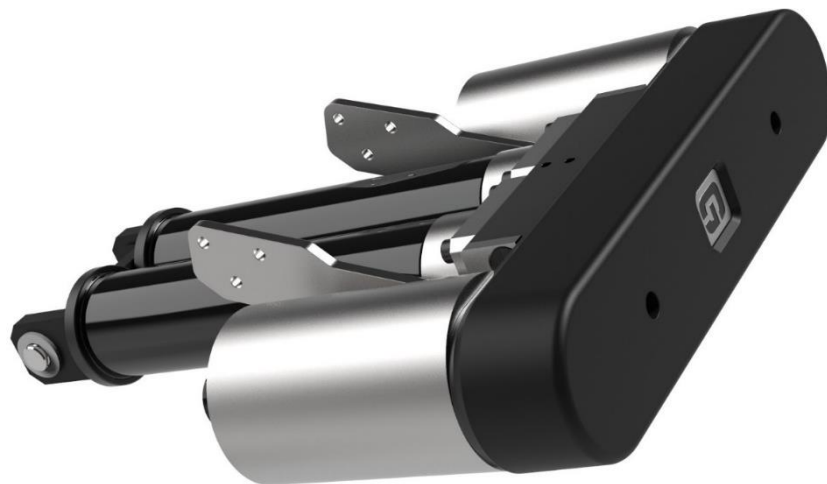


Fact Sheet Brake Actuator with associated Motor Control Modules

Key features:

- Redundant actuator for braking, to be mounted on the brake pedal shaft (physical movement of the pedal)
- Small, invisible mounting
- Upon request, a brake bracket set is available for a wide range of cars
- Pusher only, conventional braking by (safety) driver is always possible
- Integrated high resolution encoder
- Control mode based on position control or force control
- EMC compliance acc. ECE-R10 (test result outstanding)
- No safety relevance acc. ECE or ISO. Full joysteer 3.0 system mandatory for such.



Description:

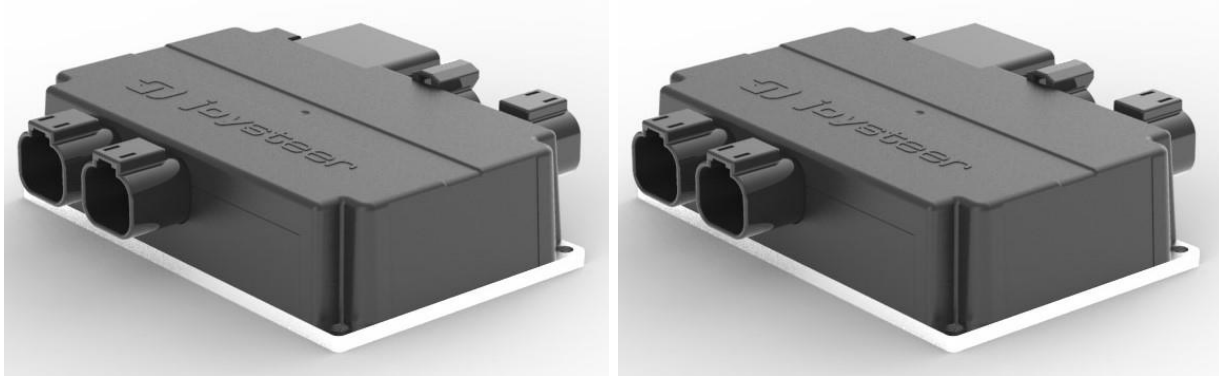
The brake actuator performs the braking function by transmitting motion to the brake pedal shaft. The module is redundant, hence does have 2 motors with integrated hall sensors and rotary encoders for position control.

The brake actuator is a pusher only, means can be overridden by foot at any time. The higher value is applied then. The brake actuator module is installed under the steering column, in line with the brake pedal shaft. A vehicle specific bracket is needed for the installation (interface to the chassis). Important for the installation is the mechanical connection of the actuator onto the pedal shaft on the right point (application of the force).

Technical Data of Brake Actuator with Motor Control Module:

- | | |
|------------------------------------|---|
| • Operates on | ideally 24VDC, (for 12VDC test are pending) |
| • Operating temperature | -20 to +80°C |
| • IP Class | IP 5K0 |
| • Stroke | 90mm (usable range) |
| • No load speed | ~250mm/sec (@24VDC) |
| • Max actuator Force | 2000N (@24VDC) |
| • Max Power consumption | 350 W |
| • Resolution (position controlled) | 0.1 mm / increment (sensor on motor shaft) |

Motor Control Module:



Due to the redundancy of the actuator, two Motor Control Modules are required.

CAN-Bus Communication:

- | | |
|--------------|--|
| • Identifier | 11-Bit-Identifier / Base frame format (CAN 2.0A) |
| • Baud rate | 500 kbit/s (high speed) |

Data/Signals from Control-System to Motor Control Module (abstract):

Timing of these CAN signals = asynchronous (no timing restriction)

- | | |
|----------------------|--|
| • Set actuator value | Position or force (Target value) |
| • Limit speed | Limits the dynamic (motor speed) of the actuator |
| • Limit force | Limits the dynamic (motor current) of the actuator |
| • Control mode | Position or force |

Data/Signals from Motor Control Module to Control-System (abstract):

Timing of these CAN signals = periodic, every 10ms

- Actual actuator position
- Actual actuator speed
- Actual actuator force
- Actual control mode
- Diagnostics

Power Supply

A small buffer battery is essential for the Motor Control Modules (energy recovery from the motors).

Power and communication cables

Customized cables are assembled when ordered (definition of cable lengths and connectors).

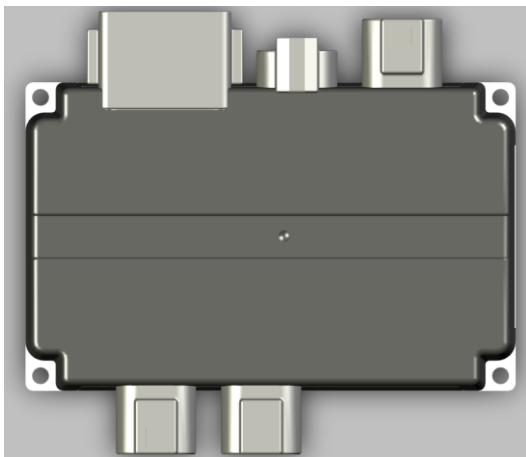
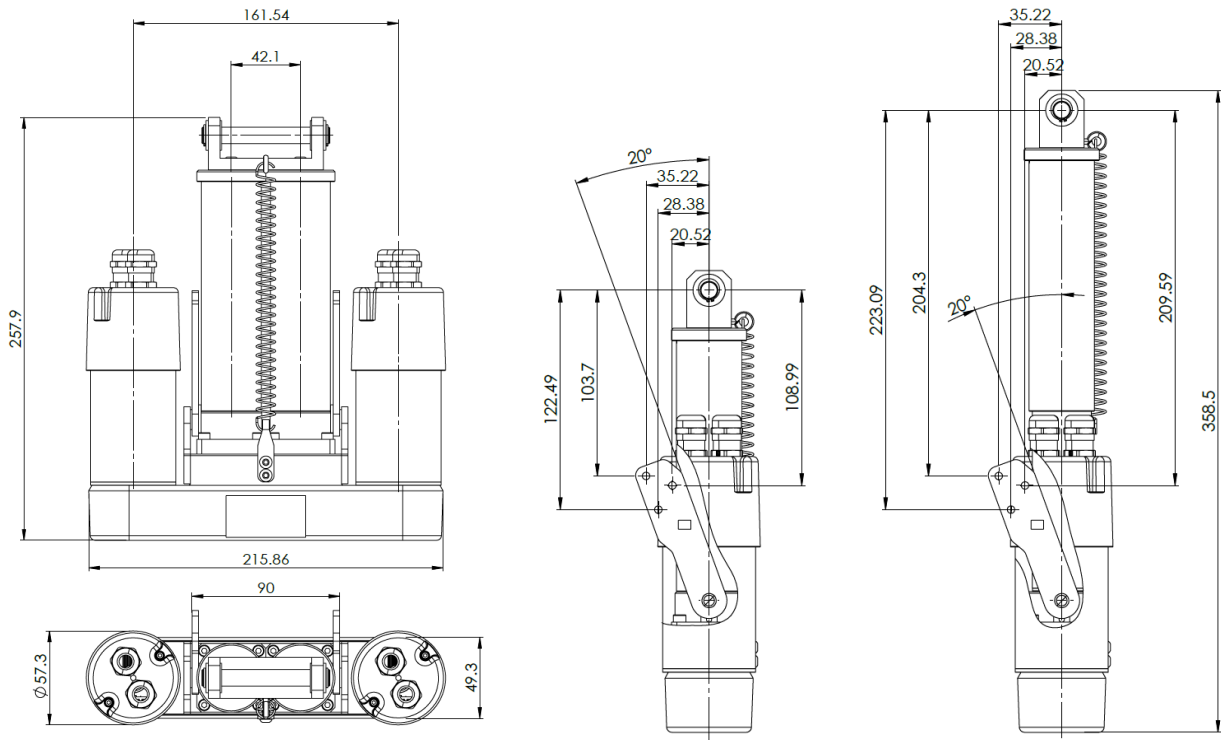
Parametrisation



The parametrization can be done with the SystemManager tool. Runs on Windows and Android. Connection to the MC with a USB-CAN-Bus Interface.



Dimensions:



Dimension of the Motor Control Module = 131 x 82 x 36mm