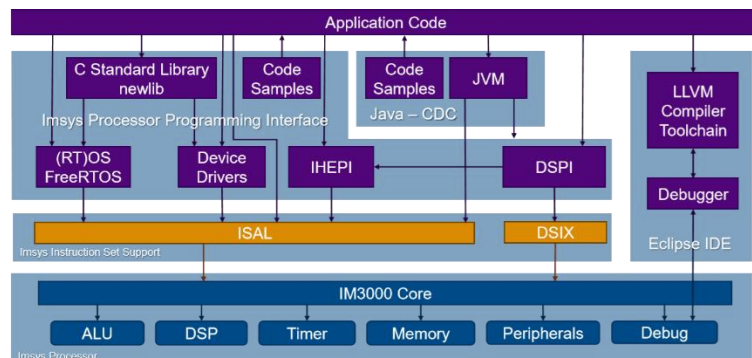


## IM4000 Processor family with full software stack and tool support

- Evolution of proven IM3000 hardware
- ISAL, instruction set architecture with LLVM semantics
- LLVM toolchain and development environment
- C (Clang, newlib), Java (CDC), FreeRTOS



The IM4000 processor is an evolution of the well proven IM3000 processor hardware. IM4000 features a dual core processor available in several configurations and as IP.

The IM4000 uses a modern software stack for embedded application development. The applications can be developed in C or Java. Imsys can also provide services for using the Imsys High-Efficiency Programming Interface (IHEPI), internal modules and microprogramming for critical parts of applications.

It supports development of IoT applications and can be part of a smart IoT device or deployed in a local hub connecting sensors and actuators of different kinds. The use of industry standard open-source software in IM4000 protects the SW investment by using enablers with large eco-systems. This caters both for evolution, stability, access to competence and 3:rd party software. Through these enablers the Imsys processor family unique low footprint features are made available.

### IM4000

- Evolved IM3000 based dual core processor architecture
- Enablers for features with low resource footprint
- C & Java
- Real time operating system
- TCP/IP including TLS
- File system & Device drivers
- Platform support for OTA upgrade
- Configuration management

### Benefits

The IM4000 software stack is built on well proven opensource components and tool chain support. Software add-on and plug-ins for efficient execution on Imsys hardware. ISAL is Imsys' Instruction Set Architecture for LLVM made to be an efficient and compiler-friendly ISA meeting the semantics of LLVM. The software stack is compatible with IM3000 series processors through ISAL.

- Evolved processor hardware with peripherals.
- Open-source based software stack
- State of the art compiler support using LLVM (ISAL)
- Microcoded acceleration of performance critical functions.
- Integrated development environment

- Possibility to test prerelease HW on FPGA

### Language support C

- Clang compiler frontend for C.  
Clang is built on top of LLVM and provides a library based architecture to allow tight integration
- ISAL instruction set architecture implemented in microcode on IM-thousand series of processors.
- C standard library newlib support on the real time operating system (FreeRTOS).  
The library is optimized for embedded applications using IM4000 processors.

### Java

- The JVM, Mika VM, implements the Connected Device Configuration of JavaME.

### Real time operating system

IM4000 uses the real time operating system FreeRTOS. A stable platform for embedded applications with a low footprint adapted to IM4000 and the IM-thousand series of processors.

### I/O and protocols

IM4000 hardware devices will be used through the operating system. Drivers for GPIO, RS232, SPI, I2C, modbus, TCP/IP, TLS and Flash memory driver is part of IM4000. Performance enhanced drivers is provided through microcode that has direct access to the processors HW resources.

### Toolchain

The Imsys tools are based on open-source and supports efficient application development. They are by choice integration friendly and can be integrated into the tool environment defined to support modern development processes.

- State of the art compiler for ISAL
- Debugger of application on target
- Integrated development environment (IDE). The LLVM based tools, Clang, debugger and other tools are specifically designed for integration into IDE.
- Trace hooks in the operating system opens up for analysis tools

### Processor

Evolved dual core processor with ISAL and IoT friendly peripherals. Multiple configurations for SoC and availability as IP core.

- Based on Imsys IP