STSW-AUTODEVKIT - AutoDevKit library release 1.5.0

Introduction

This document is updated periodically to record STSW-AUTODEVKIT updates, known problems and limitations.

Important:
From this release AutoDevKit works only on SPC5-STUDIO version 6.0.0. Download the latest version from www.st.com/spc5studio.

To install the AutoDevKit:

- Select [**help**]>[**Install new Software**]
- Choose the right components
- Pick your component list

Note: Ensure you unzip the STSW-AUTODEVKIT package file before proceeding with the installation.

Table 1. STSW-AUTODEVKIT release summary

Type	Summary
Minor release (version 1.5.0)	Components updated: • AEK-MOT-2DC40Y1 and AEK-MOT-2DC70S1 - fixed bug in driver Demos updated: • None Micro-controller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mb flash New component released: • **AEK-LCD-ILI9341** This component is designed for commercially available touch LCD displays (240x320 pixels with up to 65 K colors per pixel) based on the ILI9341 controller, managing up to two LCDs in parallel. The touch circuit is managed by the XPT2046 controller. Communication is based on the SPI protocol. • **AEK-COM-NFC05A1** – New Demo for SPC58EC Chorus 4M • **SPC5-MCTK-01** – New Demo for SPC58ECxx (Chorus 4M) The demo implements a CAN bus communication between an SPC58EC Chorus MCU and an SPC5-MCTK-01 automotive three-phase motor control kit based on SPC560P Pictus MCU and L9907 pre-driver. Through can messages, it is possible to perform basic operations on the motor, such as ramp, acceleration, deceleration and brake. In addition, it is possible to read and set registers related to the motor parameters. A serial terminal can be used to track and verify performed operations. *Important:* *Before testing this demo, update the firmware on the SPC5-MCTK-01 platform by downloading the demo for SPC560P Pictus MCU from AutoDevKit to enable the CAN port.*

Type	Summary
	New demo released: • **Automatic liftgate demo** The automatic liftgate demo includes motor actuation for automatic car trunk opening. This innovative solution implements a specific foot gesture recognition with Time-of-Flight (ToF) sensors. The system has been proved reliable in different light, weather and soil conditions, and feet sizes.

Customer support

For more information or help concerning AutoDevKit, contact the STMicroelectronics nearest sales office or visit AutoDevKit community under community.st.com/autodevkit. For a complete list of STMicroelectronics offices and distributors, refer to the www.st.com webpage.

Note: STMicroelectronics declines any responsibility regarding third-party components included in the library. No support is provided by STMicroelectronics. Please, contact the specific third-party component makers for relevant inquiries.

Software updates

Software updates and all the latest documentation can be downloaded from the STMicroelectronics website www.st.com:

- for integrated development system, download SPC5-STUDIO
- for flasher and debugger, download SPC5-UDESTK-SW
- for AutoDevKit plugin, download STSW-AUTODEVKIT

1 General information

AutoDevKit library contains software components for functional boards. Each component has a specific API able to control the specific functional board. The API consists of a set of “methods”. Some of these are very high-end and simple to use even to the hardware inexpert user. Other methods access more specific low-level board/chip functions able to exploit more advanced configurations and features.

As per any other SPC5-STUDIO component, AutoDevKit components are provided with a graphical user interface for easy configuration and set-up. The peripherals and pins configuration and allocation is automatically performed with a simple button-press action.

In the same library, simple demo examples of component usage are provided.

All components have online help available with details related to usage and available APIs.

1.1 System requirements

- SPC5-STUDIO version 6.0.0 or higher
- SPC5-UDESTK debugging software for Windows
- Microcontroller board(s)
- Functional board(s)
- Connector board(s) – if required by the project

1.2 License

Software if provided for free “as is”. The code provided is only to demonstrate functionalities and it is not industrialized. STMicroelectronics shall not hold any responsibility for the usage and misusage of the code provided. STMicroelectronics bears no liabilities in case the code (or part of it) is used for demonstrators or prototypes or commercial products. STMicroelectronics bears no liabilities in case the code contains bugs that could impact developers and/or final customers. STMicroelectronics bears no liabilities for third party code included in the library.

2 Recent AutoDevKit updates

2.1 Known limitations

- AEK-USB-2TYPEC1 pin-out is fixed and configuration is compatible only with AEK-MCU-C4MLIT1 and SPC58EC-DISP boards.
- AEK-USB-2TYPEC1 component is not available.
- USB-PD version 2.0 demo is employing free RTOS and customized SPI low-level driver.
- Demo for AEK-POW-L5964V1 for USB-PD is pin-out fixed and configuration is compatible only with AEK-MCU-C4MLIT1 and SPC58EC-DISP boards.
- Demo for AEK-POW-L5964V1 for adjustable DC-DC pin-out is not fixed but API functionalities are limited.

2.2 Supported microcontroller boards

- AEK-MCU-C4MLIT1 – Light version of SPC58EC-DISP
- AEK-MCU-C1MLIT1 – Light version of SPC582B-DIS
- SPC58EC-DISP - Discovery board for SPC58EC MCU with extended connectivity
- SPC584B-DISP – Discovery board for SPC584B MCU with extended connectivity
- SPC582B-DIS – Discovery board for SPC582B MCU with Arduino™ connector
- SPC584B-DIS- Discovery board for SPC584B MCU with Arduino™ connector

2.3 Supported connector boards

- AEK-CON-AFLVIP2 – Adaptive Front-Lighting connector board with EV-VNx7x slot
- AEK-CON-5SLOTS1 – Connector board for discovery boards with 4x37 connector allowing pin re-arranging and re-ordering
- AEK-CON-BSPOTV1 – Connector dedicated to detection in blind-spot application educational tool
- AEK-CON-SENSOR1 - Connector board for SPC5 MCU discovery boards and MEMS sensor boards in DIL 24 socket

2.4 Bug fixed

As shown in Table 1. STSW-AUTODEVKIT release summary.

3 Previous versions

Table 2. **STSW-AUTODEVKIT release history**

Type	Summary
Minor release (version 1.4.0)	Components updated: • AEK-POW-100W4V1 - fixed bug in driver • AEK-LED-21DISM1 - fixed bug in driver • AEK-MOT-2DC40Y1 and AEK-MOT-2DC70S1 - fixed bug in driver Demos updated: • None Micro-controller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mbflash New component released: • **AEK-AUD-C1D9031** The AEK-AUD-C1D9031 is a very compact AVAS solution based on SPC582B60E1 Chorus family MCU and FDA903D Class D audio amplifiers that emits warning sounds to alert pedestrians of the presence of e-vehicles. The AEK-AUD-C1D9031 integrates two audio amplifiers in stereo mode or two separate audio channels. The board compact size allows the designer to strategically place different modules around the vehicle to ensure that warning sounds can be heard along the entire vehicle length. All the modules can be controlled by a central MCU via CAN interface. • **AEK-COM-NFC05A1** The AEK-COM-NFC05A1 implements the driver for X-NUCLEO-NFC05A1. This board is configured to support ISO14443A/B, ISO15693, FeliCa™ and AP2P communication. The key embedded ST25R3911B IC manages frame coding and decoding in reader mode for standard applications, such as NFC, proximity and vicinity HF RFID standards. • **AEK-SNS-VL53L1X1** The AEK-SNS-VL53L1X1 implements the driver for VL53L1X-SATEL. The on-board Time-of-Flight (ToF) laser-ranging sensor, belonging to the ST FlightSense product family, is the fastest miniature ToF sensor on the market with accurate ranging up to 4 m and fast ranging frequency up to 50 Hz. • **AEK-CON-SENSOR1** AEK-CON-SENSOR1 connector board for automotive MEMS sensors supports the DIL24 socket boards. The related software components can be used to manage the following MEMS families through the high level APIs: – AIS2DW12 - ultra-low-power 3-axis accelerometer for automotive applications – ASM330LHH - automotive 6-axis inertial module: 3D accelerometer and 3D gyroscope – IIS2ICLX - high accuracy, high resolution, low power, 2-axis digital inclinometer with embedded Machine Learning Core – IIS3DWB - ultra-wide bandwidth, low-noise, 3-axis digital vibration sensor New demo released: • None
Minor release (version 1.3.0)	Components updated: • AEK-POW-L5964V1 - fixed bug in driver • AEK-LED-21DISM1 - fixed bug in driver Demos updated: • AEK-AUD-D903V1 - Bugfix in the Demo example code • AEK-POW-L5964V1 - Bugfix in the Demo example code • Adaptive Front-Lighting Demo - Bug fixed

Type	Summary
	Micro-controller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mbflash New component released: • **AEK-POW-100W4V1** The AEK-POW-100W4V1 expansion board is designed for power car or truck body applications requiring different voltages, such as USB-PD or infotainment. The two buck converters available from the L5964 device are combined to achieve up to 5A of current with 20 V to reach 100 W power in a single and compact device. The output channel can deliver a fixed or variable output voltage via MCU control. • **AEK-MOT-2DCxxx** The AEK-MOT-2DC70S1 and AEK-MOT-2DC40Y1 are very compact solutions for multi-DC motor driving applications embedding all the driver and signal decoding functions on the same board. Together with current sensing capability, the AEK-MOT-2DCxxx boards have three independent encoder inputs. The DC motor drivers have separated half-bridging driving thus allowing up to three separated motors with only two devices. Clearly, proper driving sequence have to be generated to avoid undesired activation of specific motors. For each motor 15 A can be provided with AEK-MOT-2DC70S1 while 35 A can be provided with AEK-MOT-2DC40Y1. On the boards, two additional high side drivers are available featuring 85 A and 25 A output currents. New demo released: • None
Minor release (version 1.2.0)	Components updated: • All components have been updated to comply with SPC5-STUDIO 6.0.0 • AEK-AUD-D903V1 – added monitoring of I^2S test signal for real-time current monitoring Demos updated: • Demo for AVAS with sound generated by a mathematical function Micro-controller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mbflash New component released: • None New demo released: • None
Bug fix release (version 1.1.1)	Components updated: • EV-VNx7x (added methods for current sensing and output current; ADC can now be user defined at 3.3 V or 5 V) • EV-VNHx7xx (added methods for current sensing and output current; ADC can now be user defined at 3.3 V or 5 V) • AEK-POW-L5964V1 (removed warnings, driver optimization, changed picture) • Linear Hall-effect sensor (ADC can now be user defined at 3.3 V or 5 V) Demos updated: • Adaptive Front Lighting (AFL) Demo - updated EV-VNx7xxx component Micro-controller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mbflash New component released: • None

Type	Summary
	New demo released: • None
Minor release (version 1.1.0)	Components updated: • AEK-LED-21DISM1 (removed warnings and driver optimization) • AEK-MOT-SM81M1 (removed warnings and driver optimization) • EV-VNx7x (removed warnings and driver optimization) • EV-VNHx7xx (removed warnings and driver optimization) • AEK-POW-L5964V1 (removed warnings, driver optimization, changed picture) • AEK-SNS-LIDA1M8 (removed warnings and driver optimization) • Linear Hall-effect sensor (removed warnings and driver optimization) Demos updated: • Adaptive Front Lighting (AFL) Demo - code optimized Micro-controller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mbflash New component released: • **AEK-COM-BLEV1** The AEK-COM-BLEV1 evaluation platform is based on the BlueNRG-1, low power Bluetooth® smart system on chip, compliant with the Bluetooth® specification and supporting master, slave and simultaneous master-and-slave roles. • **AEK-COM-GNSST31** The AEK-COM-GNSST31 represents an affordable, easy-to-use, global navigation satellite system (GNSS) module, embedding a Teseo-LIV3F single die standalone positioning receiver IC, usable in different configurations in your SPC5-Studio project. • AEK-AUD-D903V1 It is a flexible class D audio amp with I^2S interface for sound and I^2C interface for programming. It features superb protection and status reporting. New demo released: • Demo for AEK-COM-GNSST31 • Demo for AEK-COM-BLEV1 • Demo for AEKD-BLINDSPOTx1 • Demo for AVAS mono • Demo for AVAS stereo • Demo for AVAS engine sound simulator

Revision history

Table 3. **Document revision history**

Date	Version	Changes
13-Sep-2019	1	Initial release.
08-Nov-2019	2	Added details regarding STSW-AUTODEVKIT minor release version 1.0.1.
19-Feb-2020	3	Added details regarding STSW-AUTODEVKIT version 1.1.0.
30-Mar-2020	4	Added details regarding STSW-AUTODEVKIT version 1.1.1.
22-Jun-2020	5	Added details regarding STSW-AUTODEVKIT version 1.2.0.
08-Oct-2020	6	Added details regarding STSW-AUTODEVKIT version 1.3.0.
09-Feb-2021	7	Added details regarding STSW-AUTODEVKIT minor release version 1.4.0.
15-Mar-2021	8	Added details regarding STSW-AUTODEVKIT minor release version 1.5.0.

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