STSW-AUTODEVKIT - AutoDevKit Studio 2.9.0

Introduction

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

AutoDevKit Studio 2.9.0 replaces the previous plugin zip file.

This new release offers an innovative way of delivering the AutoDevKit package: a unique zipped *.exe* includes SPC5 Studio with the AutoDevKit plugin already installed. This is only the first step for our new tool named AutoDevKit Studio.

A new Welcome page has been created in AutoDevKit Studio. This page contains three tabs:

- The first tab highlights the news about the AutoDevKit ecosystem. Each "tile" represents an update.
- The second tab contains the tutorial video links to learn about AutoDevKit by yourself.
- The third tab introduces AutoDevKit sample applications. By clicking on the sample application name, the system imports the related AutoDevKit Studio project. The Welcome page appears after installing the AutoDevKit Studio. You can always recover it through the Help > Welcome menu.

The installation package includes an open on-chip debugger (OpenOCD), which aims at debugging, in-system programming and boundary-scan testing for embedded target devices.

OpenOCD is available for SPC58x projects. To use it, you need to supply the .elf file generated after compiling the project. From hardware point of view, to download the code in the MCU flash or RAM, you can use the programmer hosted on the SPC58x discovery boards or the dongle board AEK-MCU-SPC5LNK (supporting OpenOCD).

Refer to AEK-MCU-SPC5LNKU dongle (on the same webpage: AEK-MCU-SPC5LNK) for PLS UDE compatibility.

License details

For most of the components, we have migrated the software license agreement from SLA0089 to SLA0098.

For further details, refer to SLA0098.

How to install AutoDevKit Studio

Step 1. Download the zip file *www.st.com/autodevkitsw*

Step 2. Uncompress the zip file

Step 3. Launch the .exe file

Step 4. Accept the license

Step 5. Ignore warnings

Table 1. STSW-AUTODEVKIT release summary

Type	Summary
Minor release (version 2.9.0)	Updated components: • AEK-POW-8DCMH98/94/92 L99MH98 is an integrated octal half-bridge pre-driver dedicated to control up to sixteen N-channel MOSFETs. It is intended for DC motor control applications such as automotive power seat control or other applications. A 24-bit serial peripheral interface (SPI) is used for configuring and controlling the eight half-bridges or four H-bridge. SPI status registers provide high-level diagnostic information such as supply voltage monitoring, the charge pump voltage monitoring, temperature warning and overtemperature shutdown. Each gate driver monitors independently its external MOSFET drain-source voltage for fault conditions. The L99MH98 supports indirect current measurement on external MOSFETs, allowing cost saving and lower system complexity, avoiding the usage of shunt resistors. A more efficient gate current control of the external MOSFETs, called “three stages gate current”, decreases and optimizes electromagnetic interference (EMI). In addition, this release includes some new options to interact with the new AEK-MOT-4DCMX94 and AEK-MOT-2DCMX92 evaluation boards, which are based on the L99MH94 and L99MH92 devices, respectively. Updates: New Feature: Added layer and demo for communication via CAN BugFix: Modified the driver architecture to integrate support for the newly added AEK-MOT-4DCMX94 and AEK-MOT-2DCMX92 boards. Note: This update is not compatible with the previous component available in AutoDevKit 2.8.1. • AEK-POW-VNF9D1M5Q 2-channel high-side driver with STi²Fuse protection for automotive power distribution applications, featuring 27 A per channel. Updates: BugFix: Modified the driver architecture to include new features. • AEK-POW-VNF9Q20SF 4 channel high-side driver with STi2Fuse protection for automotive power distribution applications, featuring 6 A per channel. Updates: BugFix: Modified the driver architecture to include new features.

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.

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.

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

- Installation of STSW-AUTODEVKIT from *www.st.com/autodevkitsw* (AutoDevKit Studio IDE)
- AEK-MCU-SPC5LNK debugging software for OpenOCD debugger
- Microcontroller board(s)
- Functional board(s)
- Connector board(s) – if required by the project

1.2 Disclaimer

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

- Demo for AEK-POW-L5964V1 (NRND) for USB-PD is pin-out fixed and configuration is compatible only with AEK-MCU-C4MLIT1 (NRND) and SPC58EC-DISP boards.
- Demo for AEK-POW-L5964V1 (NRND) for adjustable DC-DC pin-out is not fixed but API functionalities are limited.

2.2 Supported microcontroller boards

- AEK-MCU-C4MLIT1 (NRND) - Light version of SPC58EC-DISP
- AEK-MCU-C1MLIT1 (NRND) - Light version of SPC582B-DIS
- AEK-MCU-C4MINI1 - SPC58EC with pre-allocated pins
- AEK-MCU-C4MLIT3 - cost-optimized and compact size MCU discovery kit for SPC58EC80E5 Chorus 4M automotive microcontroller with CAN-FD and unified automotive connector
- AEK-MCU-C4MLIT2 - MCU discovery kit for SPC58EC80E5 Chorus 4M automotive microcontroller featuring CAN-FD, ISO-SPI, 10BASE-T1S, 100BASE-TX and unified automotive connector
- 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
- SPC58EC-DIS - Discovery board for SPC58EC MCU with Arduino™ connector

2.3 Supported connector boards

- AEK-CON-AFLVIP2 (NRND) - Adaptive Front-Lighting connector board with EV-VNx7x slot
- AEK-CON-5SLOTS1 (NRND) - Connector board for discovery boards with 4x37 connector allowing pin re-arranging and re-ordering
- AEK-CON-BSPOTV1 (NRND) - Connector dedicated to detection in blind-spot application educational tool
- AEK-CON-SENSOR1 (NRND) - 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.

2.5 Previous versions

Table 2. STSW-AUTODEVKIT release history

Type	Summary
Minor release (version 2.8.1)	Updated components: • **AEK-POW-VNF9D5SF** 2 channel high-side driver with STi2Fuse protection for automotive power distribution applications, featuring 15 A per channel Updates: Bugfix: modified driver architecture to implement new features. • **AEK-POW-VNF9D1M5Q** 2-channel high-side driver with STi²Fuse protection for automotive power distribution applications, featuring 27 A per channel. Updates: Bugfix: modified driver architecture to implement new features. • **AEK-POW-VNF9Q20SF** 4 channel high-side driver with STi2Fuse protection for automotive power distribution applications, featuring 6 A per channel. Updates: Bugfix: modified driver architecture to implement new features.
Minor release (version 2.8.0)	New components: • **Remote Multi-Gateway Power Distribution Management over Ethernet** This application manages three AEK-POW-PDUMINI power distribution units. Each unit is connected to an AEK-MCU-C4M2 gateway acting as a TCP/IP server, plus a fourth AEK-MCU-C4M2-based Ethernet client. The client establishes independent connections to the three AEK-POW-PDUMINI servers and uses UDS diagnostics over Ethernet to query the status of each PDU channel. Based on the diagnostic responses, the client sequentially switches the channels ON and OFF across the three servers, enabling centralized, automated control and verification of the distributed PDUs. This architecture provides a simple, scalable, and fault-tolerant solution for remote power distribution management and diagnostics over Ethernet, well suited as a service-layer building block in FreeRTOS-based automotive embedded systems. *Note: To use this new feature, you can download and run the following demo applications:* *Server side (AEK-MCU-C4M2 plus attached AEK-POW-PDUMINI):* *1. SPC58ECxx_RLA AEK_POW_PDUMINI_ID0(PDU-ETH)* *2. SPC58ECxx_RLA AEK_POW_PDUMINI_ID1(PDU-ETH)* *3. SPC58ECxx_RLA AEK_POW_PDUMINI_ID2(PDU-ETH)* *Client side to be used with the AEK-MCU-C4M2:* *1. AEK-MCU-C4MLIT2_miniPDU Eth Client-Multi Node (PDU-ETH)*

Type	Summary
	• **Multi-Unit Power Distribution via CAN Bus** This application manages four power distribution boards connected via a CAN bus: three AEK-POW-PDUMINI units and one STEVAL-PDUBV1 unit. Each board is identified by a unique ID included in every CAN message transmitted over the UDS bus. Messages specify the target board ID along with the service or channel to activate, enabling precise control and communication. This design ensures efficient, scalable, and reliable power distribution management across the entire system. *Note: To use this new feature, you can download and run the following demo applications:* *1. SPC58ECxx_RLA AEK_POW_PDUMINI_ID1(PDU-CAN)* *2. SPC58ECxx_RLA AEK_POW_PDUMINI_ID2(PDU-CAN)* *3. SPC58ECxx_RLA AEK_POW_PDUMINI_ID3(PDU-CAN)* • **AEK-MCU-SRLNK** The AEK-MCU-SRLNK is a debugger/programmer dongle for Stellar automotive microcontrollers. It consists of a passive USB-to-JTAG debugger and programmer, which provides a cost-effective, small-size, and fast-prototyping solution for any vehicle applications. • **AEK-MCU-C4LIT2** The AEK-MCU-C4MLIT2 evaluation kit consists of an MCU board (AEK-MCU-C4M2), a connector board (AEK-CON-LIT) and 2 boards with embedded transceiver (AEK-CON-LTA2). The AEK-MCU-C4M2 is designed for Automotive and Transportation applications, as well as other use cases requiring automotive safety and security levels. The board features a cryptography-dedicated MCU core, used as a hardware secure module (HSM), paired with a dual 180 MHz general-purpose 32-bit core, hosted by the on-board SPC58EC80E5 MCU, which includes 4 MB of flash memory. It also hosts an OpenOCD debugger/programmer, MCU peripheral connectors, wake-up and reset buttons. Two e-fuses (STEF05L for 5 V and STEF033 for 3.3 V) are employed to increase the external output voltage smoothly and in a controlled manner during board power-up. This careful voltage ramp-up prevents inrush current surges from the power source to the load, protecting the external power supply from overload. This feature is especially useful in setups where a single power supply feeds multiple loads. Additionally, the board has been enhanced with the integration of one 10BASE-T1S interface and one 100BASE-T1 interface, providing flexible automotive Ethernet connectivity options for high-speed communication and diagnostics. *Note: To add the AEK-MCU-C4LIT2 to your project, follow the steps below:* *1. Add SPC58ECxxx Platform Component* *2. Add Init Package Component* *3. Add Low Level Drivers Component* *4. Add AutoDevKit MCU C4MLIT2/3 Init Package Component* • **AEK-POW-VNFD1248F** The AEK-POW-VNFD1248F integrates the VNFD1248F high-side dual switch controller designed specifically for automotive power distribution systems. This device provides intelligent fuse protection, enabling enhanced safety and reliability in vehicle electrical systems operating at 12 V, 24 V, and 48 V nominal voltages. • **AEK-POW-PDUMINI** The AEK-POW-PDUMINI features new extended UDS commands for enhanced control. These new commands include management of the I²T (current integration over time) for STi²Fuse devices and adjustment of the threshold levels for P-channel MOSFETs. This enables more accurate monitoring and protection of power distribution, as well as improved system reliability and flexibility. Updated components:

Type	Summary
	• **AEK-MOT-8DCMH98** L99MH98 is an integrated octal half-bridge pre-driver dedicated to control up to sixteen N-channel MOSFETs. It is intended for DC motor control applications such as automotive power seat control or other applications. A 24-bit serial peripheral interface (SPI) is used for configuring and controlling the eight half-bridges or four H-bridge. SPI status registers provide high-level diagnostic information such as supply voltage monitoring, the charge pump voltage monitoring, temperature warning and overtemperature shutdown. Each gate driver monitors independently its external MOSFET drain-source voltage for fault conditions. The L99MH98 supports indirect current measurement on external MOSFETs, allowing cost saving and lower system complexity, avoiding the usage of shunt resistors. A more efficient gate current control of the external MOSFETs, called “three stages gate current”, decreases and optimizes electromagnetic interference (EMI) Updates: Changed driver structure. • **AEK-POW-VNF9D5SF** 2 channel high-side driver with STi2Fuse protection for automotive power distribution applications, featuring 15 A per channel Updates: Modified driver architecture to implement new features. • **AEK-POW-VNF9D1M5Q** 2-channel high-side driver with STi²Fuse protection for automotive power distribution applications, featuring 27 A per channel. Updates: Modified driver architecture to implement new features. • **AEK-POW-VNF9Q20SF** 4 channel high-side driver with STi2Fuse protection for automotive power distribution applications, featuring 6 A per channel. Updates: Modified driver architecture to implement new features. • **AEK-POW-L99SP08** Smart octal P-channel for ultra-low current consumption in automotive systems, featuring 400 mA per channel, able to interact with the high-side drivers with STi²Fuse. It is controlled by the MCU via SPI Updates: Modified driver architecture to implement new features. • **AEK-POW-BMS63EM** The AEK-POW-BMS63EM board uses an SPC58NN84E7 MCU to manage two or more AEK-POW-BMSCHAIN components. The board power supplies are controlled by an SPSB100 PMIC, whose driver is available in the source folder. The board also includes 2 isolated L9963T transceivers and 1 L9963F Automotive chip for battery management applications. The demos developed show four examples of dual access ring configurations, using two BMS evaluation boards and different battery holders with 6, 10 (configuration A or B) or 14 LG INR 18650 MJ1 Li-ion battery cells. Thanks to the two embedded transceivers, the AEK-POW-BMS63EM enable the implementation of the dual access ring configuration. In this topology, it acts as the first chain node. The board is then connected to an external node (AEK-POW-BMSWTX or AEK-POW-BMS63EN) and its second embedded transceiver closes the ring and acts as a backup if the first node fails. The AEK-POW-BMS63EM is able to meet critical requirements such as voltage, temperature and current monitoring, battery state of charge (SoC), battery state of health (SOH) and cell balancing of lithium-ion (Li-ion) batteries. Added new demos: – SPC58xN - AEK-POW-BMSEM_SingleAccess-6cell – SPC58xN - AEK-POW-BMSEM_SingleAccess-10acell – SPC58xN - AEK-POW-BMSEM_SingleAccess-10bcell • **AEK-POW-SPSB081** The AEK-POW-SPSB081 is a hardware tool based on SPSB081, a power management system IC providing electronic control modules with enhanced power management functionality, including various standby modes to minimize the power consumption with programmable local and remote wake-up capability, as well as LIN and CAN FD physical communication layers. Updates: Bugfix in the driver.

Type	Summary
Minor release (version 2.7.0)	New components: • **AEK-POW-PDUMINI** The AEK-POW-PDUMINI board is based on last-generation programmable e-fuses and can be easily connected to the AEK-MCU-C4LIT3 MCU board(or the soon available AEK-MCU-C4MLIT2) using a standardized 96-pin plug-and-play automotive unified connector (other automotive MCUs like Stellar and STM32A to be supported in the future using the same connector). The key supported devices are: – **L99SP08** Smart octal P-channel for ultra-low current consumption in automotive systems, featuring 400 mA per channel, able to interact with the high-side drivers with STi²Fuse. It is controllable via SPI from MCU. – **VNF9D1M5Q** 2-channel high-side driver with STi²Fuse protection for automotive power distribution applications, featuring 27 A per channel. The board features two instances or this device. – **VNF9D5SF** 2-channel high-side driver with STi²Fuse protection for automotive power distribution applications, featuring 15 A per channel. – **VNF9Q20SF** 4-channel high-side driver with STi²Fuse protection for automotive power distribution applications, featuring 6 A per channel. – **SPSB0815** Automotive power management IC (PMIC) with LIN and CAN-FD, which manages the wake-up for the MCU e.g., following a Parking mode to Running mode application state transition. – **VN7140AJ** High-side driver with current feedback for automotive applications, used to power the MCU board from 12 V (VBAT) at power-up and after a wake-up condition. – **LDL40** 200 mA low dropout LDO. • **AEK-MCU-C4LIT3** The AEK-MCU-C4MLIT3 evaluation kit consists of an MCU board (AEK-MCU-C4M3) and a connector board (AEK-CON-LIT).The AEK-MCU-C4M3 is designed to address Automotive and Transportation applications as well as other applications requiring automotive safety and security levels. A cryptography-dedicated MCU core, employed as hardware secure module (HSM), is paired with a dual 180 MHz general-purpose 32-bit core, hosted by the on-board SPC58EC80E5 MCU, featuring 4 MB of flash memory. The board also hosts an OpenOCD debugger/programmer, MCU peripheral connectors, wake up, and reset buttons. Two e-fuses (STEF05L for 5 V and STEF033 for 3.3 V) are used to increase the external output voltage in a smooth and controlled manner, at board power-up. This careful ramp-up helps prevent a surge of inrush current from the power source to the load, thereby protecting the external power supply from overload. This feature is particularly helpful in setups where one power supply feeds multiple loads. *Note: To add the AEK-MCU-C4LIT3 to your project, follow the steps below:* *1. Add SPC58ECxxx Platform Component* *2. Add Init Package Component* *3. Add Low Level Drivers Component* *4. Import AutoDevKit MCU C4MLIT3 Init Package Component*

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	• **AEK-POW-VNF9D5SF** 2-channel high-side driver with STi2Fuse protection for automotive power distribution applications, featuring 15 A per channel • **AEK-POW-VNF9D1M5Q** 2-channel high-side driver with STi²Fuse protection for automotive power distribution applications, featuring 27 A per channel. • **AEK-POW-VNF9Q20SF** 4-channel high-side driver with STi²Fuse protection for automotive power distribution applications, featuring 6 A per channel. • **AEK-POW-L99SP08** Smart octal P-channel for ultra-low current consumption in automotive systems, featuring 400 mA per channel, able to interact with the high-side drivers with STi²Fuse. It is controlled by the MCU via SPI • **AEK-POW-VNF1248F** The device is an advanced controller for a Power MOSFET in high-side configuration, designed for the implementation of an intelligent high-side switch for 12 V, 24 V, and 48 V automotive applications. The control IC interfaces a host microcontroller through a 3.3 V and 5 V CMOS-compatible SPI interface and provides protection and diagnostics to the system. • **AEK-POW-SPSA068** SPSA068 is a BUCK voltage regulator with a precise voltage reference for MCU applications. All the regulators have internal power switches. The low-power mode (LPM) allows the operation under light-load conditions reducing the quiescent current down to 50 µA typ. An internal programmable memory allows selecting the main device parameters like output voltages and switching frequencies. An SPI interface can be used for diagnostics, programming, monitor and external window watchdog. The device offers a set of features to support applications that need to fulfill functional safety requirements as defined by automotive Safety Integrity Level. • **AEK-POW-LDOV02X** The L99VR02XP dual automotive-grade linear voltage regulator operates with reduced input voltage, minimizing the internal power dissipation and maximizing the output current. Output current limitation protects the regulator and the application from overload conditions, such as short to ground. Thanks to its operating temperature range (Tj=-40°C to 175°C), the device is suitable for electronic applications with high temperature environments and for applications that require stable power • **AEK-POW-8DCMH98** L99MH98 is an integrated octal half-bridge pre-driver dedicated to control up to sixteen N-channel MOSFETs. It is intended for DC motor control applications such as automotive power seat control or other applications. A 24-bit serial peripheral interface (SPI) is used for configuring and controlling the eight half-bridges or four H-bridge. SPI status registers provide high-level diagnostic information such as supply voltage monitoring, the charge pump voltage monitoring, temperature warning and overtemperature shutdown. Each gate driver monitors independently its external MOSFET drain-source voltage for fault conditions. The L99MH98 supports indirect current measurement on external MOSFETs, allowing cost saving and lower system complexity, avoiding the usage of shunt resistors. A more efficient gate current control of the external MOSFETs, called “three stages gate current”, decreases and optimizes electromagnetic interference (EMI)

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	• **AEK-POW-BMS63EM** The AEK-POW-BMS63EM board uses an MCU SPC58NN84E7 to manage two or more AEK-POW-CHAIN components. The board power supplies are controlled by the SPSB100 PMIC (the device driver is available in the source folder) . Additionally, the board includes the following components: – 2 isolated transceivers L9963T – 1 L9963EF automotive chip for battery management applications with daisy chain up to 31 devices The aim of the demo for this board is to provide an example of how a Dual Access topology with 2 Automotive Battery Management Systems (BMS) works, managing a battery pack with 14 Li-ion battery cells (LG INR 18650 MJ1). The AEK-POW-BMS63EM is the first node of the chain, while the additional nodes can be other BMS boards of our portfolio. AS the AEK-POW-BMS63EM embeds two transceivers, it is also the last node of the chain. The AEK-POW-BMS63EM is able to measure voltage, temperature and current monitoring, providing battery state of charge (SoC), battery state of health (SOH) and cell balancing of lithium-ion (Li-ion) batteries. Updated components: • **AEK-POW-SPSB081** The AEK-POW-SPSB081 is based on SPSB081, a power management system IC providing electronic control modules with enhanced power management functionality, including various standby modes to minimize the power consumption with programmable local and remote wake-up capability, as well as LIN and CAN FD physical communication layers. Updates: Changed driver structure. • **AEK-COM-10BASET** The AEK-COM-10BASET evaluation board is a powerful tool to explore various vehicle network architectures, leveraging on the new 10BASE-T1S automotive Ethernet protocol implementation and other on-board legacy automotive interfaces (CAN, CAN-FD and SPI). This board merges the innovations brought by the new 10BASE-T1S specification with the high-performance dual-core SPC58EC80E5 Chorus family microcontroller. The AEK-COM-10BASET essentially acts as a gateway to interconnect incompatible communication systems, allowing a vehicle zone sensor/actuator to receive messages in the 10BASE-T1S protocol format even if the zone components are not able to communicate via Ethernet. The board features a PHY-MAC transceiver, which communicates with the MCU via SPI, and a PHY only transceiver requiring an Ethernet MAC to run in the MCU. In our board, these transceivers support only half-duplex communication. Both are connected to the MCU, one using the MMI port while the other using a SPI channel. The firmware embedded in the board can manage a software-implemented Ethernet MAC and runs under FreeRTOS operating system. Updates: Bugfix in the demo.
Minor release (version 2.6.1)	Installation bugfix
Minor release (version 2.6.0)	New components: • **AutoDevKit Smart Dashboard** AutoDevKit Smart Dashboard is an intuitive GUI that allows the users: – to set the peripherals available on the board connectors (GPIO, SPI, CAN, ADC, LIN, EIRQ, I2C and PWM) and allocate the necessary pins to connect your function board – to allocate AutoDevKit functional boards in a click You can launch it by simply clicking the related button on the right-hand side of AutoDevKit application window.

Type	Summary
	Note: To add the Smart Dashboard to your project, follow the steps below: *1. Add SPC58ECxxx Platform Component* *2. Add Init Package Component* *3. Add Low Level Drivers Component* *4. Import the new AEK-MCU-C4MINI1 board component. The Smart Dashboard button will automatically appear on the right-hand side of AutoDevKit application window (Common tasks→Editors for "Application Name").* • **AEK-POW-BMSCHAIN GUI** The BMS GUI allows you to monitor a 14-cell or 6-cell load, showing the state of charge, voltage, current, temperature, and balancing status of the selected chain and node. In particular, the GUI: – Monitors single cell voltage and total voltage – Measures temperature and current – Shows the balancing status (on/off) – Signals faults (undervoltage, overvoltage, disconnected cell, etc.) – Plots of total current and voltage variations over time Updated components: • **AEK-POW-BMSCHAIN** The AEK-POW-BMSCHAIN manages multiple instances of BMS chains with nodes based on a minimum of 4 to a maximum of 14 cells. You can use any BMS node (AEK-POW-BMS63EN, AEK-POW-BMSNOTX, AEK-POW-BMSWTX, AEK-POW-BMSCC or AEK-POW-BMSCCTX) of the AutoDevKit portfolio in a BMS chain. The AEK-POW-BMSCHAIN driver tool improves acquisition routine timing of voltage current and temperature by implementing a cyclic conversion routine based on an SPI/ISOSPI burst command. The AEK-POW-BMSCHAIN driver tool also improves dual access ring chain topology: you can now attach and detach a single BMS node in real-time. The software package features State-Of-Charge (SoC) and State-Of-Health (SoH) estimation as well as a passive balancing algorithm. *Note: Use AEK-POW-BMSCC or AEK-POW-BMSCCTX only to create single chains where the first node is the AEK-POW-BMSCCTX and the remaining nodes are exclusively AEK-POW-BMSCC boards.* Updates: The component now includes AEK-POW-BMSCC and AEK-POW-BMSCCTX to cover all BMS node chain options. • **AEK-MOT-WINH92** The AEK-MOT-WINH92 is a hardware tool designed as window lift driver. Based on the L99H92, an automotive grade H-Bridge gate driver, the AEK-MOT-WINH92 features anti-pinching, provides up to 50 A to drive motors and ensures real-time diagnostic. The AEK-MOT-WINH92 node communicates with an MCU via the SPI protocol. Updates: Bugfix in the driver. • **AEK-POW-LDOV02J** The AEK-POW-LDOV02J is an evaluation board based on the L99VR02J. It can be used in several electronic applications such as microcontroller supplies, automotive display drivers, sensors, and infotainment processors. The L99VR02J is a DC-DC voltage regulator designed for automotive applications (AEC-Q100 qualified). It can deliver up to 500 mA of load current and consumes as low as 1µA when the regulator is disabled. Updates: Bugfix in the driver.

Type	Summary
	• **AEK-COM-10BASET** The AEK-COM-10BASET evaluation board is a powerful tool to explore various vehicle network architectures, leveraging on the new 10BASE-T1S automotive Ethernet protocol implementation and other on-board legacy automotive interfaces (CAN, CAN-FD and SPI). This board merges the innovations brought by the new 10BASE-T1S specification with the high-performance dual-core SPC58EC80E5 Chorus family microcontroller. The AEK-COM-10BASET essentially acts as a gateway to interconnect incompatible communication systems, allowing a vehicle zone sensor/actuator to receive messages in the 10BASE-T1S protocol format even if the zone components are not able to communicate via Ethernet. The board features a PHY-MAC transceiver, which communicates with the MCU via SPI, and a PHY only transceiver requiring an Ethernet MAC to run in the MCU. In our board, these transceivers support only half-duplex communication. Both are connected to the MCU, one using the MMI port while the other using a SPI channel. The firmware embedded in the board can manage a software-implemented Ethernet MAC and runs under FreeRTOS operating system. Updates: The following demo names have been changed: SPC58ECxx_RLA AEK-COM-10BASET CAN-ETH application and SPC58ECxx_RLA AEK-COM-10BASET CAN-ETH Gateway.
Minor release (version 2.4.0)	New components: • **AEK-POW-BMSCHAIN** The AEK-POW-BMSCHAIN is a new driver tool that manages multiple instances of BMS chains with nodes based on a minimum of 4 to a maximum of 14 cells. You can compose the chain with any BMS node type (AEK-POW-BMS63EN, AEK-POW-BMSNOTX or AEK-POW-BMSWTX) belonging to the AutoDevKit ecosystem. The AEK-POW-BMSCHAIN driver tool improves the timing of the acquisition routine for voltage current and temperature by implementing a cyclic conversion routine based on an SPI/ISOSPI burst command. The AEK-POW-BMSCHAIN driver tool also improves dual access ring chain topology: you can now attach and detach a single BMS node in real-time. The software package features State-Of-Charge (SoC) and State-Of-Health (SoH) estimation as well as a passive balancing algorithm. • **AEK-MCU-C4MINI1** The AEK-MCU-C4MINI1 is designed to address Automotive and Transportation applications as well as other applications requiring automotive safety and security levels. The board layout has been conceived to speed up the user development offering an easy prototyping evaluation tool. Despite several connection possibilities due to the MCU numerous peripherals, the user-friendly interface facilitates the interconnection of pre-configured and pin pre-mapped peripherals. The general-purpose and serial connectors have been standardized and grouped by peripheral function types. The MCU peripherals are extended with the VNH7040AY embedded H-bridge motor driver for DC motor control, featuring advanced diagnostic features (short-to-ground, short-to-battery, and open load conditions). The top connection facilitates the debugging phase (for example, when testing signal connections and data exchange), while the bottom one reduces the total occupied space by the two boards, making it the preferred choice for deployment purposes. • **AEK-POW-BMSLV** The AEK-POW-BMSLV is a hardware tool that implements a BMS low voltage solution with 14 cells. It is based on the L9963E, an automotive-grade AFE chip for battery management applications. The BMS node communicates with an MCU via ISOSPI protocol using the L9963T. The AEK-POW-BMSLV includes a PMIC unit based on the SPSB100 (custom version with CAN port) that is able to provide supply voltage to the SPC58EC MCU. Updated components: • **AEK-POW-BMS63EN** The AEK-POW-BMS63EN is a hardware tool that implements a BMS node with a minimum of 4 to a maximum of 14 cells based on the L9963E, an automotive-grade AFE chip for battery management applications. The software package includes a State-Of-Charge (SoC) and State-Of-Health (SoH) estimation as well as a passive balancing algorithm. Updates:

Type	Summary
	Bugfix on the Graphic User Interface for AEK-POW-BMS63EN demos • **AEK-AUD-D903V1** The AEK-AUD-C1D9031 is a very compact AVAS solution based on the 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. Updates: Bugfix: I2S signal generation in sync with the bit clock edge.
Minor release (version 2.2.1)	Updated components: • **SPC582B-DIS** The discovery board SPC582B-DIS helps you to discover SPC582B Line Power Architecture® Microcontrollers with full access to CPUs, I/O signals and peripherals at budget price. Bug Fix: Missing demo example • **SPC584B-DIS** The SPC584-DIS is the ideal discovery board for accelerating the development and securing a fast time-to-market, with a perfect balance among performances, functionalities and cost. Bug Fix: Missing demo example • **SPC58EC-DIS** The SPC58EC-DIS is the ideal discovery board for accelerating development and securing a fast time-to-market, with a perfect balance among performances, functionalities and cost. Bug Fix: Missing demo example
Minor release (version 2.2.0)	New components: • **AEK-POW-BMSWTX** It is a hardware tool that implements a BMS node based on the L9963E with an integrated L9963T ISOSPI <> SPI transceiver on board. The node supports from 4 up to 14 cells. Both ICs are automotive-grade. The BMS node communicates with an MCU via the ISOSPI protocol using the L9963T. The software package includes a State-Of-Charge (SoC) and State-Of-Health (SoH) estimation as well as a passive balancing algorithm. • **AEK-POW-BMSLV** It is a one board hardware tool implementing a BMS low voltage solution (<60V). It is based on the L9963E, an automotive-grade AFE, L9963T ISOSPI <> SPI transceiver, a PMIC unit based on the SPSB100 to provide supply voltages, and a main controller MCU SPC58EC . • **AEK-SNS-ASM330LHB** It is a hardware tool based on STEVAL-MKI236A, an adpter board to facilitate the evaluation of MEMS devices in the ASM330LHB product family. The ASM330LHB is a system-in-package featuring a 3-axis digital accelerometer and a 3-axis digital gyroscope with an extended temperature range up to +105 °C. The software package allows controlling sensor devices by implemention of I2C or SPI 4-wire commmunication protocols. • **AEK-POW-SPSB081** It is a hardware tool based on SPSB081, a power management system IC providing electronic control modules with enhanced power management functionality, including various standby modes to minimize the power consumption with programmable local and remote wake-up capability, as well as LIN and CAN FD physical communication layers. • **AEK-MCU-SPC5LNK** It is a debugger/programmer dongle for SPC5 automotive microcontrollers. It consists of a passive USB-to-JTAG debugger and programmer, which provides a cost-effective, small-size, and fast-prototyping solution for any vehicle applications. This dongle is fully integrated into SPC5-Studio and AutoDevKit Studio IDEs. The JTAG interface ensures an easy plug to any SPC58 family automotive microcontroller boards. In addition a virtual COM port interface enables the host PC to communicate with the microcontroller through UART.

Type	Summary
	Updated components: • **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. Updates: SPC58ECxx_RLA AEK_MOT_2DCxxx Main ECU - Seat Adj Control demo removed • **AEK-POW-BMS63EN** It is a hardware tool that implements a BMS node with a minimum of 4 to a maximum of 14 cells based on the L9963E, an automotive-grade AFE chip for battery management applications. Updates: Bugfix in SPC58NN Bernina demo applications • **AEK-COM-ISOSPI1** This component enables the L9963T, a general purpose SPI to isolated SPI transceiver intended to create a communication bridge between devices located at distance and into different voltage domains. L9963T is able to transfer communication data incoming from a classical 4-wire based SPI interface to a 2-wire isolated interface (and vice versa). Updates: Bugfix in the available demos • **AEK-AUD-D903V1** It is a very compact AVAS solution based on the 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-D903V1 integrates two audio amplifiers in stereo mode or two separate audio channels. The board can be controlled by a central MCU via CAN interface. Updates: Bugfix in the driver • **AEK-LCD-ILI9341** This component is dedicated to a commercially available touch LCD display 240x320 pixels with up to 65K colors per pixel based on the ILI9341 controller. The touch circuit is managed by the XPT2046 controller. All communications are based on the SPI protocol. It is possible to manage up to two LCDs in parallel. Updates: Bugfix in the driver • **AEK-LCD-LVGL** LVGL (Light and Versatile Graphics Library) is a popular free and open source embedded graphics library to create nice UIs for any MCU. This LVGL porting allows creating graphics on our AEK-LCD-ILI9341 LCD touch component. Note that the component is visible only if you have added and configured the AEK-LCD-ILI9341. Updates: Bugfix in the driver
Minor release (version 2.1.0)	New components: • **AEK-POW-BMS63EN** The AEK-POW-BMS63EN is a hardware tool that implements a BMS node with a min. of 4 to a max. of 14 cells based on the L9963E, an automotive-grade AFE chip for battery management applications. The software package includes a State-Of-Charge (SoC) and State-Of-Health (SoH) estimation as well as a passive balancing algorithm. • **AEK-MOT-MR200G1** The AEK-MOT-MR200G1 is designed as a mini zone controller for the side mirror application. The AEK-MOT-MR200G1 hosts an SPC582B60E1 Chorus 1M microcontroller and an L99DZ200G automotive-grade multi-output driver. Thanks to the integrated L99DZ200G, the board allows controlling different functions related to a vehicle side mirror: folding, unfolding, X-Y mirror inclination, electrochromic dimming, and heating.

Type	Summary
	Updated components: • **AEK-LCD-ILI9341** (updated) This component is dedicated to a commercially available touch LCD display 240x320 pixels with up to 65K colors per pixel based on the ILI9341 controller. The touch circuit is managed by the XPT2046 controller. All communications are based on the SPI protocol. It is possible to manage up to two LCDs in parallel. The LCD is implemented in the AutoDevKit board AEK-LCD-DT028V1. Update: Bugfix in the driver • **AEK-COM-ISOSPI1** (upgraded) This component enables the L9963T functions. L9963T is a general purpose SPI to isolated SPI transceiver intended to create a communication bridge between devices located at distance and into different voltage domains. L9963T is able to transfer communication data incoming from a classical 4-wire based SPI interface to a 2-wire isolated interface (and vice versa). Updates: Bugfix in the driver Update GUI configuration • **AEK-MOT-2DCxxx** (updated) 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. Update: Bugfix in the driver • **AEK-LCD-LVGL** (upgraded) LVGL (Light and Versatile Graphics Library) is a popular free and open source embedded graphics library to create nice UIs for any MCU. This LVGL porting allows creating graphics on our AEK-LCD-ILI9341 LCD touch component. Please note that the component is visible only if you have added and configured the AEK-LCD-ILI9341. Update: Bugfix in the driver • **Digital Twin Application (NewTwen)** (updated) Digital Twin (DT) technology is a Motor Control Kit with digital sensors for motor internal temperature detection where physical sensors cannot be placed. The purpose of this demo is to show an application of Digital Twin (DT), designed and implemented by NEWTWEN. The following devices are required: AEK-MOT-3P99081 board AEK-MCU-C4MLIT1 board Brushless DC (BLDC) motor Update: Bugfix in the driver Not recommended for new design (NRND) components: • **AEK-POW-100W4V1**: board in Mat50 (NRND). • **AEK-POW-L5964V1**: board in Mat50 (NRND). • **AEKD-USBTYPEC1**: USB Power delivery demo kit in Mat50 (NRND). • **AEK-CON-5SLOTS1**: board in Mat50 (NRND). • **AEK-CON-AFLVIP2**: board in Mat50 (NRND). • **AEK-CON-BSPOTV1**: board in Mat50 (NRND). • **AEKD-AFL001**: Adaptive Front-Lighitng kit in Mat50 (NRND). • **AEKD-AFLPANEL1**: Adaptive Front-Lighitng kit in Mat50 (NRND). • **AEKD-AFLLIGHT1**: Adaptive Front-Lighitng kit in Mat50 (NRND). Microcontroller supported: • SPC58NN84E7 Chorus line, triple core 200MHz, 6 Mb flash memory, HSM, GTM, ASIL-D • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash memory, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash memory, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mb flash memory

Type	Summary
Major release (version 2.0.0)	New components: • **AEK-POW-LDOV02J** The L99VR02J is a DC-DC voltage regulator designed for automotive applications (AEC-Q100 qualified). It can deliver up to 500mA of load current and consumes as low as 1µA when the regulator is disabled. • **AEK-LCD-LVGL** LVGL (Light and Versatile Graphics Library) is a popular free and open source embedded graphics library to create beautiful UIs for any MCU. This LVGL porting allows to create graphics on our AEK-LCD-ILI9341 LCD touch component. Please note that the LVGL component is only visible if you have added and configured AEK-LCD-ILI9341 • **AEK-MCU-BRNLIT1** The component supports the SPC58xNx microcontroller (aka Bernina) belonging to a family of devices superseding the SPC5x family. Taking advantage from the legacy of the SPC5x family, SPC58xNx introduces new features coupled with higher throughput to provide substantial reduction of cost per feature and significant power and performance improvement (MIPS per mW) • **AEK-COM-ISOSPI1** This component enables the L9963T functions. L9963T is a general purpose SPI to isolated SPI transceiver intended to create a communication bridge between devices located at distance and into different voltage domains. L9963T is able to transfer communication data incoming from a classical 4-wire based SPI interface to a 2-wire isolated interface (and viceversa)
Minor release (version 1.7.0)	New components: • AEK-POW-LDOV01J and AEK-POW-LDOV01S The L99VR01x is a DC-DC voltage regulator designed for automotive applications (AEC-Q100 qualified). It can deliver up to 200 mA of load current and consumes 1 µA when the regulator is disabled. New demo released: • AI-Car sensing node This application demonstrates how to use Core2 and Core0 simultaneously. It implements a versatile deep learning system based on the long-short term memory (LSTM) recurrent neural network (RNN) able to provide a car state classification: – car parked – car driving on normal conditions road – car driving on a bumpy road – car skidding or swerving The main idea is to define a sensing node ECU with an embedded artificial intelligence processing, namely an AI-Car sensing node. The system hosts an SPC58EC Chorus 4M microcontroller able to acquire discrete acceleration variations on a three-axis reference system. The inertial data are retrieved by the AIS2DW12 motion sensor mounted on the AEK-CON-SENSOR1 board. The acquired data is passed to an LSTM RNN able to classify the car state. The result of the classification is shown on an LCD Touch display contained in the AEK-LCD-DT028V1 board. LSTM RNN has been implemented and trained using the TensorFlow 2.4.0 framework (Keras) on the Google Colab environment. The resulting trained neural network has been converted by the SPC5-STUDIO-AI plug-in in an optimized C code library capable of running on an MCU with limited power computing resources. Updated component(s): • EV-VNx7xxx: Bugfix in the driver • EV-VNHx7xxx: Bugfix in the driver • Linear-Hall-Effect-Sensor: Bugfix in the driver Not recommended for new design (NRND) components: • AEK-POW-100W4V1: board at maturity 50 • AEK-POW-L5964V1: board at maturity 50 • AEKD-USBTYPEC1: USB Power Delivery evaluation kit at maturity 50

Type	Summary
	Microcontroller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash memory, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash memory, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mb flash memory
Minor release (version 1.6.0)	Components updated: • AEK-MOT-2DCxxx - Bugfix in the driver • AEK-CON-SENSOR1 - Bugfix in the driver • AEK-SNS-VL53L1X1- New dedicated demo for the power liftgate application Demos updated: • Automatic liftgate demo Updates: – New solution with the AEK-MOT-TK200G1 to drive the linear motor actuators, the X-NUCLEO-NFC06A1 to emulate the keyless scenario, and the AEK-COM-BLEV1 to open/close the trunk with an Android app running on a mobile phone. The demo has been developed with a model-based design using MATLAB®. The model is included in the project folder under the directory "MATLAB®". Microcontroller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash memory, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash memory, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mb flash memory New component released: • AEK-MOT-3P99081 The AEK-MOT-3P99081 evaluation board is based on the SPC560P Pictus 32-bit MCU and the L9908 gate driver allowing the control of 6 N-channel FETs for brushless motors in automotive applications. The AEK-MOT-3P99081 supports independent encoder inputs and Hall sensors to detect and control the motor speed. • AEK-MOT-TK200G1 The board hosts a L99DZ200G, a door zone system IC providing electronic control modules with enhanced power management functionality. The two low-drop voltage regulators of the device supply the system microcontroller and the external peripheral loads. They also provide enhanced system standby functionality with a programmable local and remote wake-up capability. In addition, the L99DZ200G device features five high-side drivers to supply the LEDs, and two high-side drivers to supply the bulbs, thus noticeably increasing the system-level integration. • X-NUCLEO-NFC06A1 The X-NUCLEO-NFC06A1 NFC card reader expansion board is based on the ST25R3916 device. The expansion board is configured to support ISO14443A/B, ISO15693, FeliCa™, and AP2P communication. The ST25R3916 manages frame coding and decoding in reader mode for standard applications, such as NFC, proximity, and vicinity HF RFID standards. It supports ISO/IEC 14443 Type A and B, ISO/IEC 15693 (single subcarrier only) and ISO/IEC 18092 communication protocols as well as the detection, reading, and writing of NFC Forum Type 1, 2, 3, four, and five tags. This board is the new version of the X-NUCLEO-NFC05A1. New demo released: • None
Bugfix release (version 1.5.1)	Components updated: • AEK-MOT-2DCxxx - Bugfix in the Demo • AEK-LED-21DISM1 - Bugfix in the Driver • AEK-MOT-SM81M1 - Driver optimization • AEK-AUD-C1D9031 - Demo updated with the new I²C settings • AEK-SNS-VL53L1X1- Demo updated with the new I²C settings Demos updated: • Automatic liftgate demo - Bug fixed

Type	Summary
	Microcontroller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash memory, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash memory, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mb flash memory New component released: • None New demo released: • None
Minor release (version 1.5.0)	Components updated: • AEK-MOT-2DC40Y1 and AEK-MOT-2DC70S1 - fixed bug in driver Demos updated: • None Microcontroller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash memory, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash memory, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mb flash memory 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 the SPC560P Pictus MCU and L9907 predriver. 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 the SPC560P Pictus MCU from AutoDevKit to enable the CAN port.* 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.
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 Microcontroller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash memory, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash memory, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mbflash

Type	Summary
	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 emit 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 the 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: 3-axis accelerometer and 3-axis 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 Microcontroller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash memory, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash memory, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mbflash

Type	Summary
	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 sequences 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 Microcontroller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash memory, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash memory, 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 Microcontroller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash memory, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash memory, HSM • SPC582B Chorus line, single core 80 MHz, 1 Mbflash New component released: • None New demo released: • None

Type	Summary
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 Microcontroller supported: • SPC58EC80E5 Chorus line, dual core 180 MHz, 4 Mb flash memory, HSM • SPC584B70E5 Chorus line, single core 120 MHz, 2 Mb flash memory, 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 I²S interface for sound and I²C 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.
25-May-2021	9	Added details regarding STSW-AUTODEVKIT bugfix release version 1.5.1.
06-Dec-2021	10	Added details regarding STSW-AUTODEVKIT minor release version 1.6.0.
14-Mar-2022	11	Added details regarding STSW-AUTODEVKIT minor release version 1.7.0.
04-Nov-2022	12	Added AutoDevKit Studio 2.0.0 replacing AutoDevKit library.
03-Apr-2023	13	Added AutoDevKit Studio minor release 2.1.0.
10-Nov-2023	14	Added AutoDevKit Studio minor release 2.2.0. Updated Section 2.3 Supported connector boards and Section 3 Previous versions.
22-Nov-2023	15	Added AutoDevKit Studio minor release 2.2.1.
11-Jun-2024	16	Added AutoDevKit Studio minor release 2.4.0. Updated Introduction, Table 1. STSW-AUTODEVKIT release summary, Section 1.1: System requirements and Section 2.2: Supported microcontroller boards.
09-Apr-2025	17	Added AutoDevKit Studio minor release 2.6.0. Updated Section Introduction, Table 1. STSW-AUTODEVKIT release summary, Section 2.1: Known limitations, Section 2.2: Supported microcontroller boards and Section 3: Previous versions.
13-May-2025	18	Added AutoDevKit Studio minor release 2.6.1.
01-Dec-2025	19	Added AutoDevKit Studio minor release 2.7.0.
30-Mar-2026	20	Added AutoDevKit Studio minor release 2.8.0.
04-May-2026	21	Added AutoDevKit Studio minor release 2.8.1.
02-Nov-2026	22	Added AutoDevKit Studio minor release 2.9.0.

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