Ecosystem + Trends & Motion Systems

Our **Ecosystem is changing** due to global **Megatrends**!

Autonomous Mobility further pushes requirements to Motion Systems.

As a result, a **new system architecture** is needed.



The Story of Vehicle Safety The path towards Vision Zero

Traffic Fatalities¹



Twofold Approach

Increase performance and automation to reduce human error

Increase installation rates of established safety systems



¹ Sources: Data for 2019, Federal Statistics Office, Germany (Destatis) | Global Status Report on Road Safety 2018, World Health Organization ABS: Antilock Braking System | ESP: Electronic Stability Program | LDW: Lane Departure Warning | AEB: Autonomous Emergency Braking | RCTA: Rear Cross Traffic Alert | TJA: Traffic Jam Assist

Automotive Transformation

4 major trends are driving the requirements to safety



Safety innovations needed to make the transformation happen. Safety is not negotiable!

Our Vision Zero Safe Mobility Is Our Passion – Saving Lives Our Devotion



Safe and Dynamic Driving Toward Vision Zero

Sense Plan Act

All Future Cars Need a Brake System

Friction brakes with electronic brake system stay dominant



Evolution Steps of the Vehicle Architecture Trends driving Brake Controls to Motion Systems

Continental 3

Electrification demands Energy Efficiency!

Recuperation enabled with MK C2 // zero drag Caliper & eDrum Brake increases efficiency

Automated Driving pushes new demands for Vehicle Performance!

Fast and precise autonomous pressure response (TTL*) ADAS functions paves the way to Motion Control

> Future vehicle E/E Architecture drives **Modularity of SW** towards **Distributed Solutions**!

HW Scalability and SW Portability

*TTL = time to lock

Evolution from Braking to Motion Controls

On the path to autonomous driving



Future Brake Systems

Megatrends such as **Digitalization**, **Electrification**, **Autonomous Mobility** or **Sustainability** will bring new requirements to Brake Controls.

These trends will lead to an **Evolution of Brake Controls to Motion Systems.**



Evolution of Brake Controls to Motion Systems

Modular and scalable setup to serve market needs



Continental is ready for new Brake System and Motion Control Architecture

Future Brake System Evolution Steps



Evolution from Braking to Motion Controls MK C2: Gateway to Future Brake Systems



Brake Components

Electronic Brake Systems and Wheel Brakes will contribute to future Sustainability requirements with lower emissions and energy efficiency.

With our **key components MK C2** and **ePedal technology** we are **ready** for new Brake System and **Motion Control Architecture**.



Brake-By-Wire Systems – MK C2 Benefits at a Glance

The MK C2 is Continental's second-generation brake-by-wire system and will enter series production in 2022.

The system integrates the master cylinder (MC), brake booster and control systems (ABS and ESC) into a single compact and weight-saving (approximately 30%) module. The MK C2 is built upon Multi-logic Architecture, this increases the functionality and availability of the system.



The Key Features of the MK C2



Vacuumless Vacuumless brake system for CO2 optimized powertrains.



3x Faster Autonomous braking pressure builds up three times faster than conventional systems.



Brake-by-Wire Pressure build up performance is independent from the driver due to "brake-by-wire" design.



Recuperation Efficiency Up to 5g/km less CO2 emission and +30% recuperation efficiency (+180 Wh) compared to hybrid brake systems without simulator in WLTC.