Never stop thinking

UWLink

Interface / Development platform

UWLink Mainboard User Guide

Hardware / Tool description

User Guide

1.0, 2010-06-01

Wireless Control

Edition 2010-07-16

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Table of Contents

Introduction **5**

1 Documentation Links **7**

2 The UWLink Mainboard Hardware **7**
2.1 Connector Description 9

3 Setup of Software Development Tools **10**
3.1 Step 1 – Download and install DAS Tool Interface Software 10
3.2 Step 2 – Download and install XC800_FLOAD Flash Loader Software 12
3.3 Step 3 – Download and install Keil C51 µVISION4 Tool Chain 13
3.3.1 Setting up a Software Project in Keil C51 µVISION4 13

Introduction

The UWLink (Universal Wireless Link) is a perfect starting point to experience the capabilities of Infineon's Wireless Control product portfolio. Implemented in a USB-stick format it can be easily connected to a PC. UWLink includes all ingredients for a complete wireless system:

- **UWLINK Mainboard** with a user-programmable 8Bit Microcontroller (XC886) and USB connection to the host PC

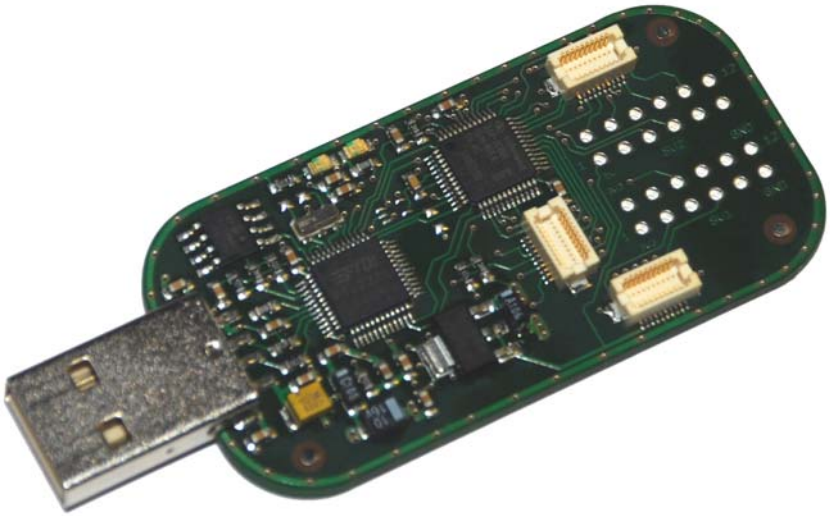


Figure 1 Photo of the UWLink Mainboard (USB Stick)

- A variety of **UWLink Extension-Boards** with many of Infineon's Wireless Control ICs (e.g. TDA5240, TDA5150, …) to be plugged into the UWLink Mainboard

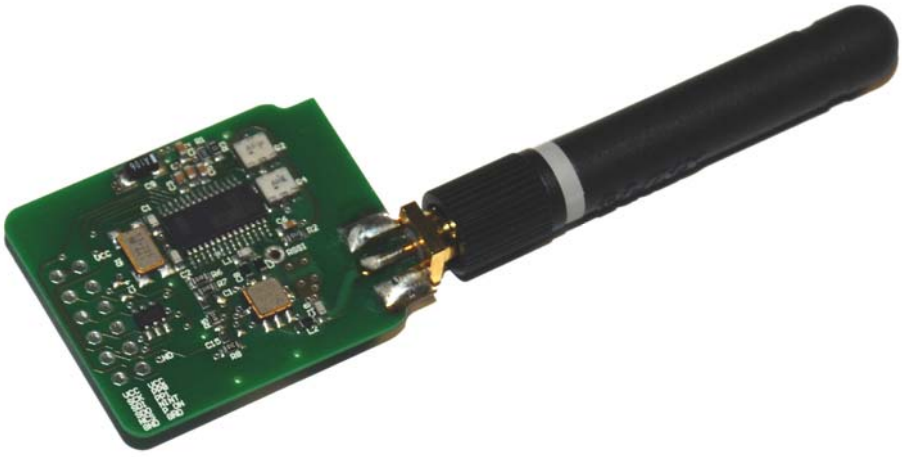


Figure 2 Photo of a typical UWLink Extension-Board (TDA5230)

UWLink may be used in two alternative scenarios:

- UWLink as a pre-programmed interface between a MS-Windows PC-Evaluation-Software, like the TDA5150-Teseus or the TDA5240-Explorer: The related UWLink firmware is either pre-programmed upon shipment of the UWLink-Combo-Kit or may be updated using the XC800_FLOAD Flash Loader software.
- UWLink as an open programmable XC886 microcontroller board: You can implement your own SmartLEWIS demonstration or application software using Keil's µVision 4 programming environment. Specific libraries and SW-frameworks for each of the SmartLEWIS™ products simplify your work.

The features of the UWLink Mainboard are as follows:

- Free programmable 8 Bit µController (XC886) with timers and serial interfacing
- 3 board-to-board connectors provide the functionality to attach several different extensions boards
- Two easy to access connectors (SV1 and SV2)
- Dual power supply capability (3.3V and 5V Mode) selectable via extension board schematic
- 100% software compatible with Infineon's XC800 USCALE start kit (see **http://www.infineon.com/USCALE**)
- Flash download to XC886 IF µController using FLOAD or Keil µVision
- UART emulation via USB interface

In the following chapters you will find instructions to setup the complete tool chain.

1 Documentation Links

Latest versions of all datasheets, application notes and other documents related to this product family may be downloaded from the Infineon Technologies – Wireless control internet web-site:

http://www.infineon.com/WLC.

Detailed information about the UWLink is available for download at:

http://www.infineon.com/UWLink.

2 The UWLink Mainboard Hardware

The most important components and connectors of the PMA RF USB Stick are illustrated in Figure 3 below.

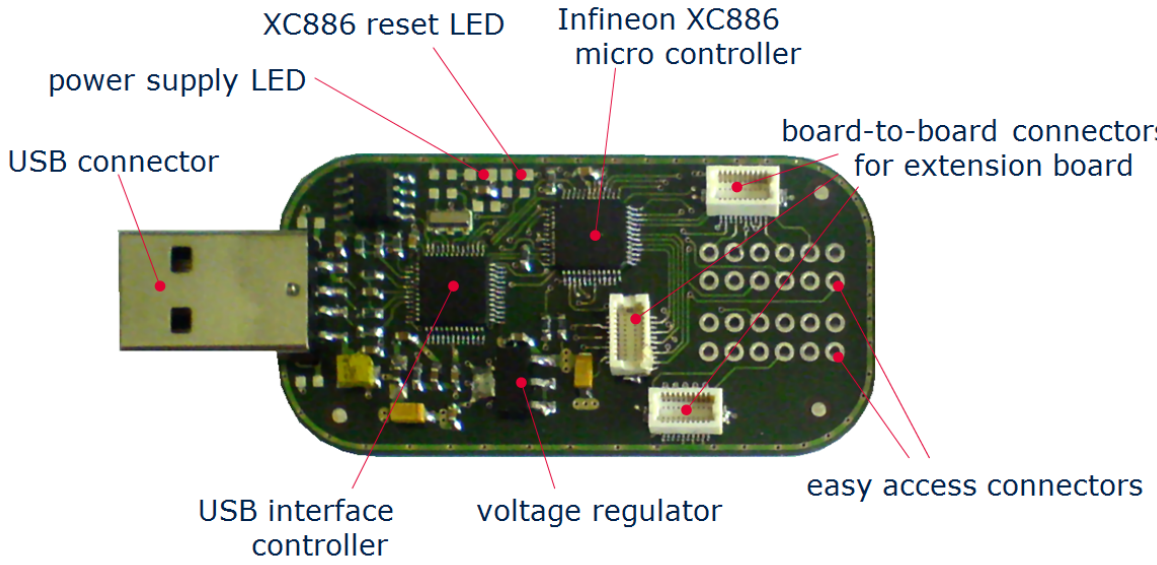


Figure 3 UWLink Mainboard – external connector / main parts

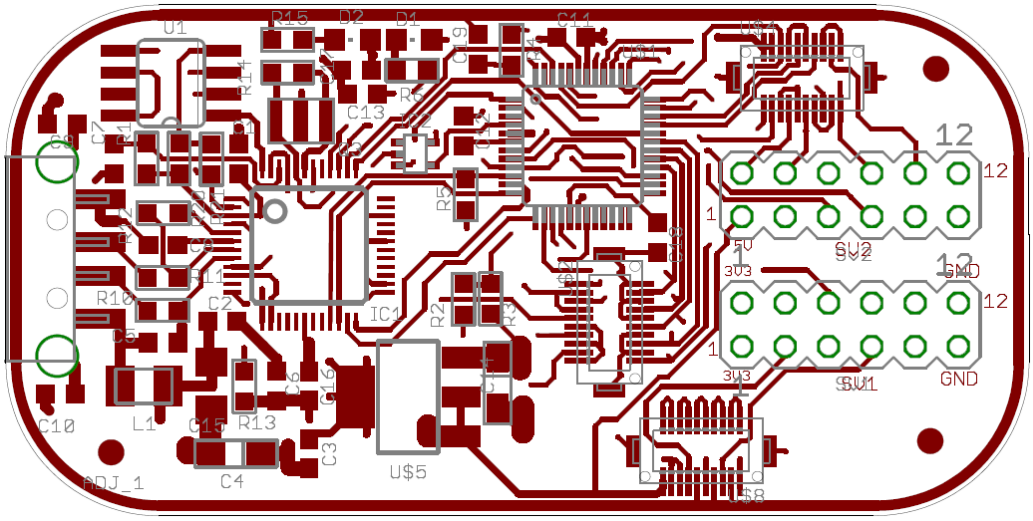


Figure 4 UWLink Mainboard – PCB Layout

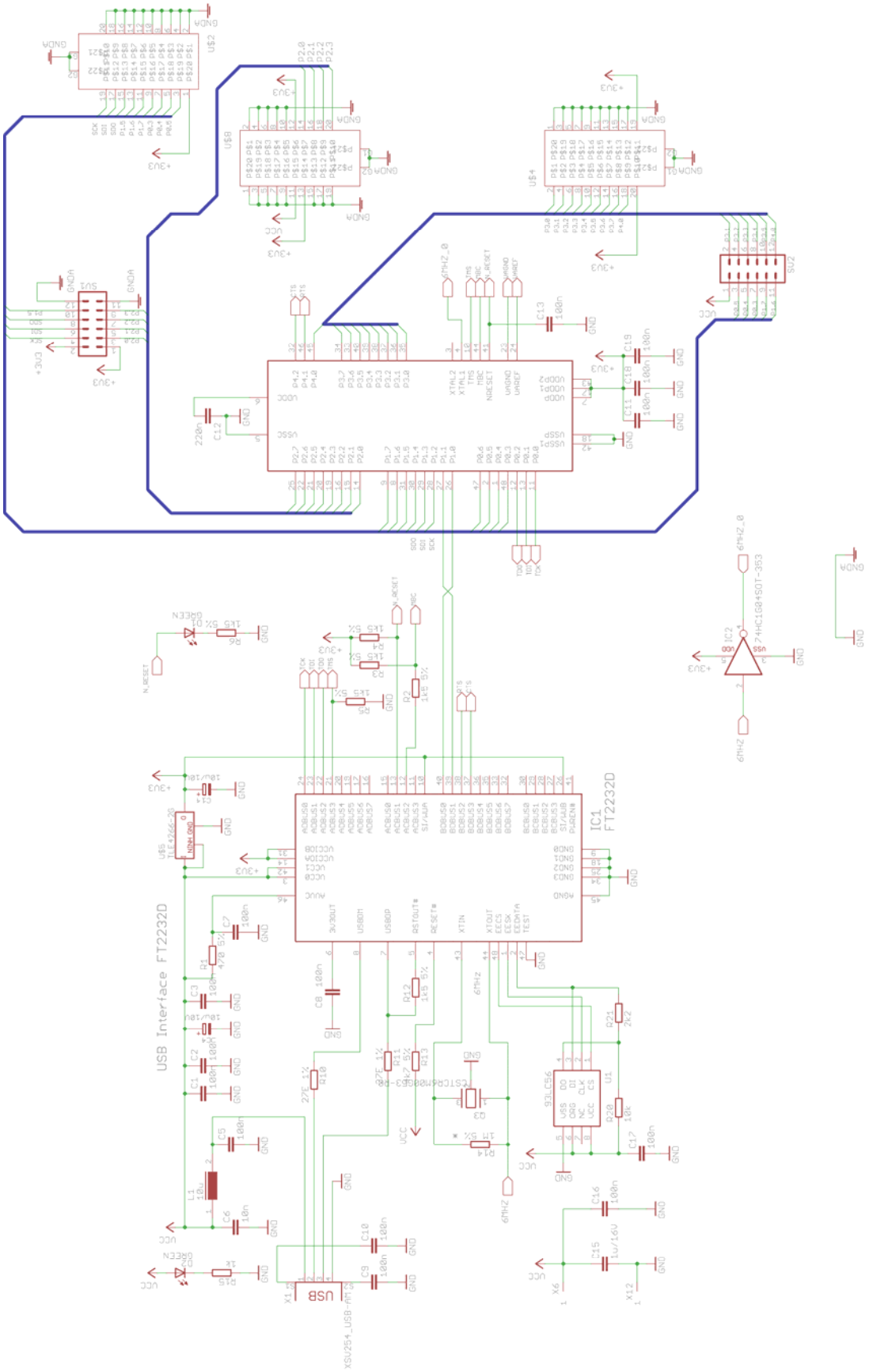


Figure 5 UWLink Schematic(v0.4)

2.1 Connector Description

The XC886 µController ports are provided on the connectors as follows in the tables below.

Pin headers SV1 and SV2:

UWLink Board			
µC Port/Supply	µC Function	Con-nector	Pin
3V3		SV1	1
3V3		SV1	2
P2.0	Input only	SV1	3
P1.2 / SCK	I/O	SV1	4
P2.1	Input only	SV1	5
P1.3 / MasterTX	I/O	SV1	6
P2.2	Input only	SV1	7
P1.4 / MasterRX	I/O	SV1	8
P2.3	Input only	SV1	9
P1.5	I/O	SV1	10
GND		SV1	11
GND		SV1	12
5V		SV2	1
P3.1	I/O	SV2	2
P0.5	I/O	SV2	3
P3.2	I/O	SV2	4
P0.4	I/O	SV2	5
P3.3	I/O	SV2	6
P0.3	I/O	SV2	7
P3.4	I/O	SV2	8
P1.7	I/O	SV2	9
P3.5	I/O	SV2	10
P1.6	I/O	SV2	11
P4.0	I/O	SV2	12

Extension board connectors U$2, U$4 and U$8:

UWLink Board			
µC Port/Supply	µC Function	Con-nector	Pin
5V		U$8	11
3V3		U$8	12
3V3		U$8	13
P2.0	Input only	U$8	14
P2.1	Input only	U$8	16
P2.2	Input only	U$8	18
P2.3	Input only	U$8	20
GND		U$8	1…10 15,17,19
3V3		U$2	1
P0.5	I/O	U$2	3
P0.4	I/O	U$2	5
P0.3	I/O	U$2	7
P1.7	I/O	U$2	9
P1.6	I/O	U$2	11
P1.5	I/O	U$2	13
P1.4 / MasterRX	I/O	U$2	15
P1.3 / MasterTX	I/O	U$2	17
P1.2 / SCK	I/O	U$2	19
GND		U$2	2,4,6,8,10 12,14,16,18,20
P3.0	I/O	U$4	2
P3.1	I/O	U$4	4
P3.2	I/O	U$4	6
P3.3	I/O	U$4	8
P3.4	I/O	U$4	10
P3.5	I/O	U$4	12
P3.6	I/O	U$4	14
P3.7	I/O	U$4	16
P4.0	I/O	U$4	18
3V3		U$4	19
3V3		U$4	20
GND		U$4	1,3,5,7,9 11,13,15,17

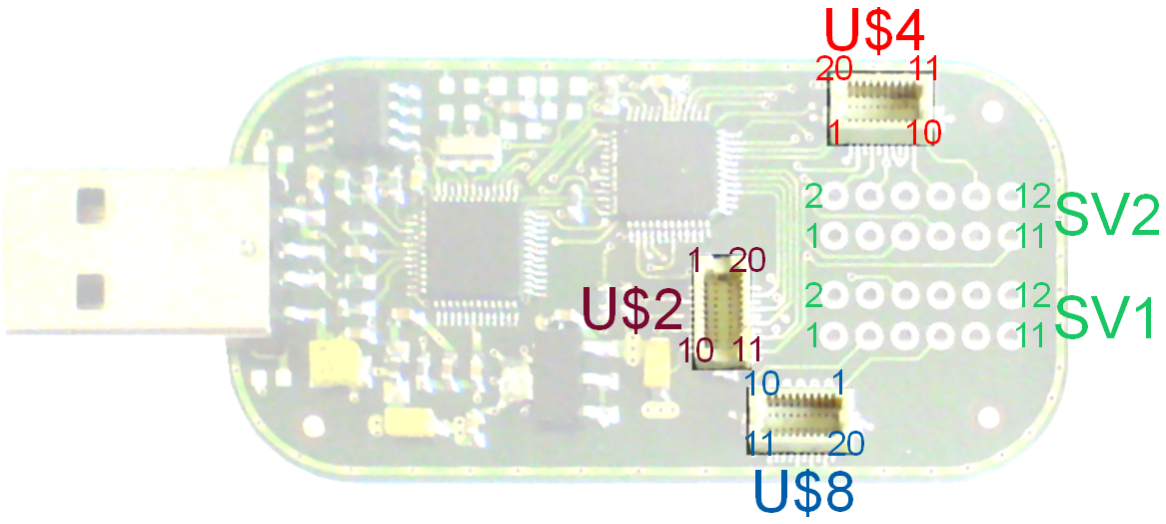


Figure 6 Extension Board Connector details

3 Setup of Software Development Tools

This chapter will guide you step-by-step through the installation of the tool environment. This process consists of the following steps which will be explained in full detail below:

- Download and install Infineon's DAS Tool Interface Software
- Usage of the flash download tooling XC800_FLOAD
- Download and install Keil's C51 µVISION4 Tool Chain
- Setting up a new software project in the Keil development suite

3.1 Step 1 – Download and install DAS Tool Interface Software

This tool provides mainly the link between the flash download utility and the Controller itself.

Attention: The DAS Tool Interface Software must be installed first before you connect the UWLink device to your computer.

With the installation of the DAS Tool Interface Software the low level drivers for the USB interface are provided and the UWLink is accepted by the local host.

Following steps needs to be done:

- Go to **www.infineon.com/DAS** and download the latest DAS package, e.g. DAS Edition v3.0.0
- Extract the **das_edition_vx.y.z** ZIP-archive to a temporary directory on your PC
- Execute **DAS_vxyz_setup.exe** and follow the on-screen instructions
- Connect the UWLink Mainboard via USB to your PC.
- After a view moments all drivers should be installed automatically.
- Now, start the **DAS Device Scanner** PC application. The following window will appear:

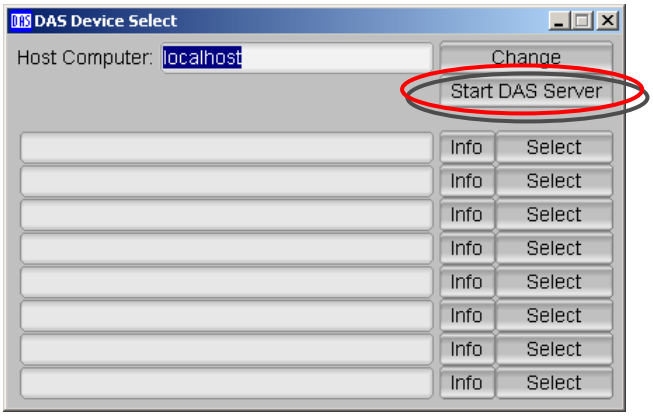


Figure 7 DAS Device Select window

- Click **Start DAS Server** in the DAS Device Select window**.** The **DAS Server Control Panel** will pop up.

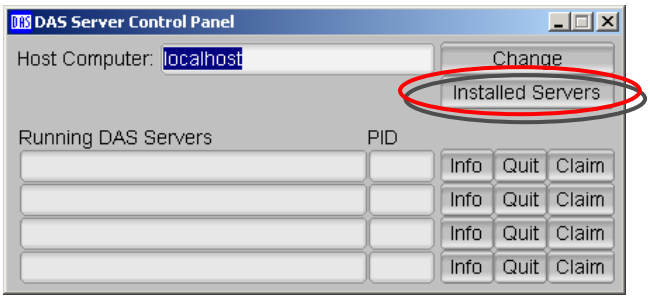


Figure 8 DAS Server Control Panel

- Click **Installed Servers** in the DAS Server Control Panel. The **Installed DAS Servers (IDS)** window will pop up.

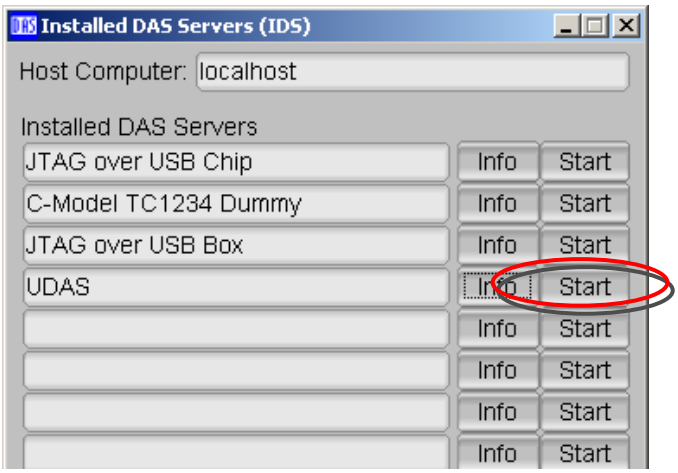


Figure 9 Installed DAS Servers (IDS) window

- Start the **UDAS** server by clicking the related Start button. The Server Control Panel will indicate the successful start of the UDAS server. The **XC800-Family** entry will show up in the Device Select list. The XC886 reset LED on the UWLINK Mainboard will start to illuminate.

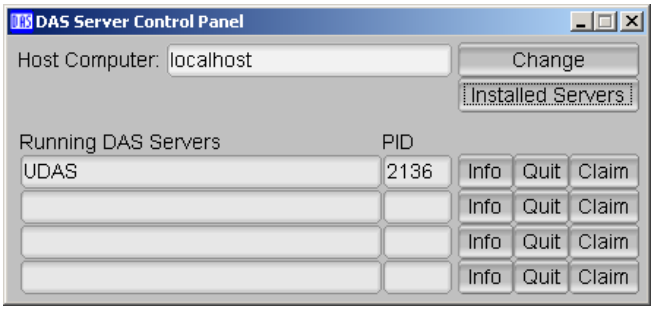


Figure 10 The Server Control Panel showing the running UDAS

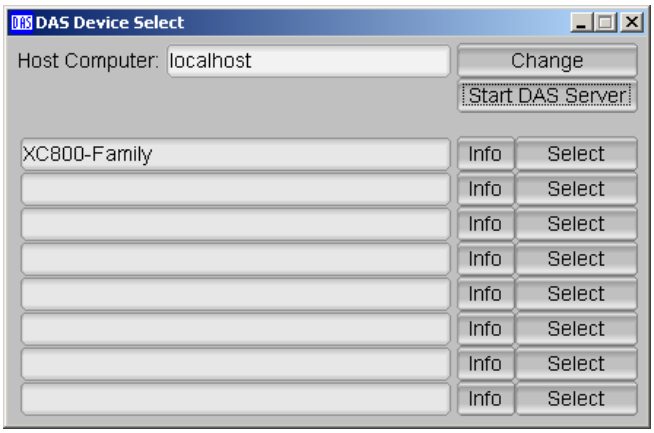


Figure 11 The DAS Device Select window showing the XC800-Family

Now the UWLink Mainboard is ready for communication with the PC via USB.

3.2 Step 2 – Download and install XC800_FLOAD Flash Loader Software

XC800_FLOAD is a free-of-charge MS Windows PC software for downloading XC800-family-microcode (hex code) into the microcontroller's programmable non-volatile on-chip memory (OTP, Flash, EEPROM) or volatile memory (XRAM). Depending on the UWLink usage scenario this may be pre-compiled microcode provided by Infineon (e.g. SILink) or any application microcode programmed by the user (e.g. self-made demo applications created using Keil's µVision Compiler) to be programmed into UWLink's XC886.

Note: In the second case, alternatively, the compiled/assembled code may be flashed directly out of the Keil µVision IDE.

The list below describes the installation and usage of XC800_FLOAD step by step.

- Go to **www.infineon.com/XC800**, click on **XC800 Development Tools**, click on **Software Downloads** and download the latest FLOAD package, e.g. FLOAD5.1a (setup_v5.1a.zip)
- Extract the **setup_vx.y ZIP-archive** to a temporary directory on your PC
- Execute **setup.exe** and follow the on-screen instructions
- Now, start the XC800_FLOAD application
- Adjust the settings as follows:
  - Protocol: **JTAG/SPD**
  - Physical Interface: **UDAS/JTAG over USB**
  - Target Device: **XC88x-8F**
- Select hex-file via file menu, e.g. TESEUS.hex
- Connect to the target (press **Connect button**). After successful connection the light must be green.
- Now the Software is ready to download the hex-file to the target XC886. Press **Download button**.

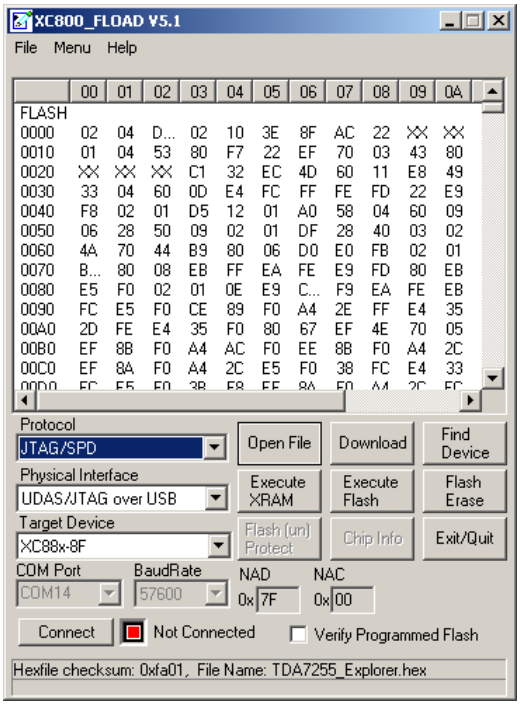


Figure 12 XC800_FLOAD window (hex-file loaded, not connected)

3.3 Step 3 – Download and install Keil C51 µVISION4 Tool Chain

The Keil µVISION4 Integrated Development Environment is a state-of-the-art software development suite available for the majority of microcontroller types on the market. The XC886 MCU family is perfectly integrated into this environment. The tool chain provides following key features:

- Project Management
- Device Initialization
- Source Code Editing
- Target Debugging
- C51 ANSI C optimizing Compiler supports all XC886 devices

Follow these steps to install the Keil C51 µVISION4 Tool Chain:

1. Install the Keil Development Environment for C51 **https://www.keil.com/c51/demo/eval/c51.htm** (user registration required). At the time of creation of this document the latest version is 9.00 as of 1/2010. This demo version of the Keil development environment is limited to a maximum code size of 2 Kbyte. The full flash memory size of the XC886 IC may be utilized by purchasing a full version from Keil.
2. Select *Install Evaluation Software* from the setup menu.
3. Select *C51 Compiler (Eval Tools)* to install Keil µVISION4 and follow the instructions in the installation routine.

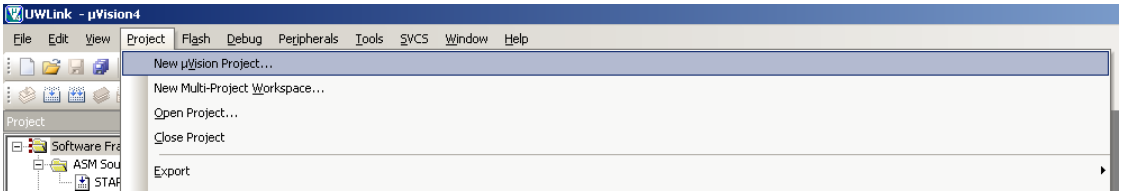
For details please refer to the online documentation from Keil.

Note: It is assumed that the default installation folder (C:\Keil) is used. If any other installation folder is selected during the Keil µVision installation process please replace C:\Keil with your custom installation folder throughout the rest of the installation process.

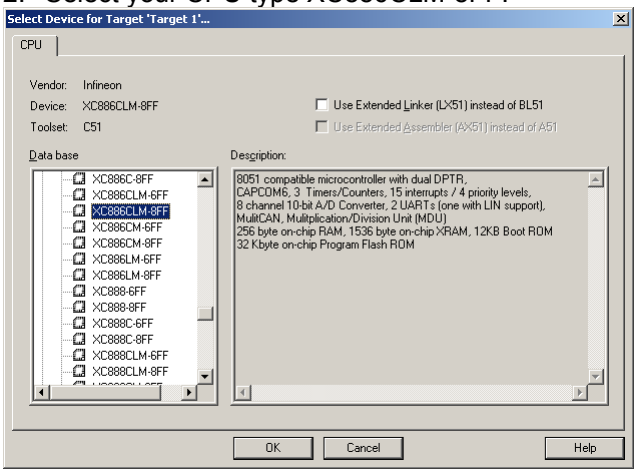
3.3.1 Setting up a Software Project in Keil C51 µVISION4

You can work directly in the example projects of the UWLink Software Framework, or you can setup your own software project for XC886 in Keil C51 µVISION4:

1. Create a new project in µVision

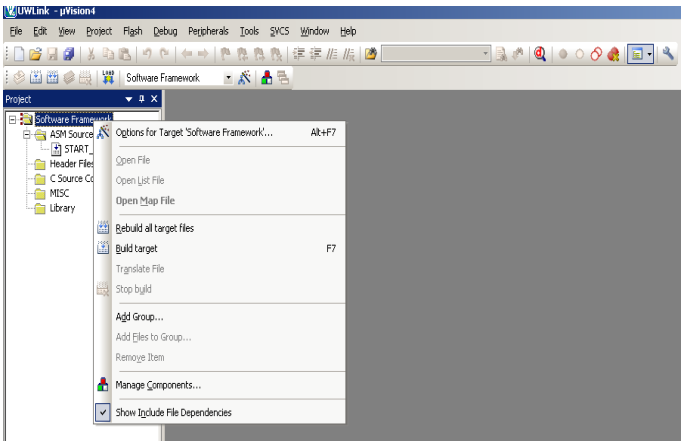


2. Select your CPU type XC886CLM-8FF.

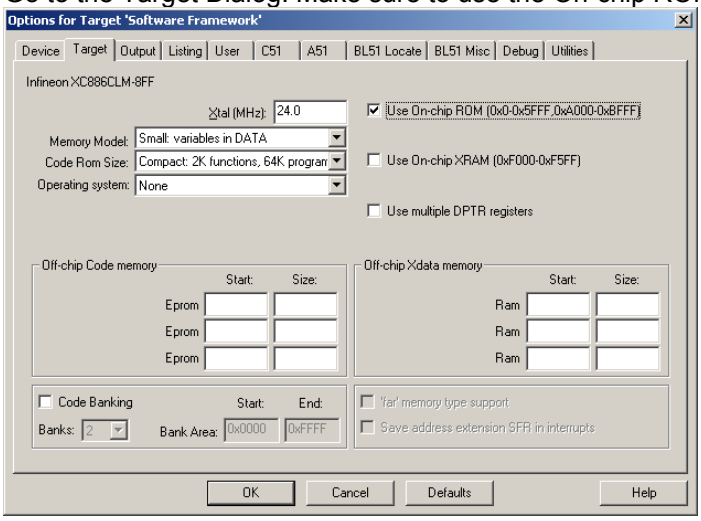


3. Configure your initial Software Project settings. Right click on your project to add and manage
- source files (.c / .a51)
- header files (.h)
- File groups

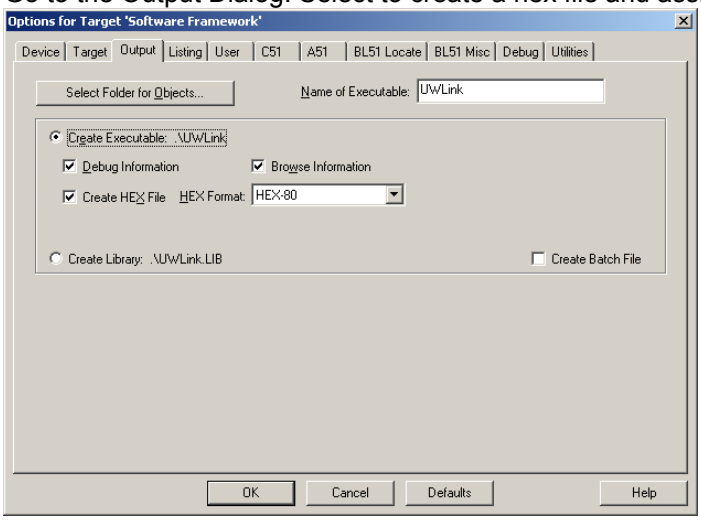
4. Adjust the settings for your project: Right click on your project and click **Options for Target.**



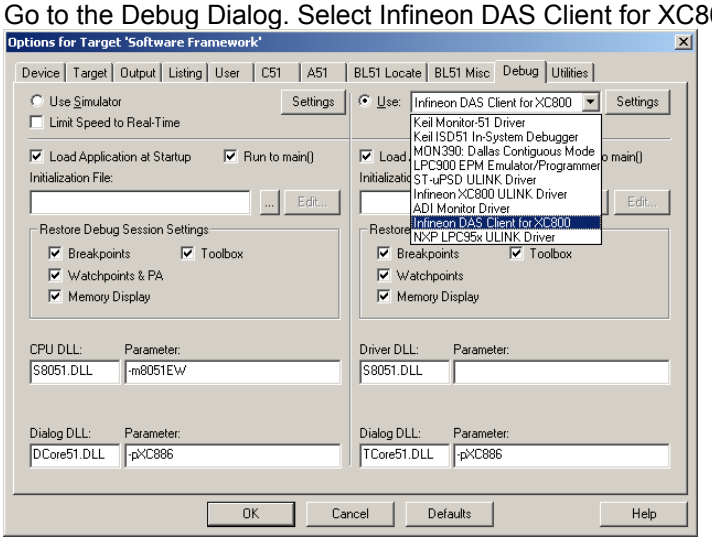
5. Go to the Target Dialog. Make sure to use the On-chip ROM (Flash memory) for code development.



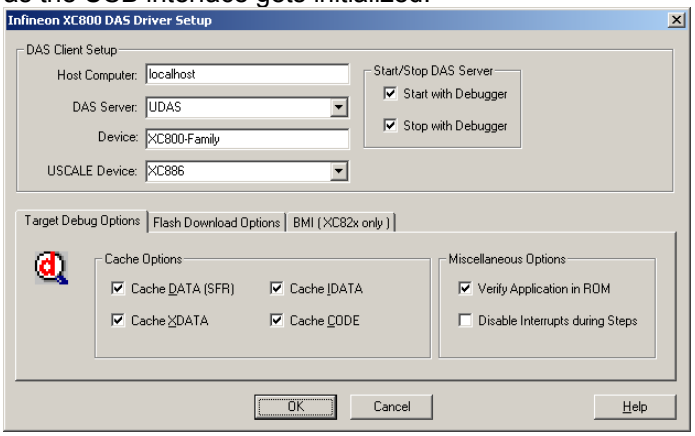
6. Go to the Output Dialog. Select to create a hex file and assign a name to it.



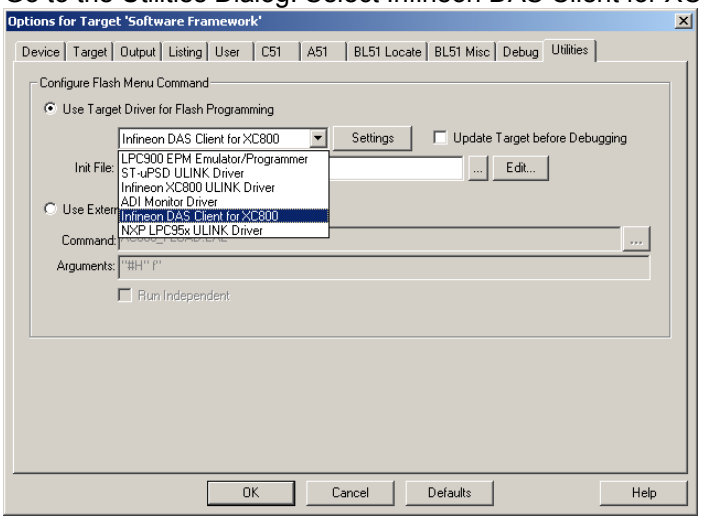
7. Go to the Debug Dialog. Select Infineon DAS Client for XC800



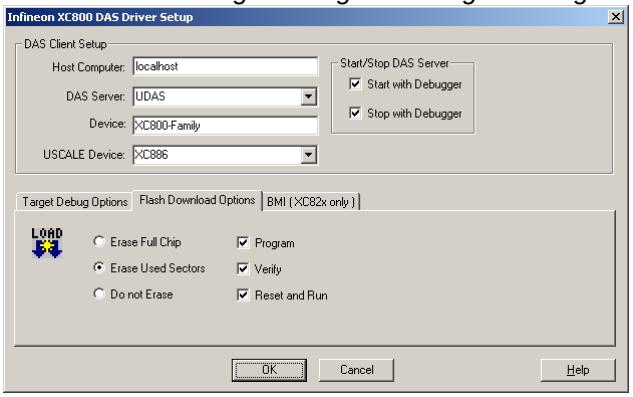
8. Press the Settings button: Note: If it is the first time after connecting your board this may take a few seconds as the USB interface gets initialized.



9. Go to the Utilities Dialog. Select Infineon DAS Client for XC800



10. Press the Settings button. Select the Program Flash option. *Note: If you select the Set Lock option you cannot re-enter Programming- or Debug Mode again.*



For further information about the usage of the Keil C51 µVISION4 environment consult the related documentation provided by Keil.

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