

# Assembly\_C\_Code\_1 for KIT\_AURIX\_TC397\_TFT

Assembly language in C code

AURIX™ TC3xx Microcontroller Training  
V1.0.0



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## Scope of work

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**Inline assembler and assembler files are used in combination in a C project.**

Two LEDs are switched on then switched off using assembly code functions.

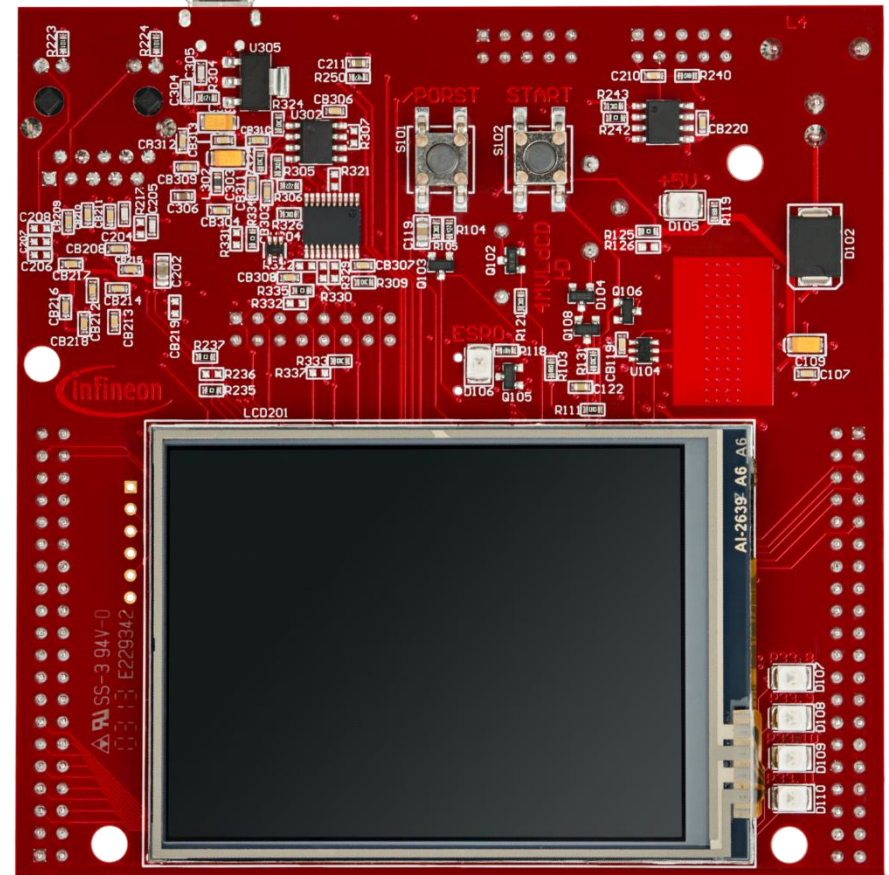
# Introduction

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- › The TASKING compiler within the AURIX™ Development Studio offers the possibility to use the assembly language inside the project code.
- › The assembly language is based on implementing code with the CPU instruction set, TriCore™ in this case.
- › This hardware oriented method allows the application to be memory efficient and faster in term of execution time comparing to higher level programming languages (C, C++, ...).
- › Assembly code can be implemented both inside dedicated source files „\*.src“ and in C source files using the `__asm()` keyword.
  
- › Useful Documentation:
  - TriCore™ instruction set:
    - “TriCore\_TC162P\_core\_architecture\_vol2of2\_Instruction\_set.pdf”
  - Tasking Compiler Assembly language:
    - “ctc\_user\_guide.pdf”

# Hardware setup

This code example has been developed for the board  
KIT\_A2G\_TC397\_5V\_TFT.



# Implementation

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## LED1 state control

LED1 driven by port 13 pin 0 can be switched ON/OFF by calling the assembly function ***set\_LED1\_State\_Assembly()***, implemented in the assembly source file ***Assembly\_Code.src***.

This functionality is ensured by the following steps:

- › Check the value passed to the function:
  - If 0 (LED\_OFF): write 0x1 to D0 data register
  - Else 1 (LED\_ON): write 0x10000 to D0 data register
- › Load the Port 13 Output Modification Register (OMR) into A0 address register
- › Store D0 value into A0 address register (Port 13 OMR register)
- › Return from function, needed to restore the context of the caller function

# Implementation

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## LED2 state control

LED2 driven by port 13 pin 1 can be switched ON/OFF by calling the assembly function ***set\_LED2\_State\_Assembly()***, implemented in the C source ***Assembly\_C\_Code.c*** file using the ***\_\_asm()*** keyword.

This functionality is ensured by the following steps:

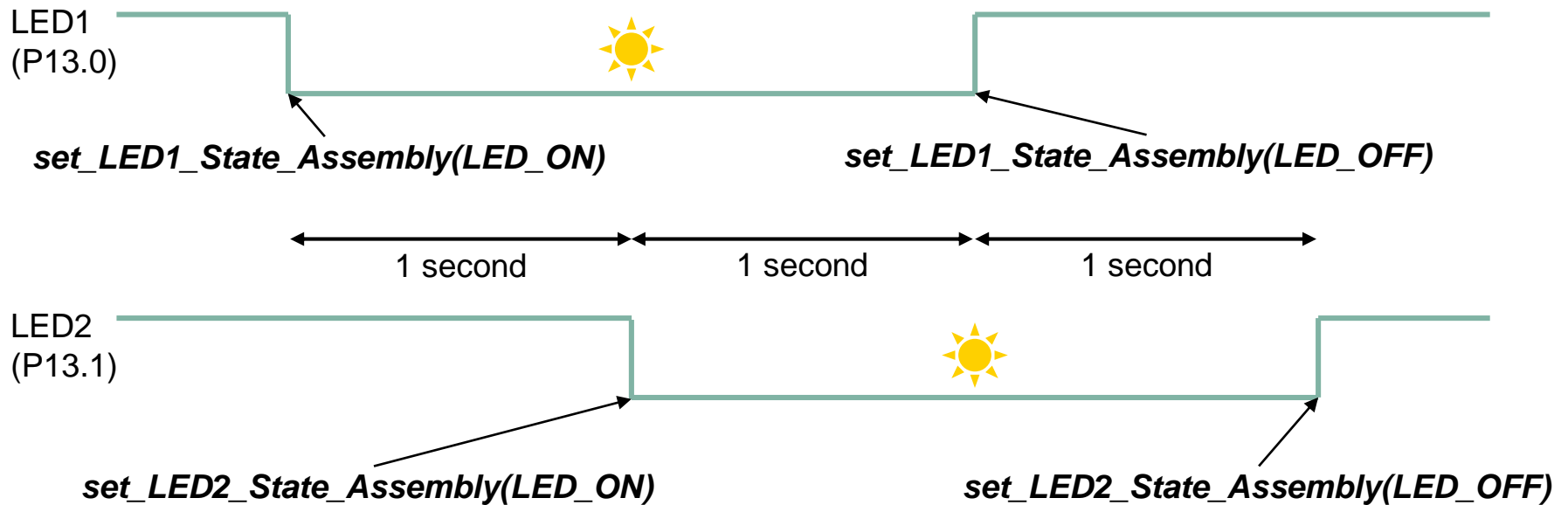
- › Check the value passed to the function:
  - If 0 (LED\_OFF): write 0x2 to D0 data register
  - Else 1 (LED\_ON): write 0x20000 to D0 data register
- › Load the Port 13 OMR register into A0 address register
- › Store D0 value into A0 address register (Port 13 OMR register)

**Note:** the return instruction is not needed in this case, because the assembly code is called inside a C code, this means the C compiler is handling restoring the context.

# Implementation

## Scenario:

- › P13.0 and P13.1 are configured to control respectively LED1 (D107) and LED2 (D108) using the *ifxPort\_setPinMode()* iLLD function.
- › Then both LED1 and LED2 are switched off using the *ifxPort\_setPinHigh()* iLLD function, please note that the LEDs are low-level active.
- › Afterwards the following is implemented:

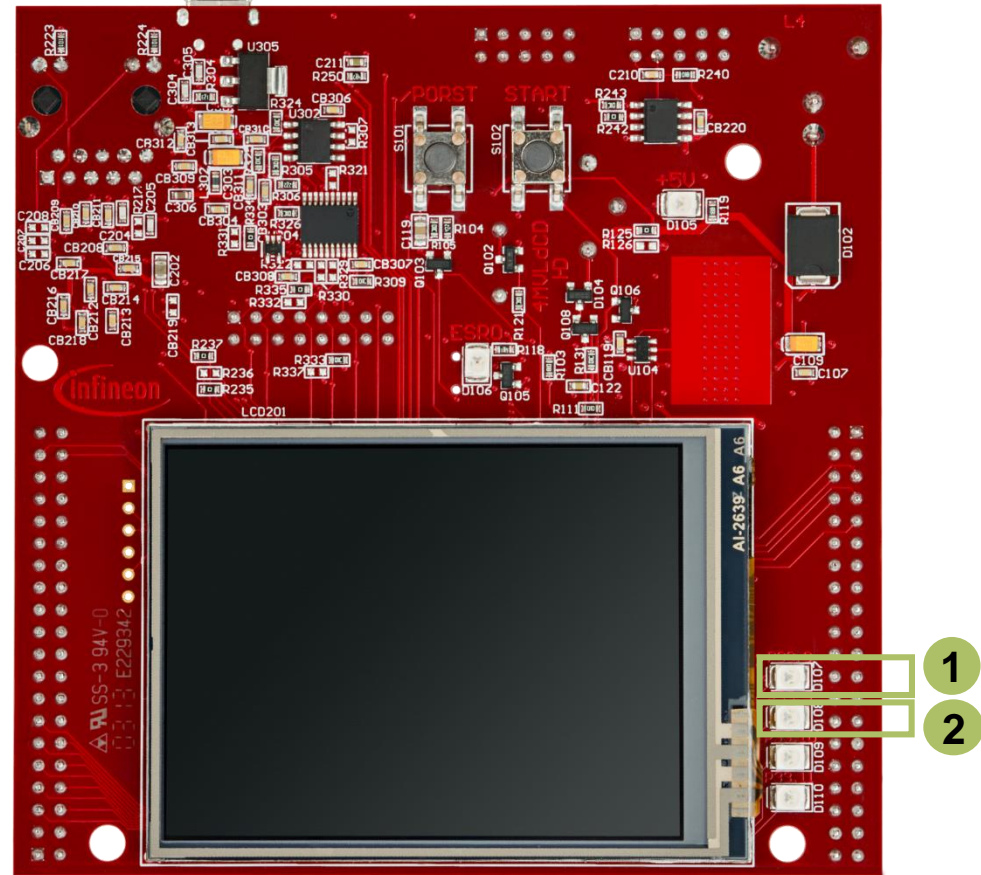


# Run and Test

After code compilation and flashing the device, check the following behavior

- › Firstly, LED1 (D107) is switched **on**
- › One second after, LED2 (D108) is switched **on**
- › One second after, LED1 (D107) is switched **off**
- › One second after, LED2 (D108) is switched **off**

For more details, please refer to the [previous slide](#).





# References



- > AURIX™ Development Studio is available online:
- > <https://www.infineon.com/aurixdevelopmentstudio>
- > Use the „*Import...*“ function to get access to more code examples.



- > More code examples can be found on the GIT repository:
- > [https://github.com/Infineon/AURIX\\_code\\_examples](https://github.com/Infineon/AURIX_code_examples)



- > For additional trainings, visit our webpage:
- > <https://www.infineon.com/aurix-expert-training>



- > For questions and support, use the AURIX™ Forum:
- > <https://www.infineonforums.com/forums/13-Aurix-Forum>

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**Document reference**

**Assembly\_C\_Code\_1\_KIT\_TC397\_TFT**

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