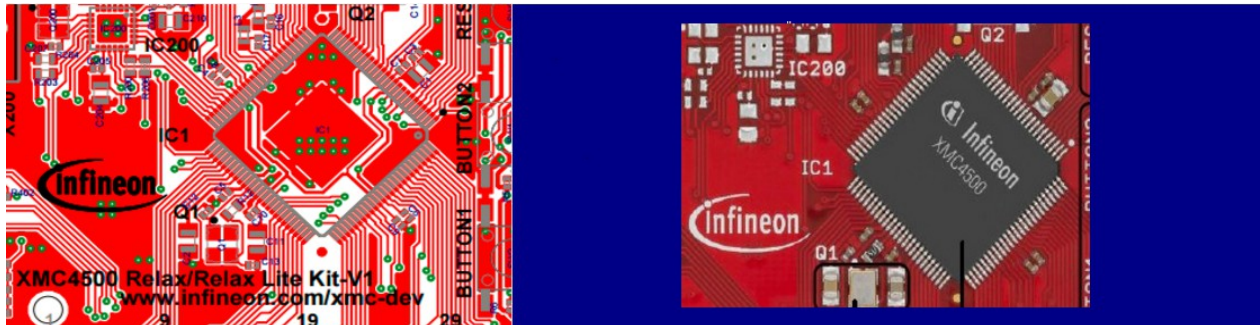




ARM XMC - experiment No. 1



- **E1.1 Name:**

Infineon ARM XMC 4500 Relax Kit – First step

- **E1.2 Overview and purpose:**

The experiment aims to provide an introduction to the ARM Cortex M4 processor family used in Infineon Relax Lite Kit platform and to the development environment DAVE 4.1. We will track the hardware platform implementation details, the power supply signals for extensions, how to transfer the executable code and the debugging capabilities in the development process.

At the end of this experiment, you will have detailed information about the hardware resources of the Infineon Relax Kit platform and the software resources of the DAVE development environment, the additional resource documents, and implementation details of a prototype program for controlling the IO ports.

- **E1.3 Resources:**

<i>Hardware</i>	XMC 4500 Relax Kit development platform (Figure 1.1), extension pins, oscilloscope
<i>Software</i>	DAVE4.1

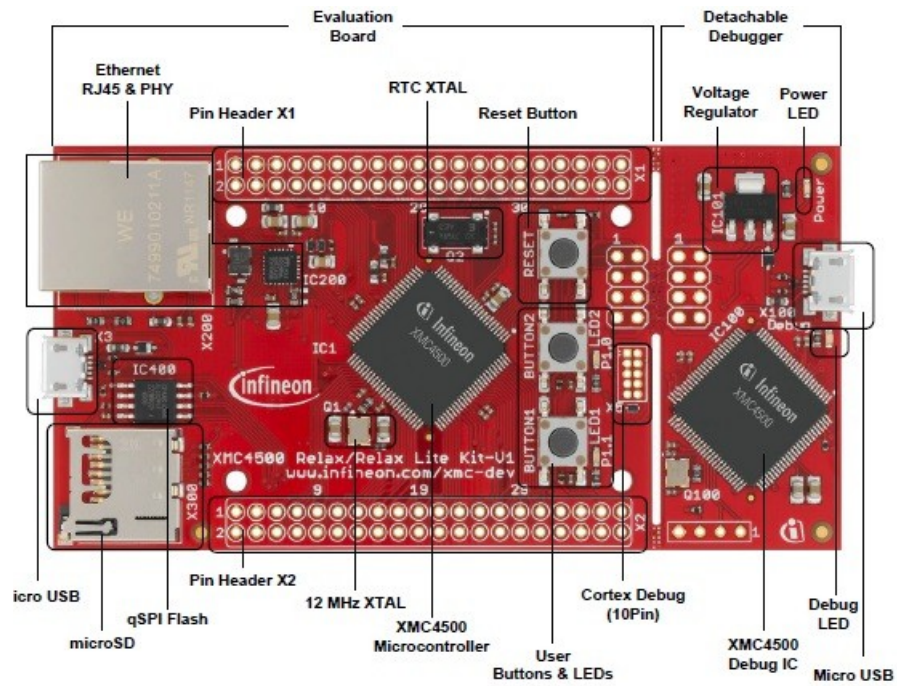


Fig. 1.1 Infineon Relax kit

• E1.4 Software example:

```
/*
 *Experiment no. 1
 *Hello World on XMC 4500 Relax Kit
 *
 * Led1 - P1.0
 * Led2 - P1.1
 */

#include <DAVE.h>

int main(void)
{
    /* Declarations */
    uint32_t t; // used for delay
    DAVE_STATUS_t status; // the Dave_Init status

    /* Initializations */
    status = DAVE_Init(); // DAVE APPs initialization


    /* Validations */
    if(status == DAVE_STATUS_FAILURE)
    {
        /* Placeholder for error handler code. The while loop below can be
        replaced with an user error handler. */
        XMC_DEBUG("DAVE APPs initialization failed\n");

        while(1U)
        {
            ;
        }
    }
}
```




```
    }  
}  
  
/* The main code*/  
while(1U)  
{  
    DIGITAL_IO_ToggleOutput(&DIGITAL_IO_0); //blink LED 2  
    for(t = 0;t<0x3ffff;t++); // delay 3ffff aprox. 1 sec  
    //DIGITAL_IO_ToggleOutput(&DIGITAL_IO_1); //blink LED 1  
    //for(t = 0;t<0x0ffff;t++); // dellay  
}  
}
```

• **E1.5 Method of running experiment:**

- Examine the instruction manual of the Relax Kit platform (http://www.infineon.com/dgdl/Board_Users_Manual_XMC4500_Relax_Kit-V1_R1.2_released.pdf?fileId=db3a30433acf32c9013adf6b97b112f9&ack=t)
- Identify the supply circuits and the signal distribution for extension pins;
- Explore the DAVE apps and add to the project the DIGITAL_IO module
 DIGITAL_IO [4.0.1]
- Configure pin P1.0 as digital output ;
- Generate code;
- Build project;
- Press the DEBUG button and test/execute your code on XMC;

• **E1.6 Problems proposed:**

1. Modify the prototype project to activate LED1;
2. Create a program that activates the LED1 when button 1 is pressed;
3. Using CLOCK_XMC1 module  CLOCK_XMC1 [4.0.0] modify the clock CPU signal frequency and rerun the problem 1;
4. Using the extension pins show the maximum frequency that can be generated on an output port;
5. Create a program that can simultaneously activate LED1 and LED2 when button 2 is pressed ;

• **E1.7 The experiment can be extended to be used for:**

- WEB servers for instrumentations through Internet;



- WEB servers for Internet of Things;
- Industrial controller for motors;
- Renewable Energy;

• **E1.8 More helpful information:**

1. **Infineon ARM Microcontroller** -
[http://www.infineon.com/cms/en/product/channel.html?
channel=db3a30433c1a8752013c3e221b9d004f](http://www.infineon.com/cms/en/product/channel.html?channel=db3a30433c1a8752013c3e221b9d004f)
2. **ARM general presentation** - [http://www.infineon.com/dgdl/Infineon-XMC_32-Bit-
Industrial-Microcontrollers-Brochure_2015-BC-v00_00-EN.pdf?
fileId=db3a30434441da190144442189d3003c](http://www.infineon.com/dgdl/Infineon-XMC_32-Bit-Industrial-Microcontrollers-Brochure_2015-BC-v00_00-EN.pdf?fileId=db3a30434441da190144442189d3003c)
3. **Internet for Instrumentation** - [http://www.infineon.com/dgdl/Infineon-XMC_32-Bit-
Industrial-Microcontrollers-Brochure_2015-BC-v00_00-EN.pdf?
fileId=db3a30434441da190144442189d3003c](http://www.infineon.com/dgdl/Infineon-XMC_32-Bit-Industrial-Microcontrollers-Brochure_2015-BC-v00_00-EN.pdf?fileId=db3a30434441da190144442189d3003c)
4. **Intelligent lightning**
[http://www.infineon.com/dgdl/Infineon_General_Lighting_Brochure_2014_v1.pdf?
fileId=db3a304327b897500127f76de0b2654b](http://www.infineon.com/dgdl/Infineon_General_Lighting_Brochure_2014_v1.pdf?fileId=db3a304327b897500127f76de0b2654b)
5. **Development platforms** - [http://www.infineon.com/cms/en/product/microcontroller/32-
bit-industrial-microcontroller-based-on-arm-registered-cortex-registered-m/32-bit-
xmc1000-industrial-microcontroller-arm-registered-cortex-registered-m0/xmc-
development-tools-kits-and-boards/channe](http://www.infineon.com/cms/en/product/microcontroller/32-bit-industrial-microcontroller-based-on-arm-registered-cortex-registered-m/32-bit-xmc1000-industrial-microcontroller-arm-registered-cortex-registered-m0/xmc-development-tools-kits-and-boards/channe)
6. **Where can I get Infineon DAVE?** -
[http://www.infineon.com/cms/en/product/channel.html?
channel=db3a30433580b37101359f8ee6963814](http://www.infineon.com/cms/en/product/channel.html?channel=db3a30433580b37101359f8ee6963814)
7. **Infineon XMC2GO release** - <https://www.youtube.com/watch?v=gvsR-10HP6o>
8. **ARM Keil IDE for Infineon XMC** - <http://www2.keil.com/mdk5>