KNESTEL
ELEKTRONIK & TECHNOLOGIE

we invent solutions

we develop customized solutions from idea to production and beyond.

Project details: High-precision measurement & control unit for an exhaust gas test bench with EtherCAT fieldbus

Industries

- Automotive, Testing and Measuring Technology

Technology fields

- Propulsion Technology, Bus Systems and Radio, CAE; Measurement, Control and Regulation Technology

Project requirements

- The aim of the project was the development with subsequent production of an EtherCat fieldbus node with Linux-based control unit and EtherCat master for an chassis dynamometer with up to 16 200 kilowatt drives and numerous auxiliary drives. Flexible EtherCAT fieldbus nodes had to be developed for data acquisition, motor control and data communication. A robust design for use in harsh test rig environments, the dynamic control of the forces to be simulated in a few milliseconds and the precise synchronization of the individual drives were essential project requirements.

MATLAB SIMULINK

EtherCAT

Facts / Highlights

Fieldbus Nodes

- Force Measurement with 24-bit resolution
- Displacement Measurement with 27-bit resolution
- Temperature Measurements
- Pressure Measurement
- Control of up to 8 linear motors for vehicle centering
- Controlling up to 2 roller shutter motors for roller cover

EtherCAT controller unit

- EtherCAT Master for data transmission in real time
- High-precision synchronization of the individual participants (latency << 1µs)
- Programming with Matlab / Simulink
- Real time Linux
- KNESTEL Rapid Prototyping Environment for online debugging

Services of KNESTEL

- Potential analysis, target price estimate, project management, requirements specification, project planning, development software and hardware, electrical and mechanical construction, EMC testing, prototyping, serial production

Possible applications

- Networking of MSR nodes and systems
- Safe and highly dynamic control and regulation of distributed systems
- (Special) mechanical engineering and test bench construction

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