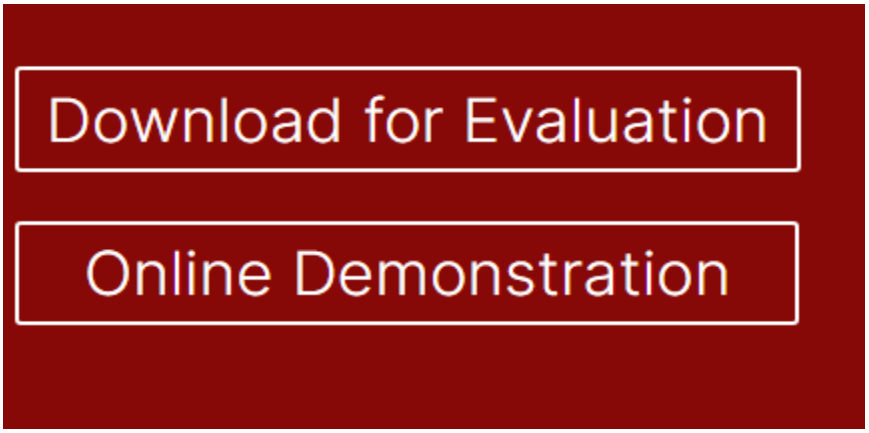
PC-lint Plus static analysis solution for C and C++

PC-lint Plus is a static analysis tool that finds bugs, quirks, idiosyncrasies, and glitches in C and C++ programs. The purpose of this analysis is to determine potential problems in such programs before integration or porting, or to reveal unusual constructs that may be a source of subtle and, yet, undetected errors. Because it looks across several modules rather than just one, it can determine things that a compiler cannot. It is normally much fussier about many details than compiler wants to be.

Installation of PC-lint Plus

Step 1: Download software from official website of gimpel

https://www.gimpel.com/



Step 2: Extract the downloaded zip file in the below directory

C:\Windows\SysWOW64

Step 3: Execute the *pclp64.exe* file (for 64bit environment) present in config directory.

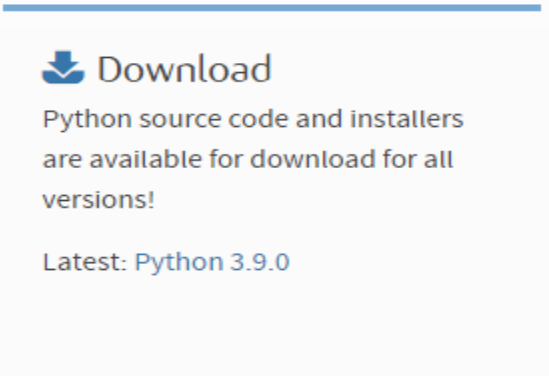
Step 4: Set the system environment variable. Add below mention path in variable 'PATH'.

C:\Windows\SysWOW64\pclp-1.3.5-windows-eval;

Installation is now completed, for verifying the installation has been done successfully, run command *pclp64* in command prompt.

Supporting software's

1.) Python: Download python latest version from below mention website.



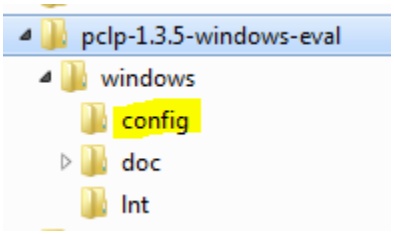
2.) Install python package 'regex and pyyaml'. In command prompt type

Pip install regex

Pip install pyymal

Compiler configuration

Step 1:Open command prompt and move to config directory



Step 2: (a.) Open your project in MPLAB X

(b.) In the “Run” menu, select “Clean and Build Main Project”

(c.) In the output pane, look for a line like:

"C:\Program Files\Microchip\xc32\v1.40\bin\xc32-gcc.exe" -x c -mprocessor=32MX795F512L

Step 3: Execute the command

python pclp_config.py

--compiler=microchip_xc32

--compiler-bin="C:\Program Files\Microchip\xc32\v1.40\bin\xc32-gcc.exe"

--config-output-lnt-file=co-xc.lnt

--config-output-header-file=co-xc.h

--compiler-options="-x c -mprocessor=32MX795F512L"

--header-option-use-enclosing-directory

--generate-compiler-config

(*Note: all these lines should be in one single line*)

Integrate PC-Lint Plus with MPLAB X

To install the plugin:

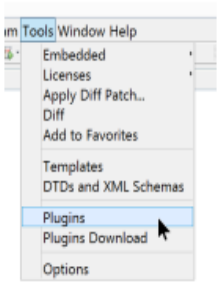
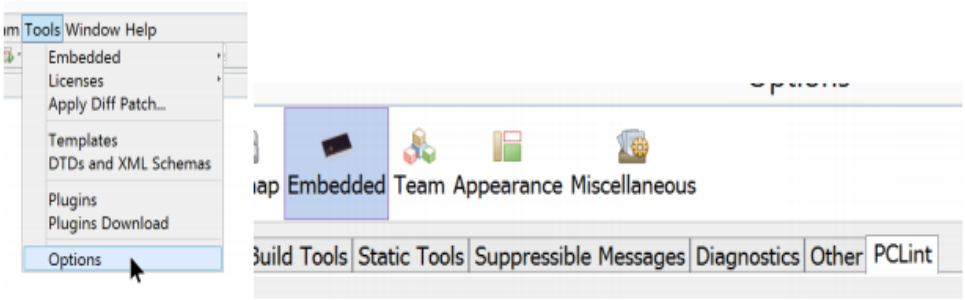


Figure 1:

1. In the "Tools" menu, select "Plugins"
2. From the "Available Plugins" tab, check the "Install" checkbox next to "PCLint"
3. Click the "Install" button

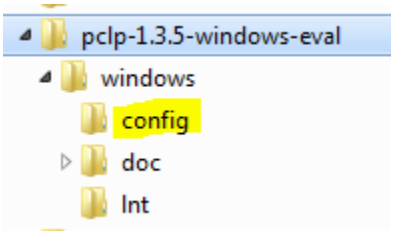
To configure the plugin:



1. In the "Tools" menu, select "Options"
2. Select the "Embedded" Tab in the top row, then the "PClint" tab
3. In the "Location" field, browse for your PC-lint Plus executable
4. In the "Options" field, select "UserOptionFile"
5. In the "User Option File" field, browse for the compiler configuration you generated in the previous section.
6. In the "Standards" field, select "NOSTANDARD"

Analysis of source code

In command prompt, move to directory config



Type the following command :

pclp64 co-xc.lnt source-files

```
C:\Windows\SysWOW64\pclp-1.3.5-windows-eval\windows\config>pclp64 co-xc16.lnt -i
 C:\Users\admin\Downloads\HIFIS\HIFIS.X\*
```

(Note: Here -i option is used to specify the project directory)

```
--- Module:   C:\Users\user\Downloads\test\HIFIS\HIFIS.X\common.h (C)

--- Module:   C:\Users\user\Downloads\test\HIFIS\HIFIS.X\config.h (C)

--- Module:   C:\Users\user\Downloads\test\HIFIS\HIFIS.X\globals.h (C)

--- Module:   C:\Users\user\Downloads\test\HIFIS\HIFIS.X\main.c (C)

--- Module:   C:\Users\user\Downloads\test\HIFIS\HIFIS.X\Makefile (C)

--- Module:   C:\Users\user\Downloads\test\HIFIS\HIFIS.X\MyConfig.mc3 (C)

--- Module:   C:\Users\user\Downloads\test\HIFIS\HIFIS.X\nvram.c (C)
C:\Users\user\Downloads\test\HIFIS\HIFIS.X\nvram.c  47  info 714: external
    symbol 'Jedec_ID_Read' was defined but not referenced
void Jedec_ID_Read(char *Manufacturer_Id, char *Device_Type, char *Device_Id)
     ^
C:\Users\user\Downloads\test\HIFIS\HIFIS.X/nvram.h  29  info 759: header
    declaration for symbol 'Jedec_ID_Read(char *, char *, char *)' could be
    moved from header to module
void Jedec_ID_Read(char *Manufacturer_Id, char *Device_Type, char *Device_Id);
     ^
C:\Users\user\Downloads\test\HIFIS\HIFIS.X\nvram.c  47  info 765: external
    symbol 'Jedec_ID_Read' could be made static
void Jedec_ID_Read(char *Manufacturer_Id, char *Device_Type, char *Device_Id)
     ^
C:\Users\user\Downloads\test\HIFIS\HIFIS.X\nvram.c  69  info 714: external
    symbol 'Read_ID' was defined but not referenced
unsigned char Read_ID()
              ^
C:\Users\user\Downloads\test\HIFIS\HIFIS.X/nvram.h  28  info 759: header
    declaration for symbol 'Read_ID()' could be moved from header to module
unsigned char Read_ID();
```

Output somewhat looks like above mention capture.