



Branch Profile Marine Technology



At home on the high seas

Maritime industry is a sector that has always been subject to change and must constantly adapt. Whether due to changing legal regulations or changing market conditions, there is always something new to discover in this industry. Adaptations and innovations also play a major role in the field of marine technology, especially when it comes to integrated software solutions.

Navigating the oceans

Software-based functions and their seamless networking are also becoming increasingly important on the world's oceans. The demands on the safety and reliability of electronic components on board are constantly increasing. But we are meeting these challenges with determination: by developing software in accordance with the highest standards and strictest process specifications, we ensure the quality and performance of tomorrow's marine technology.

Scope of Services

- System and software development in accordance with IEC 61508 and MISRA 2013
- Integration and system tests
- Requirements management
- Verification and validation

Together to Success

Together with our customers and their end customers, we develop system requirements that we effectively translate into technologically sophisticated results. The integration of subsystems from national and international development projects and ensuring consistent interoperability across system boundaries is only possible through close collaboration and coordination. We also assume responsibility as a general contractor and develop series devices in conjunction with our business partners.



Specific Project Experience

- Redesign of a marine automation component as general contractor focussing on device development, software and IT security
- Robust system solution for a system battery for underwater use
- Redundant system design for maximum avoidance of failures
- Logging and communication via RS232/RS485 or CAN
- Creation of requirement and functional specifications
- Development of a data logger for underwater applications with very high energy efficiency
- Development of a modern HMI solution as an efficient user interface for submarine control systems
- Concept and realisation of an converter for the navy
- Development and programming of the HMI interface using the uniTFTdesigner software
- Creation of technical documentation and programming guidelines

Functional Safety

- Ensuring reliability in accordance with IEC 61508
- Compliance with Misra standards 2011 / 2013

Software Development

- Creation of the Software Development Plan (SDP)
- Software requirements management (Requirements Specification)
- Creation of the software architecture (Architectural Design Specification)
- Implementation (Software Unit Design and Implementation)

Systems Engineering

- Requirements management at system level
- Support in the creation of the item definition
- Creation of the system architecture and system design

Support Processes

- Quality management
- Configuration management
- Problem and change management
- Process consulting and implementation
- Tool development
- Development of simulation environments
- Development of test tools

Verification and Validation

- Software Unit Testing
- Software Integration and Testing
- Verification of Software Safety Requirements
- Modul-, Integrations- und Systemtests
- Analysis
 - Static code analyses
 - Code reviews
 - Dynamic code analyses
 - Object Code Analyses
 - Compiler analysis reports
 - Compiler error reports
 - Floating point arithmetic analyses
 - Coverage analyses (MC/DC etc.)
 - WCET analyses
- Validation
 - System requirements
 - Software requirements
 - Requirements for the software unit

Tool Experience (synopsis)

- Microcontroller Tools: DSPIC33EP512MC806, NXP MCU (rx11160, XMC1404), Atmel AVR, ST Processor
- Programming Languages: C, C++, Python
- Microcontroller IDEs: MCUXpresso, Infineon DAVE, Atmel Studio, Keil µVision, Visual Studio, Visual Studio Code
- GUI Frameworks: Tkinter
- Networking Tools: UART, SPI, CAN, I2C, MODBUS, TCP/IP, SNMP, CANopen, Net-SNMP, FreeRTOS
- Debugging Tools: JTAG, Debugger
- Design Tools: EAGLE, SolidWorks
- Version Control: Mercurial
- Electronics Tools: Analogue and Digital Electronics, Circuit Technology (analogue and digital), DSO, Oscilloscopes, ADC, DAC, GPIO, DI/DO, PWM, NTC Thermistor, Digital Components, Watchdog, Current, PCB Design
- Measurement Tools: sensor technology, signal processing/analysis, measurement technology, thermal analyses, semiconductor physics, circuit diagram analysis, PID control, MISRA, Doxygen