Intelligent solutions for chassis applications
Always one step ahead: optimized solutions for ambitious chassis applications.

Whether transporting people or moving goods, the requirements to the chassis of a modern commercial vehicle go far beyond simply carrying a load.

Maximum protection of the driver, vehicle, and cargo are key considerations. However, there are additional important aspects for the selection of electronic components like the reduction of fuel consumption.

In the past, the electronic control units used for chassis control have been located in the cab for reasons of cost and ease of maintenance. Modern systems are increasingly being installed on the vehicle frame or directly on the actuator or aggregate. This ensures that the electronics architecture remains lean and that costs are optimized, while also reducing technical risks due to the fact that short wiring harnesses are less susceptible to external interference.

Improved reliability and lower system costs are important benefits, along with increased functional diversity. These factors all contribute to the commercial success of our customers. Our electronic systems are specially designed and built to meet the specific requirements of commercial vehicles. And we don’t just stop with the present – whether it’s a matter of safety, economy, efficiency, or the environment, solutions from Continental are often the solutions of tomorrow.
Always one step ahead: Example of the decentralized electrical/electronic architecture for the future

Example of the decentralized electrical/electronic architecture for the future

- Interdomain Backbone (High-Speed CAN, 500 kBit/s)
- CAN-FD (Flexible Data Rate)
- Ethernet

Powertrain Master Control Unit
- Engine Management
- Emission Aftertreatment
- Body Builder
- Brake
- Retarder
- Gearbox

Chassis Master Control Unit
- Level & Roll Control
- Tire Pressure Monitoring
- Battery & Energy Management
- ADAS
- Body Builder

Cabin Master Control Unit
- Door Modules
- HVAC
- Cabin I/Os
- Sleeper I/Os
- Access Control

Infotainment Master Control Unit
- MMI-CU
- Instrument Cluster
- Secondary Display
- General Purpose I/Os
- Radio & Navigation

Gateway & Computation
- VDR/DTCO*
- Tolling-OBU

Powertrain Domain *
Chassis & Safety Domain *
Cabin & Comfort Domain
Infotainment & Telematics Domain

- Safety relevant

Legend:
- Interdomain Backbone (High-Speed CAN, 500 kBit/s)
- Redundant CAN
- USB
- Powertrain Subnet (High-Speed CAN)

* Safety relevant
MU4-P multiplex solution – Variable platform chassis control unit.

Electronic control units for chassis related functionalities are mostly customer or function specific designed, like e.g. light control units or chassis level control units. To provide vehicle manufacturers with freedom to realize their own electronic control solution mounted on an open chassis of a commercial vehicle we offer a water protected platform ECU for harsh environmental conditions.

This control unit will be available in two variants: independent from head units as MUX4-Pcu and as expansion node MUX4-Pn. The MUX4-Pn expansion node is suitable for an existing multiplex system with a KI6ES® based central computer or body controller and is able to expand the I/O capability of the system outside a protected cabin being close to sensors and actuators mounted on the chassis. With the independently working control unit MUX4-Pcu the vehicle designer can select the fitting mounting area as well as the method for application programming suiting the functional needs and the existing know-how.

Advantages at a glance
- Freedom to realize individual electronic control solutions
- Water protected platform ECU for harsh environment
- Available in two variants: as master or expansion node
- Application programming suiting the functional needs

Technical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>12 V and 24 V</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP 67 / IP 6K9K</td>
</tr>
<tr>
<td>CAN interface</td>
<td>2 (client = 1 M-CAN-J)</td>
</tr>
<tr>
<td>Input digital</td>
<td>8</td>
</tr>
<tr>
<td>Input analog (parametric)</td>
<td>8 (also usable as digital inputs)</td>
</tr>
<tr>
<td>Input frequency</td>
<td>3 (master variant)</td>
</tr>
<tr>
<td>Output High Side</td>
<td>22</td>
</tr>
<tr>
<td>Wake up</td>
<td>2 digital inputs</td>
</tr>
<tr>
<td>Sensor Supply</td>
<td>5 V / 40 mA, 2 x 8 V / 15 mA (master variant)</td>
</tr>
<tr>
<td>Diagnostic services</td>
<td>Built-in diagnostic &amp; protection capabilities</td>
</tr>
</tbody>
</table>
For simple logic functionalities, like e.g. switching lights or valves we offer the inexpensive and easy to learn PLC based programming environment LogiCAD.

For more complex control algorithms our Model Based Development System (MBDS) based on Mat Lab®/Simulink® is the best choice. It guarantees full freedom for all functional needs but requires a higher level of programming experience.
Maximum efficiency and safety: advanced level and roll control systems.

A modern understanding of vehicle safety involves more than just ensuring the protection of driver and passengers. Particularly in the case of commercial vehicles, safeguarding the cargo is of crucial economic importance.

Chassis for commercial vehicle applications in Europe are predominantly equipped with air suspension. Intelligent control of the pneumatic pressure is therefore critically important. State-of-the-art level control and active roll control from Continental offer maximum safety. Our range of sophisticated solutions for commercial vehicles includes everything from simple level control for a single air-sprung drive axle to complex electronic systems for four-axle air suspension systems, including the lift axle.

Intelligent Chassis Level Management
Modern electronic solutions allow the driver to move the rear axle up and down by remote control without ever leaving the vehicle. This significantly increases the speed of coupling and decoupling the trailer and with that reduces costs. Any air losses that occur within the system can also be automatically compensated. Automatic leveling for repeated use of the same loading bay is possible as well as automatic maintenance of the same height as weight increases during loading.

Early warning of overloading and maximum protection
By carefully analyzing the way pressure increases in the air spring bellows, it is possible to calculate and display the actual load on each individual axle. This provides the driver with early warning of any overloading. Fully automatic lift axle control makes starting on slippery surfaces considerably safer. When the vehicle control unit (VCU) detects a situation requiring anti-slip regulation (ASR), the level of the supplemental/lift axle is automatically raised in order to increase traction at the drive axle. This occurs fully automatically in a fraction of seconds, with no need for driver intervention.

High-tech roll control from Continental
By automatically adjusting the individual dampers, the system is able to actively counteract rolling of the vehicle body, thereby preventing the vehicle from overturning. The roll control system also reduces pitching to a minimum, particularly during braking or unusually heavy acceleration.

Advantages at a glance
- Full automatic chassis level control
- Additional safety improvement by intelligent roll control
- Intelligent starting traction control
- Cost optimized cabin mounted ECU
- Reduced cable harness using a chassis mounted ECU
- Smooth chassis level control algorithm reduces compressed air consumption
Advanced level and roll control systems

Trendsetting: Air Spring Leveling System (ALS)
By integrating an intelligent height and pressure sensor onto the bulb of the air spring and using a maintenance free ultrasonic measuring principle we developed a cost-optimized solution for future chassis level control. The sensors can easily be integrated into existing chassis leveling systems because they provide standard analog signal outputs. Combining the ultrasonic sensor with a pneumatic valve is another step towards reducing the number of separate system components and thereby remarkably simplifying the system.

The right solution for every vehicle
Continental can provide and implement an effective, cost-orientated solution for every conceivable vehicle variant – be it a low-cost, cab-mounted unit or a chassis-mounted system close to sensors and valves.

Advanced level and roll control

![Diagram of air spring leveling system with front and rear axles connected via pressure and height sensors.]

Integrated sensor:
- Ultrasonic Chassis Height Measurement
- Pressure Sensor
See and be seen: innovative light management for commercial vehicles.

Effective vehicle lighting is an important safety factor, but modern light control systems for commercial vehicle applications have to be able to carry out a wide range of additional tasks and meet tough requirements in terms of modularity, operational safety and functionality.

A flexible, configurable, continuously verifiable lighting system for tractor and trailer is indispensable for an effective and economical operation. In addition, legal requirements vary from country to country and the vehicle may be used for special purposes. All these factors must be taken into account. The role of a modern light control system is to implement the respective requirements quickly and simply.

Electronic light management systems from Continental are built around intelligent control units with electronic power switching. This approach drastically reduces the number of components required in comparison to conventional electromechanical light control systems, which rely on relays combined with fuses in series.

Our design philosophy has the advantage of requiring less packaging space and it also results in a more reliable electrical system. The system can automatically detect short circuits, cable breaks, overload and filament breaks and features a fault memory with time stamping and precise fault path identification resulting in better operational safety of the vehicle and reduced maintenance costs.

Very compact light control unit

Advantages at a glance

- Significantly reduced number of components
- Little packaging space required
- Reliable electrical system
- Automatic fault detection and and precise fault path identification
- Fast and easy realization of additional functionalities by software
Considerable cost and time savings are also possible due to:

- No need to check the lights before setting off
- Easy adaption and configuration of the wiring harnesses
- Simple software configuration of various switching options
- Easy configuration of additional options, such as automatic light control functions to comply with various daytime running light regulations or an extra light sensor for automatically activating/deactivating the headlights

Light emitting diodes (LEDs) are increasingly being used in the rear light clusters of commercial vehicles and implemented in all kind of combinations of traditional bulbs and LED clusters or LEDs exclusively. Because LED clusters use substantially less power, the fault diagnostic system needs to be correspondingly intelligent and precise.

Electronic light control systems from Continental meet all the above needs in full and are adapted specifically to the requirements of individual customers. Low-volume vehicle production is supported by way of centralized control units featuring freely programmable functionality. For larger vehicle fleets, decentralized control units are mounted directly on the vehicle chassis in order to optimize the electronics architecture and ensure its maximum reliability. Vehicle manufacturers and also fleet operators can rely on our comprehensive expertise to provide the perfect cost-oriented solution for all their light control needs.

Lights positioning on commercial vehicles

- Headlights Low Beam: L 70 W / R 70 W
- Headlights High Beam: L 75 W / R 75 W
- Campaign Lights: 140 W
- Park Lights Front/Side: L 40 W / R 25 W
- Front Fog Lights: 140 W
- Direction Ind. Tractor Front: L 42 W / R 42 W
- Indicators (Dashboard, Hazard, Fog): 4 x 12 W
- Brake Lights: 252 W
- Park Lights L 240 W / R 240 W
- Direction Indicator Trailer: L 126 W / R 126 W
- Brake Lights: L 42 W / R 42 W
- Park Lights Side/Tail L 35 W / R 35 W
- Reverse Light: 42 W
- Rear Foglights: 84 W
- Direction Indicator Tractor Rear: L 42 W / R 42 W
Optimized for performance: modern compressed air management systems.

On practically all commercial vehicles compressed air systems are now standard equipment. A wide range of features that are essential to reliable vehicle operation would be impossible without them.

Compressed air controls the braking system, air suspension, air-sprung seats, gearbox actuation, and numerous other systems in a modern vehicle. Until now, such components as the multicircuit safety valve, pressure sensors, air dryer, and the individual control valves have all been fitted individually.

Numerous benefits, not least financial, to be gained by integrating these components into a single, compact electronic control unit:

- Costs can be saved at the manufacturing stage, for example, because significantly fewer individual components need to be fitted
- Packaging space is also optimized through direct installation on the chassis
- With judicious design, it is possible to reduce the number of compressed air reservoirs
- There are additional safety and reliability advantages thanks to the compact size of the unit and not very exposed individual components
- Automatic diagnostics monitor every component in the system to provide early warning of any failures by rectifying faults before they become serious

A modern electronically controlled compressed air management system can deliver huge fuel savings. For example, the electronic controller can prevent the air compressor being activated when conditions require the engine to deliver maximum possible power. Additionally, replenishment of the compressed air tank as well as regeneration of the air dryer cartridge are also only performed under certain driving conditions, e.g. by travelling downhill under engine brake.

Compressed Air Management

Compressed Air Management

Advantages at a glance

- Optimized packaging space
- Safety and reliability advantages thanks to compact size and excellent robustness
- Automatic diagnostics provide early maintenance requests
- Cost saving thanks to fewer individual components

Controlled Air Compressor

All in one system

- Valve Block
- Air Dryer
- Electronic Control Unit

ECU with integrated

- Sensors
- Control valves
Custom solutions for demanding applications: Tire Pressure Measurement.

Tires play an essential role in vehicle safety, but maintaining them at the correct pressure also enables significant reductions in fuel consumption, maintenance costs, and CO₂ emissions.

Tire Pressure Measurement from Continental is an intelligent tire information system that continuously monitors the tires and warns the driver immediately when low pressure is detected. Some systems can even automatically inform the fleet manager and the nearest workshop. Damaged tires can thus be repaired or replaced before expensive damages occur.

Tire wear is reduced, resulting in less vehicle downtime and lower operating costs. The state-of-the-art tire information system from Continental also allows major improvements in fleet management.

Continental provides various configuration options to suit different requirements. These range from stand-alone systems that display information to the driver on a separate cockpit display to integrated solutions that present information via a central instrument cluster.

The tire information system can be configured to meet the needs of different types of vehicle and individual requirements for specific functionality. A light commercial vehicle may only require a simple system with core functionality based on four sensors, a control unit with integrated antenna and a display unit. For heavy-duty trucks used on long distance routes, more sensors would be required with possibly additional receiving antennas. The individual components are integrated into the vehicle architecture via standard interfaces such as CAN and internally via LIN bus.

With ContiPressureCheck™ Continental offers a complete system bundle for the aftermarket to be installed onto trucks, buses and trailers. The system contains all necessary components like tire sender, receiver CCU and a separate display for the driver. For more detailed information see our specific brochures and installation manuals.
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