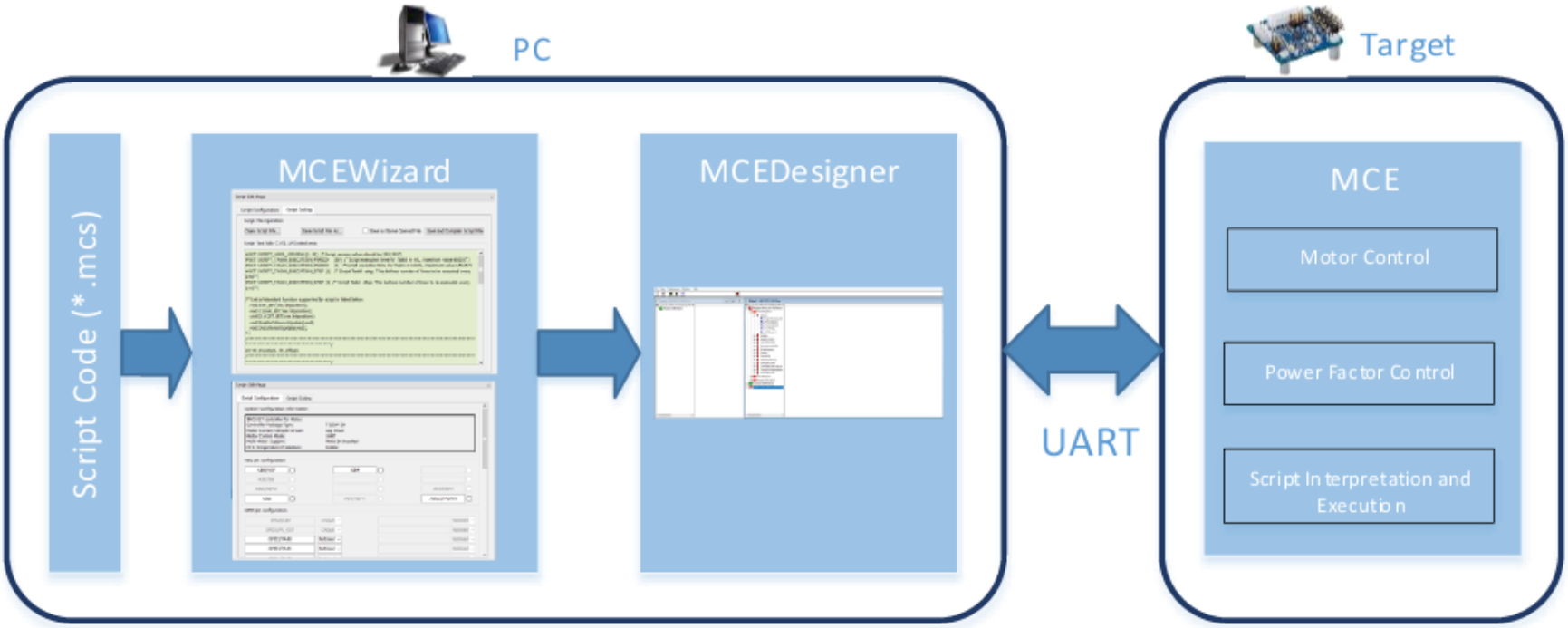
Script For MCE 2.0 User Guide

Step-by-step instructions for setting up motor control system with iMOTION™ ICs

What is Script?

› Script is proposed as a light weight virtual machine or script interpreter for iMOTION 2.0 Turnkey devices.



MCEWizard : Write Script code, IO configuration and Byte code generation
MCEDesigner : Download Byte code to target and monitor script variables

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What Script can do?

- Customized motor system application.
  - Access GPIOs and Analog channels that are not used by motor control and/or PFC.
  - Access all the motor control and PFC parameters and variables.
  - Build a customized system start-up/running behavior.
  - Calculate demanded value for host or application control.
  - Condition check for complication system control.
  - ….

This allows very flexible and powerful system design!

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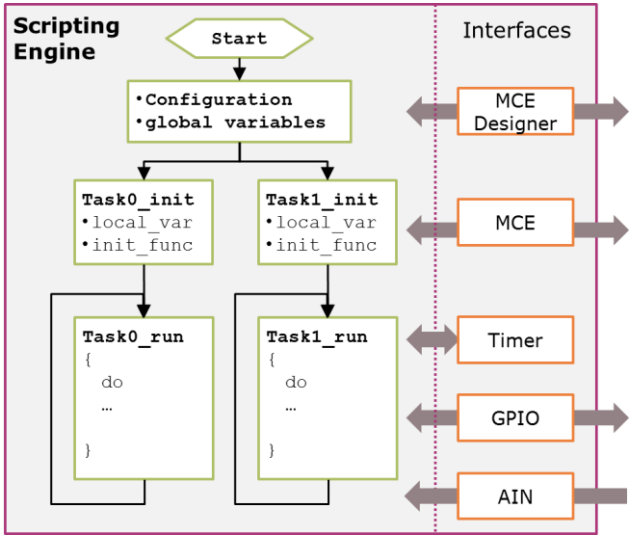
What is Script look like?

- Script code follow ‘C’ like syntax.
- Script Editor/Complier base on GUI embedded in MCEWizard.
- Script function variable can be Debug/monitor by MCEDesigner.

Structure

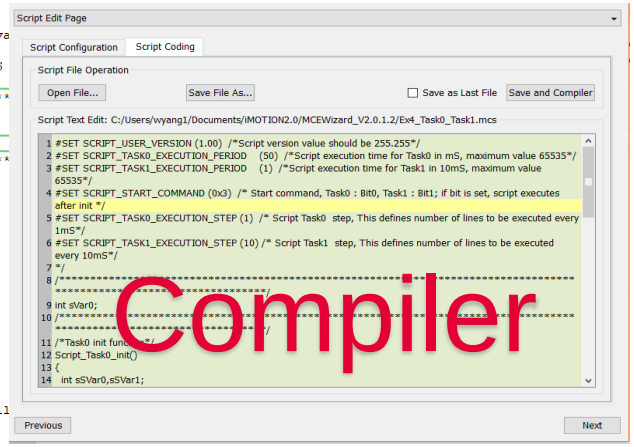


Code

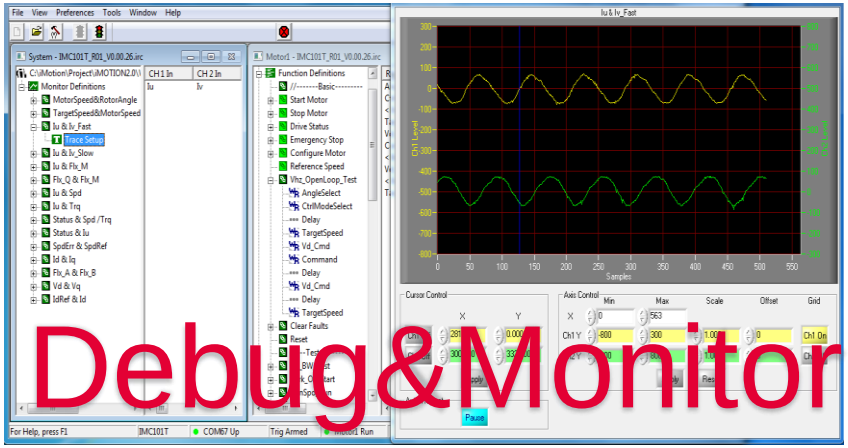
```
/*Script user version value, should be 255.255*/
#SET SCRIPT_USER_VERSION (1.00)
/*Script execution time for Task0 in mS, maximum va
#SET SCRIPT_TASK0_EXECUTION_PERIOD (1)
/*Defines number of lines to be executed every 1mS
#SET SCRIPT_TASK0_EXECUTION_STEP (2)
/**********************************************
/* Global variable definition */
int VDCBusLPF;
int VSPHSToLSDebounceCounter;
/**********************************************
/*Task0 init function*/
Script_Task0_init()
{
    /*Initialize global variable
    VDCBusLPF = 0;
    /* local variable definition */
    int VDCBusMultiplyDEN;
    /*Initialize local variable*/
    VDCBusMultiplyDEN = 0;
}

/*Task0 script function*/
Script_Task0()
{
    // Vdcbus filtering
    VDCBusMultiplyDEN = VDCBusMultiplyDEN + (VdcFil
    VDCBusLPF = VDCBusMultiplyDEN >> 6;
}
```

Compiler



Debug&Monitor



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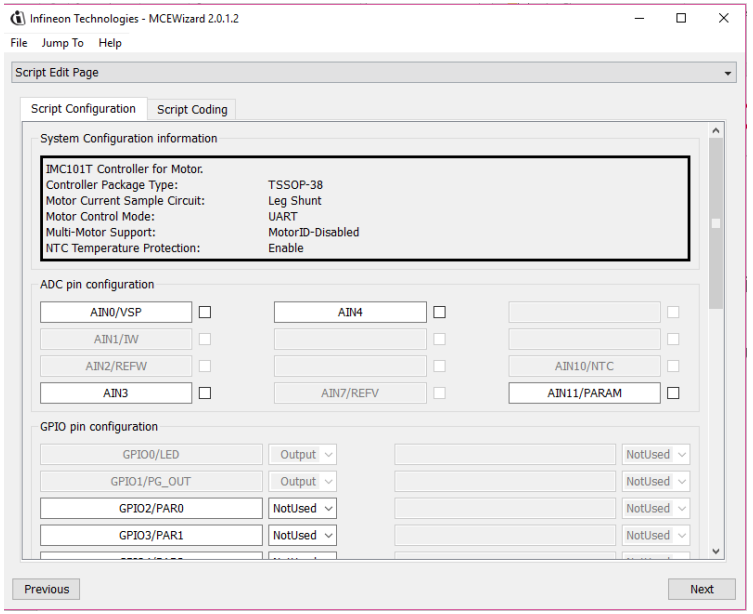
What's the process for operation Script?

1. Tuning parameters for Motor/PFC system has been finished.
2. Using MCEWizard Configures GPIOs/ADCs, generated updated parameters for Script function, and edit/compile script file.
3. Using MCEDesigner downloads parameters and Scrip compiled file, import variable .map file for tuning.
4. Tuning script function according application.(Hardware input/output, Variable write and read, Variable monitor).



Note:

1. GPIOs/ADCs configuration related with parameters configuration in MCEWizard, If there is GPIOs/ADCs selection updated, parameters file need generated and download into device.
2. Script's compiler generated file needs to download into device if code file updated.

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Section 1: Files Generation

- Using MCEWizard Configures GPIOs/ADCs, generated updated parameters for Script function, and edit/compile script file.
  - Following step1 – step 4 process for this target.

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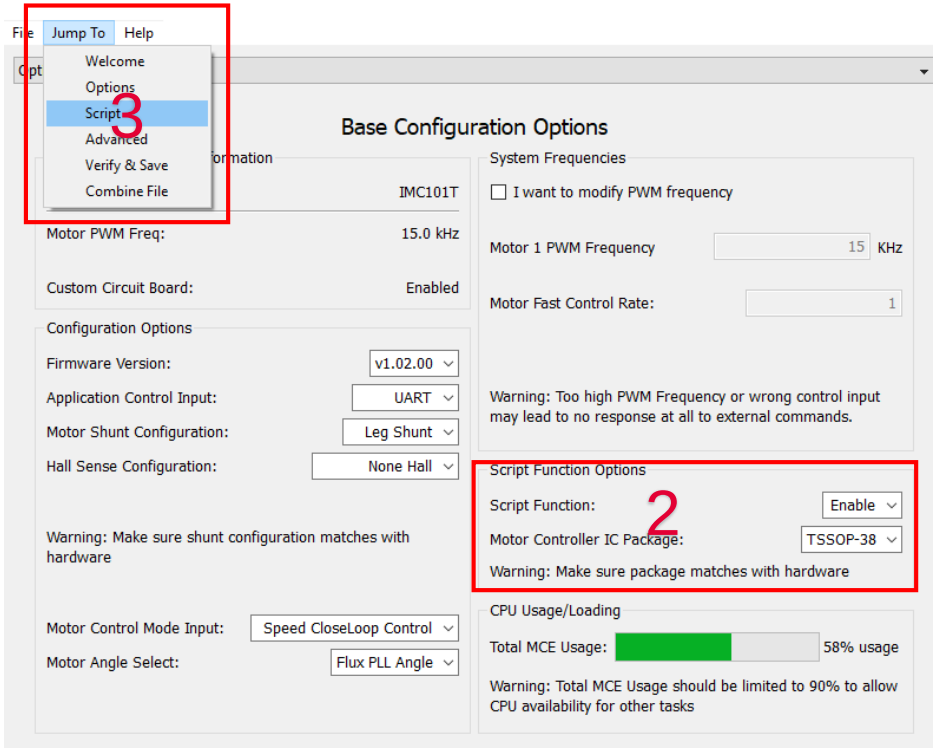
Step1: Enable Script and select the package

1. Enable “Custom Design Questions” in Welcome page
2. Enable “Script Function” and select the IC package in Options page
3. Jump to “Script” Page





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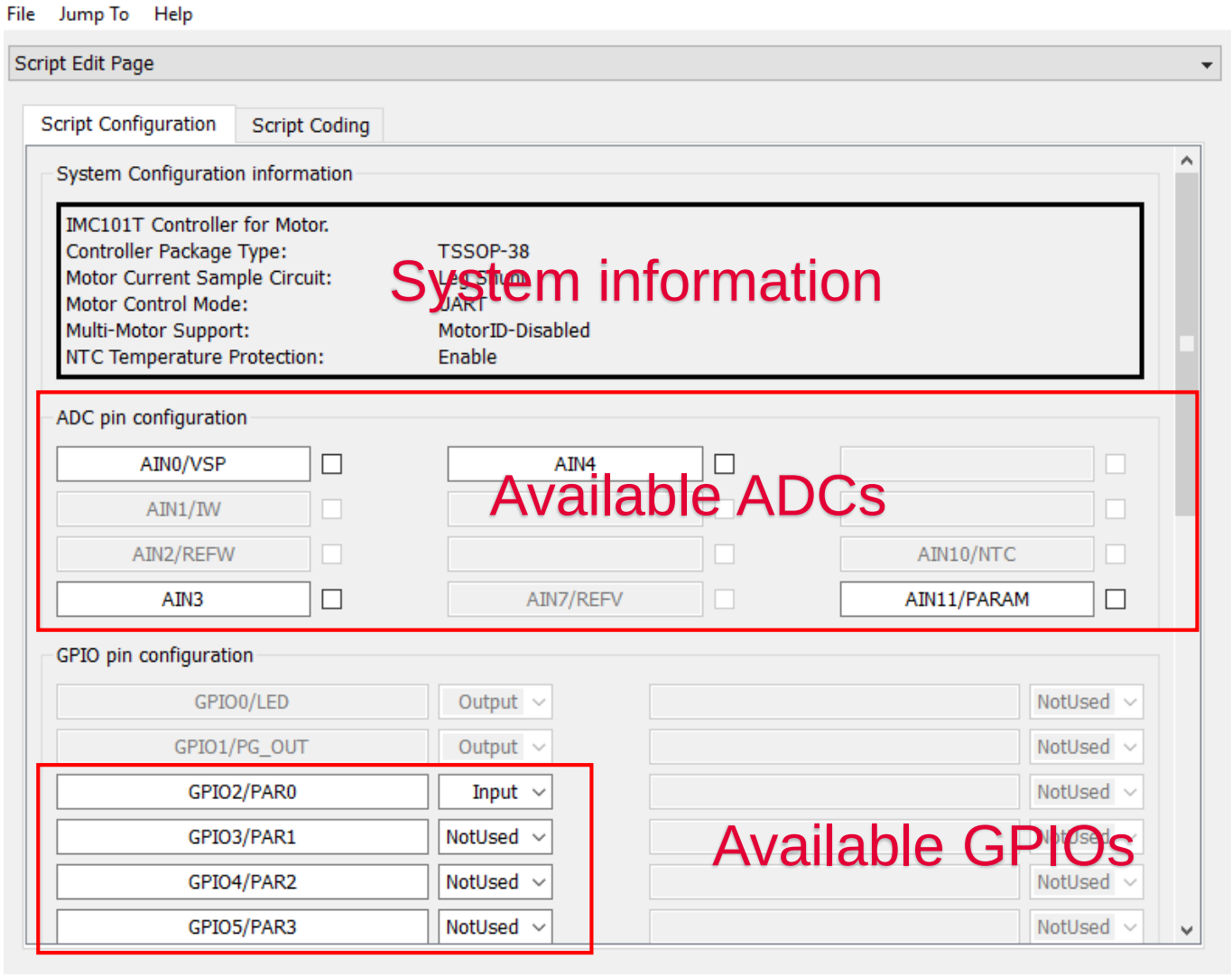
Step2: Configuration GPIOs/ADCs as system demand

1. Select unused ADCs/GPIOs if Hardware interface available.



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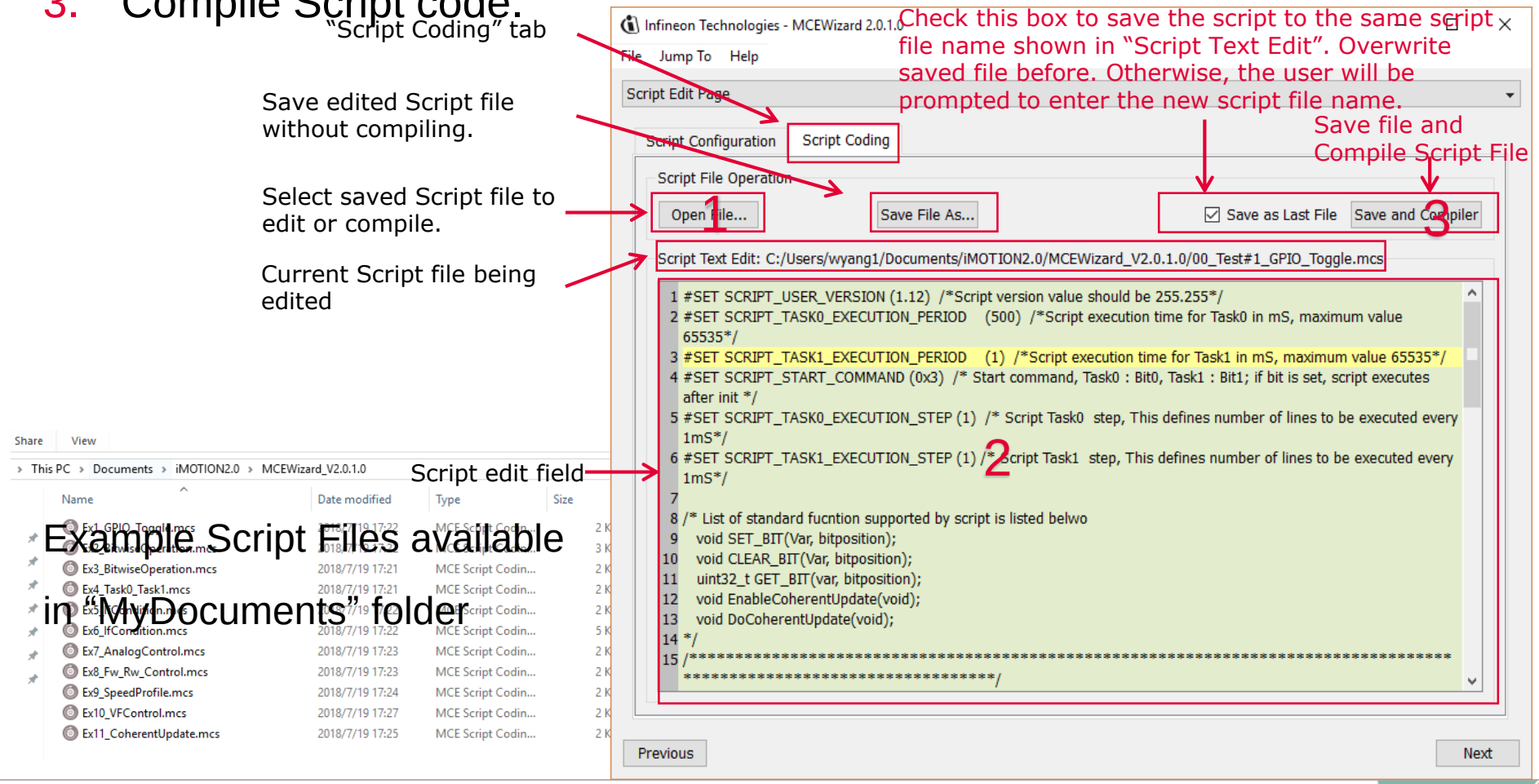
Step3: Edit Scrip code and Compile

1. Open one example Script file for a template or the file saved before.
2. Edit and Compile the code as system designed.
3. Compile Script code.



Example Script Files available in "MyDocuments" folder

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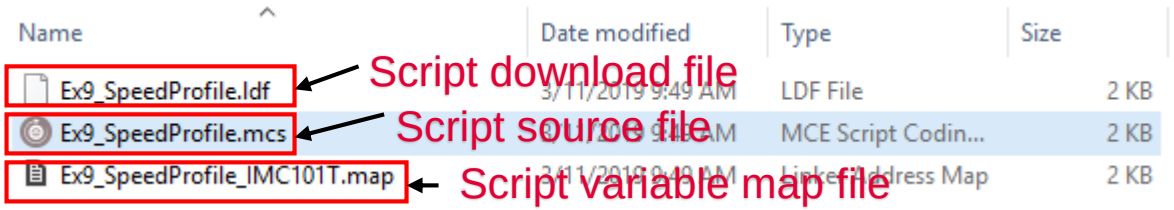
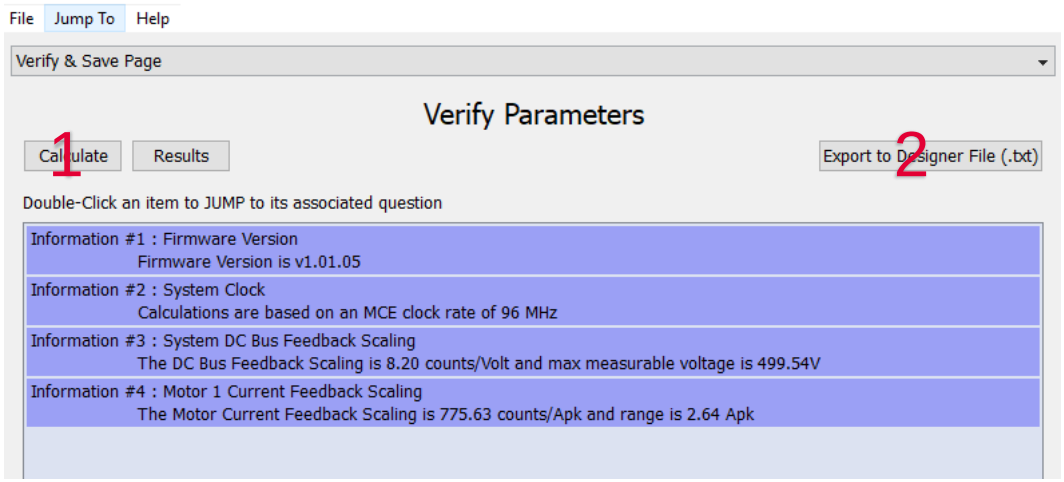
Step4: Scrip Generated Files and Parameters Generation

- After Compile, there are three files for Script.
  - .mcs → Script source code
  - .ldf → Script download file (the same name as source file)
  - .map → Script variable map file for MCEDesigner tune. Including version control inside.



- Generate and Update parameters for Script function.
  - go to “Verify & Save” page
  - “Calculate” to update value.
  - “Export to Designer File(.txt)”

  To save it.



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Section 2: Program Files and tune Script

- Using MCEDesigner downloads parameters and Scrip compiled file, import variable .map file for tuning.
  - Step 5 show the download process.
- Tuning script function according application.(Hardware input/output, Variable write and read, Variable monitor).
  - Step 6 show the download process.

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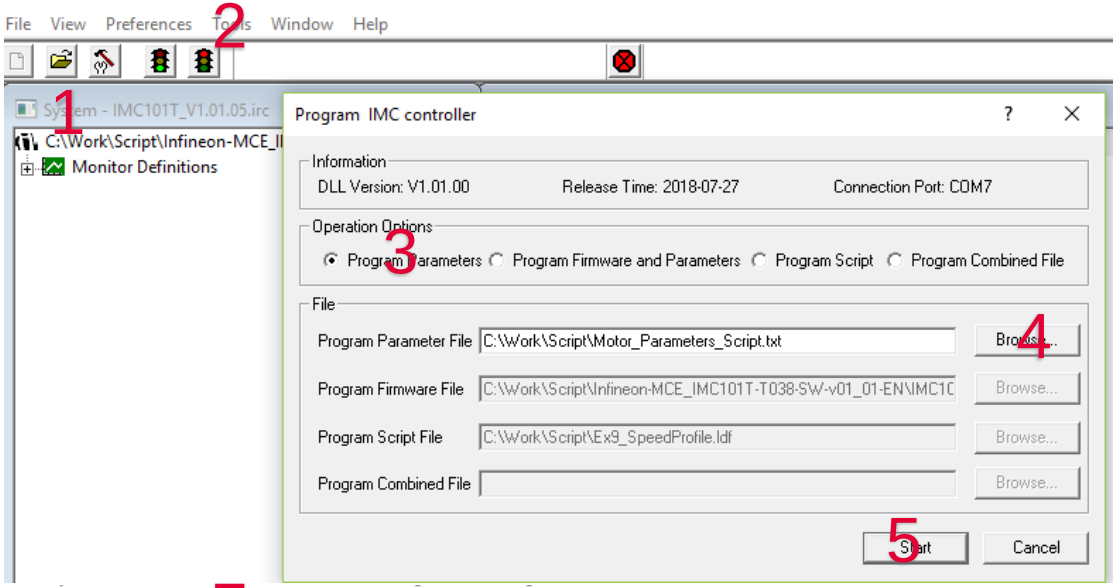
Step5: Download files

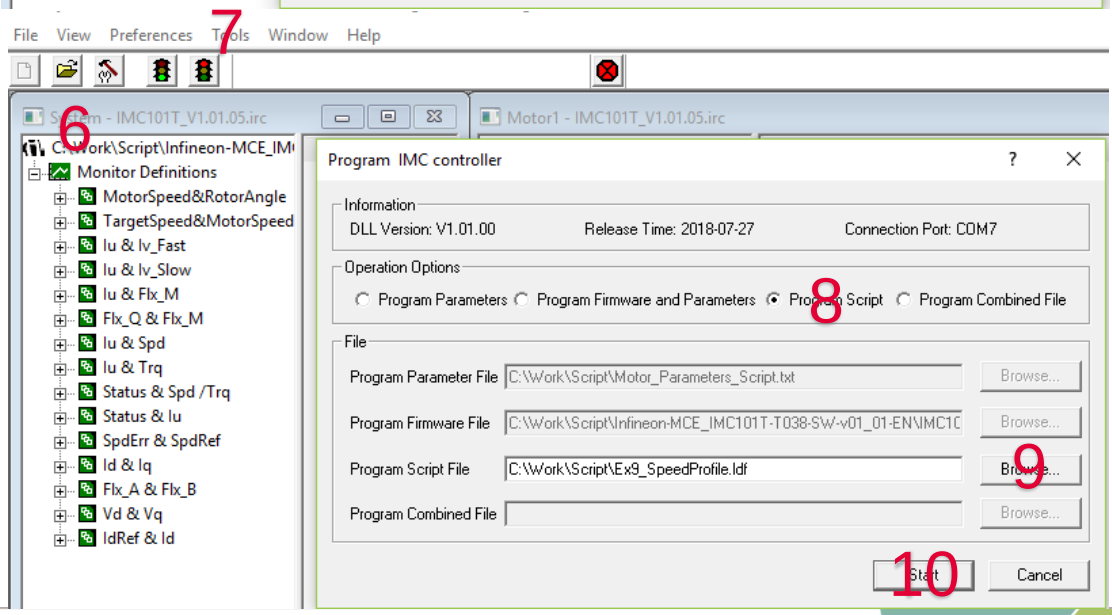
- Download Parameters file
  - Open the .irc file which motor has been tuned.
  - Press “System” page, select “Tools → Programmer”, select “Program Parameters”, “Browse..” the updated parameters for script(.txt).
  - If Firmware is not programmed, Select “Program Firmware and Parameters”

  Then “Start” to wait the process finish.

- Download Script file
  - Press “System” page, select “Tools → Programmer”, select “Program Script”, “Browse..” the script generated file(.ldf).

  Then “Start” to wait the process finish.





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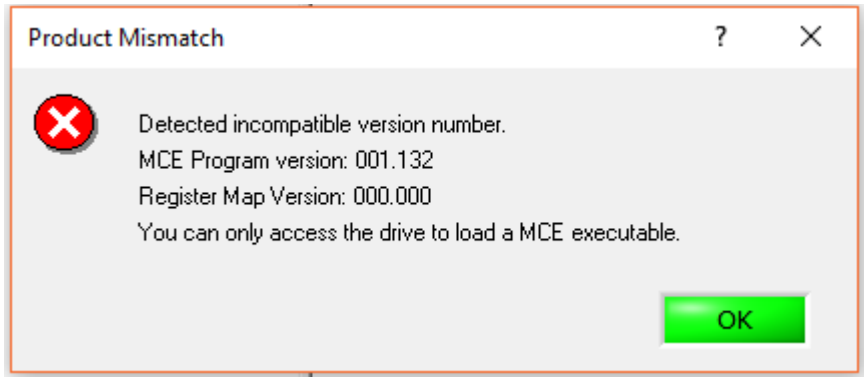
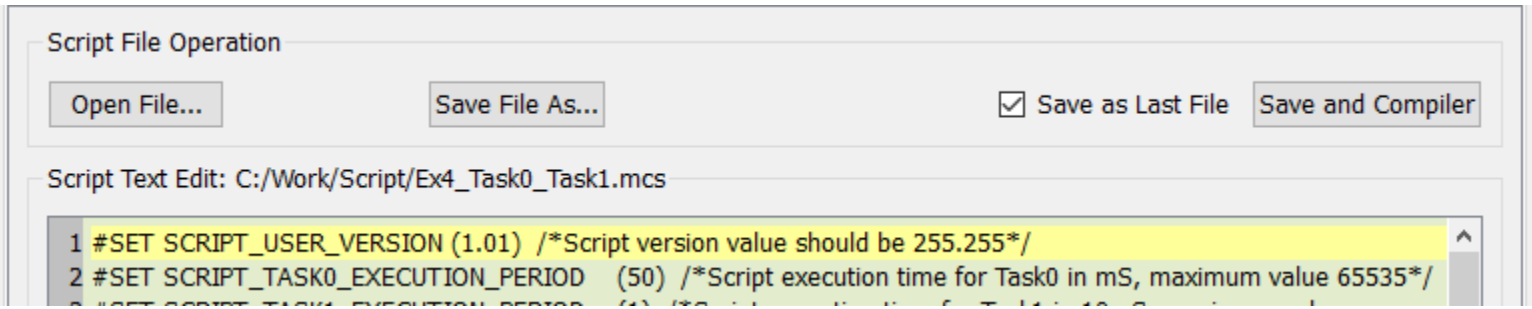
Step5: Download files

- After programming Script, if the “SCRIPT_USER_VERSION” has been updated by custom from original version, there is a version incompatible warning. This warning can be eliminated after next step.
- Then if user disable Script function, there is a default .map(For example:IMC101T_V1.01.05_Default.map) file need to import for the version compatible in release package.





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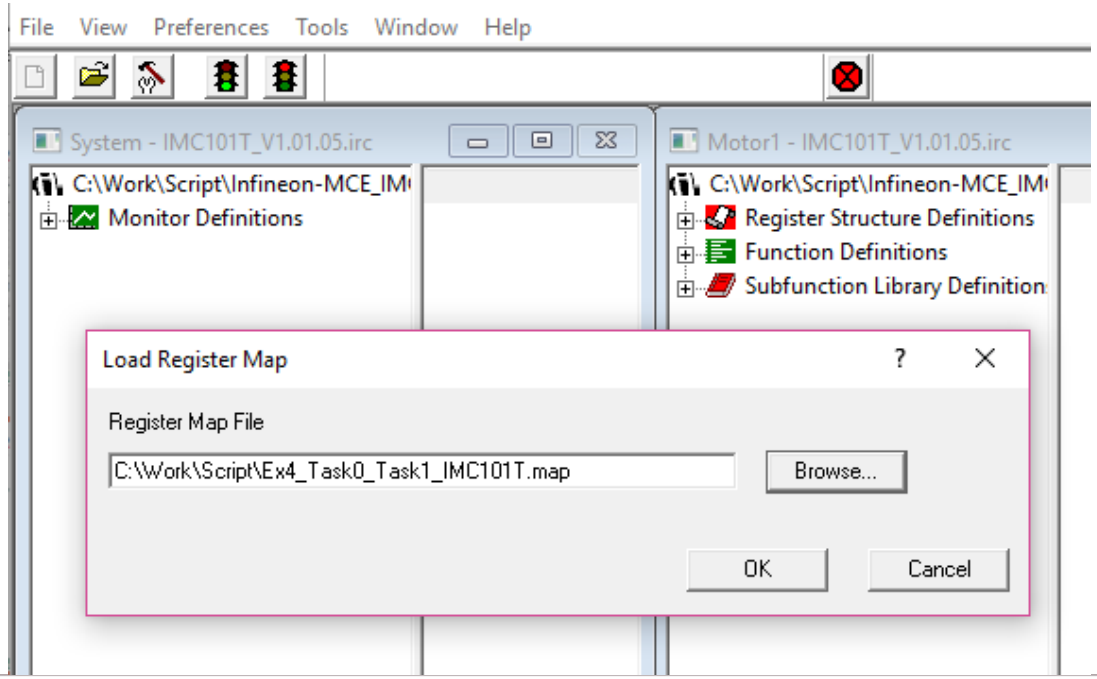
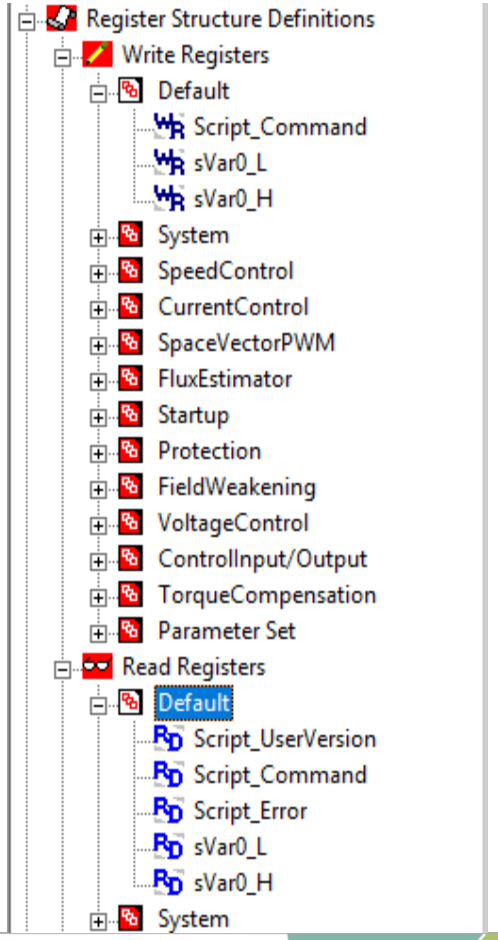
Step6: Import .map File for variable tuning

- After programed parameters and script generated file. We can tune and monitor the Global Variable.
  - Press “System” page, select “File → Import Register Map”, “Browse..” the generated register map for script(.map).
  - Variable At Write/Read register group in “Default”.
  - Write/Read Script variable for debug.





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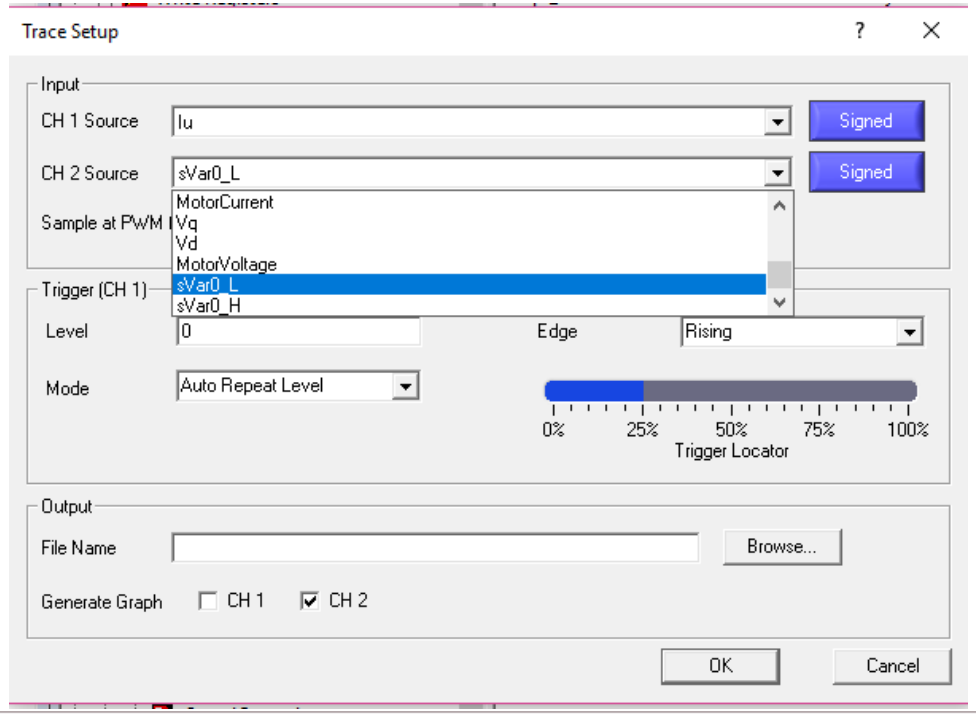
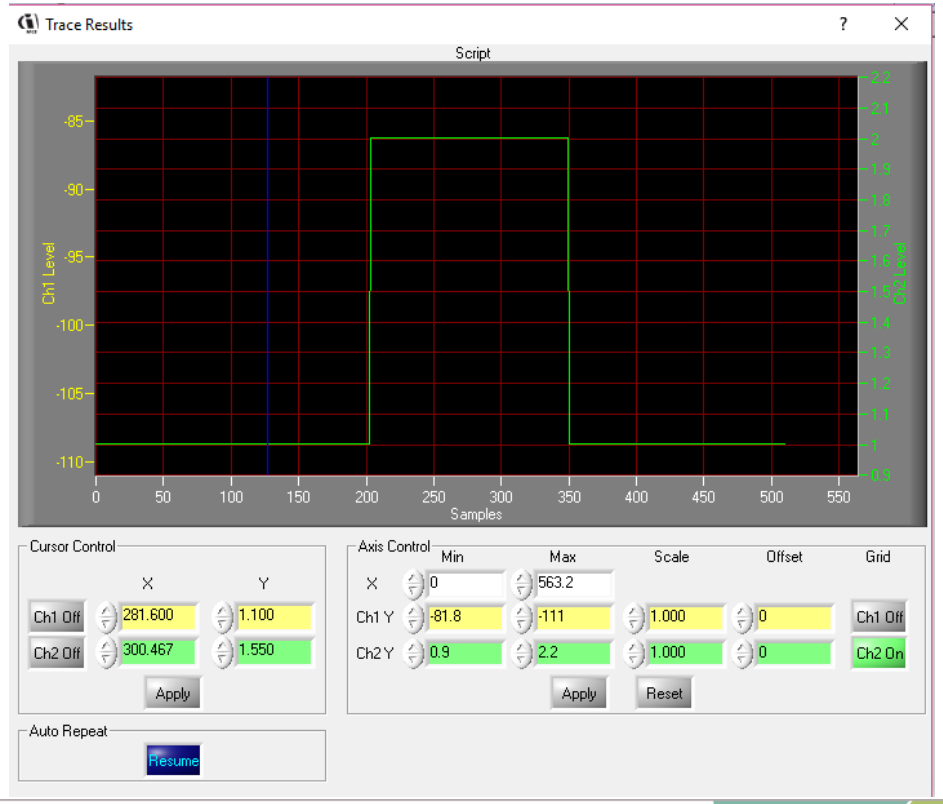
Step6: Import .map File for variable tuning

- Also, the Global Variables are in trace source list, we can see the graph of value.
  - Create a new monitor group, using Iu for trigger the auto repeat display .
  - After running the trace function, you will see the sample wave.





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How to Edit Script File?

- Reference Manual: Page 44-58: 2.5 Script Engine
  - Infineon-MCESW-RM-UM-v01_01-EN.pdf

- Application Guide:
  - Infineon-AN2018-27_How_to_Use_iMOTION_Script_Language-AN-v01_00-EN.pdf

- Web Page:
  - www.Infineon.com/iMOTION

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Script Guidelines & Limitations

- The maximum number of global variables is 30. The maximum number of local variables for each task is 24.
- The maximum allowed script code size is 16kB (approximately 1500 lines of script code). The script engine supports only 32 bit signed integer type of variables.
- The script engine supports 2 independent tasks, namely, Task 0 and Task 1, running concurrently. The user script program runs repeatedly on a configurable interval within Task 0 or Task 1 loop.
- The analog input pins are sampled by MCE every 10 ms.
- The GPIO pins are sampled and updated by MCE every 10 ms.

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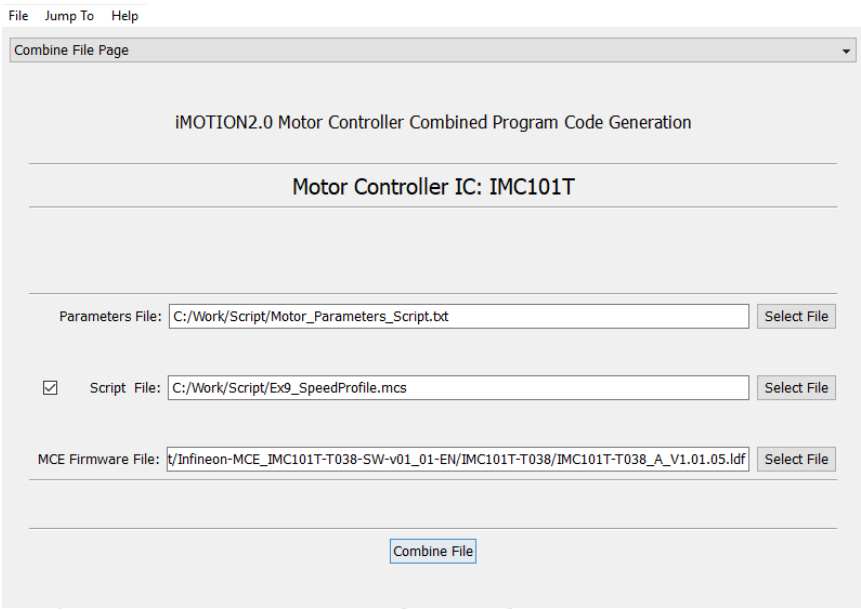
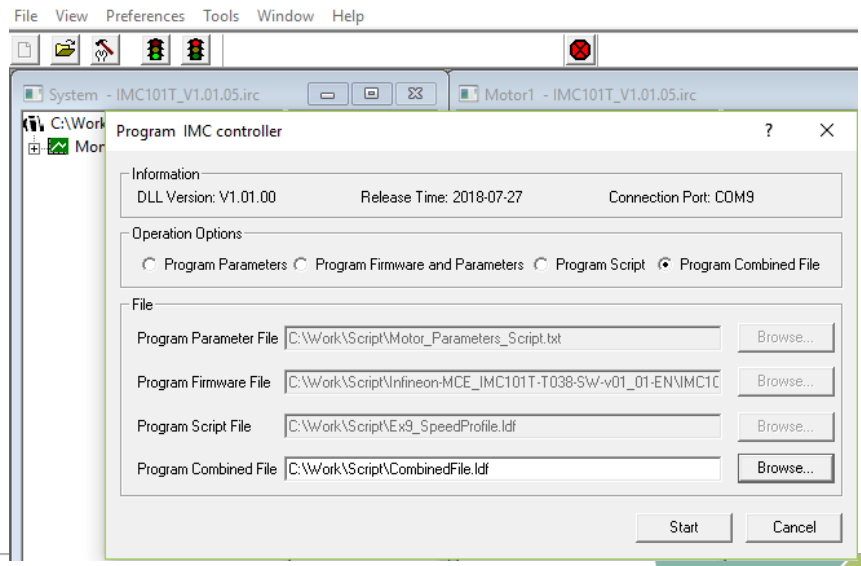
Project Deliver

- After the project design finished, only one combined file can be send out for factory without source file.
- Go to “Combine File Page” in MCEWizard. Select all the source file to be combined together.
- Using MCEDesigner “Program Combined File” verify the system generated code.





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