

# AURIX™ Application Kit TC297 TFT

## Getting Started

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## Summary of board features:

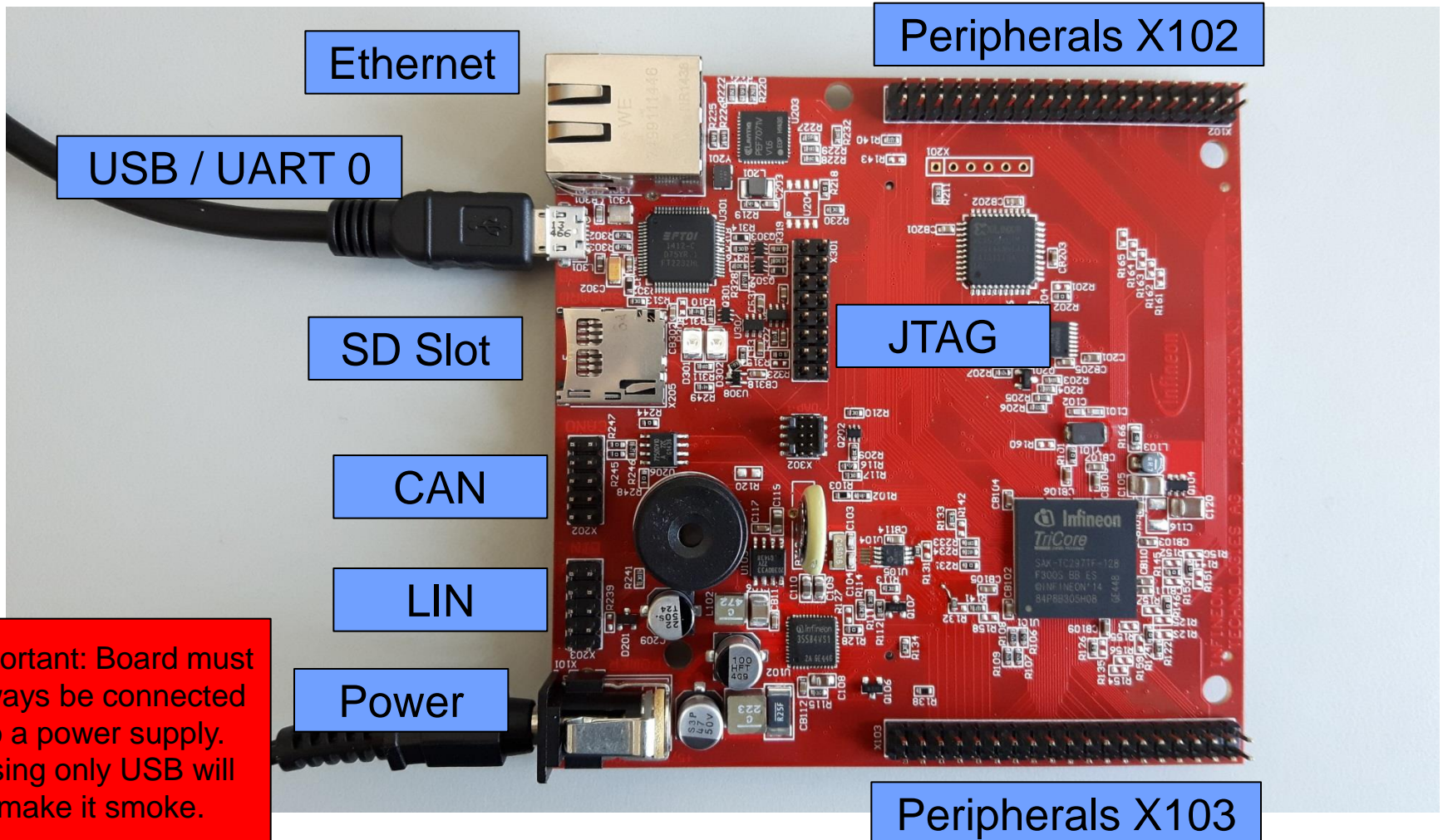
- LCD XGA Display 320 x240mini SD card slot
- Mini SD card slot
- Real-Time Clock with alarm, SRAM and unique Mac ID
- On board microUSB debug/flash connector
- Accustic beeper
- USB to UART bridge
- Ethernet PHY (if Ethernet is supported by device)
- LIN Transceiver
- High speed CAN Transceiver
- 4 Low power status LEDs
- Multi Voltage Safety Micro Processor Supply – TLF35584



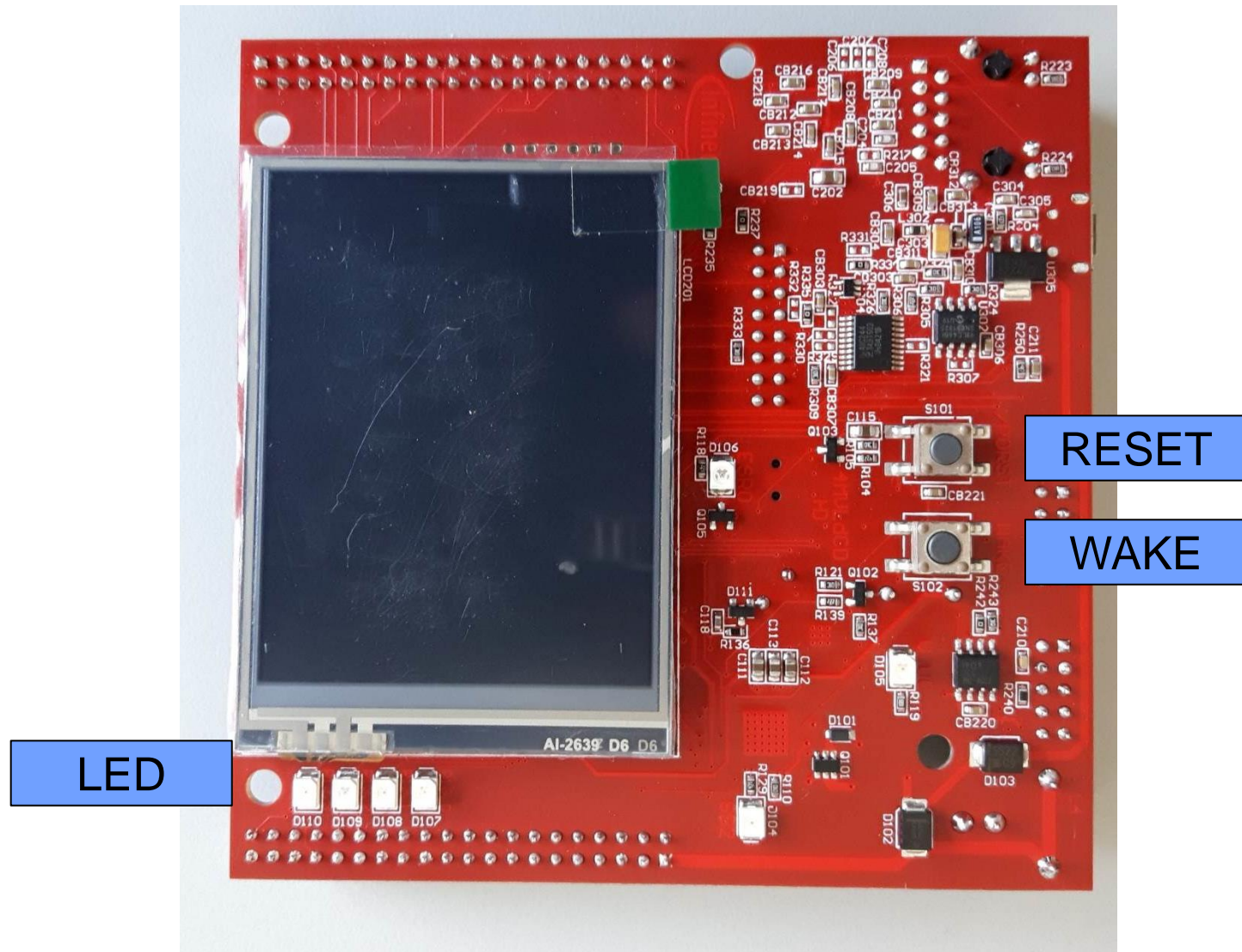
## Connectors:

- Standard power connector
- microUSB connector for ASC0 interface and debug
- RJ45 Ethernet connector (if Ethernet supported by device)
- 10-pin header for DAP (Debug Access Port)
- 16-pin header for JTAG
- 10-pin 2x5 header for LIN
- 10-pin 2x5 header for CAN0
- 2 x 40-pin connectors with I/O signals RM 2.54mm

# Hardware – Upper View



# Hardware – Lower View







X102			X103		
VCC_IN	1 2	V_UC (+5V)	VCC_IN	1 2	V_UC (+5V)
GND	3 4	GND	GND	3 4	GND
AN21	5 6	AN20	P33.10	5 6	P33.9
AN33	7 8	AN32	P14.8	7 8	P14.7
AN3	9 10	AN2	P14.6	9 10	P10.6
AN8	11 12	AN0	P10.7	11 12	P10.4
P33.5	13 14	P33.4	P02.0	13 14	P02.1
P33.3	15 16	P33.2	P02.2	15 16	P02.3
P33.1	17 18	P33.12	P02.4	17 18	P02.5
P33.8	19 20	P33.6	P02.6	19 20	P02.7
P23.0	21 22	P23.1	P02.8	21 22	P00.0
P23.2	23 24	P23.3	P00.1	23 24	P00.2
P23.4	25 26	P33.11	P00.3	25 26	P00.4
P22.0	27 28	P22.1	P00.5	27 28	P00.6
P22.2	29 30	P22.3	P00.7	29 30	P00.8
P15.2	31 32	P15.3	P00.9	31 32	P00.10
P15.4	33 34	P15.5	P00.11	33 34	P00.12
P15.6	35 36	P15.7	AN45	35 36	AN44
P20.9	37 38	P20.10	AN17	37 38	AN16
P14.4	39 40	P14.5	AN25	39 40	AN24

**Figure 5-2 IO Connectors TC267, TC277, TC297 - Pinout**

# UART Pinning – To be verified!!!!!!!. Maybe wrong board



Port	ASCLIN	MCU PIN	Board Pin
uartusb	0	TX - P14.0 RX - P14.1	MicroUSB
uart1	1	TX - P20.10 RX - P15.5	TX - X102(38) RX - X102(34)
uart2	1	TX - P02.02 RX - P02.3	TX - X103(15) RX - X103(16)
uart3	1	TX - P33.12 RX - P14.8	TX - X102(18) RX - X103(07)
uart4	2	TX - P02.00 RX - P02.1	TX - X103(13) RX - X103(14)
uart5	2	TX - P33.09 RX - P33.12	TX - X103(6) RX - X102(18)
uart6	3	TX - P00.00 RX - P00.1	TX - X103(22) RX - X103(23)



You need the following tools

- HighTec Toolchain
- PLS UDE (v4.6 or later)
- DAS Driver Package

which can be installed from `tools.eit.h-da.de`

For the HighTec Free Entry Toolchain, please go to

- <http://free-entry-toolchain.hightec-rt.com/>

Depending on the type of project you might need additional open source tools

- HTERM - <http://www.der-hammer.info/terminal/>
- Python - <https://www.python.org/>



# Getting Started HighTec Toolchain

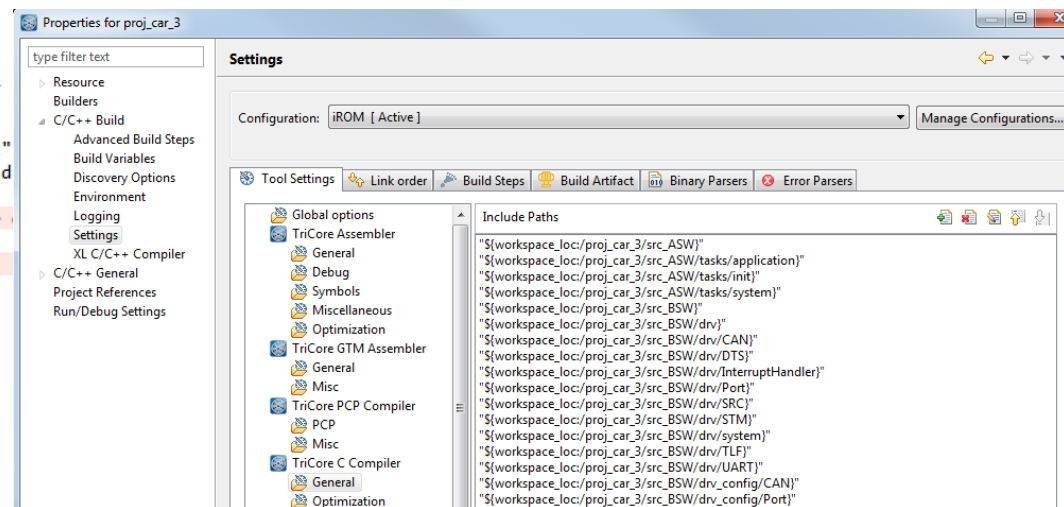


- Copy the reference project to your computer and import it into your workspace
- Clean the project and try to build it
- Typically, some file locations need to be updated
- In project properties, check the following entries
  - Include path for the C and C++ compiler (Hidden under the General Tab)
  - Linker: Library search path and linker description file
- **Always build a ROM configuration!!!**

```
**** Build of configuration iROM for project proj_car_3 ****

C:\tools\Infineon\HighTec\toolchains\tricore\v4.6.5.0\bin\make.exe all
Building file: ../src_BSW/startup/core_startup.c
Invoking: TriCore C Compiler
"C:\tools\Infineon\HighTec\toolchains\tricore\v4.6.5.0\bin\tricore-gcc"
-mcpu=tc29xx -mversion-info -MMD -MP -MF"src_BSW/startup/core_startup.d
In file included from ../src_BSW/startup/core_startup.c:16:0:
../src_BSW/startup/core.h:13:22: fatal error: register.h: No such file
compilation terminated.
make: *** [src_BSW/startup/core_startup.o] Error 1

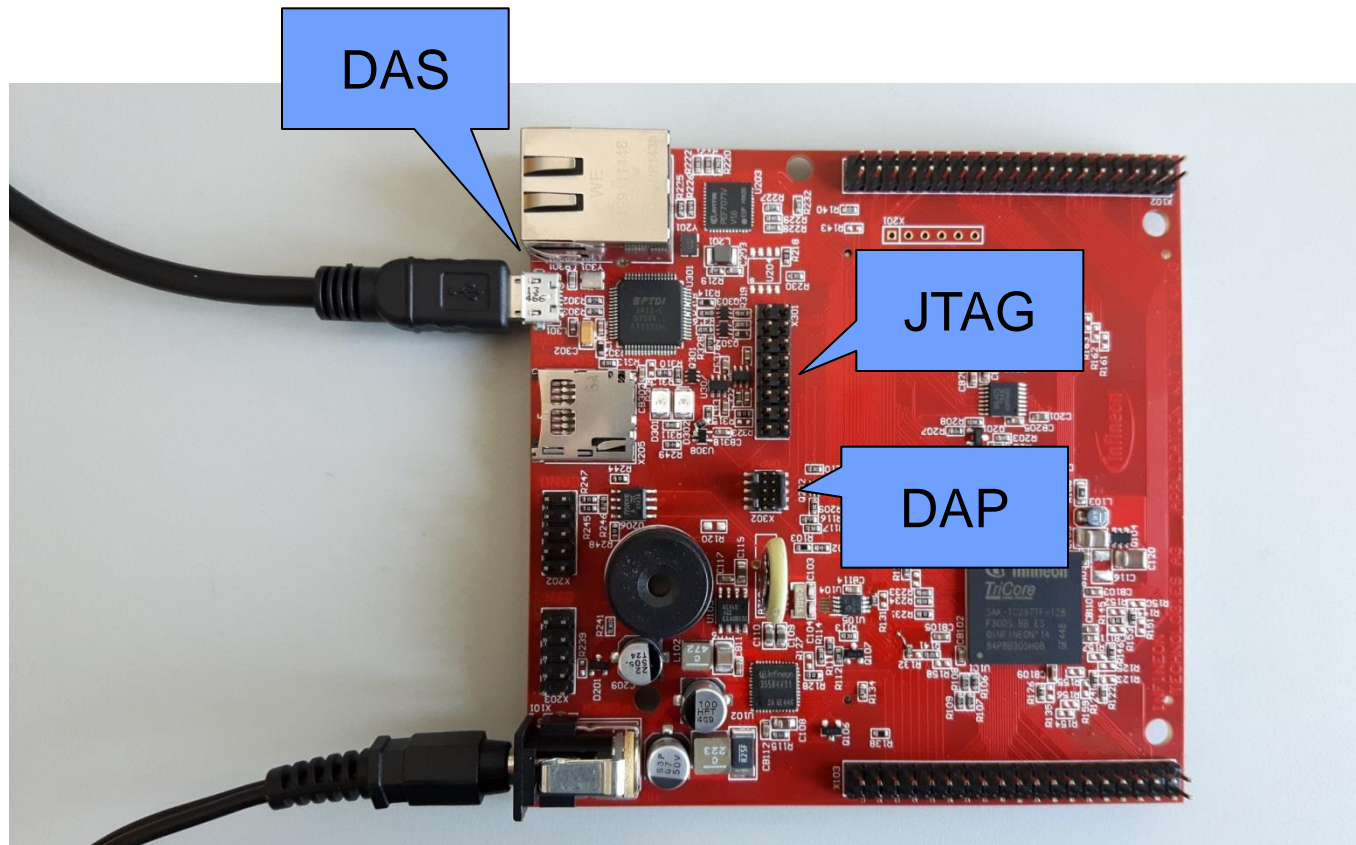
**** Build Finished ****
```



# Setting up a project workspace for the PLS Debugger



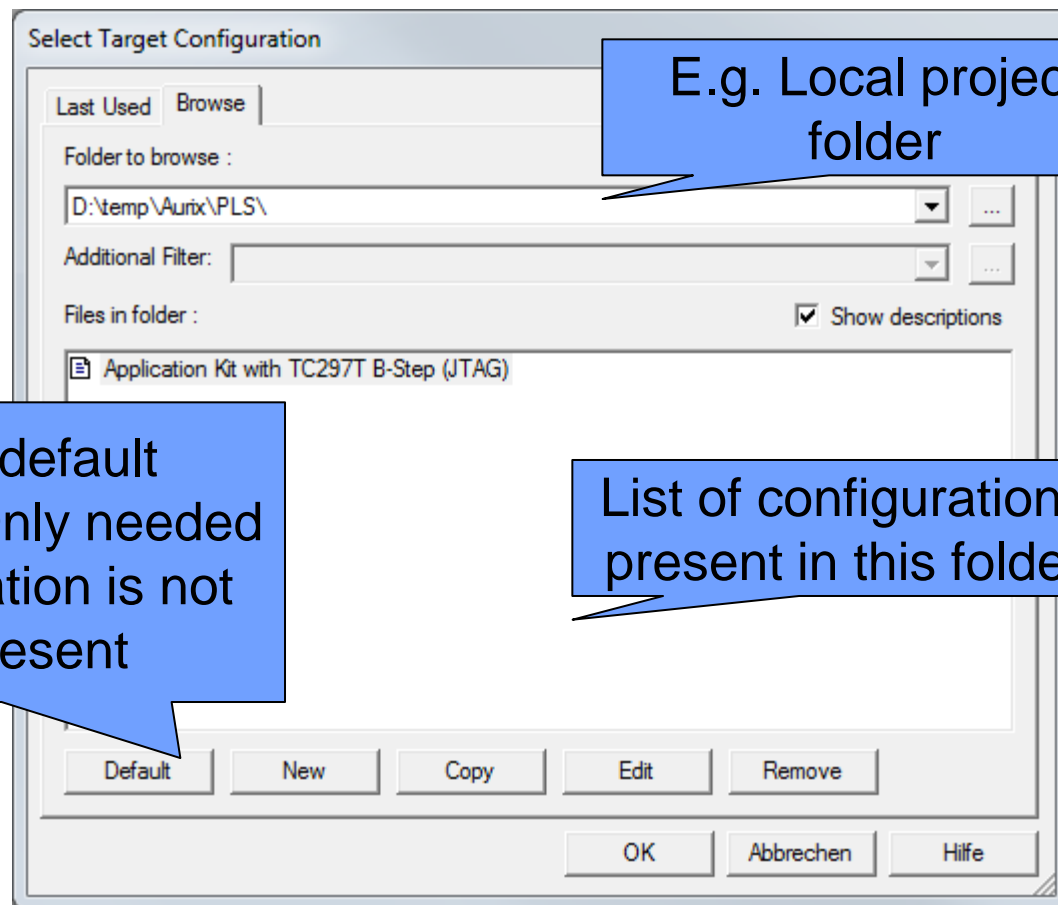
- Several debug interfaces do exist, which require individual configurations



# Setting up a project workspace for the PLS Debugger



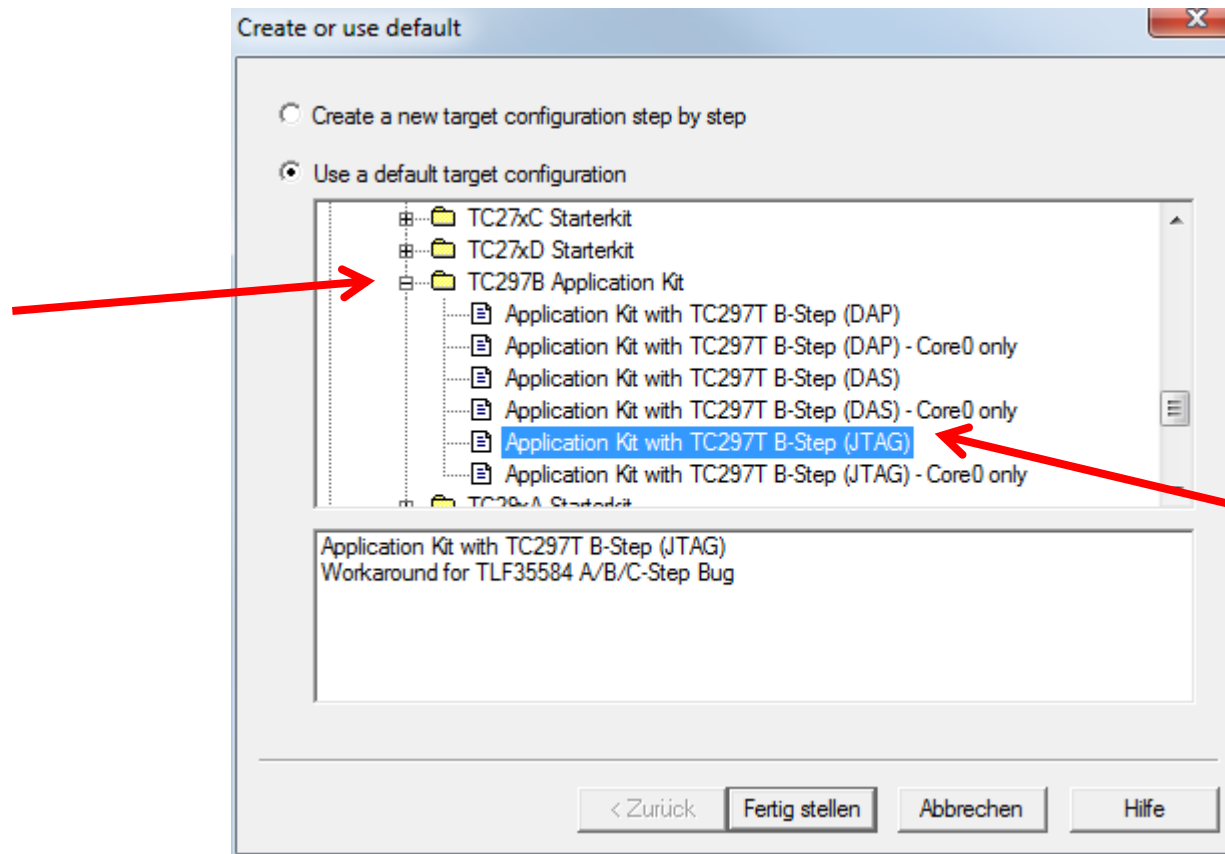
- PLS provides different preconfigured debug scripts which contain valid settings for the target.
- The following pages show the process for a JTAG connection



# Setting up a project workspace for the PLS Debugger (1a)



- Make sure to select the correct BOARD and Target Interface



# JTAG / DAP



## JTAG

Controller0.Core0 (Master) - TriCore2 Target Interface Setup

General | Connect / Reset | Debug | Start / Halt | Info

Select Target Communication Port

☒ Use default communication device / port

☐ Use UDE Communication Device

Any suitable communication device

Use IO Pod :

☐ Use Infineon Device Access Server (DAS) for Starterkit

JTAG Options

Max. Time to Wait after Target Hardware Reset:  (ms, 0 ... 5000)

JTAG Clock Speed:

☐ Connect JTAG signals via OCDS-Level2 trace pod

☐ Use open drain reset (if available on access device)

Tool arbitration :

No tool arbitration

☒ Check for exact JTAG ID match

☐ Scan JTAG Port for Clients on Connect

☐ Refresh JTAG settings on each command

☐ Use reduced JTAG clock while target is running

☐ Use DAP for target access

Save settings to workspace file only (default mode)

## DAP

Controller0.Core0 (Master) - TriCore2 Target Interface Setup

General | Connect / Reset | Debug | Start / Halt | Info

Select Target Communication Port

☒ Use default communication device / port

☐ Use UDE Communication Device

Any suitable communication device

Use IO Pod :

☐ Use Infineon Device Access Server (DAS) for Starterkit

JTAG Options

Max. Time to Wait after Target Hardware Reset:  (ms, 0 ... 5000)

JTAG Clock Speed:

☐ Connect JTAG signals via OCDS-Level2 trace pod

☐ Use open drain reset (if available on access device)

Tool arbitration :

No tool arbitration

☒ Check for exact JTAG ID match

☐ Scan JTAG Port for Clients on Connect

☐ Refresh JTAG settings on each command

☐ Use reduced JTAG clock while target is running

☒ Use DAP for target access

Save settings to workspace file only (default mode)



- It might happen that the Board does not boot because the TLF is not turned off
- In this case, you will see that the red reset LED will flicker a couple of times before the board is dead.

## Solution

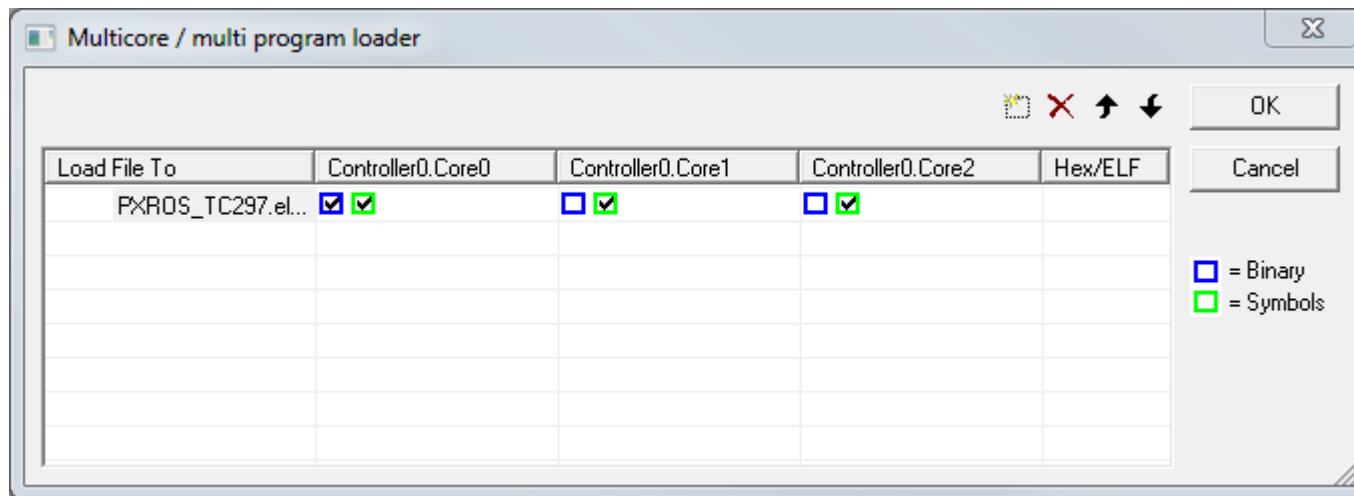
- Compile a SMALL program, e.g. the example Serial
- Create a target connection with a PLS configuration which is resetting the TLF by script (check the debug script description for this).
- As soon as the window pops up, that no connection can be established
  - Reset the board
  - Restart the connection (must be done before the TLF times out, i.e. within 1 second)
- Flash a firmware which disables the TLF upon boot.



# Setting up a project workspace for the PLS Debugger



- Load your program in the debugger (File ➔ Load Program)
- Select your previously compiled elf file
- Binary to core 0, symbols to all cores



- In the Flash Tool: Program all
- Delete all multicore run configurations (Menu Config)

# PLS Debugger

Core Status

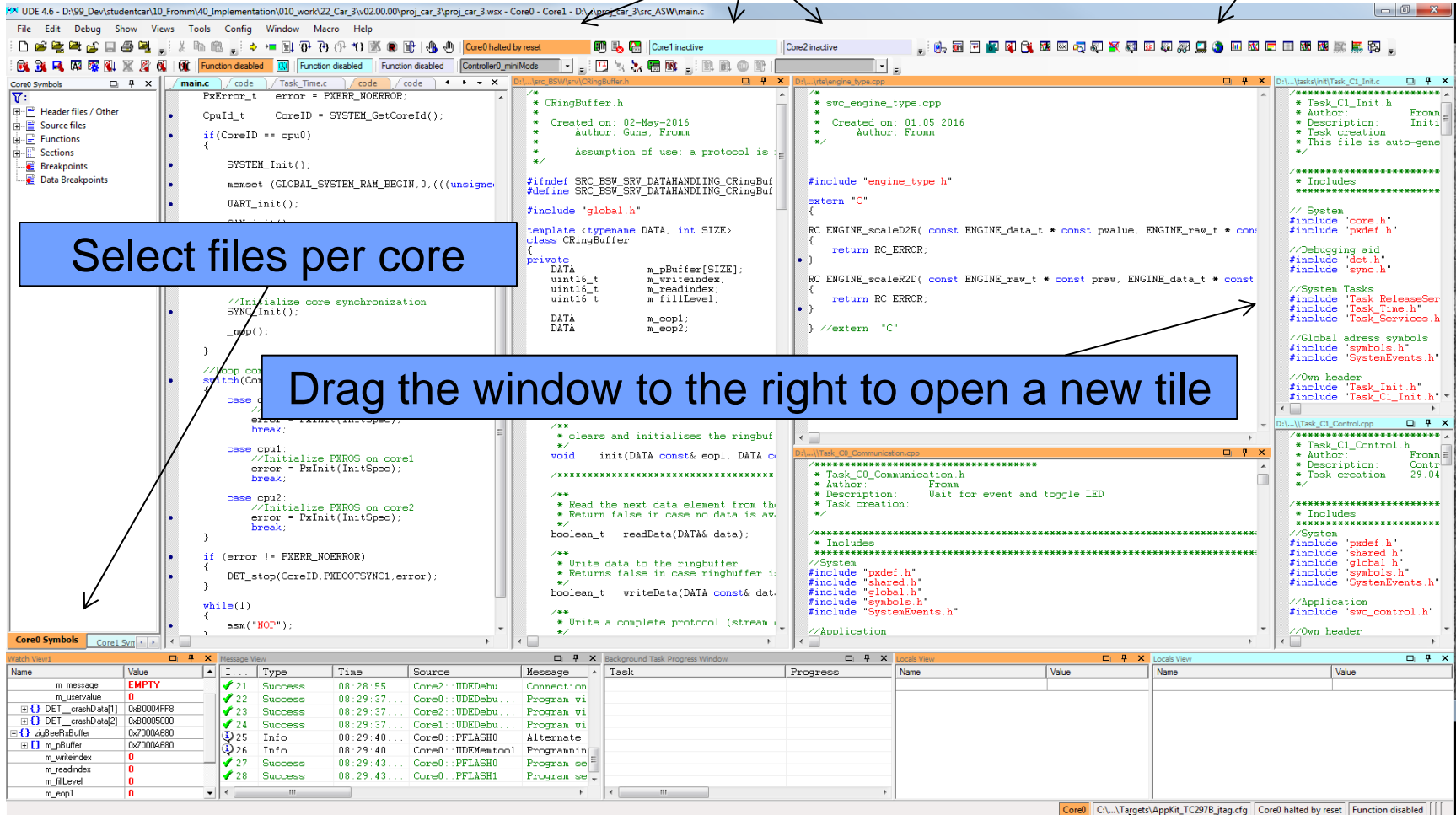
Open Debug Windows

Select files per core

Drag the window to the right to open a new tile

Globals

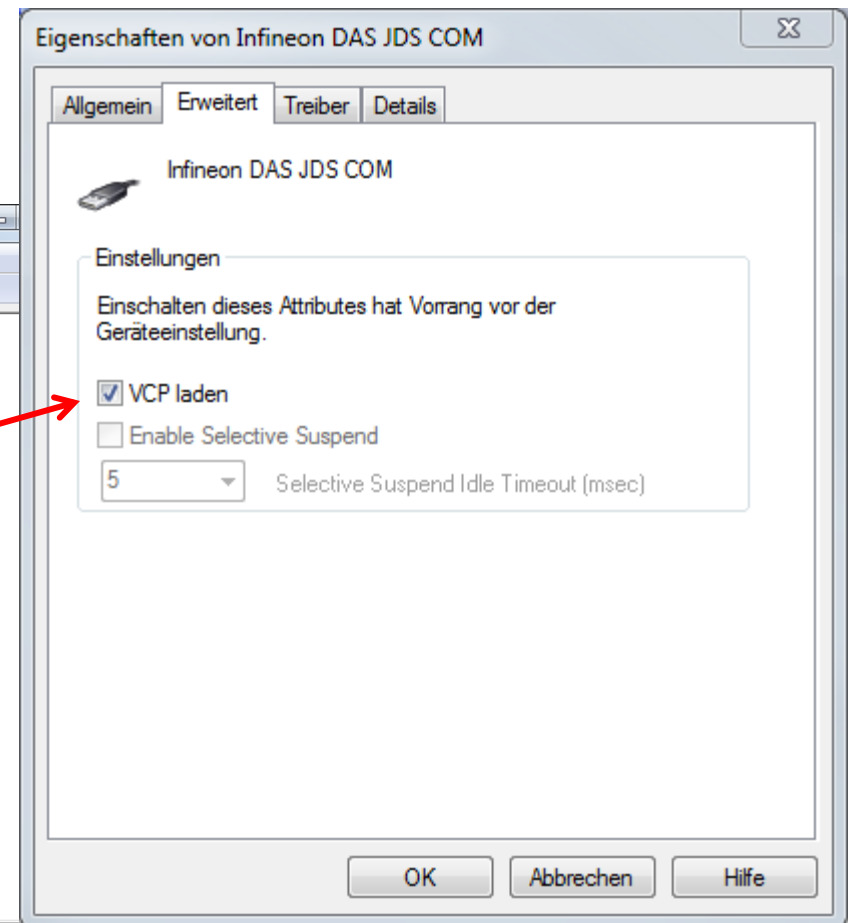
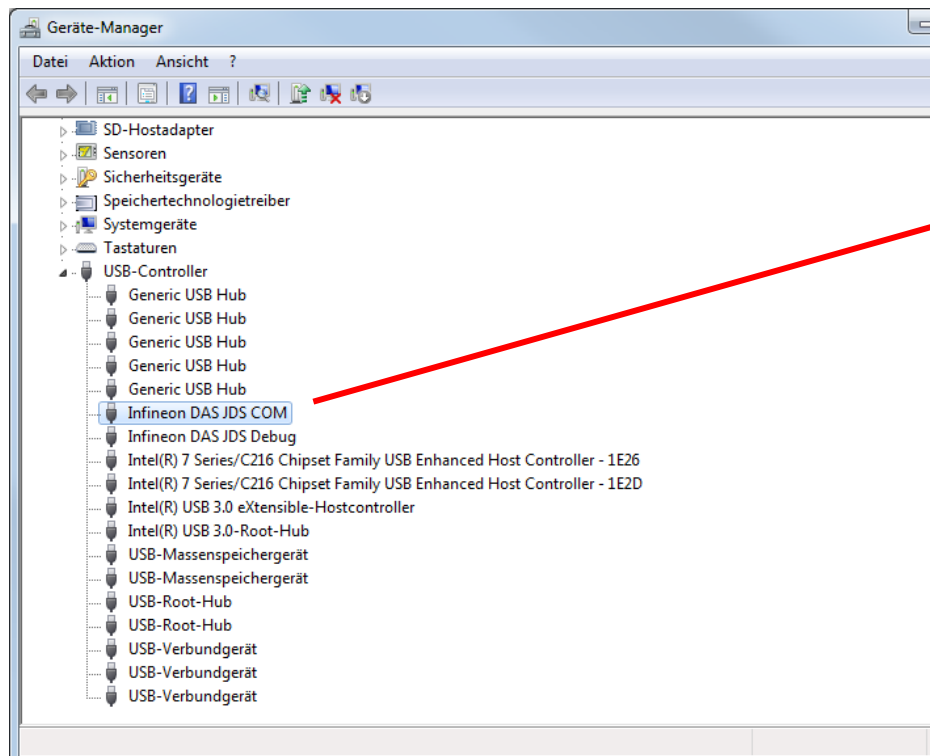
Locals



# Using the USB Port



- Install the DAS package
- Connect the USB port to your PC
- Open the device Manager
- Activate the VCP function
- Reconnect the port



## Additional information



- Board User Manual: ApplicationKitManual-TC2X7-V10.pdf
- Aurix HW Manual: tc29xB\_um\_v1.3.pdf

<http://www.infineon.com/> ➔ MyInfineon  
You need an own Login

# Port Configuration



Please add a general description here, explaining the structure and central files

## UART – Pinning and Ports



Please provide a table, explaining which pins for which ASCLIN can be used

Provide a brief description of the configuration steps









**etc**

