

Real time EtherCAT MCR unit

**AIR- AND WATERPROOF
REAL-TIME SYNCHRONOUS**

for automotive, test and measurement technology



Technology fields

Propulsion technology, MCR technology, bus systems, radio, CAE

Project requirements

The **project objective** was the development and production of an EtherCAT fieldbus node with Linux-based control unit and EtherCAT master for an exhaust roller test stand with up to 16 drives of 200 kilowatts each and numerous auxiliary drives. Flexible EtherCAT fieldbus nodes for measurement data acquisition, motor control and data communication had to be developed. A robust design for use in harsh test bench environments, dynamic control of the forces to be simulated within a few milliseconds and precise synchronization of the individual drives were essential requirements.

Facts/Highlights

Fieldbus node

- 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
- Control of up to 2 shutter motors for roller cover

EtherCAT control unit

- EtherCAT Master for data transfer in real time
- High-precision synchronization of the individual participants (latency $\ll 1 \mu\text{s}$)
- Programming with Matlab/SIMULINK
- Real-time Linux
- **KNESTEL** Rapid Prototyping Environment for online debugging

Services of KNESTEL

Potential analysis, target price estimation, project management, specifications, project planning, development of software and hardware, electrical and mechanical design, EMC test, prototyping, series production

Possible applications

- Networking of MCR nodes and systems
- Safe, highly dynamic control and regulation of distributed systems
- (Special) machines and test stand construction

About KNESTEL: Knestel has been developing and producing customized electronic and mechatronic special solutions in the fields of motor and machine control, frequency converters, image processing, MCR technology, software development, radio, bus systems and gas analysis for 40 years.

We support our customers from the idea to the finished implementation. Individual solutions and concepts - technically up to date. Our production - electronics manufacturing, device and switch cabinet construction, Production of subassemblies, assembly and mechanical processing - is equipped with the latest technology.