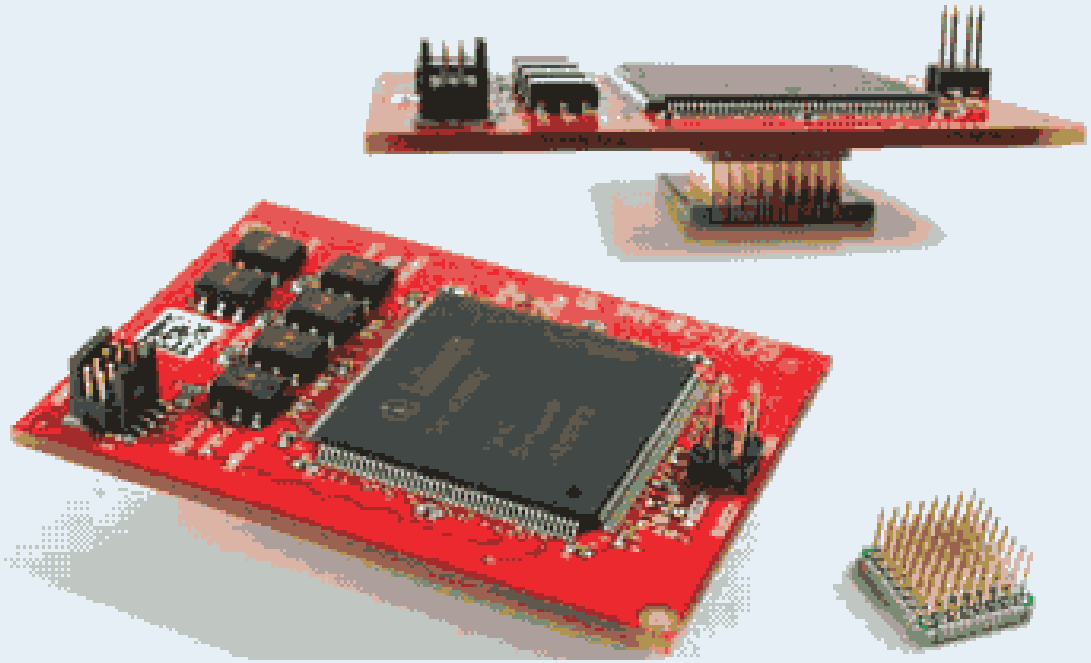
XC2000ED



Never stop thinking

What does Calibration Mean?

- Customers have a need to optimize non-volatile data sets
  - Variables that are associated to features
  - Variables that are adaptive, changing over time

    (Data which is stored in EEPROM Emulation (DFLASH) or serial EEPROM)
- Variables are generally stored in non-volatile memory (FLASH) and are moved to volatile memory (RAM) when Calibrating
  - Typically defined as:
    - volatile data_type mem_type var_Name = value;
    - Examples:

```
/* const addressed via DPP mechanism */
volatile const __near int calValue1 = 0xAA55;
/* const addressed via EXTP instruction */
volatile const __far int calValue2 = 0x1234;
/* const addressed via EXTS instruction */
volatile const __huge int calValue3 = 0x5678;
```

General Requirements for Calibration

- A method to control and change constant data
  - Via Calibration tool such as an ETK from ETAS
    - Parallel or Serial
  - Via CAN using "XCP" Calibration Protocol
  - Via a debugger using scripts and "watch window"
    - Runs without run control, only access to variables
- The system must behave identically before/during calibration
  - Data needs to be "redirected" to volatile memory (RAM)
  - General Requirements:
    - Same access times to the variables
    - No change in the user code (one code set)
    - Ideally no special treatment of constants for the target microcontroller (code reuse between families)

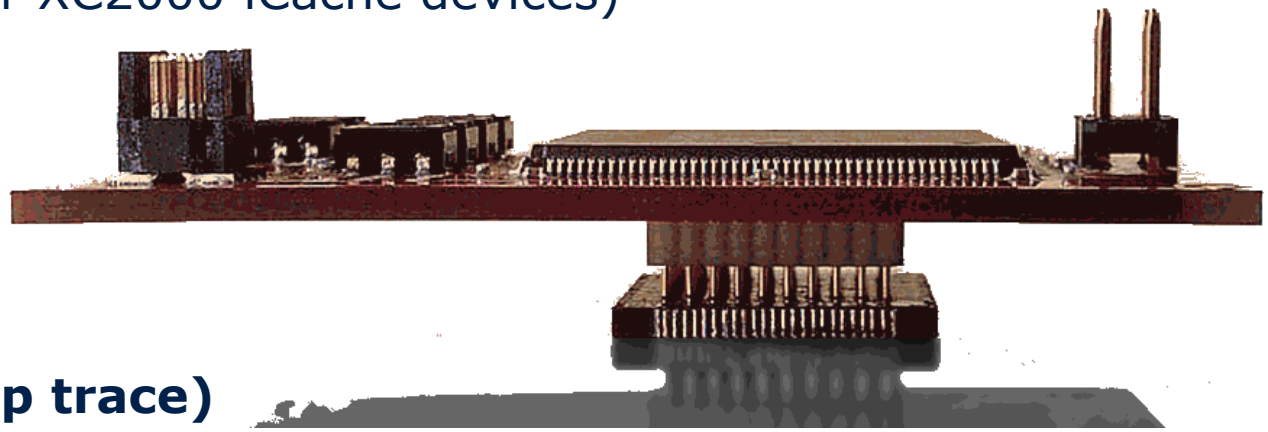
Solutions for Calibration for XC2000

- Currently available Solutions
  - ETAS - Parallel ETK solution
  - ETAS - Calibration via XCP Protocol (using external RAM)
  - ETAS - Calibration via XCP Protocol (using internal PSRAM)
- Other feasible Solutions
  - ETAS - Serial ETK (using internal PSRAM/external RAM) by using the JTAG interface
  - **XC2000ED device**

XC2000ED
Emulation / Calibration support

XC2000ED

- Superset Emulation Device for the XC2000 Family
- XC2080ED, XC2090ED
- XC2091ED (NEW for XC2000 iCache devices)

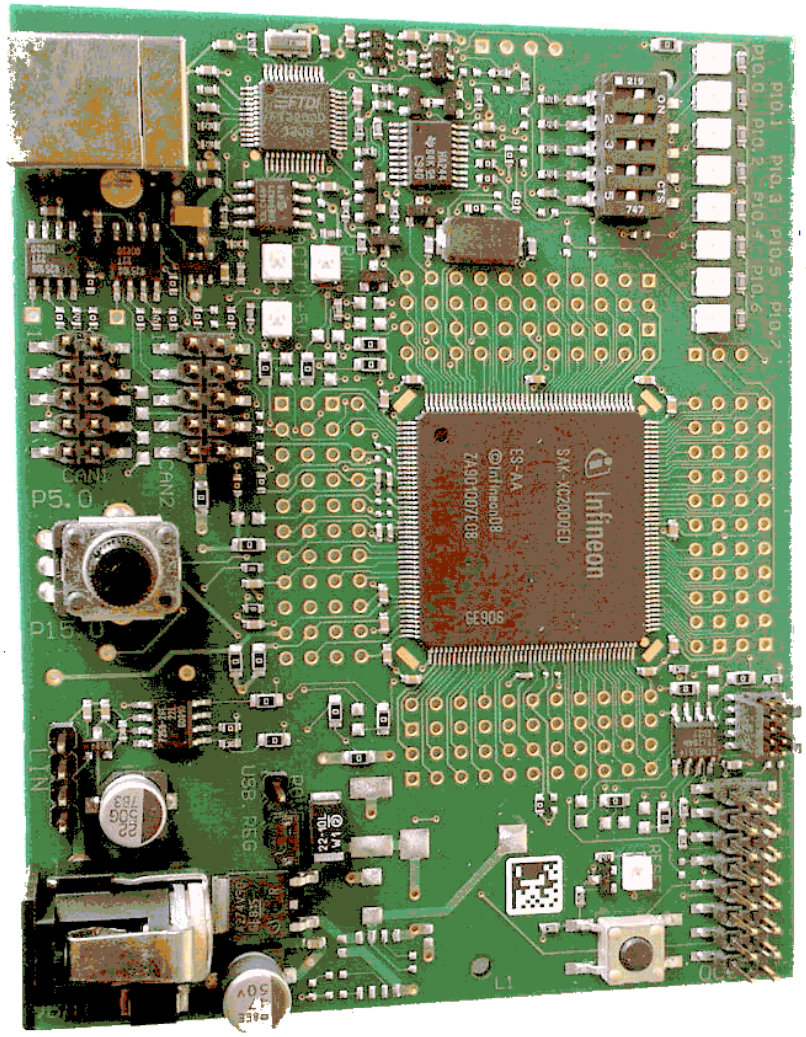


MCDS enabled (on chip trace)

- **MCDS - Multi-Core Debug Solution**
- Similar to 32 bit TriCore families
- MCDS adapted for single core 16 bit CPU
- On-chip dedicated trace buffer (TMEM)

XC2000ED
Positions in HITEX Webshop available now

- XC2000ED Easykit
  - 249,- €
- XC2000ED LQFP 176
  - 99,- €
- XC2000ED LQFP 144
  - 99,- €



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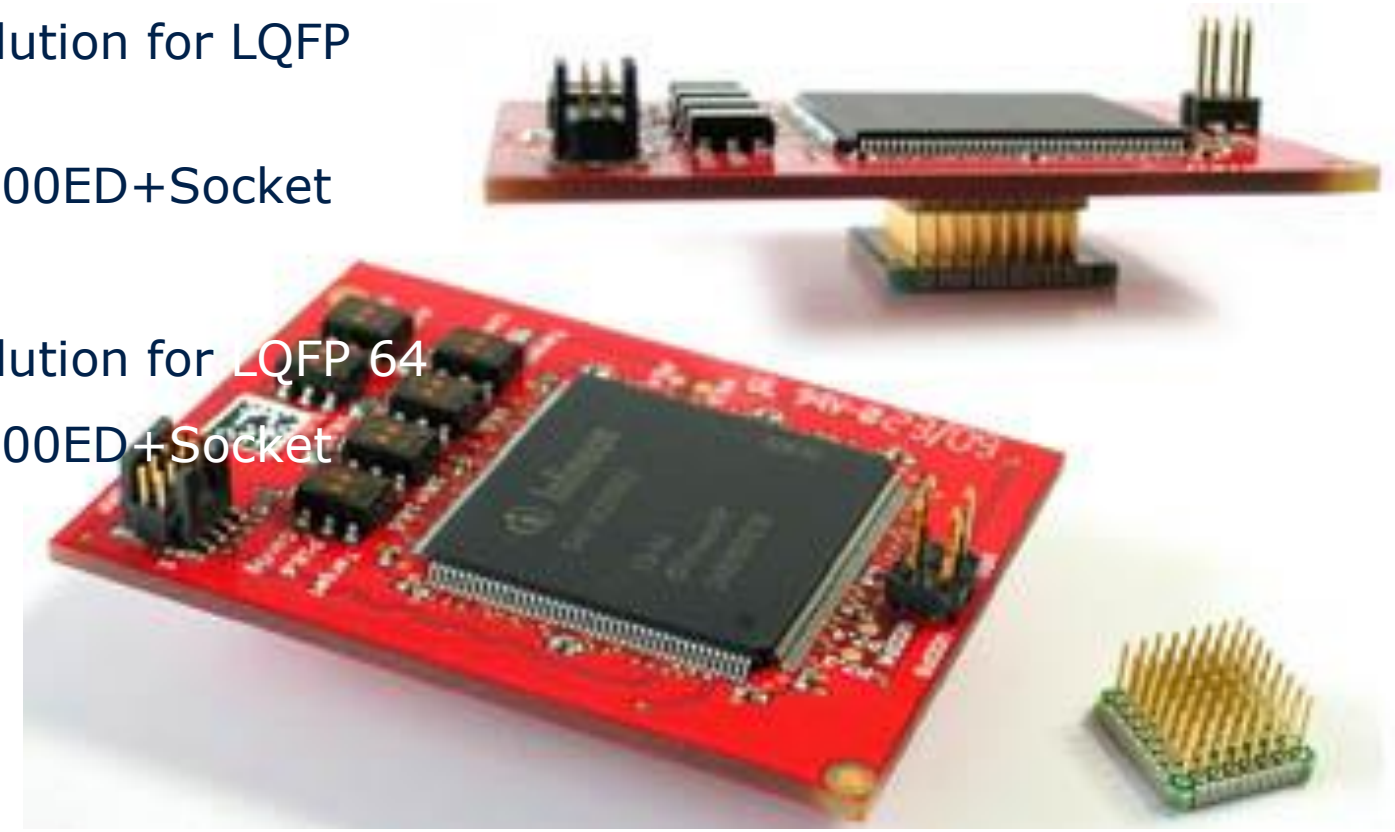
Positions in HITEX Webshop available

- Solder socket solution for LQFP 144
  - contains XC2000ED+Socket
  - 549,- €
- Solder socket solution for LQFP 100
  - contains XC2000ED+Socket
  - 479,- €
- Solder socket solution for LQFP 64
  - contains XC2000ED+Socket
  - 449,- €



XC2000ED Distribution

- XC2000ED hardware will not be provided by Toolpartners and Distributors
- Customers can buy the hardware in HITEX Webshop
- XC2000ED Samples LQFP176+LQFP144 in Webshop available
- XC2000ED Easykit in Webshop available

XC2000ED
MCDS support

MCDS - Multi-Core Debug Solution

The complexity of today's systems-on-chip (SoCs) has outgrown the capabilities of traditional hardware are software debug methods. A typical SoC now contains multiple processors of different types, several different buses, loads of embedded software, and a multitude of discrete signals. With only a fraction of the internal signals visible at the chip I/O, there is very little visibility into what is going on inside the chip.

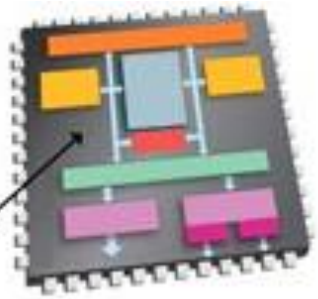
Further complicating the debug problem is the fact that these SoCs are often embedded in machinery where a failure may only occur under real-life conditions—while an engine is running or while a router is pushing packets through the Internet. Debugging these kinds of problems requires capturing the necessary data from deep within a chip at the time that the failure occurs.

Infineon Technologies has developed the Multi-Core Debug Solution (MCDS) to address the problem of debugging deeply embedded, multi-processor systems. By deploying MCDS in either a production SoC or a debug version of the SoC, you can execute real-time, cycle-accurate tracing of selected processors, buses, and signals within the chip non-intrusively, under real life conditions, and without adding pins to the chip. MCDS offers the benefits of:

- Debugging in the real target system: No mechanical or electrical constraints
- Full visibility: Cycle-accurate trace of multi-processor, multi-bus SoCs
- No limitation for low-pin-count, high-frequency devices
- Complex triggering modes—for example, triggering on an event not happening—allowing you to minimize the amount of trace data you collect
- Portability: MCDS is adaptable to any processor or bus architecture; software developers continue to use tools they are familiar with
- Low cost: No expensive hardware needed to access MCDS
- Proven implementation: Hundreds of software developers are already using MCDS-capable versions of popular Infineon controllers to develop system software

XC2000ED
MCDS support

MCDS lets you debug an embedded system **here** while it is operating in real time **here**, using **tools** you already know and without adding pins to your chip.



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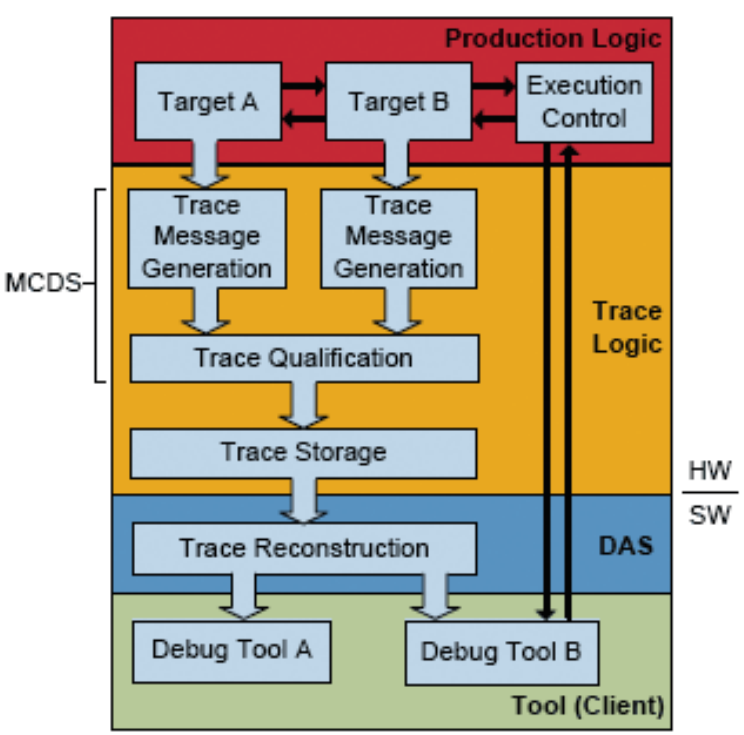
MCDS support

MCDS works on the principle of adding logic to your chip to collect and store trace data from selected targets, then transferring that trace data to debug software for analysis. Figure 1 illustrates the concept of how data flows through an MCDS-based debug system. The trace logic shown in Figure 1 could be implemented either in the production chip or on a special debug die that is excluded from the mass production version of the chip.



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Use Cases

Debugging

- Halt on complex trigger conditions
- Record trace around bug
- Halt (suspend) system when trace buffer full.
  Read out and continue

Performance Analysis

- Continuous measurement (DAP) of performance indicators
- Trigger on performance indicators

Measurement

- Continuous trace (DAP) of data writes, qualified by
  - being within an address range
  - writing task
  - data content

Tool Partner Support

- The following Tool Partner support XC2000ED
  - PLS
    - www.pls-mc.com
  - Lauterbach
    - www.lauterbach.com
  - HITEX
    - www.hitex.com
  - iSystem
    - www.isystem.com

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