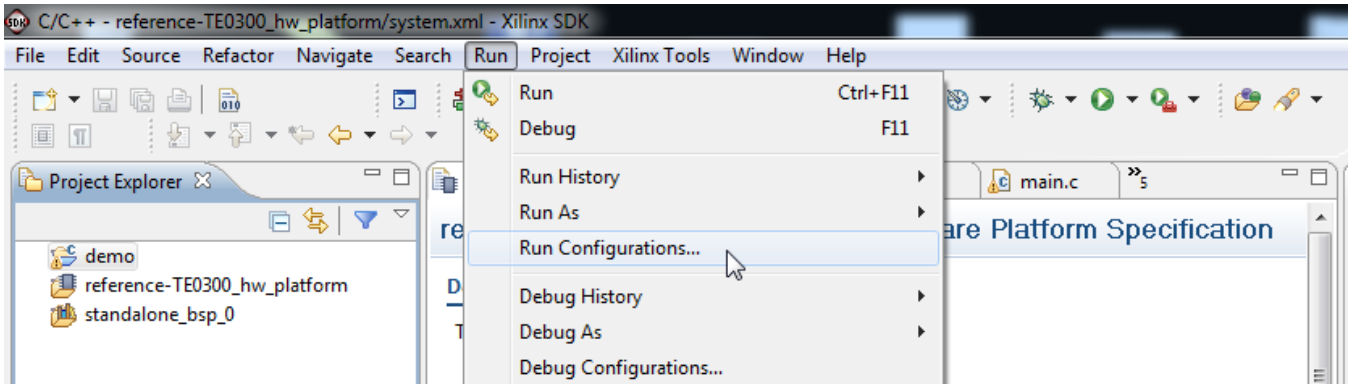
# Run the demo project

## Configure debug and run operation

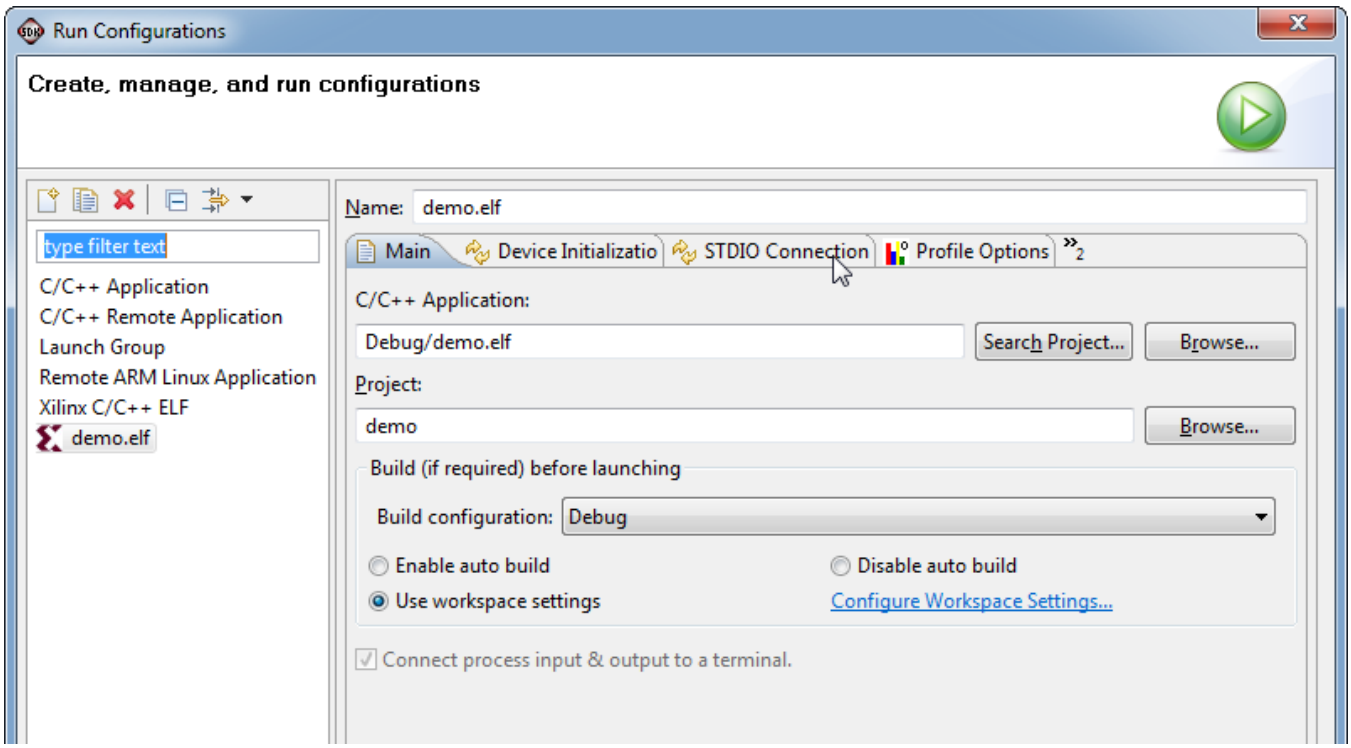
Before you could run the "demo.elf" file on MicroBlaze you should configure the "stdio output".

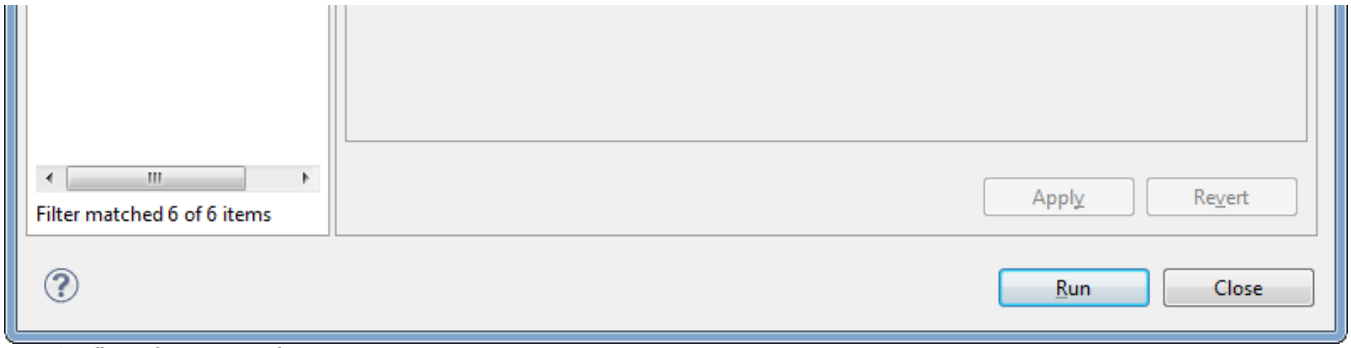
You shoud click "Run">"Run Configurations...".




**Open "Run Configurations"**

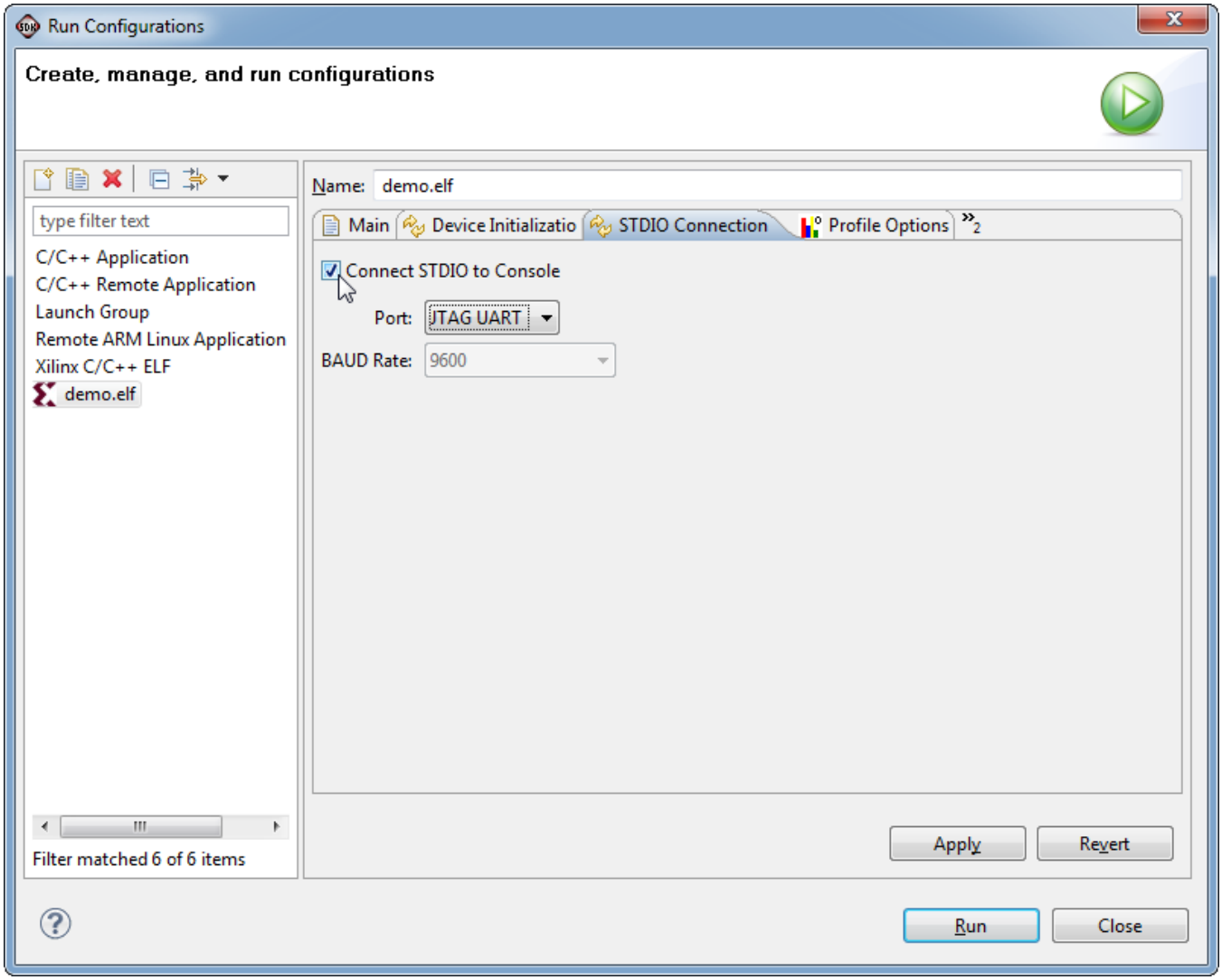
A pop-up "Run Configutations" will appear. Click "demo.elf" (if it is not already selected) and then click "SDIO Connection" tab.


Run Configurations
Create, manage, and run configurations
type filter text
C/C++ Application
C/C++ Remote Application
Launch Group
Remote ARM Linux Application
Xilinx C/C++ ELF
demo.elf
Name: demo.elf
Main
Device Initializatio
STDIO Connection
Profile Options
C/C++ Application:
Debug/demo.elf
Search Project...
Browse...
Project:
demo
Browse...
Build (if required) before launching
Build configuration: Debug
Enable auto build
Disable auto build
Use workspace settings
Configure Workspace Settings...
Connect process input & output to a terminal.




**"Run Configurations" opened**

Check (✓) the box "Connect STDIO to Console" and select as port "JTAG UART". Then click "Apply" button.



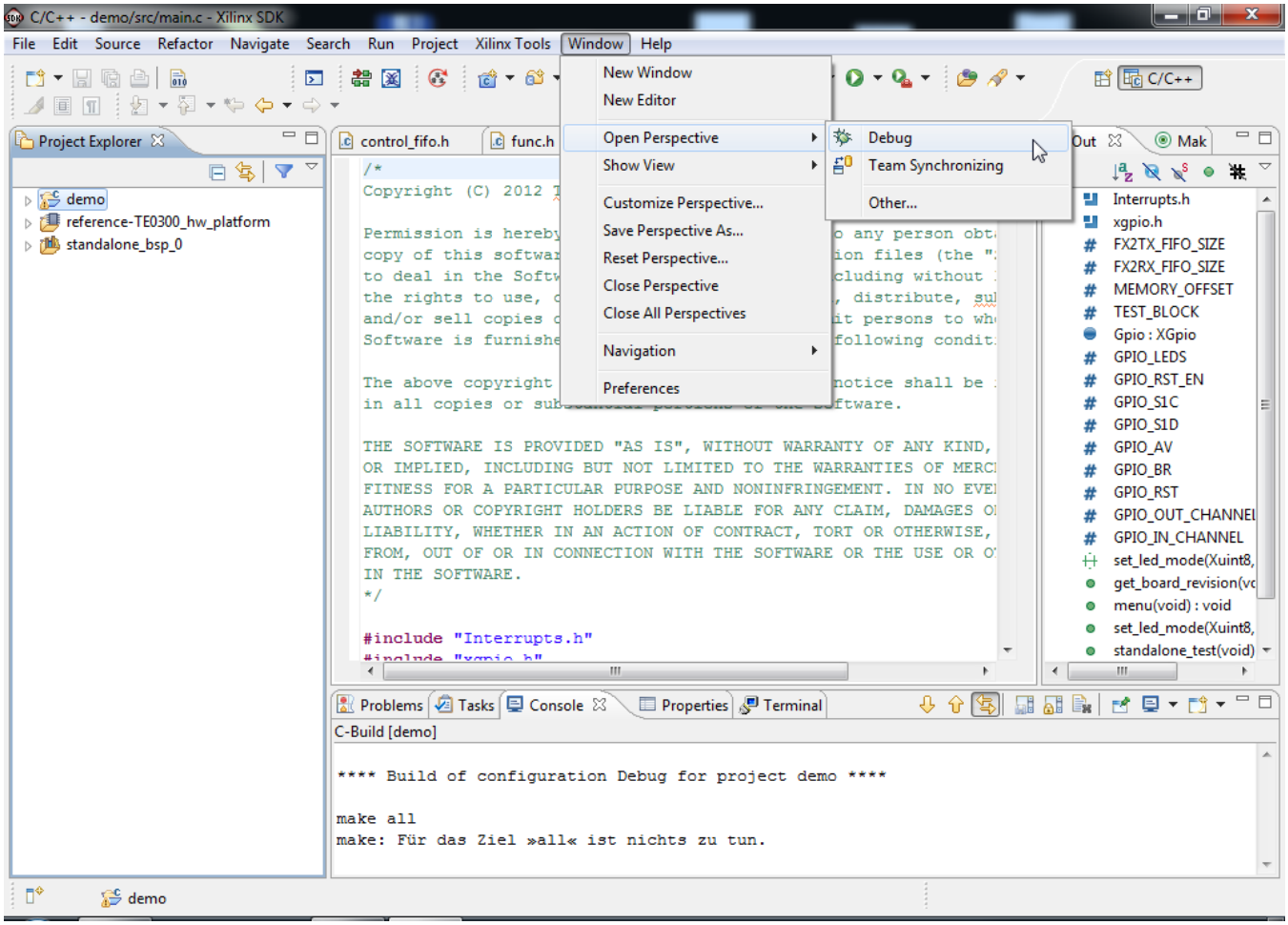

**Connect STDIO to Console**

Then click "Close" button. The pop-up will close.

The Debug operation normaly share these settings, so you doesn't need to repeat this procedeure for debug operation but is better to check the settings (it is better to be on the safe side).

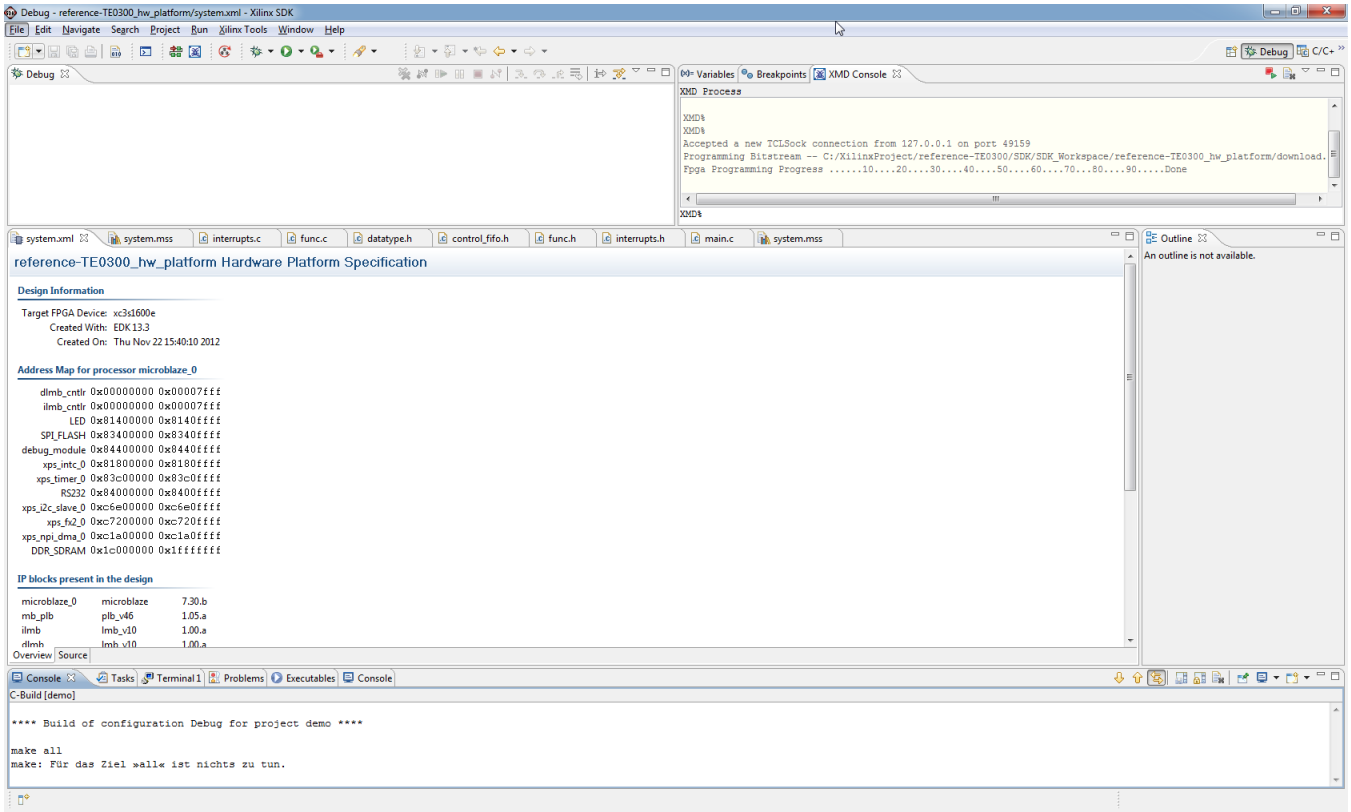
## Change perspective from "C/C++" to "Debug"

To change perspective you should click "Window">"Open Perspective">"Debug".




**Open Debug Perspective**

The new perspective is the following.




**Debug perspective opened**

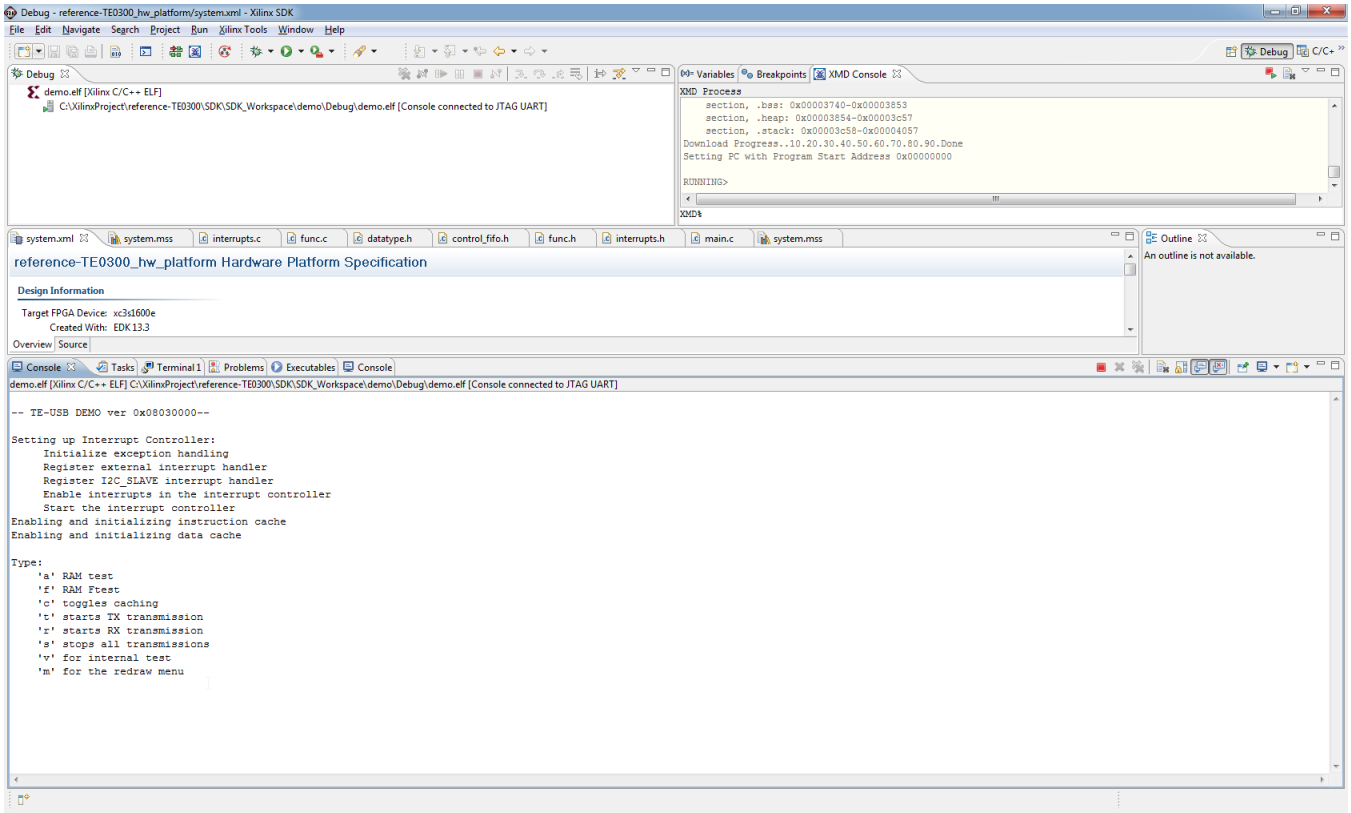
# Use the *"demo"* project with the XMD UART

> Demo program (running on MicroBlaze) will work even in case the UART port is left unconnected: it is not necessary to use a USB/Uart converter or Uart port on a PC, if you are using XMD UART HDL block.

With this application, you can test the PC USB JTAG FPGA communication using a simulated UART (XMD_UART) on JTAG/USB connection.

## GUI procedure

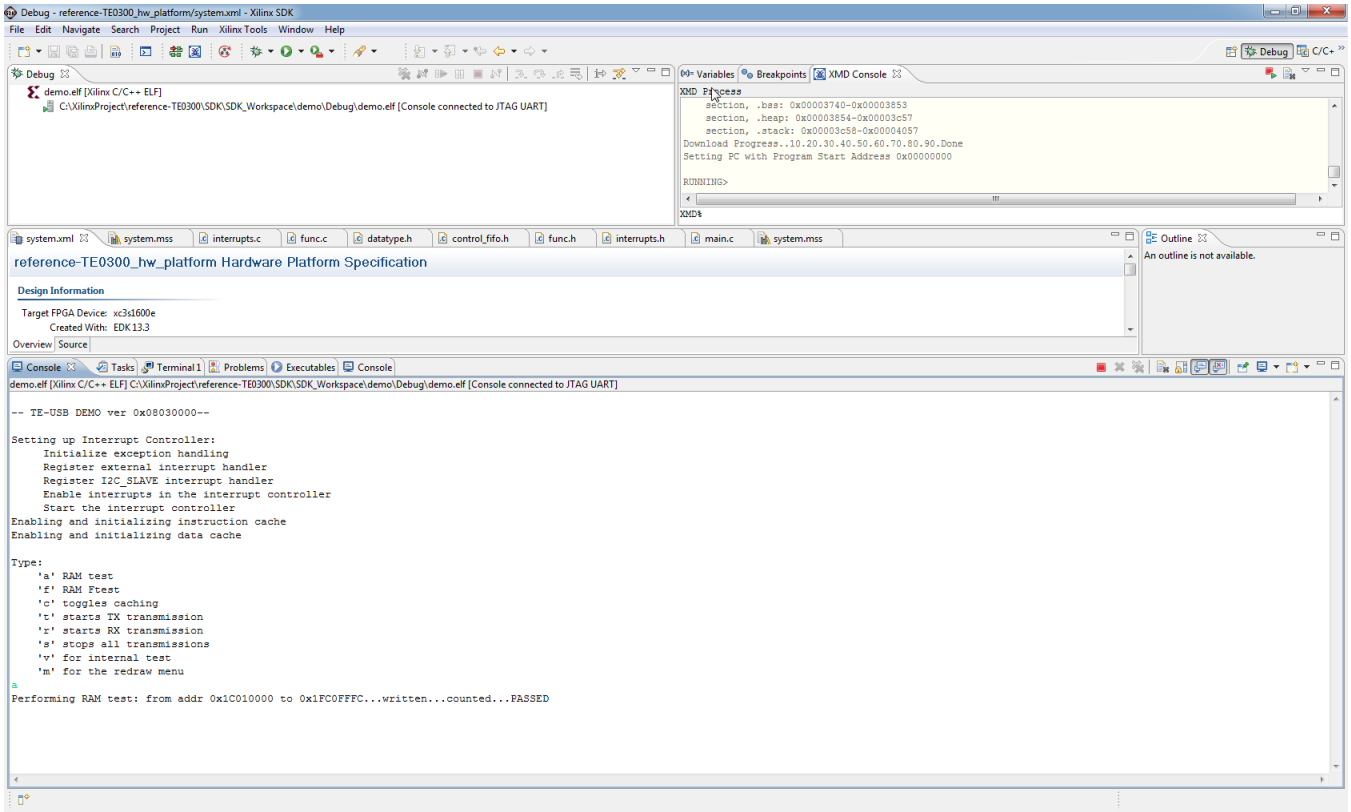
In this simple case you can simply click "Run" > "Run"



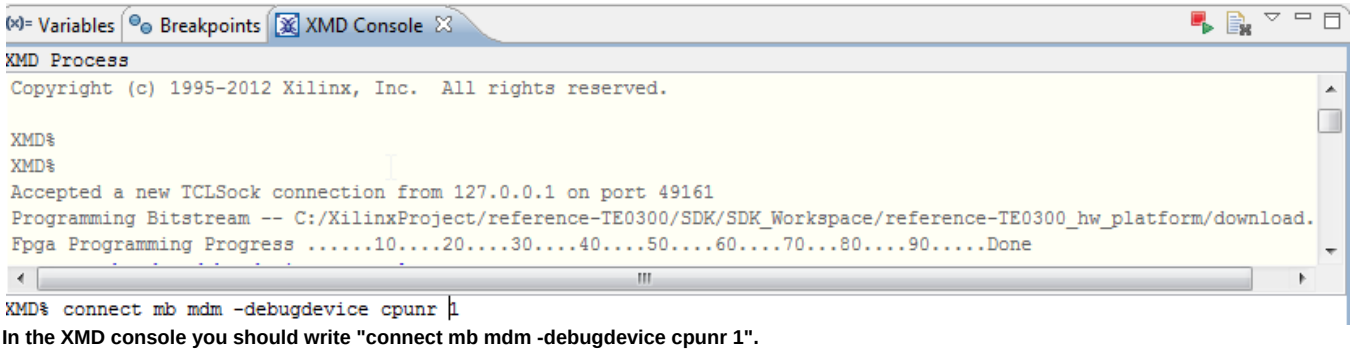

**demo.elf downloaded and connected to Jtag-Uart**

In the console the menu of demo.elf should appear. If the menu doesn't appear you have probably set RS232 instead of debug (mdm) and/or set incorrectly "Stdio output".

If you write the character "a" the RAM test should start.




# XMD procedure




**In the XMD console you should write "connect mb mdm -debugdevice cpunr 1".**

In the XMD console you shoud write "rst" and then click "return" on the keyboard.

```
Variables  Breakpoints  XMD Console
XMD Process
Connected to "mb" target. id = 0
Starting GDB server for "mb" target (id = 0) at TCP port no 1234
XMD% rst
System reset successfully

0
XMD%
XMD% dow C:/XilinxProject/reference-TE0300/SDK/SDK_Workspace/demo/Debug/demo.elf
```

**In the XMD console you should write "dow C:/XilinxProject/reference-TE0300/SDK/SDK_Workspace/demo/Debug/demo.elf" and then click "return" on the keyboard.**

```
Variables  Breakpoints  XMD Console
XMD Process
    section, .heap: 0x00003854-0x00003c57
    section, .stack: 0x00003c58-0x00004057
Download Progress..10.20.30.40.50.60.70.80.90.Done
Setting PC with Program Start Address 0x00000000
System Reset .... DONE

XMD%
XMD% run
```

**In the XMD console you shoud write "run" and then click "return" on the keyboard.**

```
Variables  Breakpoints  XMD Console
XMD Process
Setting PC with Program Start Address 0x00000000
System Reset .... DONE

XMD% run

RUNNING> 0
XMD%
XMD% terminal -jtag_uart_server 4321
```

**In the XMD console you shoud write "terminal -jtag_uart_server 4321" and then click "return" on the keyboard.**

After this  you should open some terminal emulators (because you want to input/output some characters with the XMD UART), such as

- Microsoft / Hilgraeve HyperTerminal (usually included in Windows before Vista START MENU > All programs > Acessories > Communications > Hyper Terminal).
- ClearTerminal (very easy)

Connect using the following settings:

- No Host address
- Port Number: 4321
- TCP/IP connection type (client)

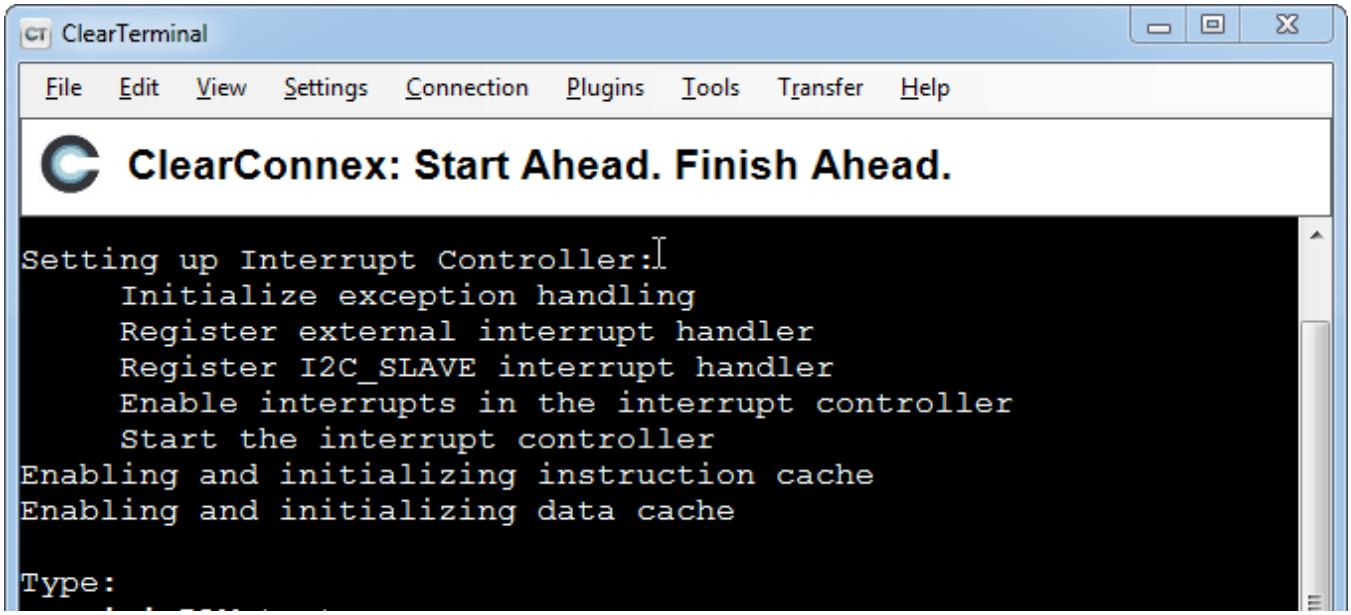
The UART settings (not required by ClearTerminal) are:

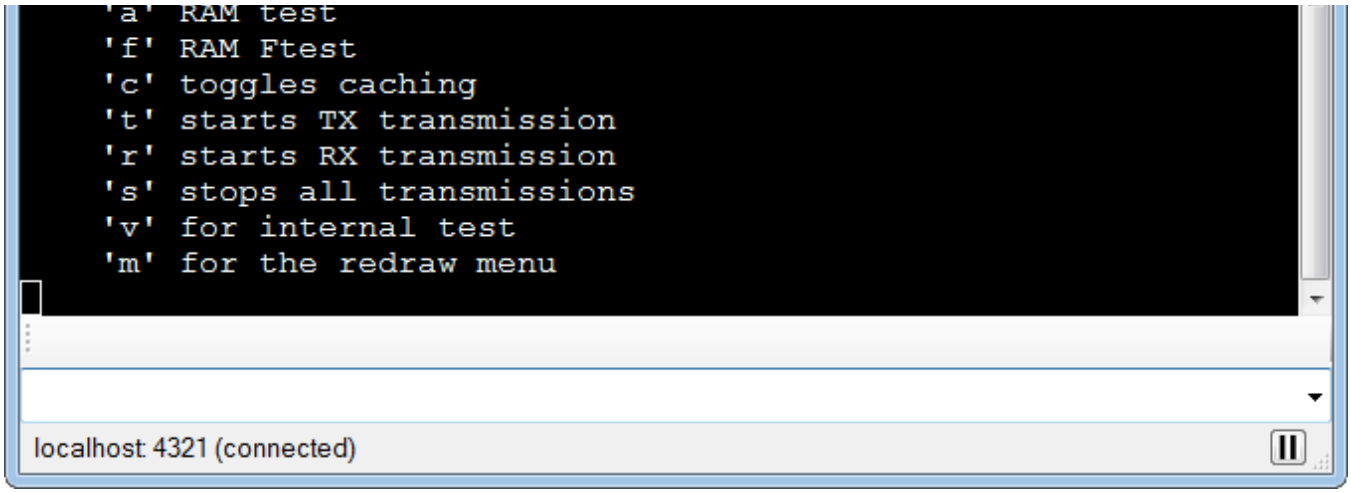
- bits per seconds: 115,200
- data bits: 8
- parity: none
- stop bits: 1
- flow control: none (otherwise you will not be able to enter commands)

In the XMD console you shoud write "stop" and then click "return" on the keyboard.

In the XMD console you shoud write "run" and then click "return" on the keyboard.

After this two further step the menu of "demo.elf" should appear in the terminal emulator.

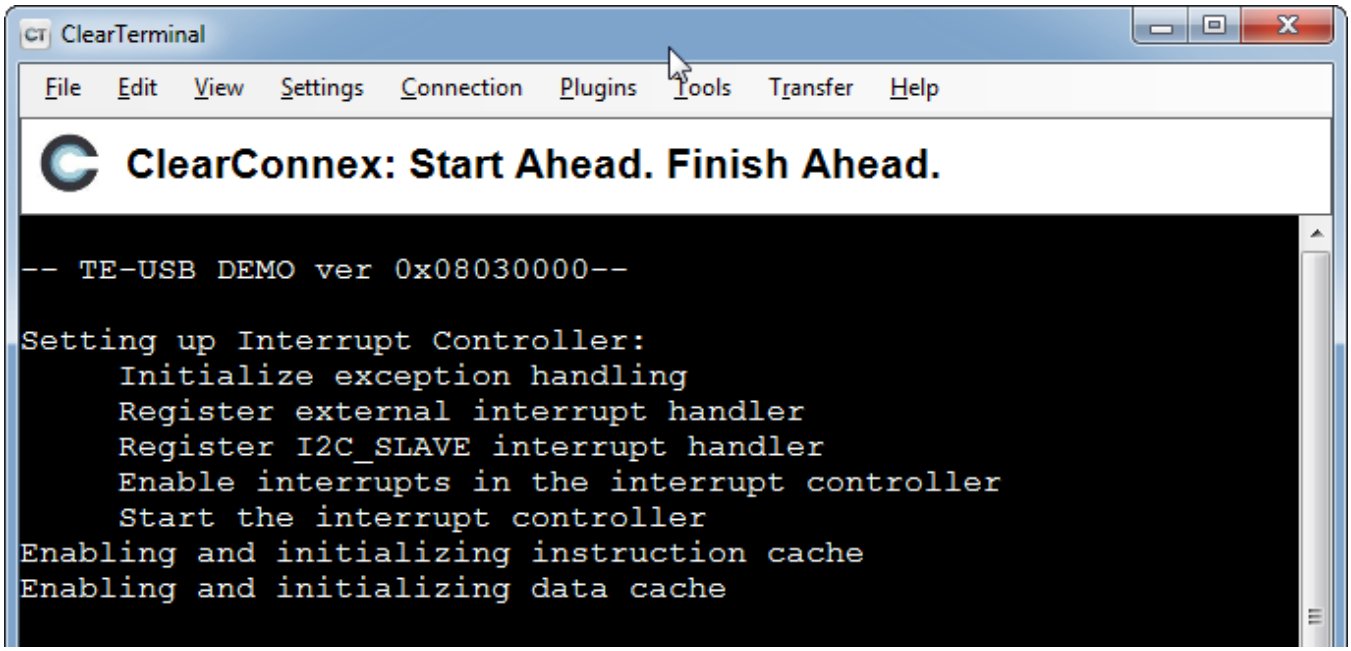

ClearTerminal
File Edit View Settings Connection Plugins Tools Transfer Help
ClearConnex: Start Ahead. Finish Ahead.
Setting up Interrupt Controller:
Initialize exception handling
Register external interrupt handler
Register I2C_SLAVE interrupt handler
Enable interrupts in the interrupt controller
Start the interrupt controller
Enabling and initializing instruction cache
Enabling and initializing data cache
Type:

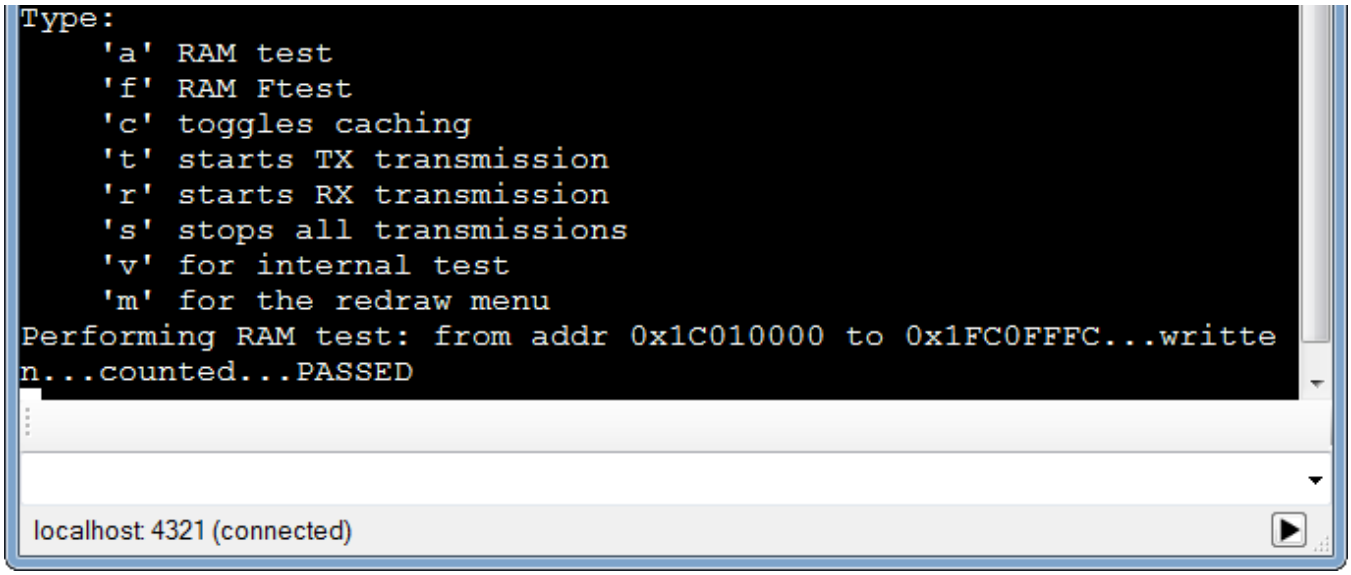



**After this two further step the menu of "demo.elf" should appear in the terminal emulator.**

In the console the menu of demo.elf should appear. If the menu doesn't appear you have probably set RS232 instead of debug (mdm) and/or set incorrectly "Stdio output".

If you write the character "a" the RAM test should start.


ClearTerminal
File Edit View Settings Connection Plugins Tools Transfer Help
ClearConnex: Start Ahead. Finish Ahead.
-- TE-USB DEMO ver 0x08030000--
Setting up Interrupt Controller:
Initialize exception handling
Register external interrupt handler
Register I2C_SLAVE interrupt handler
Enable interrupts in the interrupt controller
Start the interrupt controller
Enabling and initializing instruction cache
Enabling and initializing data cache




**If you write the character "a" the RAM test should start.**

## Use the *demo* project without the XMD UART

To use the *demo* project without the XMD UART, you need to use "RS232" instead of "debug_module" as standard in/out port. Otherwise the application running on the Microblaze processor freezes if you disconnect the XMD. To accomplish that you need to set up the Microblaze "Software Platform Settings".

- In the dialog window select "OS and libraries" in the left window and pick "RS232" as a stdout and stdin interface.
- Then rebuild the software and download again the project to the FPGA.

The UART is then redirected to external pins, which are defined in the *data/system.ucf* file.

> The UART settings are:
>
> - bits per seconds: 115,200
> - data bits: 8
> - parity: none
> - stop bits: 1
> - flow control: none (otherwise you will not be able to enter commands)

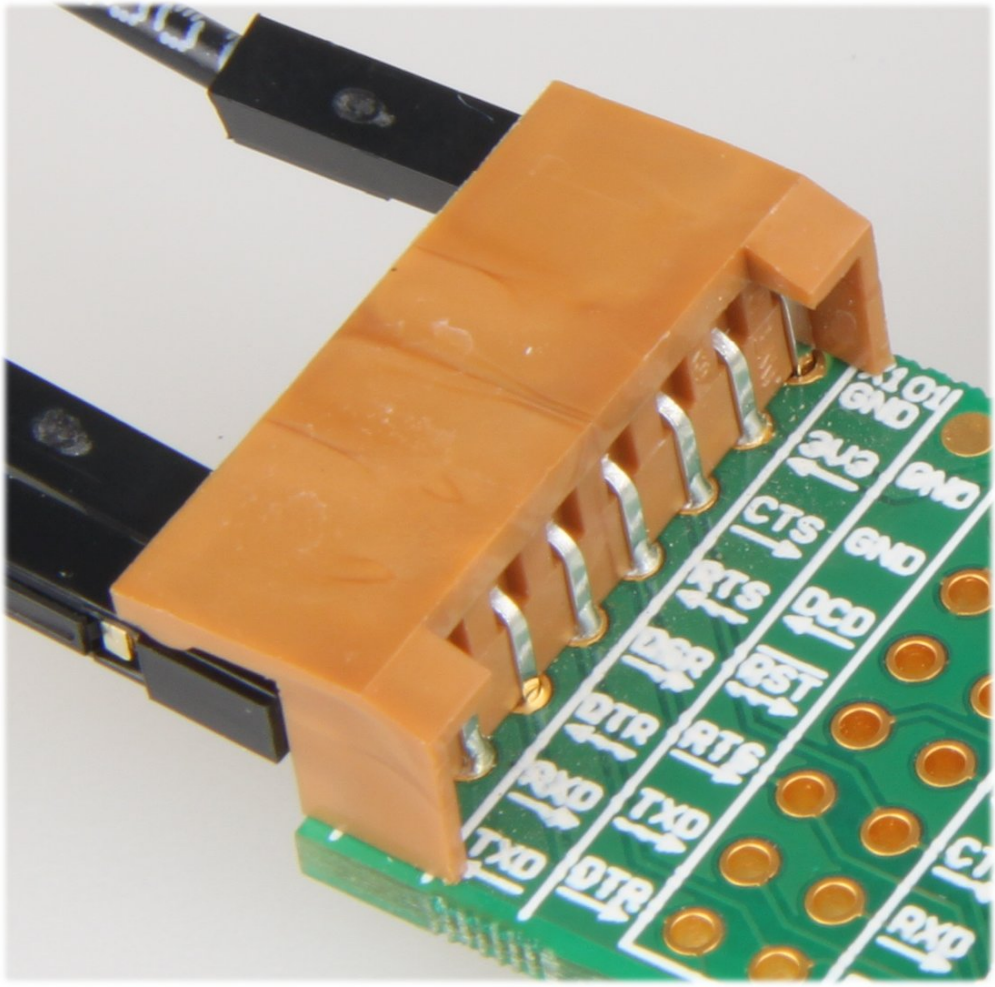
The following snippet shows the case of the TE0300 series modules:

Module RS232 constraints*
**Net fpga_0_RS232_RX_pin LOC=B13;**
**Net fpga_0_RS232_TX_pin LOC=B14;**
Please refer to the table below  for other module series relevant to this application note.

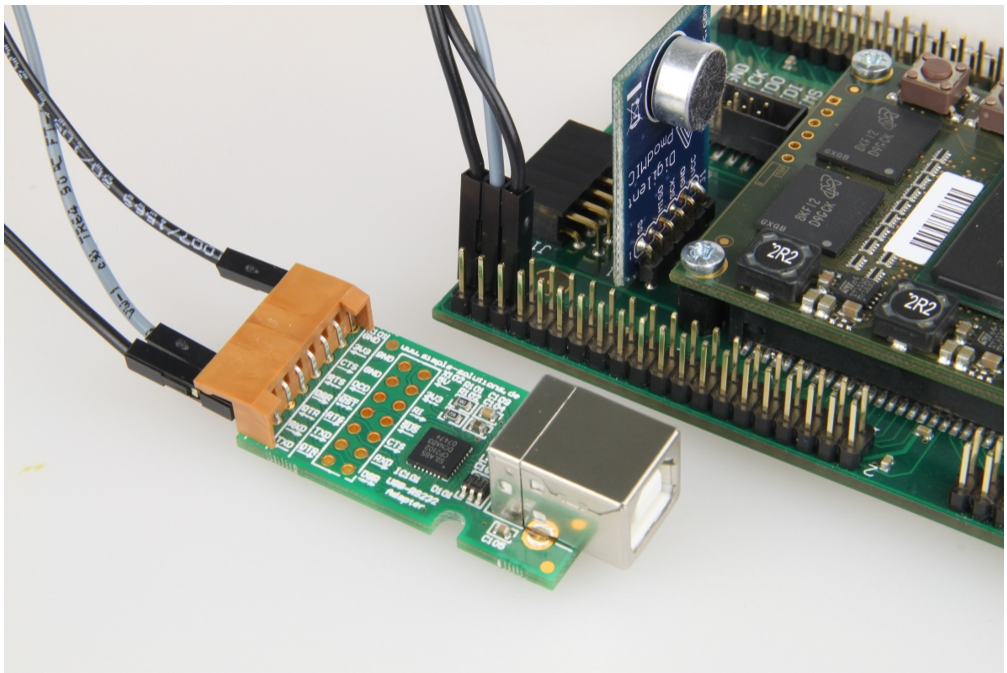
| TE series | RS232_RX FPGA ball | RS232_RX module pin | RS232_TX FPGA ball | RS232_TX module pin |
|---|---|---|---|---|
| **TE0300** | R6 | J5-29 | P6 | J5-31 |
| **TE0320** | V17 | J5-IO18 | W17 | J5-IO19 |
| **TE0630** | Y7 | J5-29 | AB7 | J5-31 |

| | | | | |
|---|---|---|---|---|
| **TE0303** | It doesn't apply | J1-33 | It doesn't apply | J1-34 |
| **TE0304** | It doesn't apply | J1-3 | It doesn't apply | J1-2 |
| **TE0323** | It doesn't apply | J4-35 | It doesn't apply | J4-37 |
| **host (PC)** | TX | TX | RX | RX |

**Location of UART pins examples.**




**Sample UART to USB virtual COM port converter.**



**Sample UART to USB virtual COM port converter: signal detail for TE0320 and TE0323.**