ACT – AURIX™ Configuration Tool

ATV MC

July 2015

ACT – Intention

- The ACT was developed to:
  - Simplify pin mapping
    - Provides an overview over used/configured pins
    - Shows possible module connections and signal paths to the single pins/balls
    - Support PCB-design
  - Provide an interface to easily configure the iLLD
  - Have a single core OS

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AURIX™ Configuration Tool – ACT

- ACT will be provided as a plugin for Tasking VX Toolset for Tricore from Altium

Free of charge!

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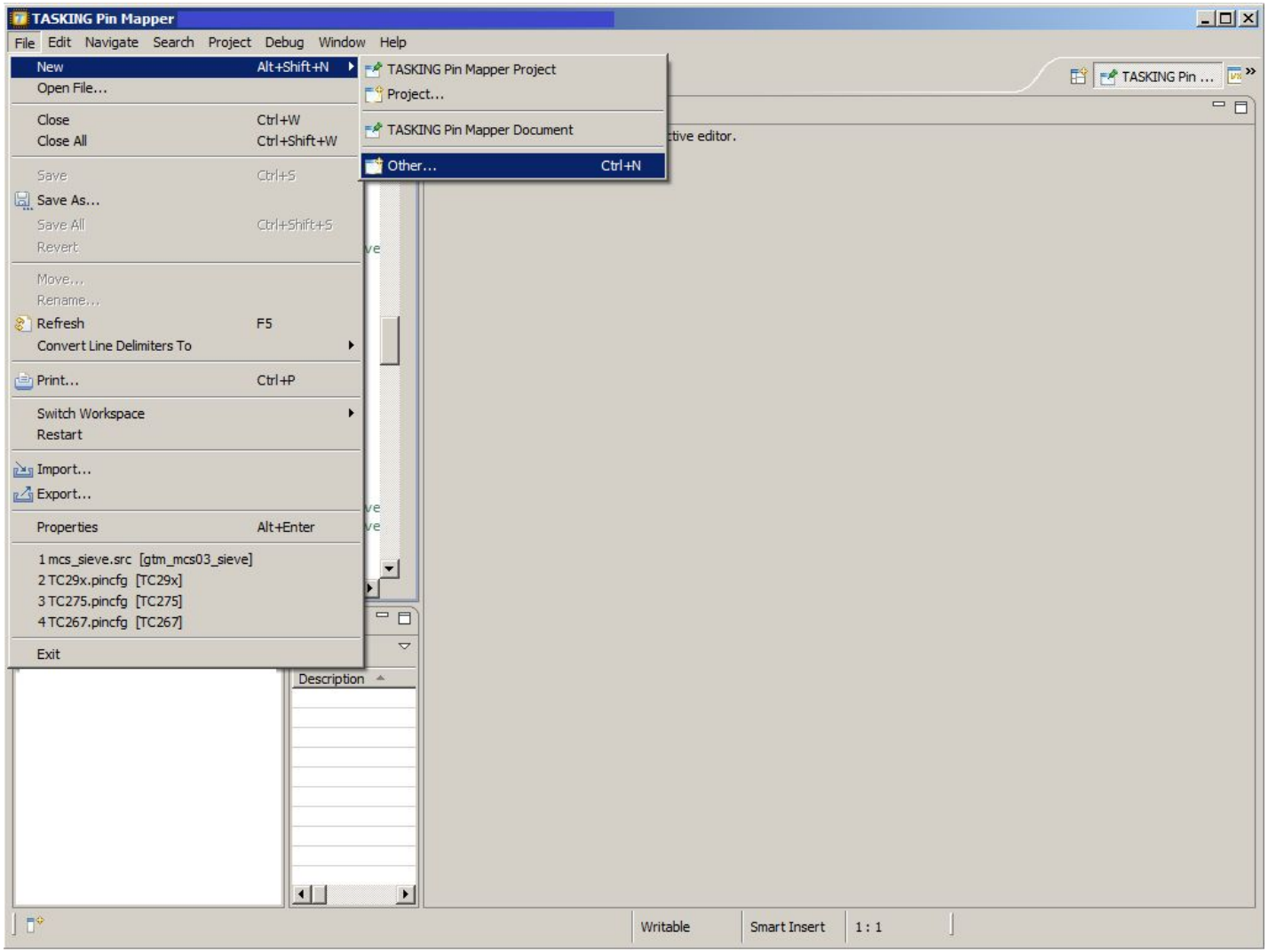
Pin-Mapper

New Pin-Mapper project



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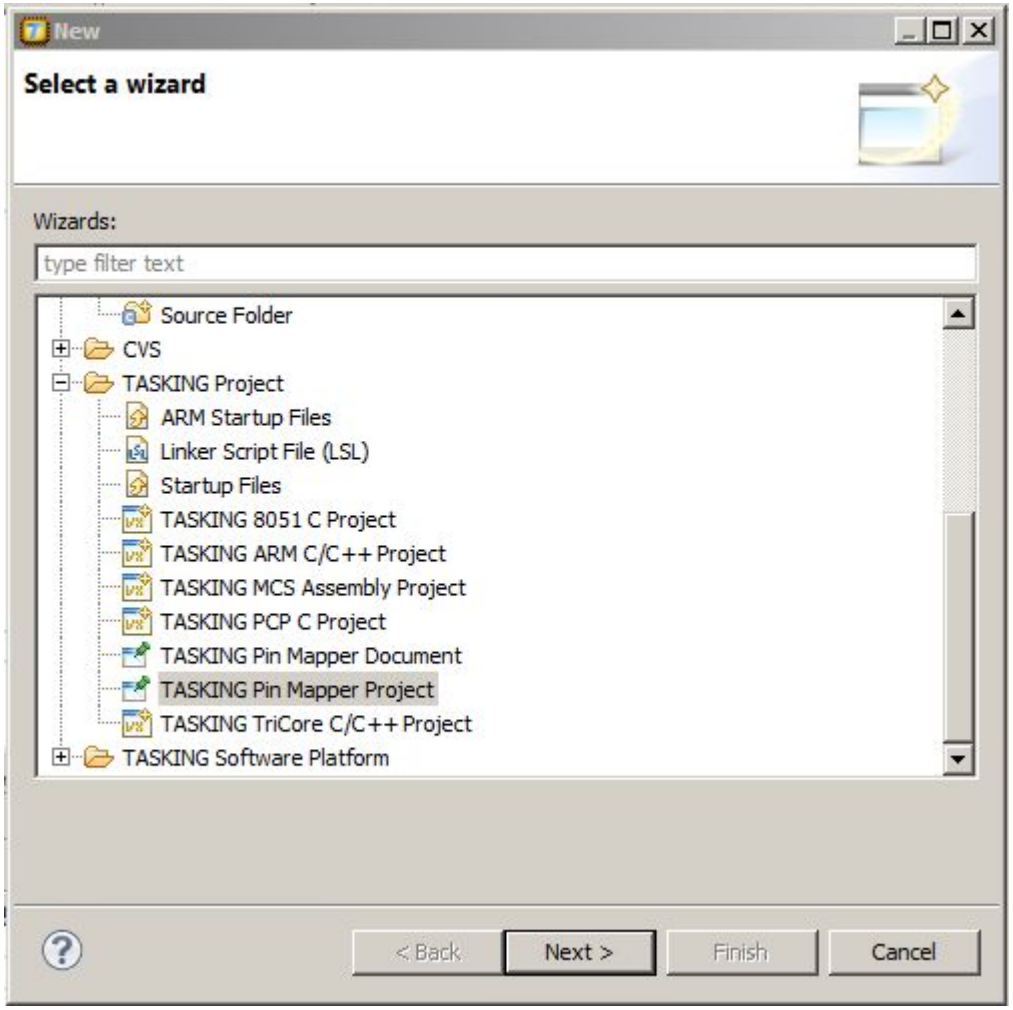
Select TASKING Pin Mapper Project



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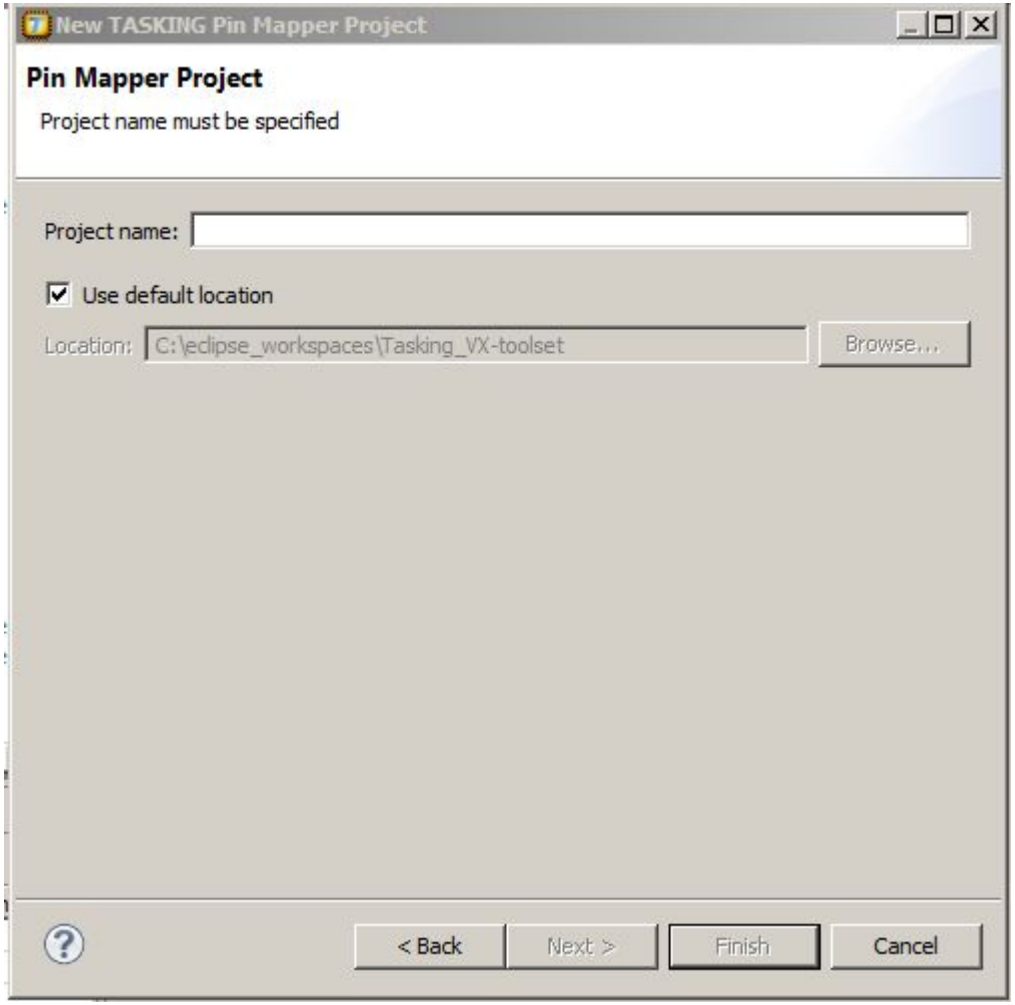
Give the project a name



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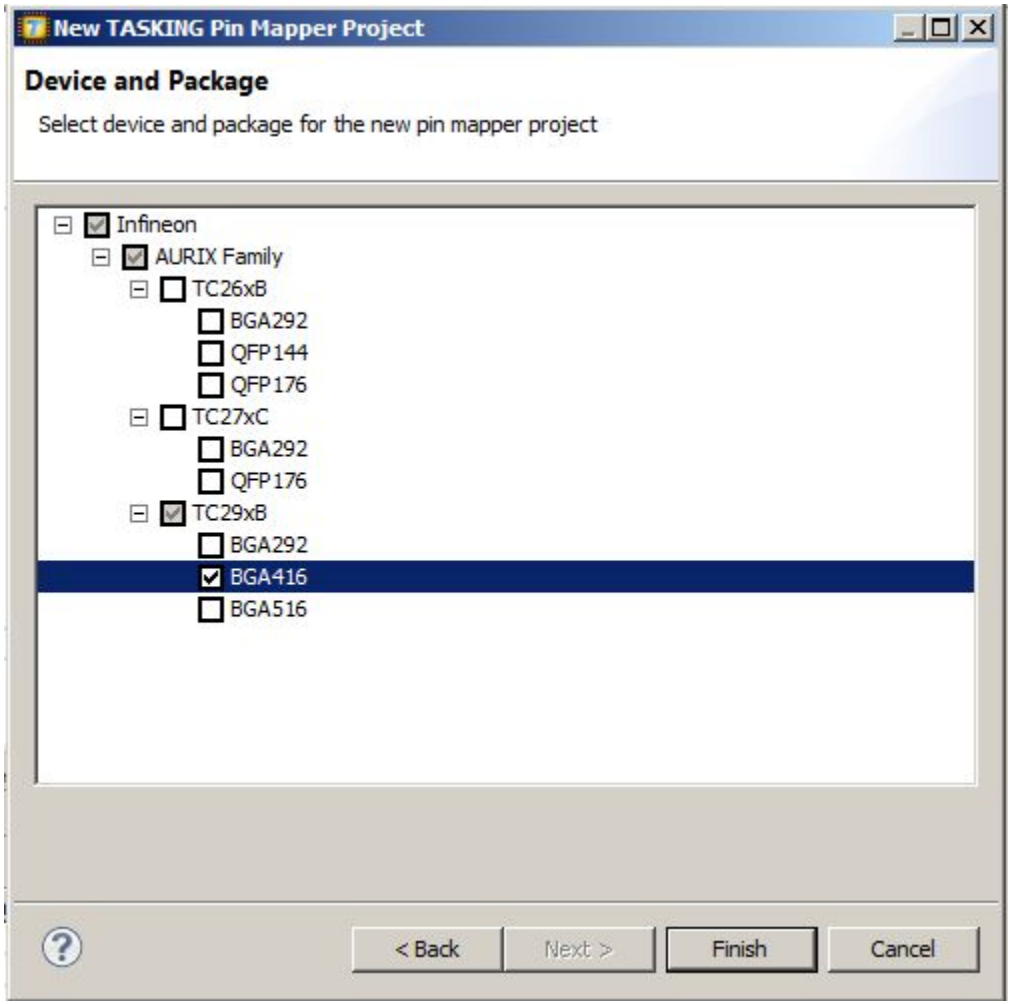
Select the derivate and the package



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Open the pin-mapper

- Select the project in the project explorer on the left side
- Right click on the project

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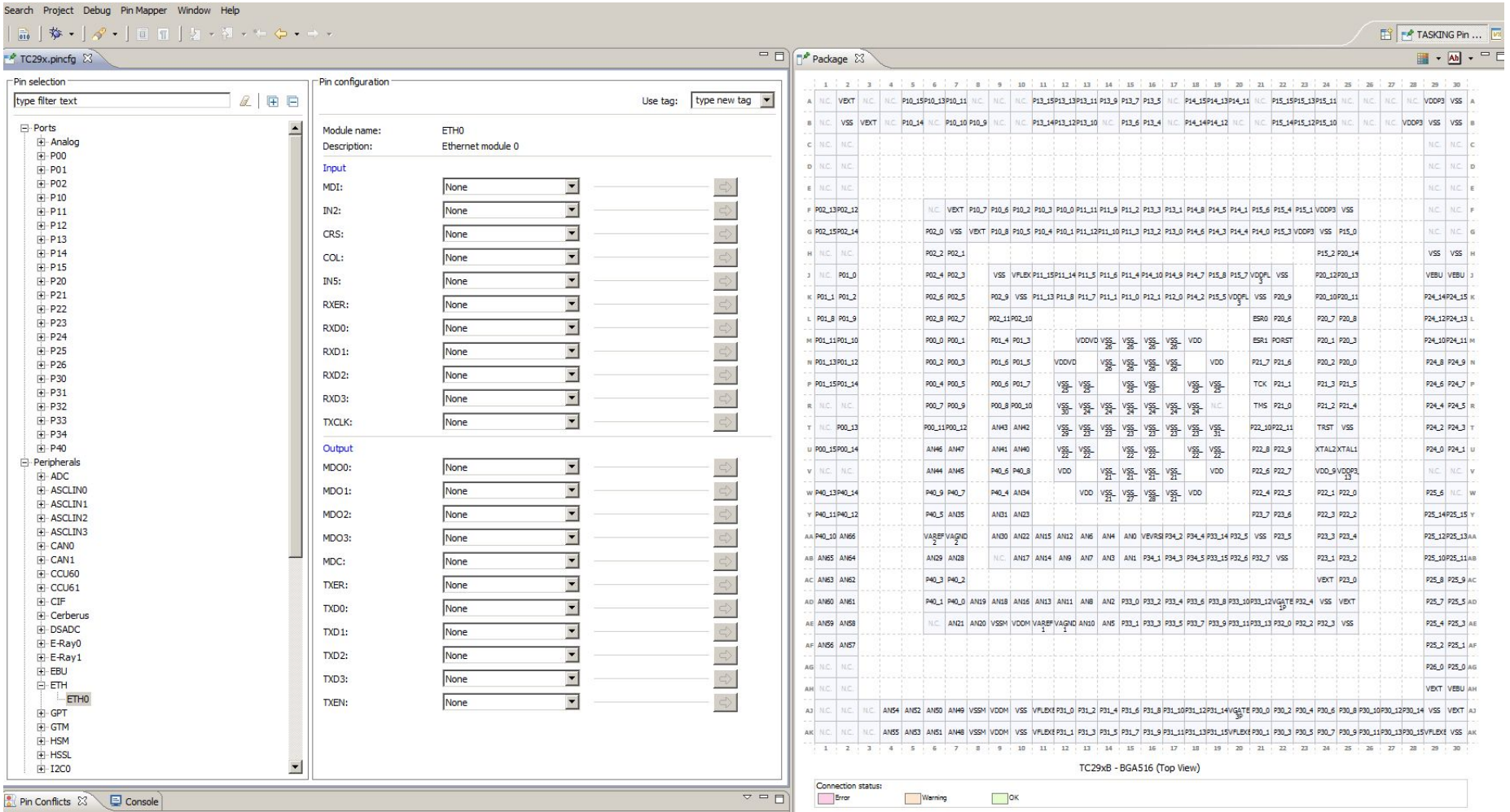
Overview

Ports Configuraiton

Package and Overview



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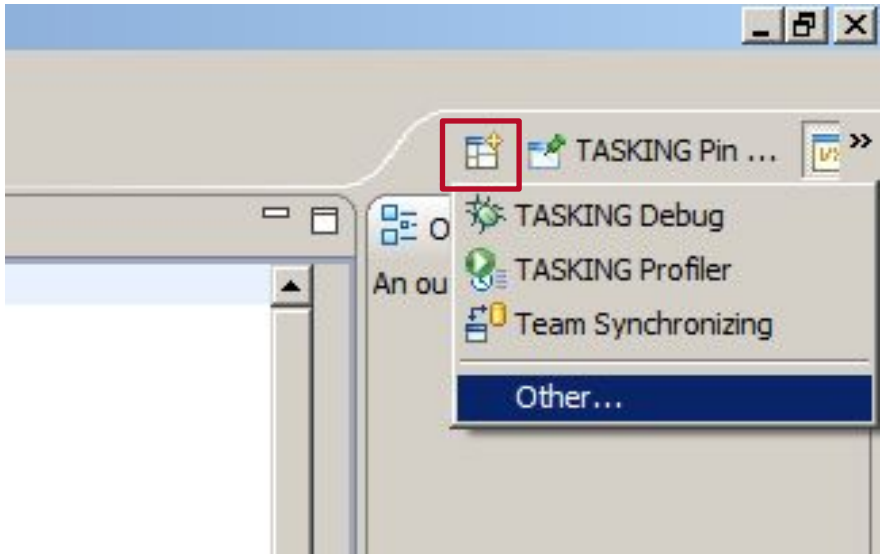
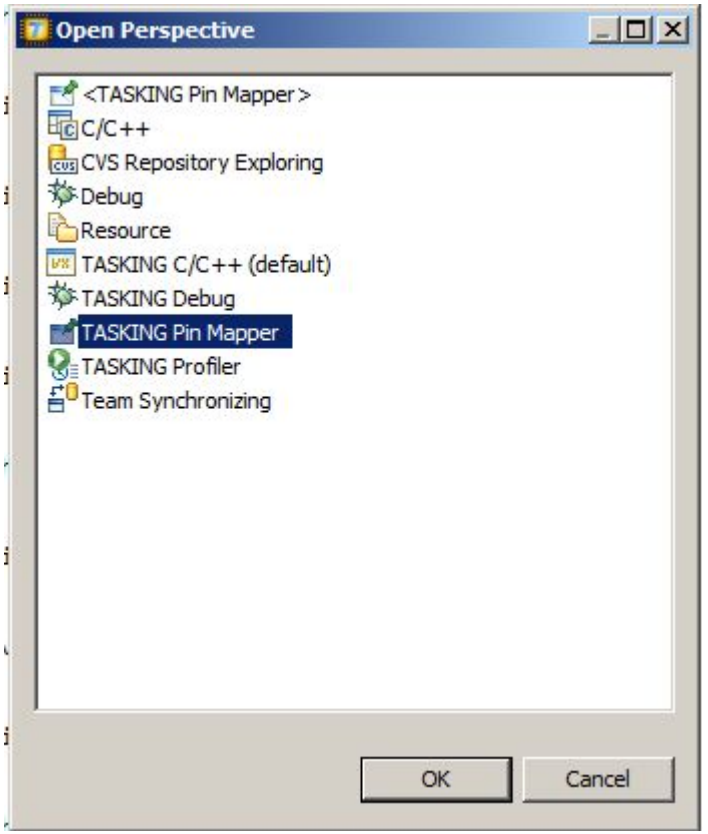
If package is not shown

- Open the right perspective





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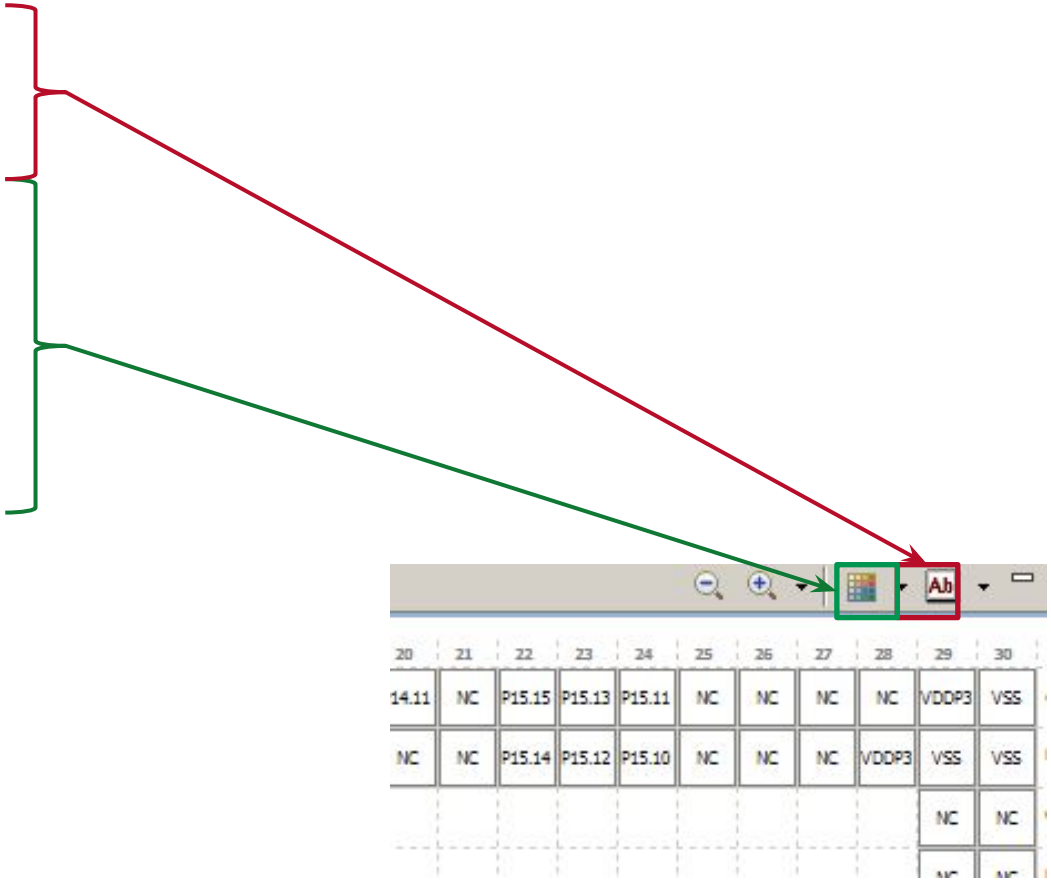
Package Overview – Different States

- Can display:
  - Module names
  - Symbolic names
  - Connection status
  - Pad classes
  - Power domains
  - Reset state



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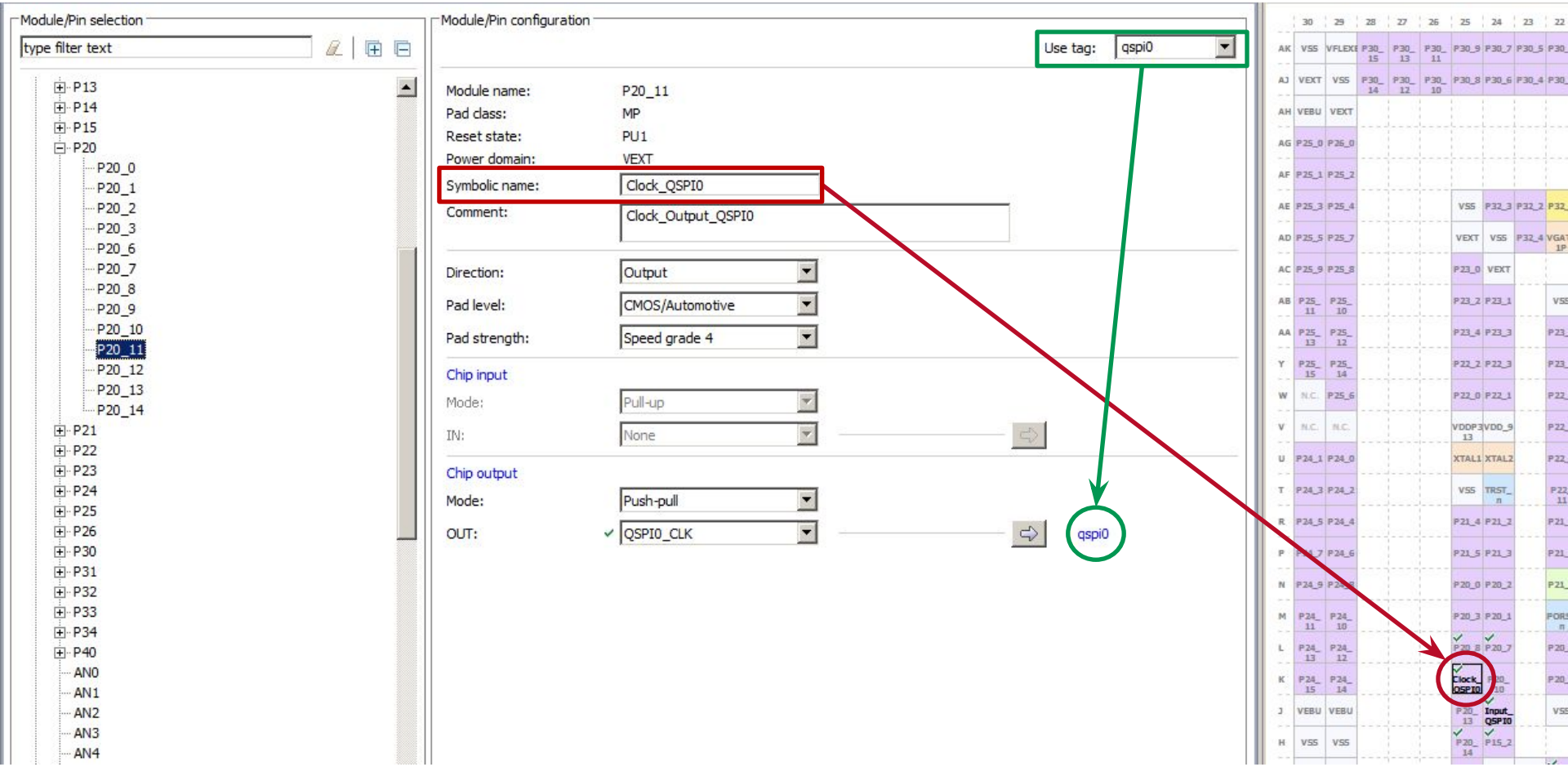
Configuration

- Easily assign symbolic names to pins
- Easily mark connections between modules and pins as Use-tags



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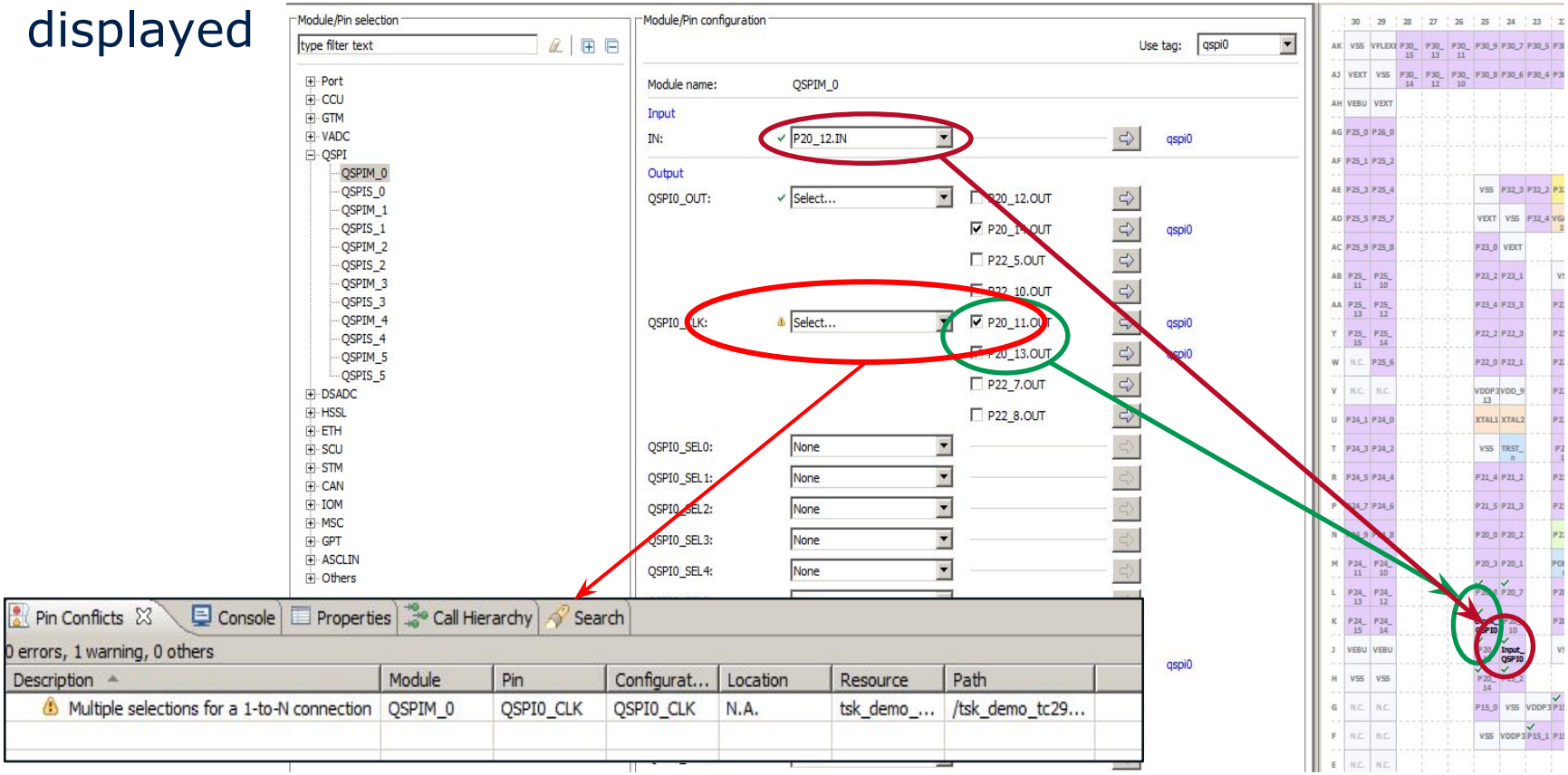
Configuration

- Select the pin you want to use for the signal
- If two pins are selected for an uniqe signal, a warning is displayed



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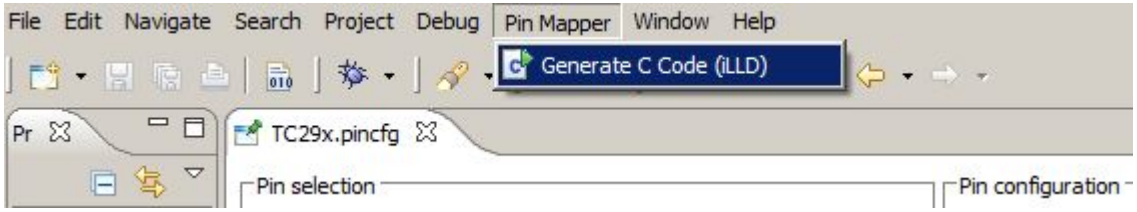
After configuration

- Generate .c and .h files if needed



- And select the folder in the project where the files should be

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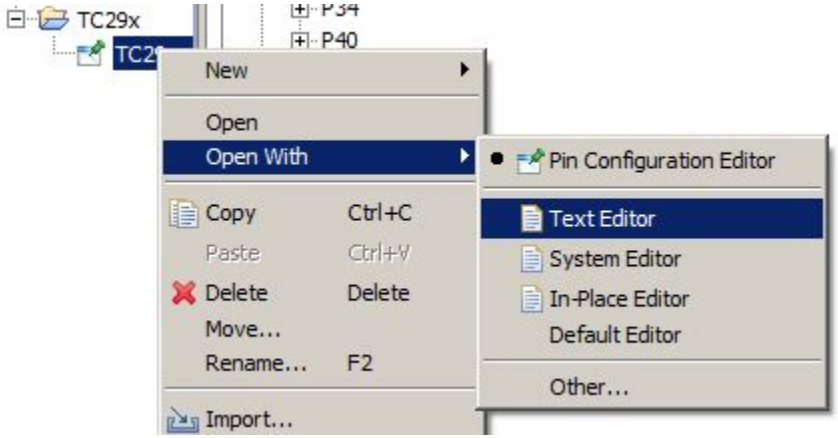
Config-file itself

- The configuration is stored in xml-like-format



- Can be used for further processing
  - Next time open the file with Pin Configuration Editor again

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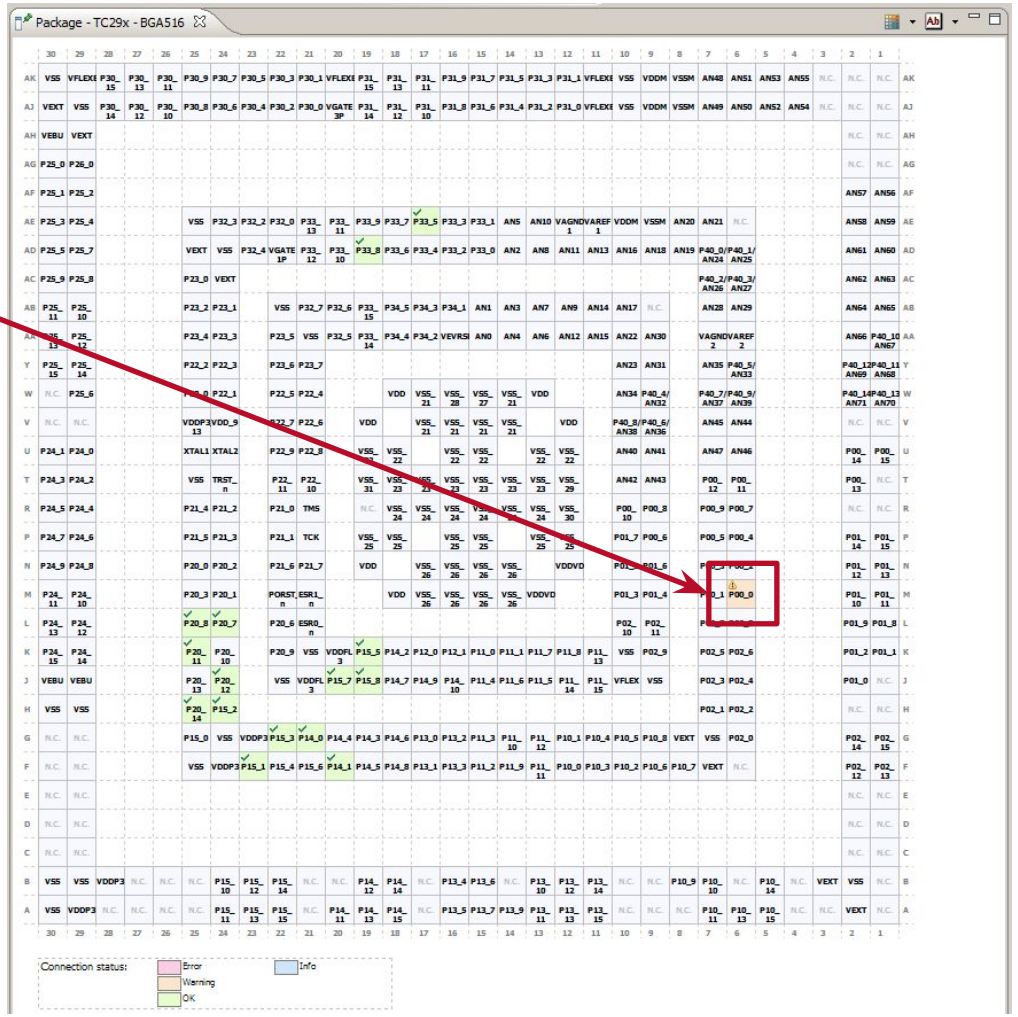
ACT – Pin Mapper

- Shows all configured pins with possible errors and warnings
- Can display:
  - Module names
  - Symbolic names
  - Connection status
  - Pad classes
  - Power domains
  - Reset state



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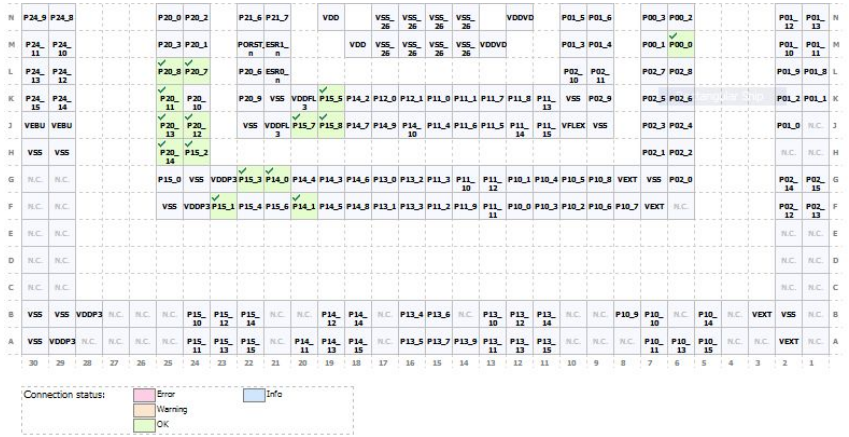
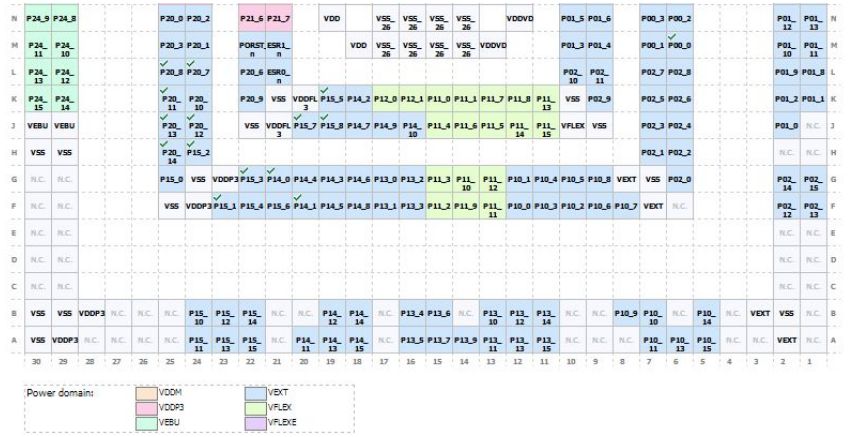
ACT – Pin Mapper

Connection Status

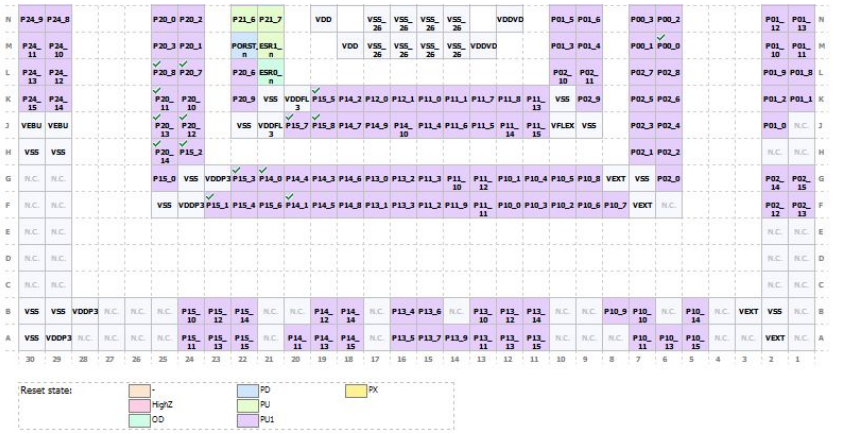


Pad Class

Power Domain



Reset State



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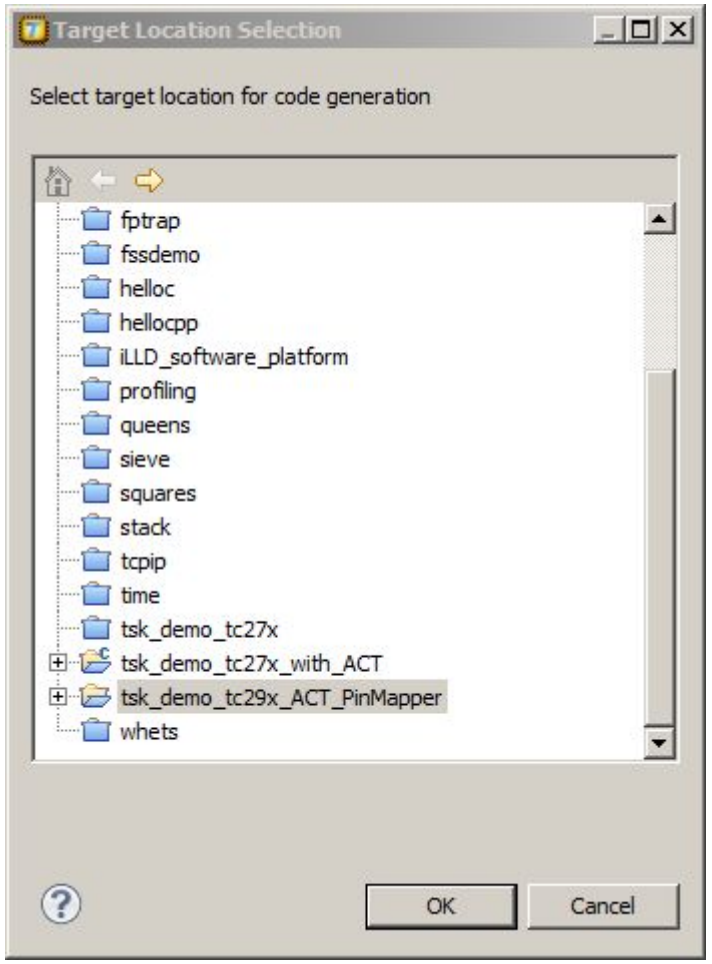
ACT – Pin Mapper

- After the configuration the target project for the setting has to be chosen
- The configuration is stored in

  xml-like-format



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ACT – Driver Configuration

ACT – Driver Configuration

- iLLD come from tests and application used by several teams at infineon ATV
- iLLD are basic function low level drivers for use and demonstration for almost every module
- All drivers have the same code styling -> common look and feel
- Already tested in pre-silicone with a virtual prototype or in RTL-simulations
- Each derivate (TC2YX) has its own set of drivers
- No dependency between the peripheral drivers
- The strict iLLD coding guidelines allow layering of drivers for multi-dimensional system scenarios
- Available in the beta ACT-release (estimated Q2/15)

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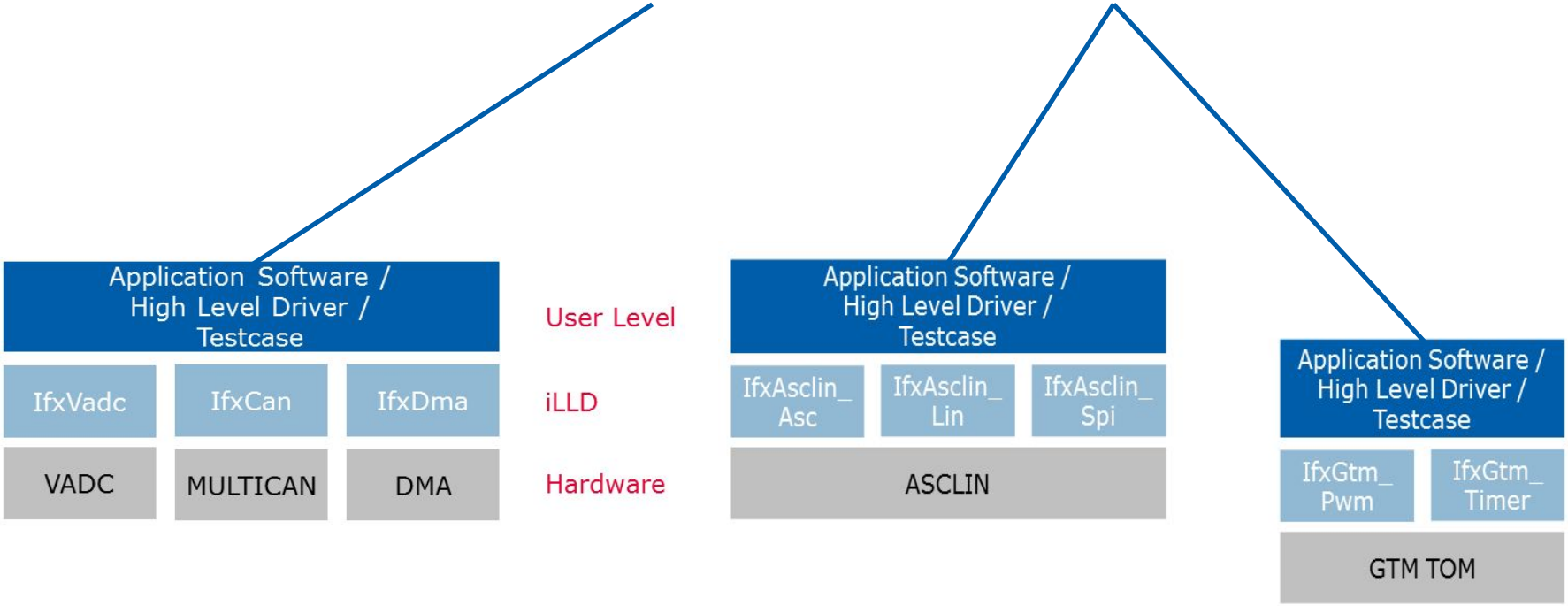
ACT – Driver Configuration

- The iLLD consists of unifunctional and multifunctional drivers



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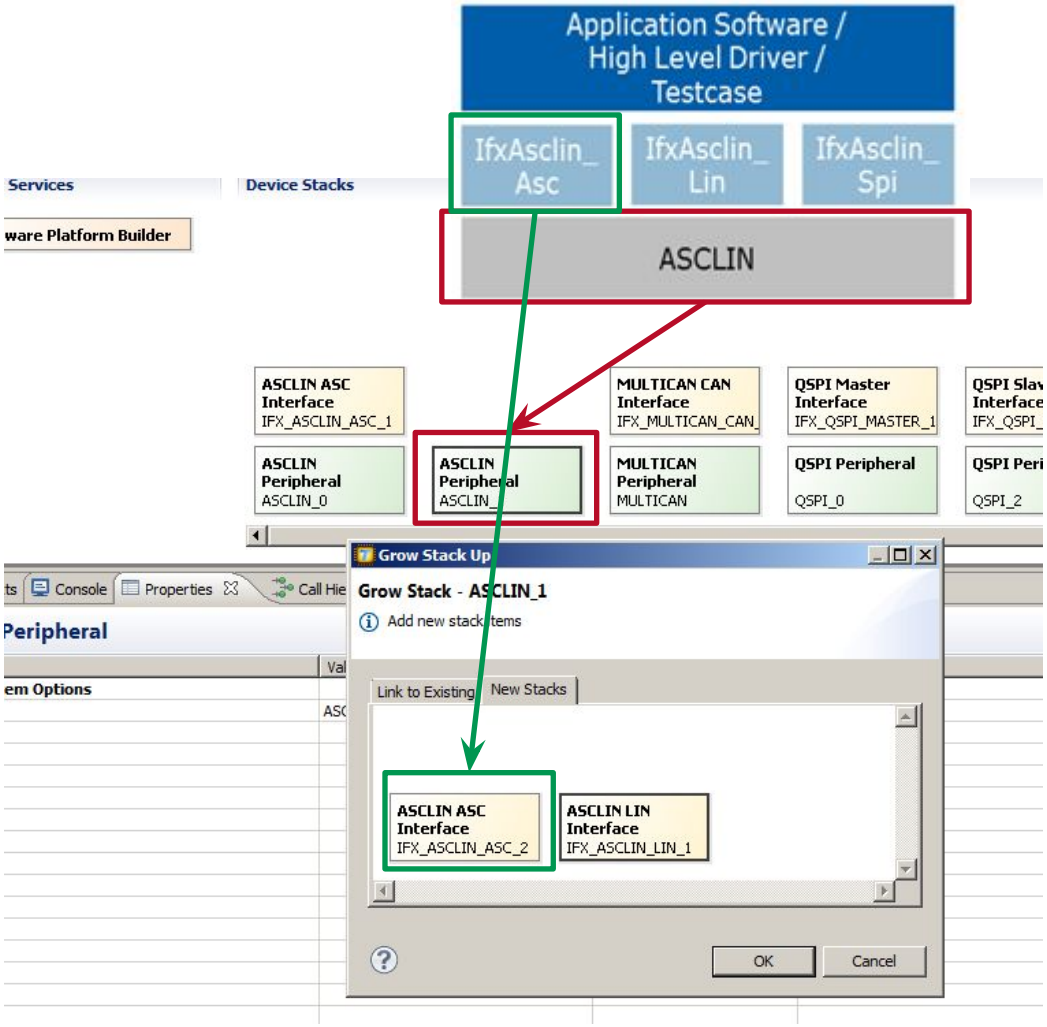
ACT – Driver Configuration

- Multifunctional drivers: Add a new peripheral and choose the iLLD for this module
  - Right click in the window and add a new service or driver
  - Then you can choose the iLLD for the module



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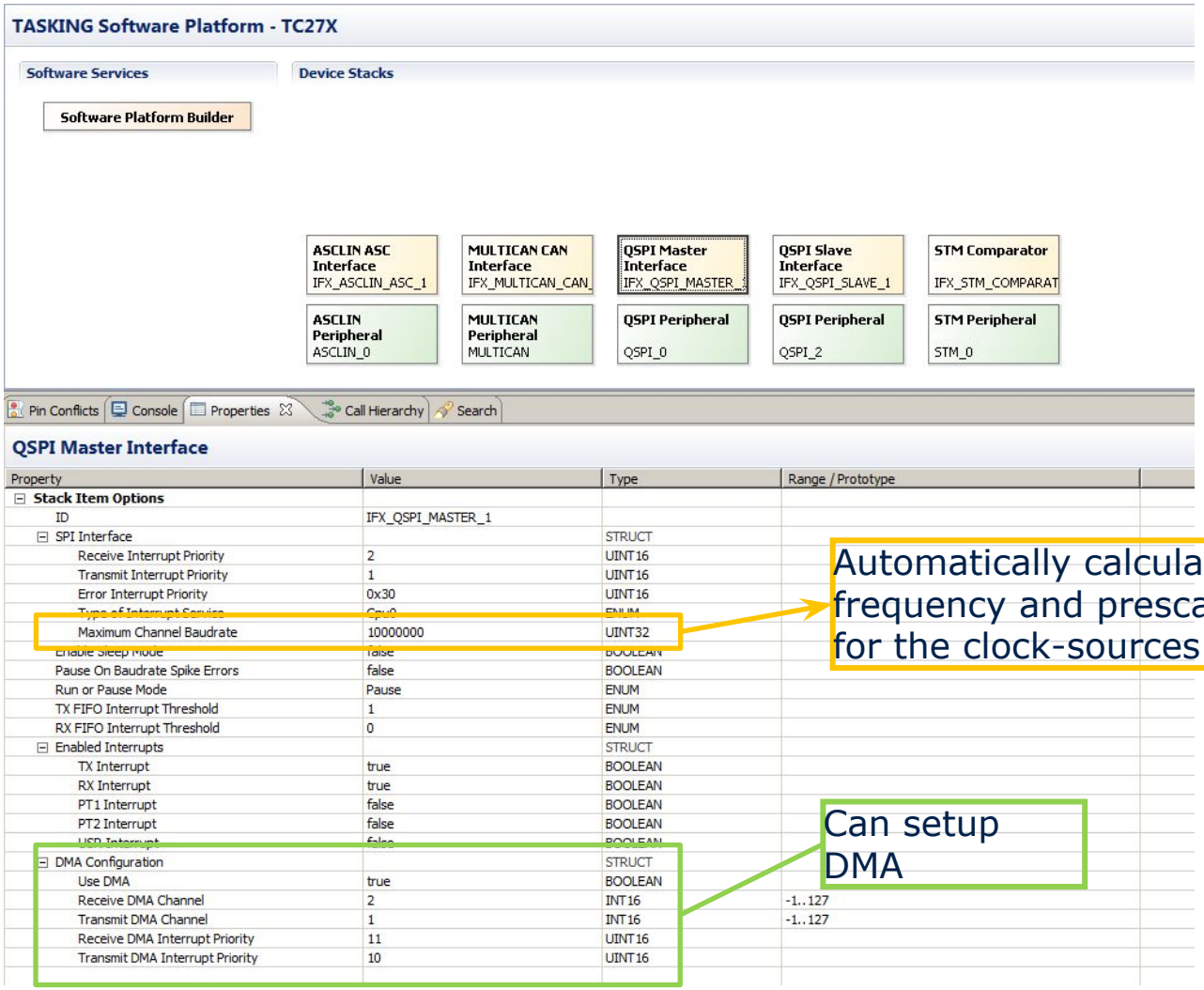
ACT – Driver Configuration

- Select the iLLD from a module and configure your parameters



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ACT – Generated Struct

- E. g., for QSPI Master, the generated init-struct is

QSPI Master Interface

Property	Value
Stack Item Options	
ID	IFX_QSPI_MASTER_1
SPI Interface	
Receive Interrupt Priority	2
Transmit Interrupt Priority	1
Error Interrupt Priority	0x30
Type of Interrupt Service	Cpu0
Maximum Channel Baudrate	10000000
Enable Sleep Mode	false
Pause On Baudrate Spike Errors	false
Run or Pause Mode	Pause
TX FIFO Interrupt Threshold	1
RX FIFO Interrupt Threshold	0
Enabled Interrupts	
TX Interrupt	true
RX Interrupt	true
PT1 Interrupt	false
PT2 Interrupt	false
USR Interrupt	false
DMA Configuration	
Use DMA	false

```
/*
 *  Software Platform Generated File
 *  --------------------------------
 */

#include "ifx_qspi_master_cfg_instance.h"


const ifx_qspi_master_cfg_instance_t ifx_qspi_master_instance_table[1] =
{
    {
        {
            2,
            1,
            0x30,
            IFX_QSPI_MASTER_INSTANCE_BASE_ISR_PROVIDER_CPU0,
            10000000,
        },
        false,
        false,
        IFX_QSPI_MASTER_INSTANCE_PAUSE_RUN_TRANSITION_PAUSE,
        IFX_QSPI_MASTER_INSTANCE_TX_FIFO_THRESHOLD_1,
        IFX_QSPI_MASTER_INSTANCE_RX_FIFO_THRESHOLD_0,
        {
            true,
            true,
            false,
            false,
            false,
        },
        {
            false,
            2,
            1,
            11,
            10,
        },
        0,
    },

};
```

DMA

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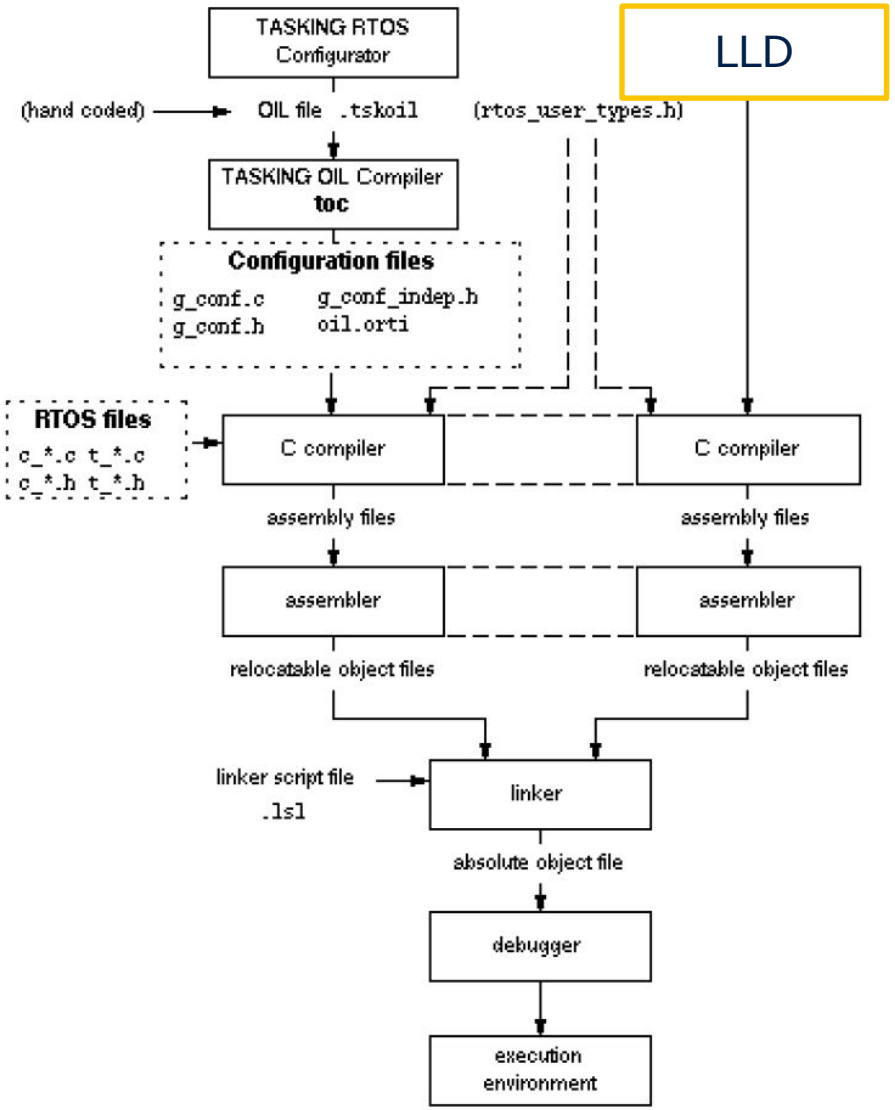
ACT – OS

OS – With Respect To The TASKING OS

- 3 stage implementation:
  - Configurator
    - Generates an oil-file
  - OIL compiler
    - Generates c- and h-files
  - Normal compiler+linker
    - Generates the hex-/elf-file



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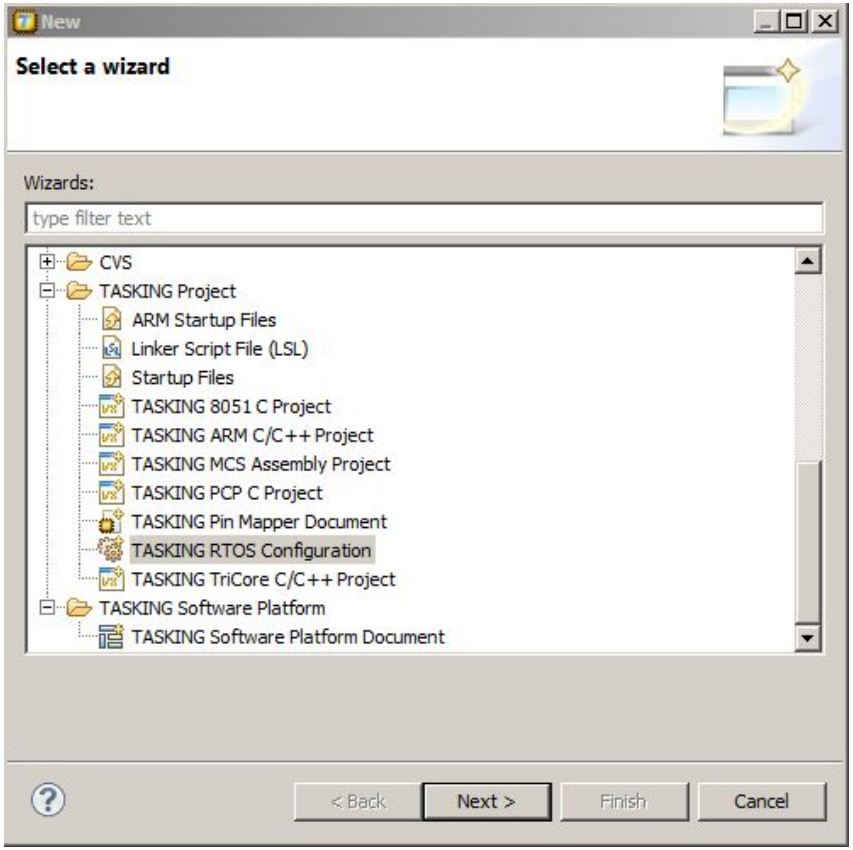
OS – Create the Config

- Select File ☐ New



- And create the oil-file

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OS – OIL-Configurator

Object / Attribute	Value	Type	Description
OS	New_OS		
APPMODE	APPMODE1		
TASK	T1		
TASK	T2		
TASK	T3		
TASK	T4		
TASK	T5		
TASK	T6		
TASK	T7		
TASK	T8		
ISR	Taster1ISR		
ISR	Taster2ISR		
ISR	Taster3ISR		
ISR	Taster4ISR		
COUNTER	SYSTEM_COUNTER		System timer counter
ALARM	A1		
ALARM	A2		
ALARM	A3		
ALARM	A4		
ALARM	A5		
ALARM	A6		
ALARM	A7		
ALARM	A8		
EVENT	E1		
EVENT	E2		
RESOURCE	R1		
RESOURCE	R2		
RESOURCE	RES_SCHEDULER		System scheduler resource
COM	New_COM		
MESSAGE	M1		
MESSAGE	M2		

OS-routines

Task-config

Alarm-config

Event-config

Resource-config

Message-config

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OS – Basic Configuration

OS	New_OS	
STATUS	EXTENDED	ENUM
STARTUPHOOK	TRUE	BOOLEAN
ERRORHOOK	FALSE	BOOLEAN
SHUTDOWNHOOK	FALSE	BOOLEAN
PRETASKHOOK	FALSE	BOOLEAN
POSTTASKHOOK	FALSE	BOOLEAN
USEGETSERVICEID	FALSE	BOOLEAN
USEPARAMETERACCESS	FALSE	BOOLEAN
USERESSCHEDULER	TRUE	BOOLEAN
LONGMSG	FALSE	BOOLEAN
ORTI	FALSE	BOOLEAN
RUNLEVELCHECK	FALSE	BOOLEAN
SHUTDOWNRETURN	FALSE	BOOLEAN
IDLEHOOK	FALSE	BOOLEAN
IDLELOWPOWER	FALSE	BOOLEAN
USERTOSTIMER	TRUE	BOOLEAN
RTOSTIMERPRIO	1	UINT32 [1..255]
RTOSTIMER	T6	ENUM
OSCLOCKHZ	10	UINT32 [1..100000]
CPUCLOCKMHZ	200	UINT32 [1..400]

Task-config

Used hook-routines

OS-timer setup

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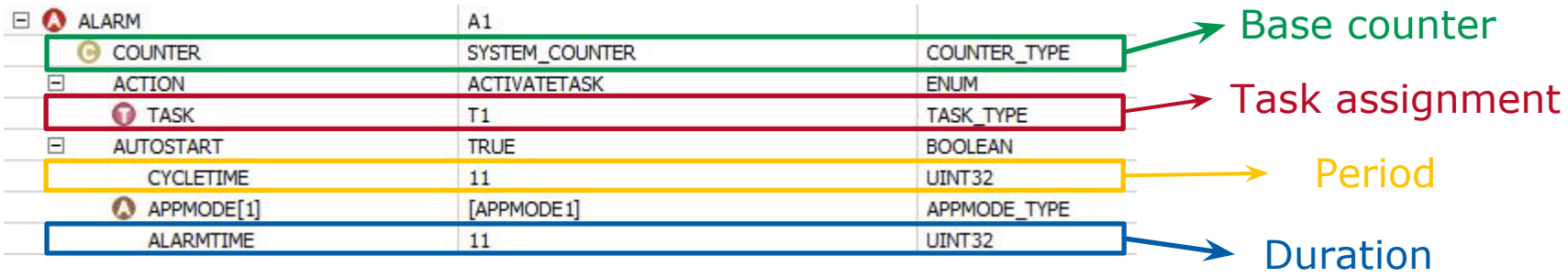
OS – Alarm Configuration



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OS – Task Configuration

TASK	T1	
PRIORITY	1	UINT32 [1..254]
SCHEDULE	FULL	ENUM
ACTIVATION	1	UINT32 [1..255]
AUTOSTART	FALSE	BOOLEAN
RESOURCE[2]	[RES_SCHEDULER, R1]	RESOURCE_TYPE
EVENT[1]	[E1]	EVENT_TYPE
MESSAGE[1]	[M2]	MESSAGE_TYPE
STACKSIZE	250	UINT32

Preemptiv/non preemptive scheduling

Resource assignment

Event assignment

Message assignment

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