XC2287M HOT
Solution ASC

Uses a timer triggered LED to toggle with ASC Interrupt

Device: XC2287M-104F80
Compiler: Tasking Viper 2.4r1
Code Generator: DAvE 2.1
Hello World with ASC

Let’s get started now!
XC2287M HOT Exercise ASC
Interaction of Development Tools

IDE

Compiler
Assembler
Linker
Locator

Debugger/Emulator
debugger

Programming Tool

Target

DAvE

int main(){
    char a;
    long b;
    ...

SW    HW
In this exercise you will:

- Configure the XC2287M with DAvE
- Configure USIC 0 Channel 0 as a UART
- Receive a character from a PC and generate a receive interrupt
- Transmit the received data back to the PC
- Toggle one of the LED’s on the board on receipt of every character
HOT Exercise ASC Block Diagram

- **Rs 232 via USB**
  - RXD: P7.4
  - TXD: P7.3

**USIC 0 – ASC 0**
- Receive Buffer
- Transmit Buffer
- U0C0 Receive IRQ
  - Priority 3

**PC**
- TxD
- RxD

**Transfer by Interrupt handler**

**ASC RX Interrupt**
- Received Character -> U0C0 ASC TX (Sends Received character)
- Clear ASC status register

**Exit**
HOT Exercise ASC  
Start DAvE

- **Start DAvE**  
  - Click on the

- **Create a new project** (Startup Dialog pop up automatically)
  
  - Click on ‘Create a new project’ or select File -> New
  
  - Select microcontroller: ‘XC2287M’
HOT Exercise ASC
Select Device
HOT Exercise ASC - DAvE Configurations

- Project Settings
- Close the window
HOT Exercise ASC - DAvE Configurations
Save DAvE Project

- Save your DAvE project

  - Path: C:\IFX_HOT\XC2287M\Examples\ASC
  
  - Project name: ASC\ASC.dav
Save your DAvE Project File

1. Open the Save Project As dialog box.
2. Select the ASC folder.
3. Enter the date name as ASC.dav.
4. Click on the Speichern button to save the project.
HOT Exercise ASC - DAvE Configurations
ASC settings

- **XC2287M**
  - **USIC0**: Click on the

![DAvE XC2287M (Release v2.0)](image)
Configure ‘Protocol’

- Select ASC for USIC0 (U0C0)
- Close the windows by pressing
HOT Exercise ASC - DAvE Configurations
ASC settings (cont.)

- **XC2287M**
  - **USIC0, CH0:**
    - Click on the CH 0
Configure ASC – General

- Enable module
- Pin selection – Transmit (TxD) P7.3, Receive (RxD) P7.4
- Others- default
Configure ASC – Control

- Click on ‘Receive Interrupt’
Configure ASC – Interrupts

- Drag 'U0C0 OIC INT' from Level 0 to Level 3, Group 0
Configure ASC – Functions

- Click on 'U0C0_ASC_vInit'
- Click on 'U0C0_ASC_vSendData'
- Click on
HOT Exercise ASC - DAvE Configurations

**XC2287M**

- **Port:**
  - Click on the
HOT Exercise ASC - DAvE Configurations
Port settings

- **Parallel Ports**
  - **Ports:**
    - Configure Port 10
Configure Port 10

- Use P10.0 as general IO
- Set Direction to Out
- Close the window
Parallel Ports

Functions:
- Include ‘IO_vInit’
- Include ‘IO_vTogglePin’
HOT Exercise ASC - DAvE Configurations

Save DAvE Project

- Save your DAvE Project File
  - Go to File → Save (or Save As) or click on
  - Filename entered previously:
    “c:\IFX_HOT\XC2287M\Examples\ASC\ASC.dav”
Let DAvE Generate Code for You

- Go to **File → generate Code** or click on

- DAvE generated code files are
  - MAIN.C, MAIN.H
  - U0C0.C, U0C0.H
  - USIC0.C, USIC0.H
  - IO.C, IO.H
  - SCS.C, SCS.H
  - XC22XXREGS.H
Create New Work Space

- Click on
- Filename: "c:\IFX_HOT\XC2287M\Examples"
- Click 'OK'
HOT Exercise ASC – Tasking VX Toolset

- Create New Project

- Click on Workbench
Import DAVE Project

- Click on File -> Import
- Select Tasking VX-toolset for C166...
- Click ‘OK’
- Import DAVE Project
  - Click `Infineon DAvE C166 Project`
  - Click `Next`
- Import DAvE Project
- Add Dave Project ‘ASC’
- Click ‘Finish’
**HOT Exercise ASC – Tasking VX Toolset**

- **Configure Target Board**
  - Select the project in the navigator
  - Select ‘Project/Target Board Configuration’
  - Select ‘Infineon XC2000/XE166 Easykit Board’
  - Choose ‘XC2287M-104F’
  - Click ‘Finish’
Software Hint

DAvE doesn’t change code that is inserted in the ‘USER CODE’ sections if you let DAvE regenerate the code. Therefore, whenever adding code to the generated code, write it into a ‘USER CODE’ section.

The code you really have to add looks like this:

```c
while(1)
{
    // USER CODE BEGIN (Main,4)
    BlinkLED();
    // USER CODE END
}
```
void U0C0_ASC_vi0IC(void)
{
    // USER CODE BEGIN (ASC0IC,2)
    // USER CODE END
    if (U0C0_PSR & 0x4000)
    {
        // USER CODE BEGIN (ASC0IC,4)
        IO_vTogglePin(IO_P10_0);
        U0C0_ASC_vSendData (U0C0_RBUF);
        // USER CODE END
        U0C0_PSCR |= 0x4000;         // clear PSR_RIF
    }
    // USER CODE BEGIN (ASC0IC,15)
    // USER CODE END

    // End of function U0C0_ASC_vi0IC
Click on ‘Build Project ASC’
Note: It is recommended to use the latest DAS version. Download the latest version at www.infineon.com\DAS
HOT Exercise ASC - Device Access Server

1.) Checking USB connections

This gets identified only when COM port is used:
- Via the USB interface on the Easykit with FTDI chip

The DAS JTAG composite device gets identified:
- When miniWiggler is connected
- When USB Wiggler Box is connected
- Via the USB interface on the Easykits with FTDI chip
HOT Exercise ASC - Device Access Server

2.) Check DAS status

1. Start DAS device scanner
2. Start DAS Server Control panel

3. If DAS device scanner does not show any device, start the appropriate DAS server

Incase you are connected via the USB Wiggler box, then start „JTAG over USB Box“

Incase you are connected via the FTDI chip or mini wiggler, then start „UDAS“
3.) Starting the servers manually

4. Incase „UDAS“ server is started and XC2000 easykit is connected via on-chip FTDI or via separate miniWiggler, following status changes could be noted.

5. Incase „JTAG over USB Box“ server is started and XC2000 starter kit is connected via Wiggler box, following status changes could be noted.
Connect XC2287M Board to PC

Modify The DIP Switch Settings, S102: **OFF-OFF-OFF-OFF-OFF**
(Start from Internal Flash)

Reset The Board (Press The Reset Button)
HOT Exercise ASC – Tasking VX Toolset
Run Debugger

1. Click on "Resume" and start program.
With the FTDI chip an on board, USB interface can be used for UART. FTDI device will converts the USB protocol the ASC protocol. Both USB and UART can be used at the same time.

Open Device Manager and check which COM port is activated for the FTDI chip.
HOT Exercise ASC
Start HyperTerminal

1. Start->Programs->Accessories->Communications->HyperTerminal
2. Enter any name and click ‘OK’
3. Connect using: COMx (COM port activated for the FTDI chip)
4. Click ‘Configure’ to enter Port settings
5. Select 19200 baud, no Parity, 8 Data Bits and 1 Stop Bit
6. Click ‘OK’
Start typing

- Enter ASCII characters in the HyperTerminal

- The characters you enter are sent to the XC2287M and back to the Terminal Program so that you can read them on the screen

- The characters are not sent directly from the keyboard to the screen!
  - Hold the reset button down to verify that the screen no longer displays the typed characters
The yellow LED will toggle when the ASC sending the data back.
HOT Exercise ASC – Tasking VX Toolset
Run Debugger

Verifications

- Click on ‘Suspend’
- Click on ‘Restart’
- The LED no longer toggles when a key is pressed
- Click on ‘Resume’
- LED toggles again when a key is pressed