



Electronics Development for Process Automation

Empowering the Next Generation of Process Instruments

MESCO Core Competencies and Development service

Electronics Development for Process Instruments

MESCO develops complete electronic solutions for process instruments on behalf of customers – from concept to certification. We design both embedded hardware and software, integrating modern industrial communication interfaces, including those for use in hazardous areas. In addition, we support our clients in implementing functional safety to ensure long-term reliability and plant safety.



MESCO Services

- Concept & design for industrial electronics
- Hardware and software development
- Prototyping and industrial product testing
- Certification support for functional safety, explosion protection, and cybersecurity

Embedded Hardware Design

- Expertise in analog signal processing for sensor-based devices and industrial measurement systems.
- High-quality analog electronics design to ensure accuracy and reliability.
- Electronics with Embedded microcontroller design for harsh environments
- Optimization for low power consumption, real-time performance and Industrial Ethernet/ fieldbus connectivity.
- Implementation of safety architectures
- Miniaturized Electronics for Industry 4.0
- Design of miniaturized field devices for compact, cost-efficient solutions
- Low-power and energy-efficient embedded solutions, battery powered solutions
- Ex- and EMC compliant designs, PCB design for advanced manufacturing
- Fieldbus reference and interface implementations

Embedded Software Design

- Software module development including requirements, architecture and design
- Control algorithms, digital signal processing and measurement applications
- Secure software development, Functional safety software development according to IEC 61508

Industrial Communication

HART Solutions

- HART protocol integration with own MESCO HART Rev7 communication stack
- Multi-vendor fieldbus lab testing, FDI compliance testing
- EDDL development

Ethernet-APL solutions

- Standard-compliant SPE/ Ethernet-APL interfaces
- Proof-of-concept using MESCO SPE / Ethernet-APL Evaluation Boards
- Integration of multi-protocol solutions (PROFINET/ PROFI-safe, Ethernet-IP/ CIP Safety)
- PoDL power supplies and explosion-proof concepts
- Implementation of Ethernet communication interfaces with Functional Safety and Security constraints



IO-Link

- Standard-compliant HW/SW IO-Link interface development
- IO-Link Safety protocol
- IODD development

Standards compliance

- IEC 61158, IEC 61784, IEC 62541, IEC 61131-2, IEEE 802.1AS, IEEE 802.11, 802.15.4

Safety, Certification & Advanced Industrial Services

Explosion Protection (Ex) for Industrial Electronics

- Design and development of intrinsically safe field devices (FISCO) and Ex-protected hardware.
- Creation of Ex-circuit diagrams, low-power designs, and international approvals.
- Global standards compliance: IECEx, ATEX, FM, CSA
- Standards: ATEX 100a / 94/9/EC; IEC 60079-0, -7, -11, -18

Functional Safety (SIL) for Process Instruments

- Support on SIL-certification for safety-critical products
- Hardware/software development up to SIL3
- Integration of safe communication protocols for industrial fieldbus systems.
- Development of parametrization and diagnostic software for functional safety systems.
- Standards: IEC 61508 (SIL2/SIL3); IEC 61511; IEC 62061 / EN ISO 13849-1

Cyber Resilience & Industrial Security

- Secure design and cyber resilience for industrial devices per ACT / Security standards.
- Threat analysis, security consulting, and ongoing industrial cybersecurity support.
- Support for audits and security certification
- Standards: IEC 62443 (SL2/SL3)

Testing & Certification

- Type test, integration test and compliance testing for industrial electronics
- In-house EMC testing
- In-house fieldbus interoperability testing
- Support for external certification processes

MESCO Design Services at a glance:

- Hardware and Software design for Process Instruments
- Low-power interfaces, PoDL power supplies, explosion-proof concepts
- Multiprotocol Ethernet solutions and protocol compliance testing
- Implementation of safety functions and protocols
- Support of fieldbus testing (PI, FCG, ETG, ODVA), safety certification for SIL2/SIL3 (TÜV / Exida) and Cyber Security Constraints (TÜV / CRA)

Let's build the Future of Process Instruments – Together!

MESCO Electronic Design Services – fully transparent, competent, reliable, technically Top-Notch.

Contact us to discuss your next-generation device platform, instrumentation project or compliance challenge.