

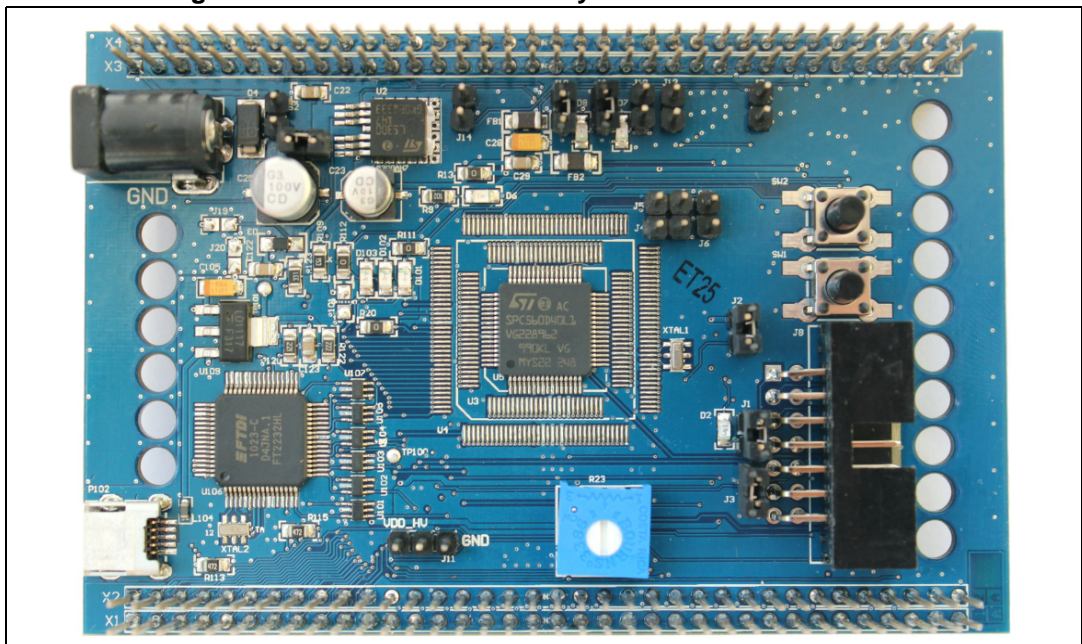
### Getting started with SPC56D-Discovery board

## Introduction

The SPC560D-Discovery board, hereafter described as SPC560D-DIS, is an evaluation tool supporting STMicroelectronics SPC56D-Line microcontrollers. The selected solution is the quickest way to discover the SPC56D family, to program the device, to build and to debug applications.

SPC560D-DIS board is based on the 32-bit microcontrollers Power Architecture® Core SPC560D40L1.

**Figure 1. SPC560D-DIS Discovery board with SPC560D40L1**



The evaluation board allows full access to all of the CPUs I/O on the two 2x36 headers with exception of JTAG, TCK, TMS, TDI, TDO, XTAL, EXTAL and VDD\_LV pins.

SPC560D-DIS discovery board is supported by a specific application project inside SPC5Studio (a visual integrated software development environment to easily develop software for SPC56 MCU's), where micro start-up routines, I/O mapping and a simple test codes have been already designed by STMicroelectronics experts.

SPC5Studio is available for download on [www.st.com](http://www.st.com). SPC5Studio comes with HighTec GNU "C" compiler free fully featured 30 days trial version. An E2E Community is available on ST web.

The PCB, all components and all HW parts meet requirements of the applicable RoHS directives

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# 1 Getting started

## 1.1 Delivery checklist

The SPC560D-DIS kit contains the following items:

- #1 SPC560D-DIS evaluation board; the label applied on the PCB bottom side of the PCB is the debugger serial number.
- #1 USB type A to mini-B cable.

The jumpers allow to configure the board to enable features and different flash modalities.

## 1.2 Setting up hardware and connections

The user has to follow this procedure in order to setup the hardware:

1. Remove the board and the PSU from the protective plastic envelops.
2. Connect the USB cable to the board then in a PC USB port.
3. The board is supplied and ready to be used and programmed.
4. The LED D6 (green) reveals +5 V supply is present and the regulator works properly.

The user LEDs D7 and D8 (both green) are blinking and they show all connections are right and the microcontroller is working properly<sup>(a)</sup>.

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a. The LEDs are blinking because a demonstration code has been stored in the microcontroller. The software is included in the "Test App SPC560D-DIS board".

## 2 How to connect and program SPC560D-DIS

The following procedure describes how to connect and flash the microcontroller using the USB port and the integrated debugger.

### 2.1 How to connect the board

The procedure describes how to connect the board and to program PLS USB-JTAG adapter.

1. Turn off the board (Switch S1="OFF")
2. Connect the USB cable to the board
3. Plug the USB cable to the PC (USB 2.0 or higher)
4. Turn on the board (Switch S1="ON")
5. The user LEDs D7 and D8 are blinking
6. The controller is ready to be programmed with the user software.

### 2.2 Load a test program

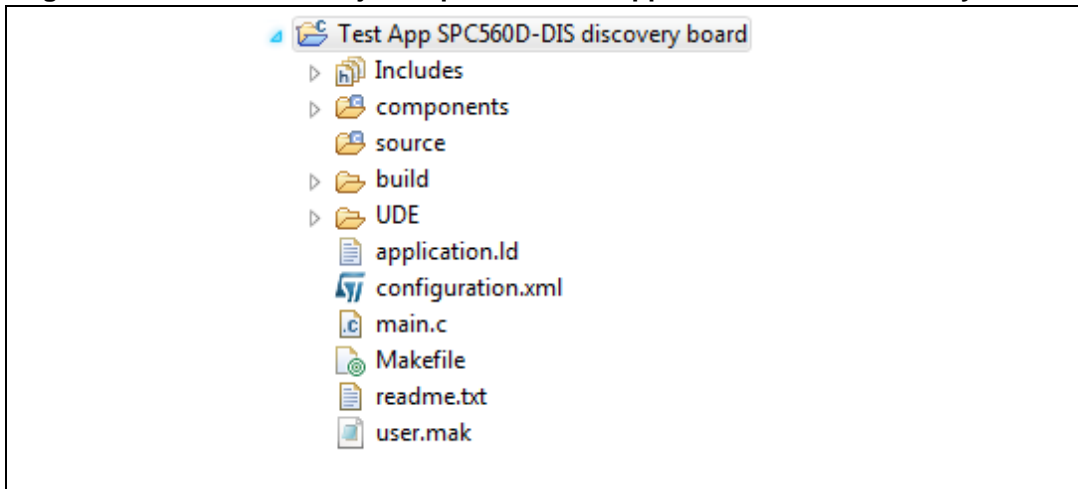
The procedure describes how to flash the microcontroller using SPC5Studio and UDE-PLS software<sup>(b)</sup>.

1. Run SPC5Studio
2. Import the test application developed for this board ("Test App SPC560D-DIS board.zip")
3. In "Project Explorer" select and open the test application project named "Test App SPC560D-DIS discovery board".

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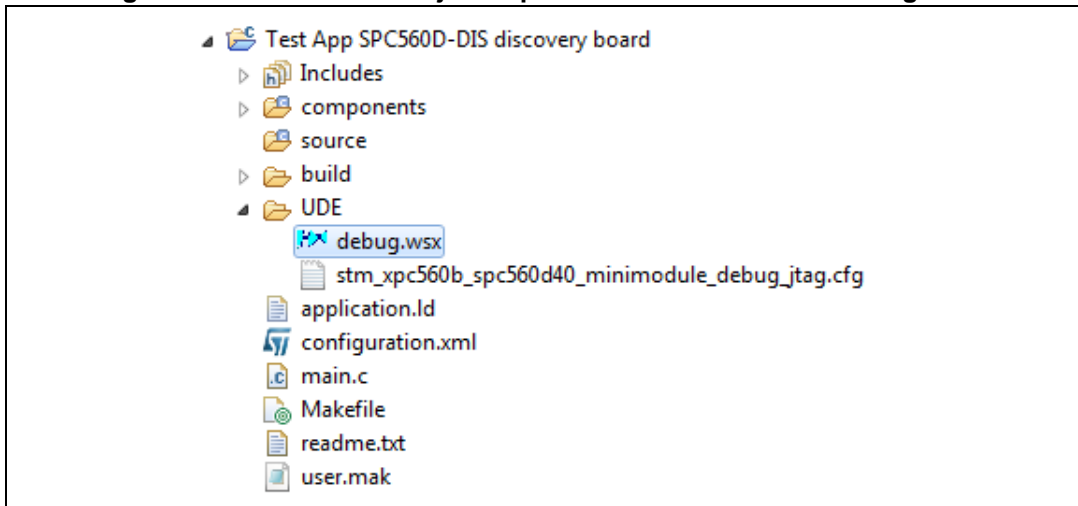
b. Both of these softwares must be downloaded and installed in your PC.

Figure 2. SPC5Studio - Project explorer - "Test App SPC560D-DIS discovery board"



- 4. The demo code is in the file "main.c<sup>(c)</sup>".
- 5. Save the project and build it.
- 6. Select and open the UDE folder then click to "debug.wsx": a new program (UDE Visual Platform) is launched in a new window.

Figure 3. SPC5Studio - Project explorer – UDE folder and "debug.wsx"

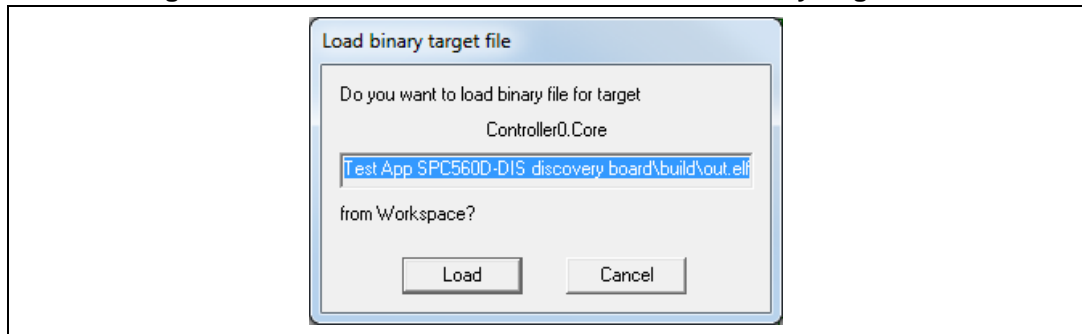


- 7. In "Message View" a message informs if the board is connected and if the microcontroller has been identified by the programmer/debugger properly.
- 8. In the window "Load binary target file" should be present the path where the file "out.elf" has been generated. The default path is: "C:\SPC5Studio\workspace\Test App SPC560D-DIS discovery board\build". To select a different path in the main bar select "File" then "Load Program" then select the path and the file to load.
- 9. Press "Load button" to load the binary "out.elf" file (Figure 4).

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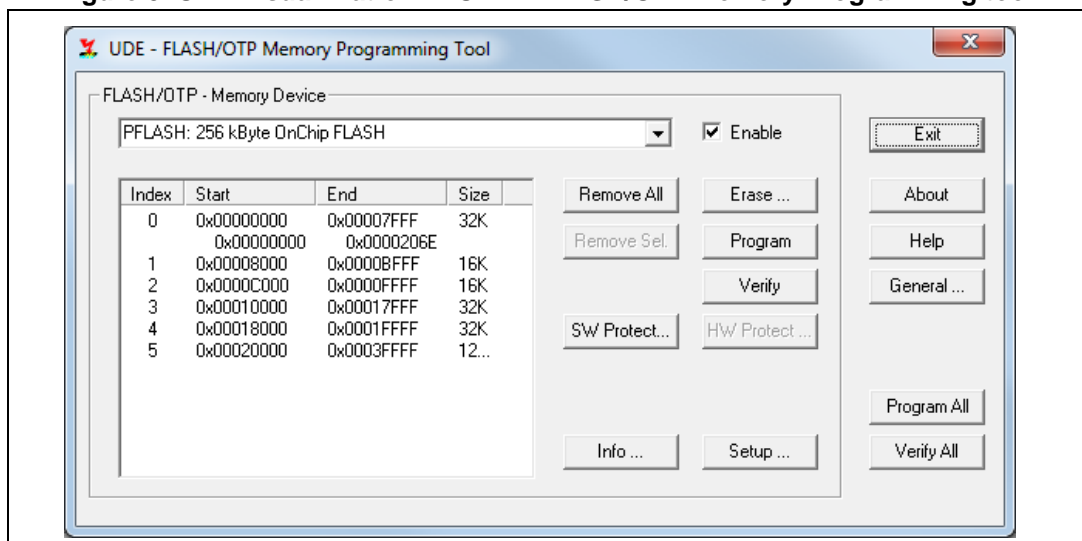
c. The code can be modified. The final result can be different with respect to the original code.

Figure 4. UDE Visual Platform - Window "Load binary target file"



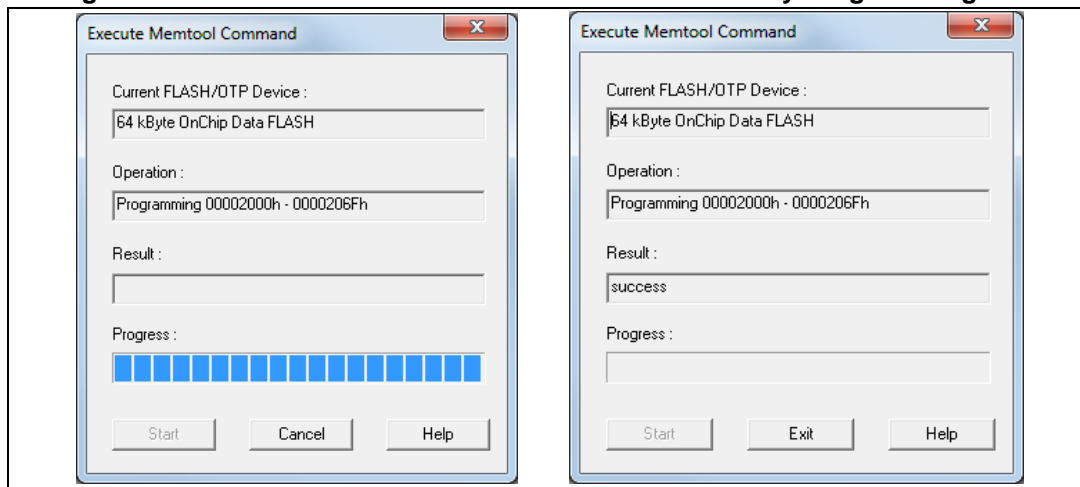
10. In the new window (Figure 5) press the button "Program All".

Figure 5. UDE Visual Platform - UDE - FLASH/OTP Memory Programming tool



11. The execution of the flash procedure is reported in Figure 6.

Figure 6. UDE Visual Platform - UDE - FLASH/OTP Memory Programming tool



12. Close the "UDE Visual Platform"
13. Remove and plug the USB cable
14. Check the user LEDs D7 and D8: they are blinking in according to the code developed and stored in the microcontroller.

The document UM1602 (see [Section Appendix B: Reference documents](#)) is focused to describe and to understand how to use SPC5studio and how to create, build and debug a project.



## Appendix A    General handling precautions

The following precautions are recommended when the SPC560D-DIS board is using:

- Do not modify or manipulate the board when the DC supply or the USB cable is connected to the board.
- The connectors and cables should be plugged and removed when the board is off.
- Do not supply the board with a DC source higher than 12 V or with reverse polarity.
- Pay attention to the PSU DC power plug: it must be with 2.1 mm inner diameter and with positive connected to the center.
- It is recommended to use antistatic tools.

## Appendix B Reference documents

*SPC5Studio users guide* (User manual UM1602, DocID024185).

## Revision history

**Table 1. Document revision history**

Date	Revision	Changes
11-Feb-2014	1	Initial release.
03-Nov-2015	2	Updated: - <a href="#">Section 1.1: Delivery checklist</a> - <a href="#">Section 1.2: Setting up hardware and connections</a> - <a href="#">Section Appendix A: General handling precautions</a>

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