HICore®

Shorter Time to Certification – Shorter Time to Market

With HICore 1, HIMA is offering a complete, TÜV-certified hardware and software package, as well as selected functional safety services.

For customers who require IEC 61508 certification for their application, HICore 1 can make this otherwise complex certification process faster and easier. HICore not only optimizes the 'time to market', it also cuts costs. That's because the high integration density of the HICore architecture means that fewer additional components have to be purchased. Passive cooling and just-in-time programming also serve to significantly optimize costs.

HICore 1 – Safety System-on-Chip
- Certified by TÜV according to IEC 61508 up to SIL 3
- Applicable up to EN ISO 13849 PL e
- Fully redundant 1oo2D architecture
- Operating System certified by TÜV according to IEC 61508 up to SIL 3
- Non-interfering communications sub-system (COM)
- Safe communications:
  - FSoE (Fail Safe over EtherCAT)
  - PROFIsafe profiles v2.4 and v2.6.1
  - ISOfast

Standards
- IEC 61508 Edition 2, Parts 1–7
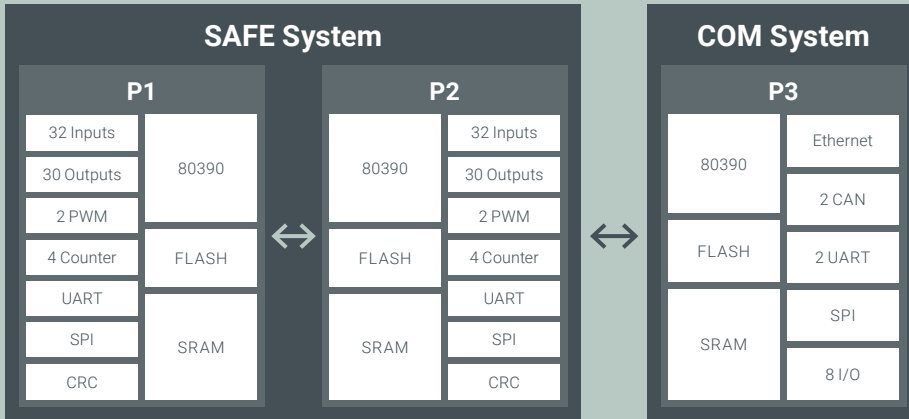- EN ISO 13849-1

Applications
HICore 1 is the complete safety solution including hardware and operating system.

It provides versatile application for functional safety in embedded designs and enables safe communications for applications like safe sensors and safe actuators.

HICore 1 Architecture

HIMA's HICore 1 architecture is based on a redundant 1oo2D microprocessor system with DP80390 cores. Thanks to an additional microprocessor, the integrated communication sub-system operates independently and on a non-intefering basis. All three embedded microprocessors feature exclusive, integrated data and program memories, separate on-chip debugging units, and communication interfaces. Integrated comparators and other features allow HICore 1 to fulfill all functional safety requirements of IEC 61508 up to SIL 3.

SAFE System		COM System
P1 / **P2**		**P3**

SAFE System

P1: 32 Inputs, 30 Outputs, 2 PWM, 4 Counter, UART, SPI, CRC | 80390, FLASH, SRAM

P2: 80390, FLASH, SRAM | 32 Inputs, 30 Outputs, 2 PWM, 4 Counter, UART, SPI, CRC

COM System

P3: 80390, FLASH, SRAM | Ethernet, 2 CAN, 2 UART, SPI, 8 I/O

High integration density of HICore 1 architecture

HICore Operating System/ Middleware

- HICore 1 OS covers all aspects of platform safety (self tests, etc.).
- HICore 1 middleware abstracts hardware from customer application. No register level programming required/permitted.

CUSTOMER APPLICATION
SAFE COMMS | MIDDLEWARE
HICORE OS
HICORE SOC | WATCHDOG
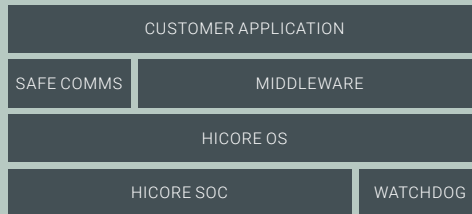
Services

With more than 35,000 TÜV-certified systems installed over the course of 45 years, HIMA is a reliable partner for functional safety. This experience and know-how is available with every HICore 1 Safety System-on-Chip and related consulting services:

- Concept consulting
- Functional safety consulting
- Customer product certification
- Component selection
- Hardware development
- Software development
- HIMA LIFECYCLE SERVICES
- IEC 61508 compliant production

Features
- Energy-efficient, high-performance DP80390 (8-bit) processor cores
- Optimized MCS-51 (8051) instruction set
- Max. clock: 100 MHz
- Memory "SAFE System":
  - 2 x 256 KB Flash
  - 2 x 64 KB SRAM
- Memory "COM System":
  - 512 KB Flash
  - 128 KB SRAM
- Core voltage: 1.8 V
- I/O voltage: 3.3 V
- Typ. power consumption: below 300 mW
- Operating temperature: −40 °C to +85 °C
- Storage temperature: −40 °C to +105 °C
- Enclosure: FPBGA256

I/Os
- 48 safe I/Os
- 8 safe counter inputs
- 2 safe PWM outputs
- Redundant SPI for analog I/Os

Interfaces
- SPI
- UART
- CAN
- Ethernet

Development environment
- IAR Workbench