



## Setting Up Intel Version\* to Switch Between Two Versions of Microsoft Visual Studio

### 1.1. Introduction

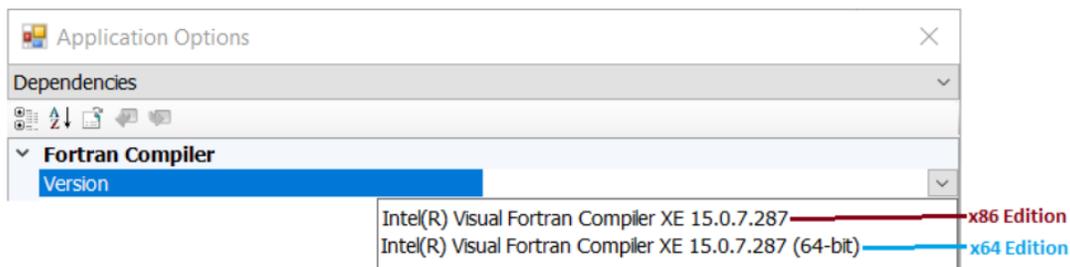
By default, the Intel Fortran compiler will detect and use the most recent and compatible version of Visual Studio (VS). For example, if VS 2013 and VS 2015 are both installed, Intel 15 Update 4 and newer will always use VS 2015.

Sometimes, due to model compatibility, a PSCAD user needs to be able to switch between using two different versions of VS with the same compiler. For example, some models may require Intel 15 Update 7 / VS 2013, and some models may require Intel 15 Update 7 / VS 2015. In theory, because Intel 15 would by default use the newer version of Visual Studio (VS 2015), the Intel 15 / VS 2013 models can never be run.

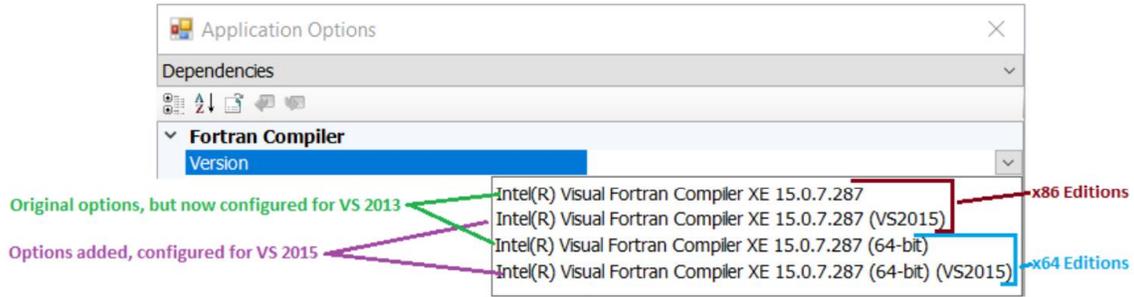
To overcome this issue, in an upcoming version of PSCAD, the user will be able to select the desired combination of Intel compiler and VS directly within the PSCAD application.

In the meanwhile, three possible work-arounds are as follows:

- Use two different versions of Intel, a newer version of Intel that supports the newer version of VS, and an older version of Intel that does not support the newer version of VS but that does support the older version of VS.
- Have two separate machines, each set up with one of the two configurations.
- As described in this document, the third option involves modifying the Fortran configuration file, with the result that the user can select the desired Intel / VS combination in the PSCAD Application Options:
  - Normally, the Application Options will display only one instance of both editions (x86 or x64) of one version. In the following sample image, Intel 15.0.7.287 (x86 and x64) is displayed:



- After following the instructions in Section 1.2, however, the Application Options will display two instances of one version of Intel (e.g Intel 15.\*), for a particular edition (x86/x64). Each instance will pair with the desired VS version.
- In the sample image on the next page:
  - The **original options** have been modified to only use VS 2013, and
  - **Two additional options** have been added, which will only use VS 2015 by default



The result from the procedure will be to give the user the option to switch between using two different instances of Intel within the PSCAD Application Options, one for each versions of Visual Studio.

## 1.2. Procedure

### 1.2.1. Create a Working Copy of the *fortran\_compilers.xml* File

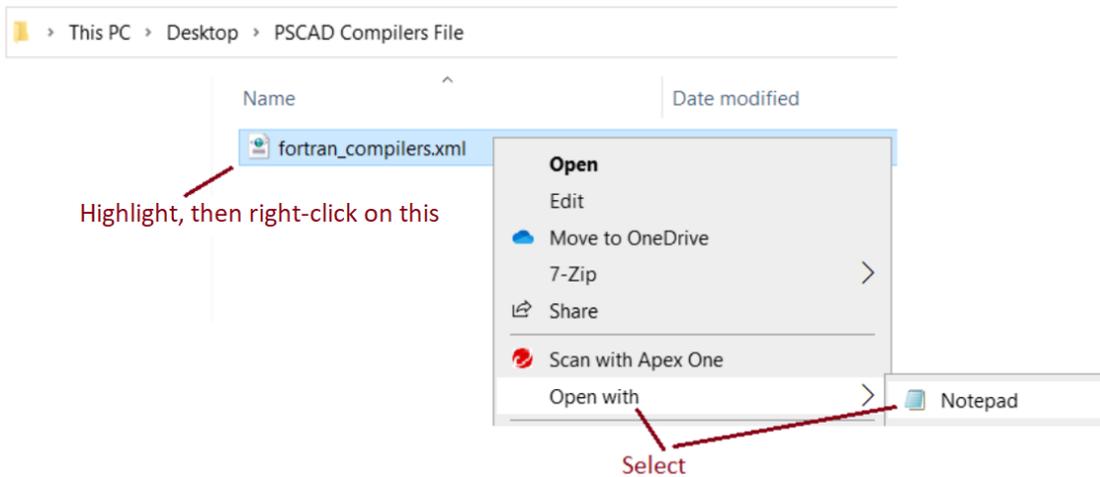
- a. Make a copy of the *fortran\_compilers.xml* file, and save it somewhere local (e.g. on your desktop). The *fortran\_compilers.xml* file can be found in the top folder of the PSCAD program files (PSCAD must be installed).

For example:

- For PSCAD v4.6, this file is normally here: *C:\Program Files (x86)\PSCAD46\*
- For PSCAD v5.0, this file is normally here: *C:\Program Files (x86)\PSCAD50\*

### 1.2.2. Create a Second Intel Compiler Row

- a. Open the copied \*.xml file in an .xml reader or in Notepad.
  - For example, it can be opened in Microsoft Visual Studio.
  - For example, it can be opened in Notepad as shown:



- b. In the opened file, find the row corresponding to the version and edition of Intel you are wanting to apply this procedure to.

For example, for Intel 15 / x86

```
fortran_compilers.xml x
<?xml version="1.0" encoding="utf-8"?>
<!-- Fortran compilers supported by EMTDC -->
<!-- Last modified $Date: 2020/12/01 23:26:31 $

<fortran_compilers version="1.0" id="PSCADx4"
  <compiler name="MHCRC" version="4.6.2"
  <compiler name="MHCRC" version="8.1"
  <compiler name="MHCRC" version="8.1"
  <compiler name="INTEL" version="12.*"
  <compiler name="INTEL" version="13.*"
  <compiler name="INTEL" version="14.*"
  <compiler name="INTEL" version="15.*"
```

For example, for Intel 15 / x64

```
fortran_compilers.xml x
<?xml version="1.0" encoding="utf-8"?>
<!-- Fortran compilers supported by EMTDC -->
<!-- Last modified $Date: 2020/12/01 23:26:31 $

<fortran_compilers version="1.0" id="PSCADx4"
  <compiler name="MHCRC" version="4.6.2"
  <compiler name="MHCRC" version="8.1"
  <compiler name="MHCRC" version="8.1"
  <compiler name="INTEL" version="12.*"
  <compiler name="INTEL" version="13.*"
  <compiler name="INTEL" version="14.*"
  <compiler name="INTEL" version="15.*"
  <compiler name="INTEL" version="16.*"
  <compiler name="INTEL" version="17.*"
  <compiler name="INTEL" version="18.0"
  <compiler name="INTEL" version="19.0"
  <compiler name="INTEL" version="19.1"
  <compiler name="INTEL" version="19.2_later"
  <compiler name="INTEL" version="15.*"
```

**Note**

In the fortran\_compilers.xml file, for any compilers with both 32-bit and 64-bit editions, the first appearing row for each compiler is for the 32-bit edition, and the second appearing row for the same compiler is for the 64-bit edition.

- c. Copy the entire row, then paste it in the row directly below. You should now have two identical rows.

For example, Intel 15 / x86

```
fortran_compilers.xml x
<?xml version="1.0" encoding="utf-8"?>
<!-- Fortran compilers supported by EMTDC -->
<!-- Last modified $Date: 2020/12/01 23:26:31 $

<fortran_compilers version="1.0" id="PSCADx4"
  <compiler name="MHCRC" version="4.6.2"
  <compiler name="MHCRC" version="8.1"
  <compiler name="MHCRC" version="8.1"
  <compiler name="INTEL" version="12.*"
  <compiler name="INTEL" version="13.*"
  <compiler name="INTEL" version="14.*"
  <compiler name="INTEL" version="15.*"
  <compiler name="INTEL" version="15.*"
  <compiler name="INTEL" version="15.*"
```

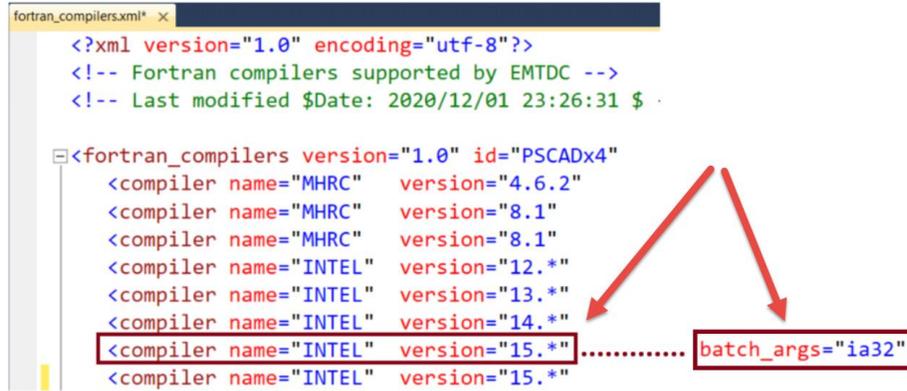
For example, Intel 15 / x64

```
fortran_compilers.xml x
<?xml version="1.0" encoding="utf-8"?>
<!-- Fortran compilers supported by EMTDC -->
<!-- Last modified $Date: 2020/12/01 23:26:31 $

<fortran_compilers version="1.0" id="PSCADx4"
  <compiler name="MHCRC" version="4.6.2"
  <compiler name="MHCRC" version="8.1"
  <compiler name="MHCRC" version="8.1"
  <compiler name="INTEL" version="12.*"
  <compiler name="INTEL" version="13.*"
  <compiler name="INTEL" version="14.*"
  <compiler name="INTEL" version="15.*"
  <compiler name="INTEL" version="16.*"
  <compiler name="INTEL" version="17.*"
  <compiler name="INTEL" version="18.0"
  <compiler name="INTEL" version="19.0"
  <compiler name="INTEL" version="19.1"
  <compiler name="INTEL" version="19.2_later"
  <compiler name="INTEL" version="15.*"
  <compiler name="INTEL" version="15.*"
```

### 1.2.3. Configure the First Row (Product) to Use the Older Version of Visual Studio

- a. Follow the length of the first row until you reach the "batch\_args" segment:
  - For example, for Intel 15 x86, this will appear as *batch\_args="ia32"*:



```

fortran_compilers.xml x
<?xml version="1.0" encoding="utf-8"?>
<!-- Fortran compilers supported by EMTDC -->
<!-- Last modified $Date: 2020/12/01 23:26:31 $ .

<fortran_compilers version="1.0" id="PSCADx4"
  <compiler name="MHRC" version="4.6.2"
  <compiler name="MHRC" version="8.1"
  <compiler name="MHRC" version="8.1"
  <compiler name="INTEL" version="12.*"
  <compiler name="INTEL" version="13.*"
  <compiler name="INTEL" version="14.*"
  <compiler name="INTEL" version="15.*" ..... batch_args="ia32"
  <compiler name="INTEL" version="15.*"
    
```

- For example, for Intel 15 x64, this will appear as *batch\_args="intel64"*



```

fortran_compilers.xml x
<?xml version="1.0" encoding="utf-8"?>
<!-- Fortran compilers supported by EMTDC -->
<!-- Last modified $Date: 2020/12/01 23:26:31 $ .

<fortran_compilers version="1.0" id="PSCADx4"
  <compiler name="MHRC" version="4.6.2"
  <compiler name="MHRC" version="8.1"
  <compiler name="MHRC" version="8.1"
  <compiler name="INTEL" version="12.*"
  <compiler name="INTEL" version="13.*"
  <compiler name="INTEL" version="14.*"
  <compiler name="INTEL" version="15.*"
  <compiler name="INTEL" version="15.*" ..... batch_args="intel64"
  <compiler name="INTEL" version="16.*"
  <compiler name="INTEL" version="17.*"
  <compiler name="INTEL" version="18.0"
  <compiler name="INTEL" version="19.0"
  <compiler name="INTEL" version="19.1"
  <compiler name="INTEL" version="19.2, later"
  <compiler name="INTEL" version="15.*" ..... batch_args="intel64"
  <compiler name="INTEL" version="15.*"
    
```

- b. Then, inside the batch\_args quotations, enter the older version of Visual Studio you wish to be used, according to the following format:

VS####      Space

For example, for *Intel 15 x86* and *Visual Studio 2013*, VS2013 and a space would be added as shown:

```

fortran_compilers.xml* x
<?xml version="1.0" encoding="utf-8"?>
<!-- Fortran compilers supported by EMTDC -->
<!-- Last modified $Date: 2020/12/01 23:26:31 $ .

<fortran_compilers version="1.0" id="PSCADx4"
  <compiler name="MHRC" version="4.6.2"
  <compiler name="MHRC" version="8.1"
  <compiler name="MHRC" version="8.1"
  <compiler name="INTEL" version="12.*"
  <compiler name="INTEL" version="13.*"
  <compiler name="INTEL" version="14.*"
  <compiler name="INTEL" version="15.*" ..... batch_args="ia32"
  <compiler name="INTEL" version="15.*"

```



For example, for *Intel 15 x64* and *Visual Studio 2013*, VS2013 and a space would be added as shown:

```

fortran_compilers.xml* x
<?xml version="1.0" encoding="utf-8"?>
<!-- Fortran compilers supported by EMTDC -->
<!-- Last modified $Date: 2020/12/01 23:26:31 $ .

<fortran_compilers version="1.0" id="PSCADx4"
  <compiler name="MHRC" version="4.6.2"
  <compiler name="MHRC" version="8.1"
  <compiler name="MHRC" version="8.1"
  <compiler name="INTEL" version="12.*"
  <compiler name="INTEL" version="13.*"
  <compiler name="INTEL" version="14.*"
  <compiler name="INTEL" version="15.*"
  <compiler name="INTEL" version="15.*"
  <compiler name="INTEL" version="16.*"
  <compiler name="INTEL" version="17.*"
  <compiler name="INTEL" version="18.0"
  <compiler name="INTEL" version="19.0"
  <compiler name="INTEL" version="19.1"
  <compiler name="INTEL" version="19.2, later"
  <compiler name="INTEL" version="15.*" ..... batch_args="intel64"
  <compiler name="INTEL" version="15.*"

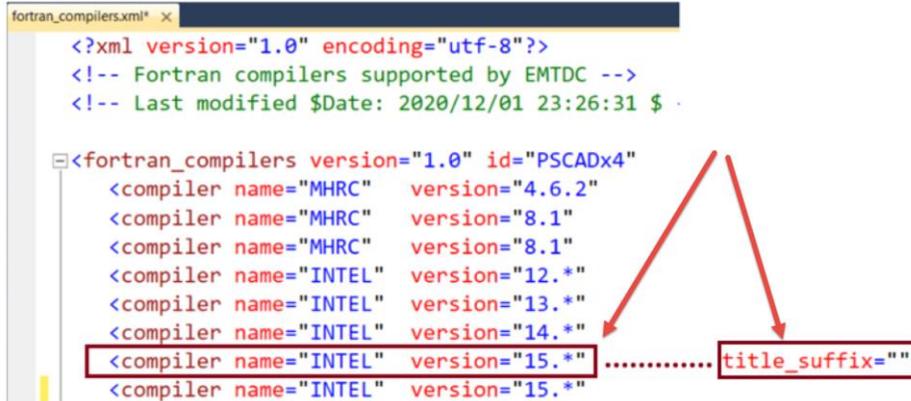
```



### 1.2.4. Label the First Row (Product)

The following steps will simply create a description to be displayed for the user, to help differentiate between the two options that will be present in the PSCAD Application Options. The description can be created as follows:

- a. Follow the length of the first row until you reach the "title\_suffix" segment:
  - For example, for Intel 15 x86, this will appear as `title_suffix=""`:



```
<?xml version="1.0" encoding="utf-8"?>
<!-- Fortran compilers supported by EMTDC -->
<!-- Last modified $Date: 2020/12/01 23:26:31 $ .

<fortran_compilers version="1.0" id="PSCADx4"
  <compiler name="MHRC" version="4.6.2"
  <compiler name="MHRC" version="8.1"
  <compiler name="MHRC" version="8.1"
  <compiler name="INTEL" version="12.*"
  <compiler name="INTEL" version="13.*"
  <compiler name="INTEL" version="14.*"
  <compiler name="INTEL" version="15.*" ..... title_suffix=""
  <compiler name="INTEL" version="15.*"
```

- For example, for Intel 15 x64, this will appear `title_suffix=" (64-bit)"`



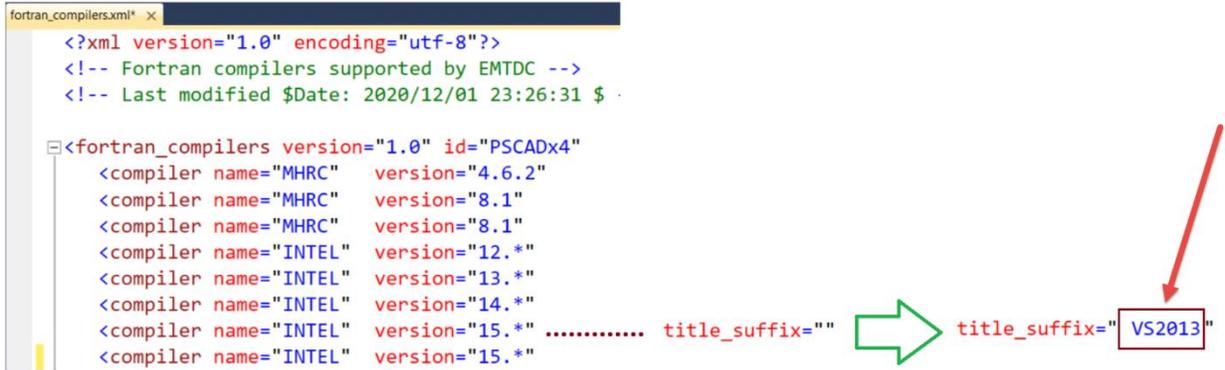
```
<?xml version="1.0" encoding="utf-8"?>
<!-- Fortran compilers supported by EMTDC -->
<!-- Last modified $Date: 2020/12/01 23:26:31 $ .

<fortran_compilers version="1.0" id="PSCADx4"
  <compiler name="MHRC" version="4.6.2"
  <compiler name="MHRC" version="8.1"
  <compiler name="MHRC" version="8.1"
  <compiler name="INTEL" version="12.*"
  <compiler name="INTEL" version="13.*"
  <compiler name="INTEL" version="14.*"
  <compiler name="INTEL" version="15.*"
  <compiler name="INTEL" version="15.*" ..... title_suffix=" (64-bit)"
  <compiler name="INTEL" version="16.*"
  <compiler name="INTEL" version="17.*"
  <compiler name="INTEL" version="18.0"
  <compiler name="INTEL" version="19.0"
  <compiler name="INTEL" version="19.1"
  <compiler name="INTEL" version="19.2, later"
  <compiler name="INTEL" version="15.*" ..... title_suffix=" (64-bit)"
  <compiler name="INTEL" version="15.*"
```

- b. Then, inside the *title\_suffix* quotations, enter the newer version of Visual Studio, according to the following format:

Space VS####

For example, for *Intel 15 x86* and *Visual Studio 2013*, a space and VS2013 would be added as shown:



```

<?xml version="1.0" encoding="utf-8"?>
<!-- Fortran compilers supported by EMTDC -->
<!-- Last modified $Date: 2020/12/01 23:26:31 $ .

<fortran_compilers version="1.0" id="PSCADx4"
  <compiler name="MHRC" version="4.6.2"
  <compiler name="MHRC" version="8.1"
  <compiler name="MHRC" version="8.1"
  <compiler name="INTEL" version="12.*"
  <compiler name="INTEL" version="13.*"
  <compiler name="INTEL" version="14.*"
  <compiler name="INTEL" version="15.*" ..... title_suffix=""
  <compiler name="INTEL" version="15.*" ..... title_suffix=" VS2013"
  
```

For example, for *Intel 15 x64* and *Visual Studio 2013*, A space and VS2013 would be added as shown:



```

<?xml version="1.0" encoding="utf-8"?>
<!-- Fortran compilers supported by EMTDC -->
<!-- Last modified $Date: 2020/12/01 23:26:31 $ .

<fortran_compilers version="1.0" id="PSCADx4"
  <compiler name="MHRC" version="4.6.2"
  <compiler name="MHRC" version="8.1"
  <compiler name="MHRC" version="8.1"
  <compiler name="INTEL" version="12.*"
  <compiler name="INTEL" version="13.*"
  <compiler name="INTEL" version="14.*"
  <compiler name="INTEL" version="15.*"
  <compiler name="INTEL" version="15.*"
  <compiler name="INTEL" version="16.*"
  <compiler name="INTEL" version="17.*"
  <compiler name="INTEL" version="18.0"
  <compiler name="INTEL" version="19.0"
  <compiler name="INTEL" version="19.1"
  <compiler name="INTEL" version="19.2, later"
  <compiler name="INTEL" version="15.*" ..... title_suffix=" (64-bit)"
  <compiler name="INTEL" version="15.*" ..... title_suffix=" (64-bit) VS2013"
  
```

### 1.2.5. About the Second Row (Product)

The second of the two rows will already be configured to use the newest detected compatible version of Visual Studio, by default.

You could provide a label for this second-appearing product that will appear in the PSCAD Application Options by modifying the *title\_suffix* accordingly (see Section 1.2.4 for tips).

### 1.2.6. Move your Working Copy of the *fortran\_compilers.xml* File to the PSCAD Program Files

- a. Delete or rename the old (pre-existing) *fortran\_compilers.xml* file located in the PSCAD Program Files.
- b. Move your working copy of the *fortran\_compilers.xml* file to the PSCAD Program Files.

**Notes**

1. You will require Windows Administrator Privileges for these steps.
2. See Section 1.2.1 for the location of the PSCAD Program Files.

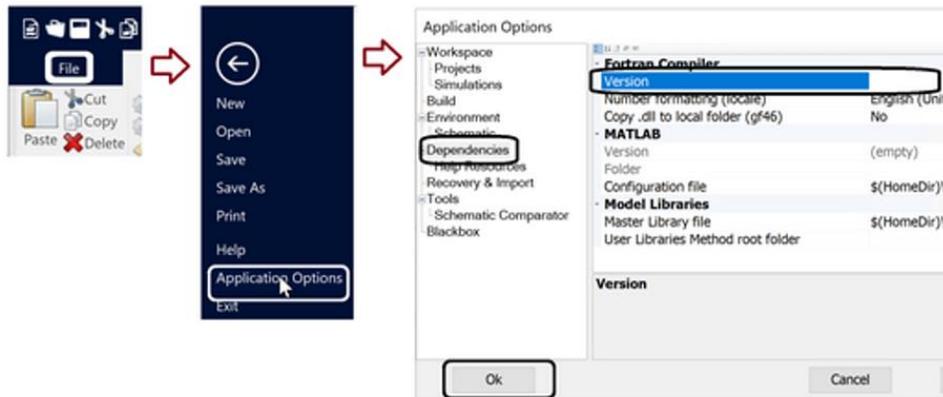
Proceed to Section 1.3 for information on switching between the two Intel configurations.

### 1.3. Switching Between the Two Versions of Intel

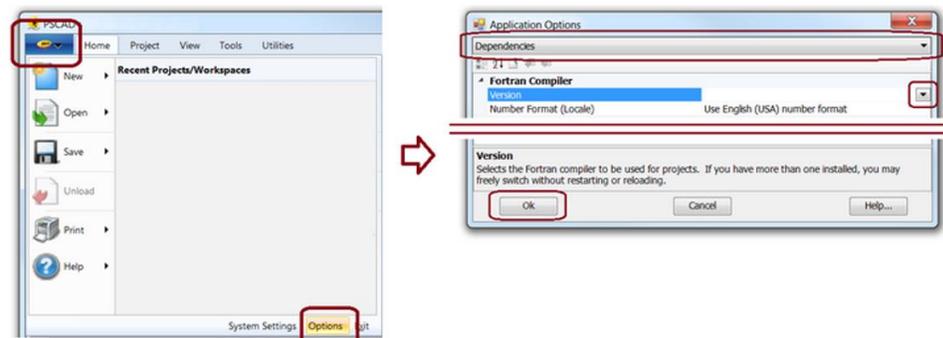
Once you have set up your Intel / VS options as per Section 1.2, you may switch between the two options as follows:

- a. Select the Intel version in the PSCAD Application Options as follows:
  - Display the Application Options, and view the option in Dependencies | Fortran Compiler:

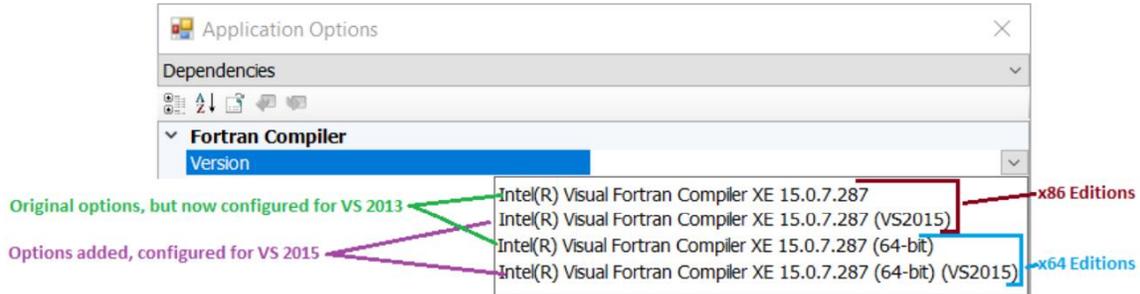
PSCAD V5



PSCAD X4



- Select the preferred Intel / VS combination. The **original (first appearing) option** should now be configured for using the older version (for example, VS 2013) and the **new (second appearing) option** should be configured for using the newer version (for example, VS 2015).



- b. This step is used for switching PSCAD configuration between using VS 2013 and older or VS 2015 and newer. This step is required only if the following two conditions are met:
1. You are using Intel 15 Update 4 or newer, and
  2. One of your two Intel versions will be using VS 2013 or older and the other will be using VS 2015 and newer.

Proceed as follows:

- When you will be using Intel with VS 2013 and older, configure PSCAD to use VS 2013 and older as per Step 3 of this [article](#).
- When you will be using Intel with VS 2015 and newer, configure PSCAD to use VS 2015 and newer as per Step 2 of the above article.