

Power liftgate

Mini-zone controller demonstrator



Controlling the trunk with a simple foot gesture

The demonstrator offers an innovative approach involving the use of Time-of-Flight (ToF) sensors and redundant methods with NFC and Bluetooth. It is built on innovative model-based design software, able to control several subsystems connected via CAN and ensure highly accurate gesture recognition.

KEY BENEFITS

- High reliability
- No accidental openings
- Automatic stop if obstacles encountered on trunk opening path
- Versatile solution including various subsystems
- Model-based design software

KEY FEATURES

- Control of two linear DC motor actuators to open & close trunk
- Motion detection to prevent trunk actions if the vehicle is not still
- Trunk locking and unlocking
- Activation of turning lights and beepers to confirm trunk actions
- Trunk operation with NFC key
- Trunk operation via mobile phone APP through Bluetooth
- Display of trunk state through mini-infotainment touch display
- Motor system self-calibration

Usage

Different input commands can be used to open and close the trunk:

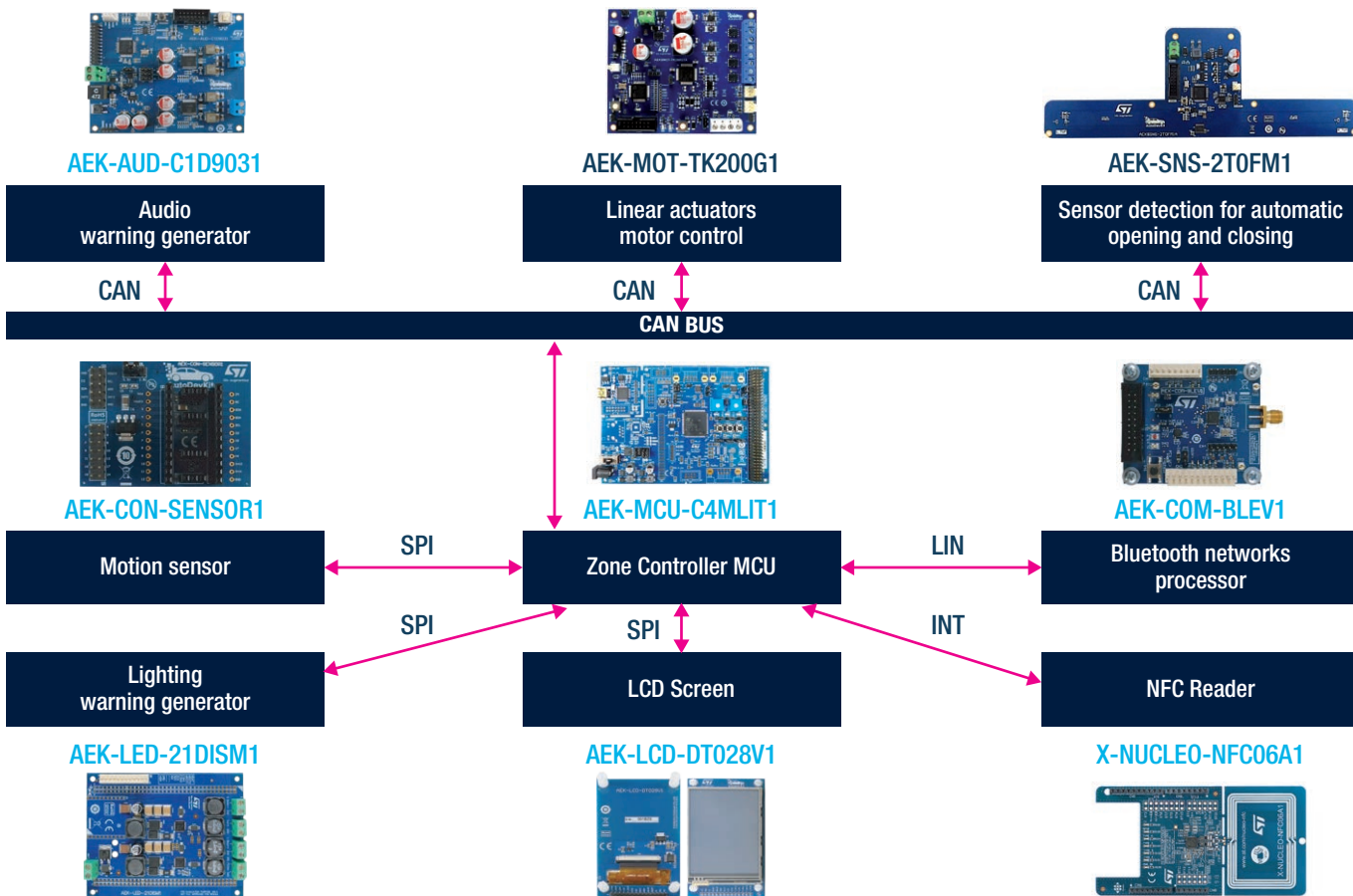
1. Foot gesture detection
2. Smartphone app via Bluetooth
3. NFC key

Acoustic and visual alerts are available to confirm the received commands and the start of open or close actuation.

The system includes a MEMS accelerometer to ensure that trunk actuation can be disabled during vehicle movement.

When the opening or closing trunk detects an obstacle, the system stops the linear actuators and reverses direction slightly to limit damage.

Block diagram



Evaluation kit

Board list and software	Description
AEK-MOT-TK200G1	Power liftgate controller board based on L99DZ200G multi-output driver and SPC582B Chorus microcontroller
AEK-MCU-C4MLIT1	MCU discovery board for SPC5 Chorus 4M automotive microcontroller with CAN transceivers
AEK-AUD-C1D9031	AVAS solution based on SPC582B60E1 Chorus family MCU and FDA903D Class D audio amplifier
AEK-LED-21DISM1	Digitally controlled LED driver board for automotive lighting applications
AEK-SNS-2T0FM1	Recognizing the foot detection algorithm to open/close the trunk
AEK-CON-SENSOR1	Connector board for SPC5 MCU discovery boards and MEMS sensor boards in DIL 24 socket
AEK-LCD-DT028V1	Display expansion board with resistive touch for Chorus family
X-NUCLEO-NFC06A1	NFC card reader expansion board based on ST25R3916 for STM32 and STM8 Nucleo
AEK-COM-BLEV1	Bluetooth communication board based on BlueNRG-1
SPC5-STUDIO	Code generator, quick resources configurator, and Eclipse development environment for SPC5 MCUs
STSW-AUTODEVKIT	AutoDevKit library plugin for SPC5-STUDIO

