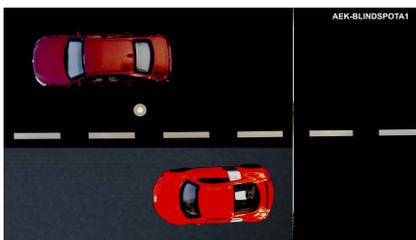


## Blind-spot detection simulation kit



## Features

- Conveyor belt with DC gearbox motor
- Hall sensor for magnetic field detection
- 1 car model 1:43 fixed
- 1 car model 1:43 with internal magnets to be placed on the conveyor belt
- High brightness LED turns on when two cars are near each other
- Part of the [AutoDevKit™](#) initiative
- RoHS and WEEE compliant

## Description

The [AEKD-BLINDSPOTA1](#) blind-spot kit simulates the detection of motor a vehicle in the regions around a car that drivers typically cannot see directly or with mirrors. It works by interpreting magnetic field variations through a Hall sensor mounted on one car model that remains stationary and magnets mounted on another car model that moves on the conveyor belt driven by a 12 V<sub>DC</sub> gearbox motor with 40 RPM and high torque.

The [AEKD-BLINDSPOTA1](#) hardware assembly system is used with the [AEKD-BLINDSPOTB1](#) kit of boards to drive the blind-spot demo loads.

The goal of the training kit is to help developers build effective firmware for blind-spot systems using the [SPC5-Studio](#) integrated development environment with the [AutoDevKit](#) plugin extension.

Product summary	
Blind-spot detection simulation kit	<a href="#">AEKD-BLINDSPOTA1</a>
Firmware for AEKD-BLINDSPOTB1	<a href="#">STSW-BLINDSPOT</a>
Development environment	<a href="#">SPC5-Studio</a>
<a href="http://community.st.com/autodevkit">community.st.com/autodevkit</a>	<a href="#">AutoDevKit</a>
AutoDevKit library plugin for SPC5-STUDIO	<a href="#">STSW-AUTODEVKIT</a>
SPC5-UDESTK Debugging Software for Windows	<a href="#">SPC5-UDESTK-SW</a>
MCU discovery board for SPC5 Chorus 4M automotive microcontroller with CAN transceivers	<a href="#">AEK-MCU-C4MLIT1</a>
Digitally controlled LED driver board for automotive lighting applications	<a href="#">AEK-LED-21DISM1</a>
VN7050AS evaluation board based on VIPower M0-7 technology	<a href="#">EV-VN7050AS</a>
Applications	<a href="#">Chassis and Safety</a>

# 1 Overview

Blind-spot detection is implemented in modern transportation vehicles to prevent accidents in common overtaking scenarios and other dangerous circumstances involving vehicles occupying areas that cannot be seen directly by the drivers of other vehicles. These warning systems detect the presence of vehicles in blind-spot zones and alert the driver.

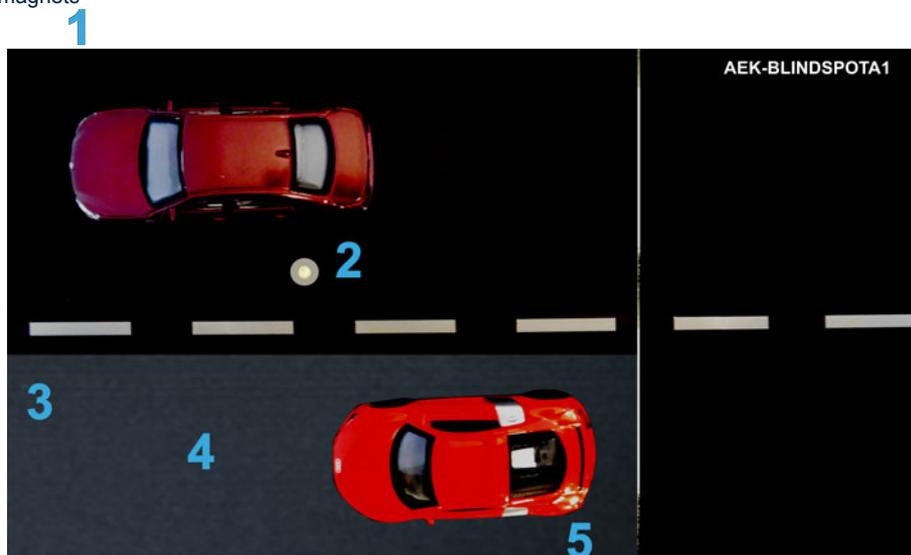
In this simulation kit, the system consists of a plexiglass structure to simulate the loads and a set of boards to drive the application (**AEKD-BLINDSPOTB1**). Two cars are placed on the demo: one is stationary, while another car with embedded magnets moves on the conveyor belt driven by a gear-DC motor. A Hall sensor under the belt measures the magnetic field around it and a LED near the stationary car indicates when the blind-spot warning signal is triggered.

The application is controlled by:

- a 32-bit automotive microcontroller (**SPC58EC80E5**)
- a VIPower actuator board (**EV-VN7050AS**) with a high side driver used to drive the conveyor belt geared DC motor
- a LED driver board (**AEK-LED-21DISM1**) drives the warning LED

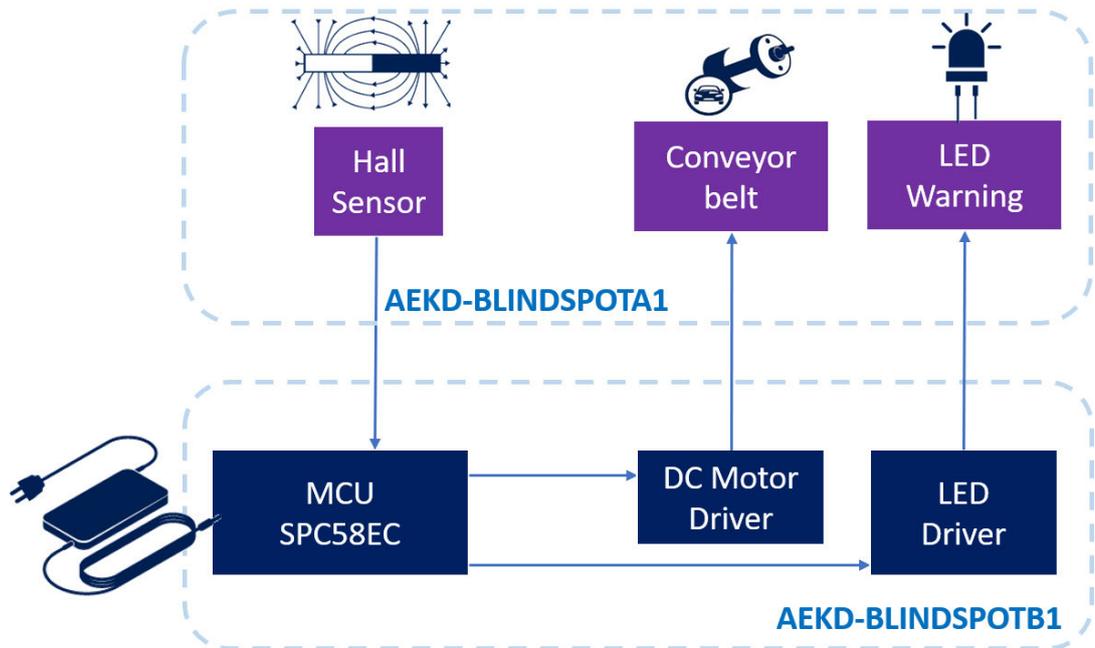
**Figure 1. AEKD-BLINDSPOTA1 hardware assembly**

1. Side for board connection
2. LED
3. DC motor
4. Hall sensor
5. Car with magnets



## 1.1 Block diagram

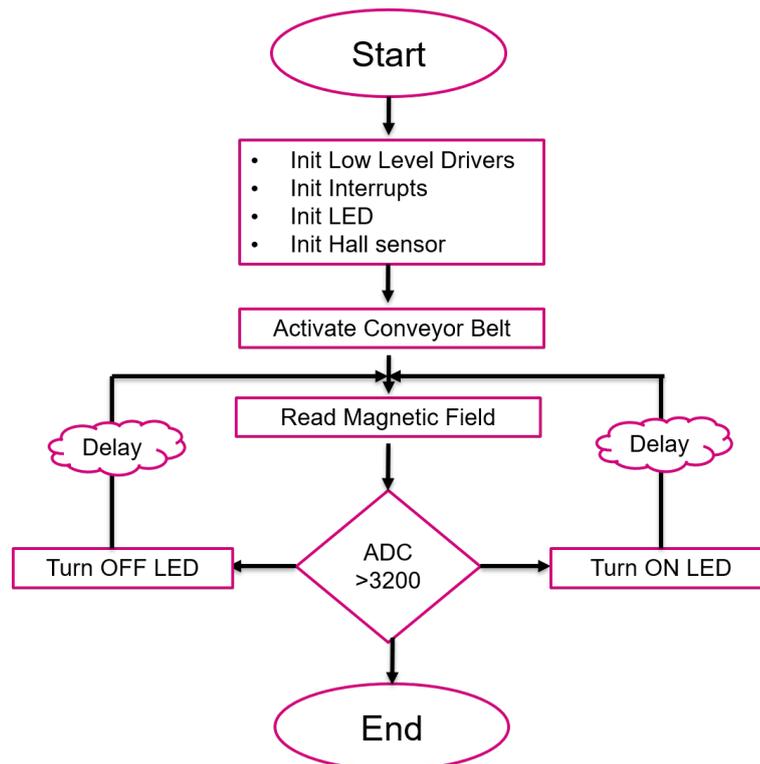
Figure 2. AEKD-BLINDSPOTA1 plus AEKD-BLINDSPOTB1 blind-spot detection kit component block diagram



## 1.2 How to create a blind-spot detection application using AutoDevKit

- Step 1.** Create a new project and select the MCU platform to use, i.e. SPC58 Chorus 4 Mb
- Step 2.** Add SPC5 Init Component for clock configurator, interrupt management and an operating system abstraction layer together with bootstrap files
- Step 3.** Add AutoDevKit Init Component for Board View Editor
- Step 4.** Add low-level drivers for MCU peripherals management
- Step 5.** Pick AutoDevKit components according to the blind-spot warning system to build: LED driver, DC motor driver for the conveyor belt and the Hall sensor capture component
- Step 6.** Configure the added AutoDevKit components
- Step 7.** Run automatic pin allocation
- Step 8.** Verify the assigned pins in the PinMap Editor
- Step 9.** Connect your boards using the Board View
- Step 10.** Write the `main()` function using AutoDevKit with high-level APIs

**Figure 3.** `main()` function operation block diagram



- Step 11.** Compile the code
- Step 12.** Download the code using PLS UDE
- Step 13.** Debug your application

## Revision history

**Table 1. Document revision history**

Date	Version	Changes
13-Feb-2020	1	Initial release.
04-Mar-2020	2	Minor text changes.

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