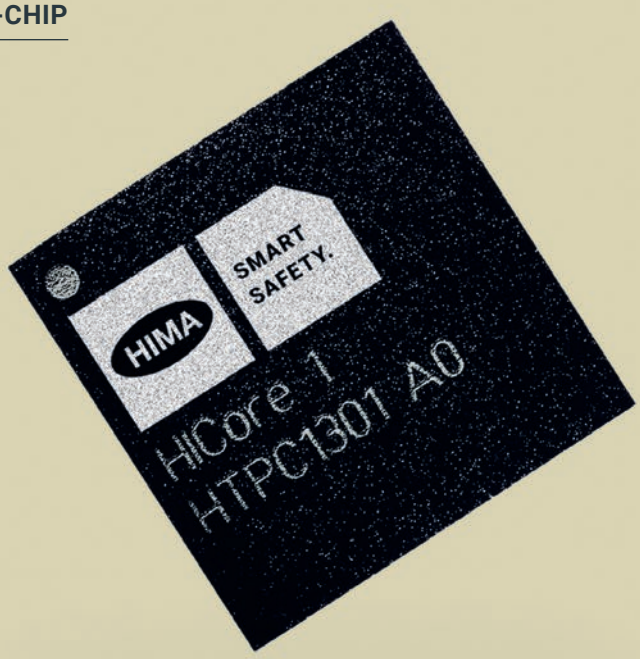
TECHNICAL FACTS
HICore 1 SAFETY SYSTEM-ON-CHIP



HICore®

Shorter Time to Certification – Shorter Time to Market

With HICore 1, HIMA is offering a complete, TÜV-certified hardware and software platform, with optional functional safety services. For those who require IEC 61508 and EN ISO 13849-1 certification for their application, HICore 1 will make this otherwise complex certification process faster and easier. HICore 1 not only optimizes 'time to market', it also cuts costs. HICore's high level of integration reduces the number of external components significantly. This high integration level, combined with passive cooling makes HICore 1 the smallest SIL 3 / PL e platform on the market. Last but not least, it reduces obsolescence issues with resulting redesigns and cost.

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 1oo2 architecture
- Non-interfering communications sub-system (COM)
- HIMA Operating System certified by TÜV Rheinland up to SIL 3 / PL
- Safe communications:
  - FSoE (Fail Safe over EtherCAT)
  - PROFIsafe
  - CIP Safety
  - CANopen Safety

Safety Standards

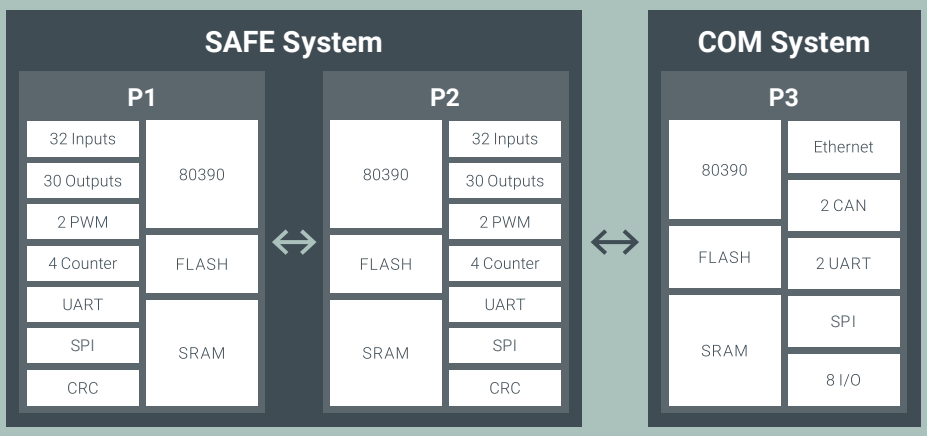
- IEC 61508, Parts 1–7
- EN ISO 13849-1
- EN 62061

Applications

HICore 1 is the complete safety platform including hardware, operating system and middleware. It provides versatile application for functional safety in embedded designs and enables safe communications for applications like safe sensors, safe actuators and safe remote I/Os.

HICore 1 Architecture

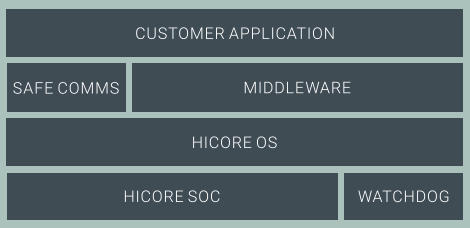
HIMA's HICore 1 architecture is based on a redundant 1oo2 microprocessor system with DP80390 cores running in lockstep. An additional microprocessor, with non-interfering interfaces to the safety-system, operates independently as communications subsystem. All three embedded cores feature exclusive, integrated data and program memories, separate on-chip debugging units, and communication interfaces. Dedicated, integrated circuitry allows HICore 1 to fulfill all functional safety requirements of IEC 61508 up to SIL 3 and EN ISO 13849-1 up to PL e.



High integration density of HICore 1 architecture

HICore Operating System and 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.



Services

With more than 40,000 TÜV-certified systems installed over the course of 50 years, HIMA is a reliable partner for functional safety. This experience and expertise are available with every HICore 1 Safety System-on-Chip and 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
- Lagertemperatur: –40 °C to +105 °C
- Enclosure: FPBGA256

I/Os

- 48 safe I/Os
- 8 safe counter inputs
- 2 safe PWM outputs
- 2 SPI for analog I/Os and other connectivity

Interfaces

- SPI
- UART
- CAN
- Ethernet

Development environment

- IAR Workbench