
- `serverconfig.dll`

If `mymagic.xla` is generated, install the add-in into Excel. If not, import `mymagic.bas` to the Visual Basic project of the workbook.

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**Note** If you do not have administrative privileges on the machine, you can run `regAsm` with the `/regfile` option.

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## See Also

### More About

- “Create and Install a Deployable Archive with Excel Integration For MATLAB Production Server” on page 1-2

## Data Marshaling Rules

In this section...
“Default Marshaling Rules” on page 1-10
“Change Rules for Marshaling Data into MATLAB” on page 1-10
“Change Rules for Marshaling Data into Excel” on page 1-11

### Default Marshaling Rules

These types of data do not have natural mappings between MATLAB and Excel:

- Dates: Excel has a special data type for dates, and MATLAB does not.
- Blank cells: MATLAB has no equivalent construct for a blank cell in an Excel spread sheet.

If you do not change the marshaling rules when compiling the add-in, the rules for marshaling Excel data into MATLAB are:

- Excel dates are marshaled into MATLAB doubles.
- Empty cells are marshaled into zeros.

If you do not change the marshaling rules when compiling the add-in, the rules for marshaling MATLAB data into Excel are:

- MATLAB NaNs are marshaled into Visual Basic® #QNANs.
- MATLAB does not return any Excel dates.

### Change Rules for Marshaling Data into MATLAB

You can change how dates and empty cells are marshaled into MATLAB when compiling the add-in:

- Excel dates can be marshaled as MATLAB character arrays.
- Empty cells can be marshaled as MATLAB NaNs.

To change the marshaling rules:

- 1 In the class mapper portion of the **MATLAB Compiler** project window, select the signature of the function you want to modify.
- 2 Select **Data Conversion Properties** from the context menu.
- 3 Select the input argument rules to change.
- 4 Click outside of the dialog box to close it.

## Change Rules for Marshaling Data into Excel

You can change how dates and NaNs are marshaled into Excel when compiling the add-in:

- MATLAB NaNs can be converted into zeros.
- MATLAB numeric values can be converted into Excel dates.

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**Note** To see a date in the expected format, ensure that the Excel cell is formatted to display its contents in a date format.

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To change the marshaling rules:

- 1 In the class mapper portion of the **MATLAB Compiler** project window, select the signature of the function you want to modify.
- 2 Select **Data Conversion Properties** from the context menu.
- 3 Select the output argument rules to change.
- 4 Click outside of the dialog box to close it.

## See Also

### More About

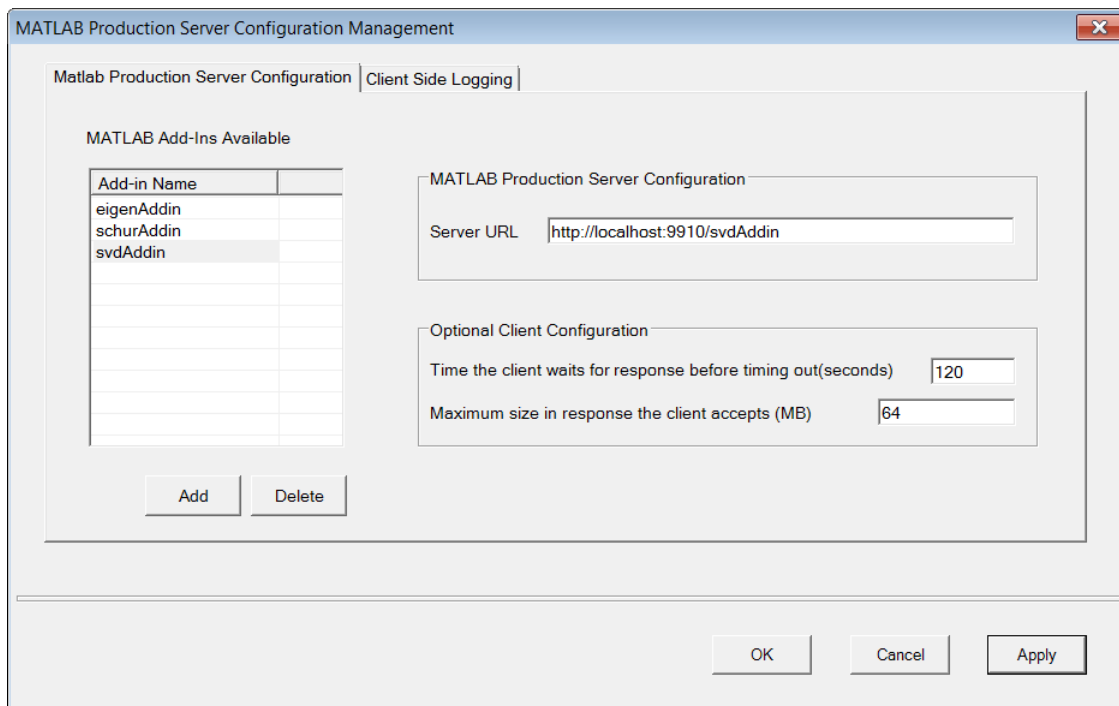
- “Install the Excel Add-In” (MATLAB Compiler SDK)

## Change the Server Configuration

Before you can run an Excel add-in on a MATLAB Production Server instance, you must configure it.

To configure the server information for an add-in:

- 1 In Excel, select **Add-Ins > Configure MATLAB Production Server**.



- 2 Select the **MATLAB Production Server Configuration** tab.
- 3 Select the add-in to configure. The server URL corresponding to the add-in displays in the **Server URL** field.

If the add-in is not listed, click **Add** under the **MATLAB Add-ins Available** table. Enter the name of the add-in, and click **OK**.

- 4 If the **Server URL** field is empty, enter the URL based on the application protocol you want to use: HTTP or HTTPS. A server certificate must be installed in the certificate store of the client or local machine running the Excel add-in when using HTTPS.



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Protocol	URL	Default Port Number
HTTP	http://<HostName>:<PortNumber>/ ctfArchiveName	9910
HTTPS	https://<HostName>:<PortNumber>/ ctfArchiveName	9920

- 5 Modify the **Optional Client Configuration** options if necessary.
- 6 Click **OK**.

## See Also

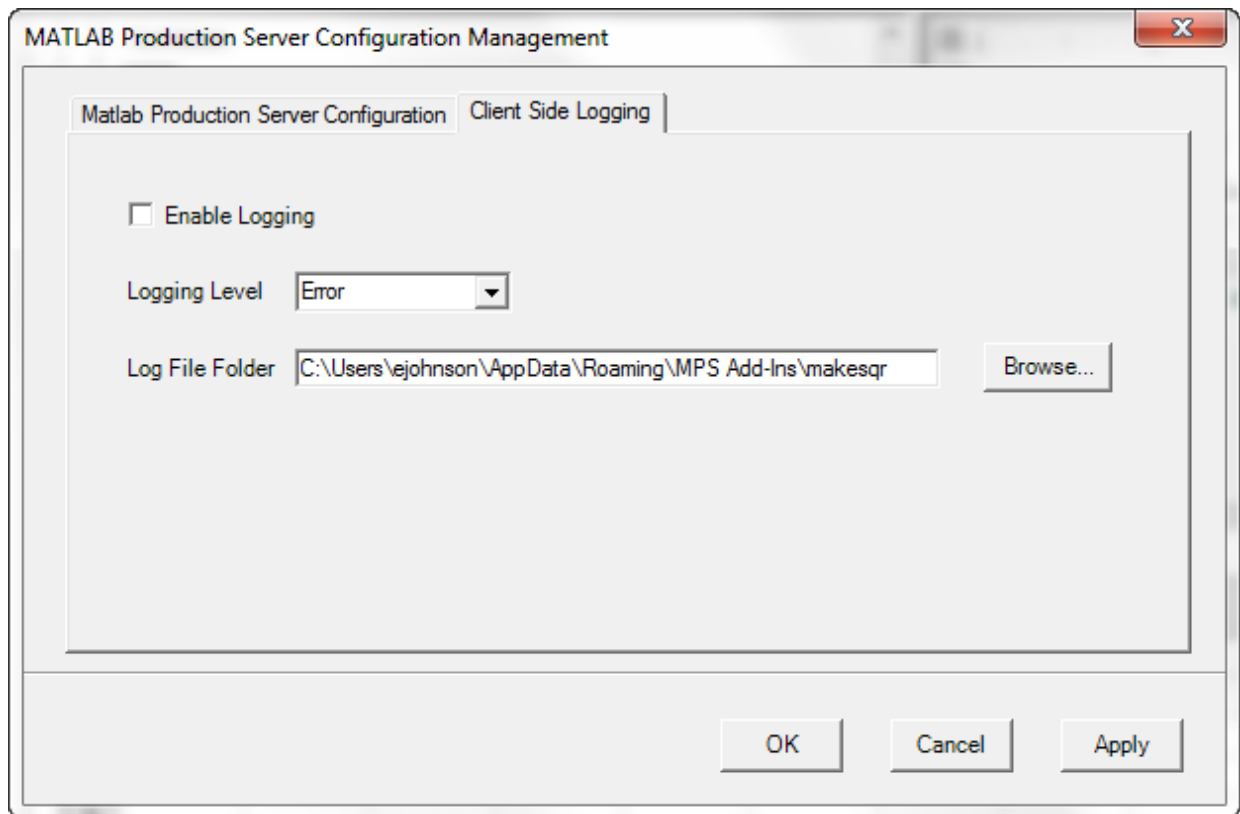
### More About

- “Install the Excel Add-In” on page 1-8

## Enable Client Logging

Client logging writes messages to a persistent log file. The messages are useful for debugging issues with the add-in. Client logging is disabled by default. To activate it:

- 1 In Excel, select **Add-Ins > Configure MATLAB Production Server**.



- 2 Select the **Client Side Logging** tab.
- 3 Check the **Enable Logging** box.
- 4 Select the logging level from the **Logging Level** drop-down list.
  - **Error** — Log error messages.
  - **Information** — Log information about server interactions in addition to error messages.

- **Verbose** — Log everything.
- 5** In the **Log File Folder** box, enter the folder into which log files are written.

When client logging is enabled, all registered MATLAB Production Server add-ins generate log files. The files follow the naming convention *logFolder\addinName-date.log*.

## **XLA File Not Generated**

The compiler may not generate the *projName.xla* file for various reasons, including that Excel is not configured to trust access to the VBA project object model. When this happens, you can install the add-in by importing the *projName.bas* file into the workbook's Visual Basic project.

## Server Configuration Add-in Not Enabled

If your trust settings in Excel are configured to either disable all add-ins or to require add-ins to be published by a trusted publisher, it is possible that the **Configure MATLAB Production Server** add-in is not available after installation. In most cases, the add-in is installed but disabled.

To check if the add-in is installed in Excel:

- 1** Select **File>Options**.
- 2** Select **Add-Ins**.
- 3** Look for **ServerConfig.Connect** in the list of disabled add-ins.

You can enable the add-in by adjusting the trust settings in Excel.

## **Error Using a Variable Number of Outputs**

If your add-in throws the error:

Error in myfunc: Object reference not set to an instance of an object

The likely cause is that the MATLAB function used by the add-in returns a variable number of outputs.

Add-ins using code run on a MATLAB Production Server instance do not support MATLAB functions that return a variable number of outputs. You can either rewrite your MATLAB function to return a fixed number of outputs, or you can create an add-in that runs locally to your Excel installation.