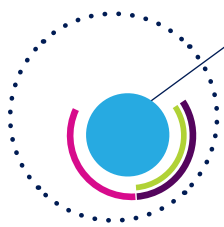




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# SPC56 MCU family development tools





# Tools for the SPC56 family



## Evaluation and development tools to get your system application started with the SPC56 family of 32-bit automotive MCUs

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### OVERVIEW

The SPC56 family of automotive microcontrollers is supported by a full range of state-of-the-art tools from major third parties:

- Development tool chains and IDE's
- Real time debuggers and emulators
- Drivers and runtime software libraries
- AUTOSAR platforms
- Calibration tools

ST works continuously with our third-party partners to ensure that the latest devices in the SPC56 family are supported by these toolchains. Our aim is to provide customers with efficient toolchains yielding optimum code size and performance, via productivity tools such as emulators with backward simulation from a recorded trace, or quality-assurance tools, such as code-coverage analyzers.

### BENEFITS

- Comprehensive set of modular and scalable development solutions
- Broad 3<sup>rd</sup>-party tool support
- Reduced development time, faster time-to-market
- Full compliance with quality and safety standards



## DEVELOPMENT TOOLS

### Compilers and IDE

STMicroelectronics collaborates with major third parties to provide state of the art tools for the SPC56xx family in accordance with the latest automotive quality and safety standards (ISO 61508, ISO 26262, MISRA, Automotive Spice).

### Debugging and emulation tools

Close cooperation with our partners has resulted in a comprehensive set of scalable solutions for debuggers and emulators, continuously updated to support our latest devices.

### Run-time libraries

In order to increase development efficiency, drivers and runtime libraries are available for all devices.

### Autosar

A complete AUTOSAR environment is available to support the entire SPC56 family of MCUs. Various AUTOSAR revisions are supported on specific part numbers.

### RTOS

A full range of operating systems compliant with OSEK and AUTOSAR standards is available through our third-party network.

## SUMMARY OF TOOLS AND PROVIDERS

| SPC56 product lines | IDE and compilers                                                                       | Debuggers and emulators                                                  |
|---------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| SPC563M line        | Green Hills<br><a href="http://www.ghs.com">www.ghs.com</a>                             | Lauterbach<br><a href="http://www.lauterbach.com">www.lauterbach.com</a> |
| SPC564A line        | Wind River<br><a href="http://www.windriver.com">www.windriver.com</a>                  | PLS<br><a href="http://www.pls-mc.com">www.pls-mc.com</a>                |
| SPC560P line        | Cosmic Compiler<br><a href="http://www.cosmic-software.com">www.cosmic-software.com</a> | iSystem<br><a href="http://www.isystem.com">www.isystem.com</a>          |
| SPC560B/C/D line    | High-Tec GNU Compiler<br><a href="http://www.hightec-rt.com">www.hightec-rt.com</a>     | RLink<br><a href="http://www.raisonance.com">www.raisonance.com</a>      |
| SPC56EL line        | Byte Craft<br><a href="http://www.bytecraft.com">www.bytecraft.com</a>                  | P&E Micro<br><a href="http://www.pemicro.com">www.pemicro.com</a>        |
|                     | Ash Ware<br><a href="http://www.ashware.com">www.ashware.com</a>                        |                                                                          |



## SPC56 FAMILY STARTER KITS

The SPC56xx-SK provides a complete entry level solution enabling quick evaluation of the SPC56 family of automotive microcontrollers. The system is based on an interchangeable microcontroller daughter board and integrates a JTAG interface for making easier, starting from a single evaluation platform, the evaluation and the development of applications for the complete range of microcontrollers.

| Part number         | Description                                                                                                               | Devices     |
|---------------------|---------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>SPC560B50-DB</b> | Bolero daughter board for REVA Kit.                                                                                       | SPC560B50L5 |
| <b>SPC560B50SK</b>  | Raisonance Starter Kit for Bolero 512K with integrated Rlink. Includes RFlasher and Ride software (limited to 64K).       | SPC560B50L5 |
| <b>SPC560P50-DB</b> | Pictus daughter board for REVA Kit.                                                                                       | SPC560P50L5 |
| <b>SPC560P50SK</b>  | Raisonance Starter Kit for Pictus 512K with integrated Rlink. Includes RFlasher and Ride software (debug limited to 64K). | SPC560P50L5 |
| <b>SPC563M64-DB</b> | Monaco daughter board for REVA Kit.                                                                                       | SPC563M64L5 |
| <b>SPC563M64SK</b>  | Raisonance Starter Kit for Monaco 1M5 with integrated Rlink. Includes RFlasher and Ride software (debug limited to 64K).  | SPC563M64L5 |

## SPC56 FAMILY EVALUATION KITS

The SPC56xxKIT is a full evaluation system supporting SPC56 family microcontrollers. The complete system consists of a motherboard and a mini-module which plugs onto the motherboard. Different mini-modules are available for evaluating powertrain, body, chassis and safety applications with different target devices of the family. The evaluation system allows full access to the CPU, all of the CPU's I/O signals and motherboard's peripherals such as CAN, SCI, LIN, Flex-Ray and Ethernet.



### KEY FEATURES

- Power switch with LED indicators
- 12 V DC power supply input barrel connector and onboard L9758 regulator with three different power voltages: 5 V, 3.3 V and 1.2 V
- Configurable onboard peripherals to operate at 5 V or 3.3 V
- Two CAN channels: one with high-speed transceiver and DB9 connector, one with low-speed fault-tolerant and high-speed transceiver (selectable with jumpers) and DB9 connector
- Two LIN channels: one with transceiver and pin header connector populated, one with footprints only
- One SCI channel with transceiver with DB9 connector
- Two Flex-Ray channels: one with transceiver and DB9 male connector, one with footprint only
- Four user push buttons with polarity selection, four user LED's, potentiometer for analog voltage input, pin array for accessing all I/O signals
- Expansion connectors for accessing all I/O signals

## EVALUATION KITS FOR POWERTRAIN MICROCONTROLLERS

| Part number            | Description                                                                                                                           | Supported devices                                                       |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b>SPC56XXMB</b>       | Motherboard for all SPC56 family products, includes: universal power supply, USB cable, documentation CD, Rlink flasher HW-SW (demo). | All                                                                     |
| <b>SPC563MADPT144S</b> | Socketed mini module for SPC563M in QFP144 package. Requires SPC56XXMB.                                                               | SPC563M60L5<br>SPC563M64L5                                              |
| <b>SPC563MADPT176S</b> | Socketed mini module for SPC563M and SPC564A in QFP176 package. Requires SPC56XXMB.                                                   | SPC563M60L7<br>SPC563M64L7<br>SPC564A70L7<br>SPC564A74L7<br>SPC564A80L7 |
| <b>SPC564AADPT324S</b> | Socketed mini module for SPC564A in BGA324 package. Requires SPC56XXMB.                                                               | SPC564A74B4<br>SPC564A80B4                                              |

## EVALUATION KITS FOR SAFETY AND CHASSIS MICROCONTROLLERS

| Part number            | Description                                                                                                                      | Supported devices                                        |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <b>SPC56XXMB</b>       | Motherboard for all SPC56xx products, includes: universal power supply, USB cable, documentation CD, Rlink flasher HW-SW (demo). | All                                                      |
| <b>SPC560PADPT64S</b>  | Socketed mini module for SPC560P in QFP64 package. Requires SPC56XXMB.                                                           | SPC560P34L1<br>SPC560P40L1                               |
| <b>SPC560PADPT100S</b> | Socketed mini module for SPC560P in QFP100 package. Requires SPC56XXMB.                                                          | SPC560P40L3<br>SPC560P44L3<br>SPC560P50L3<br>SPC56AP60L3 |
| <b>SPC560PADPT144S</b> | Socketed mini module for SPC560P in QFP144 package. Requires SPC56XXMB.                                                          | SPC560P50L5<br>SPC560P54L5<br>SPC56AP60L5                |
| <b>SPC56ELADPT100S</b> | Socketed mini module for SPC56EL in LQFP100 package. Requires SPC56XXMB.                                                         | SPC56EL60L3                                              |
| <b>SPC56ELADPT144S</b> | Socketed mini module for SPC56EL in LQFP144 package. Requires SPC56XXMB.                                                         | SPC56EL60L5                                              |

## EVALUATION KITS FOR CAR BODY MICROCONTROLLERS

| Part number            | Description                                                                                                                           | Supported devices                                                                      |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <b>SPC56XXMB</b>       | Motherboard for all SPC56 family products, includes: universal power supply, USB cable, documentation CD, Rlink flasher HW-SW (demo). | All                                                                                    |
| <b>SPC560BADPT64S</b>  | Socketed mini module for SPC560D in QFP64 package. Requires SPC56XXMB.                                                                | SPC560D40L1                                                                            |
| <b>SPC560B64A100S</b>  | Socketed mini module for SPC560B/C in QFP100 package. Requires SPC56XXMB.                                                             | SPC560B40L3<br>SPC560B50L3<br>SPC560B54L3<br>SPC560B60L3<br>SPC560C40L3<br>SPC560C50L3 |
| <b>SPC560BADPT144S</b> | Socketed mini module for SPC560B in QFP144 package. Requires SPC56XXMB.                                                               | SPC560B40L5<br>SPC560B50L5                                                             |
| <b>SPC560BADPT176S</b> | Socketed mini module for SPC560B in QFP176 package. Requires SPC56XXMB.                                                               | SPC560B64L7                                                                            |



## SPC56 FAMILY EMULATION AND CALIBRATION ADAPTERS

ST offers emulation and calibration systems designed to work with enhanced automotive calibration and debug tools, for all packages of SPC56 automotive MCU family.

There are two available emulation/calibration solutions, both of which can be directly attached to the application (in lieu of the SPC56 device itself) using Poly-Pod connectors matching the device package footprint. By using one of these solutions connected to their application, customers can access additional or improved features such as data measurement, parameter calibration, memory management and full-speed execution traces.

The first solution are standalone calibration adapter boards (such as the SPC56xxCALx adapter) which provide both emulation and calibration functions all in a single board. The calibration adapter embeds up to 2 Mbytes of onboard SRAM and a Nexus port to support calibration operations.

The second solution is the VertiCal hardware system, with a standardized tool connector that allows a variety of calibration and debug hardware to be connected as required. A VertiCal base board can be plugged directly onto the application using a Poly-Pod, and complemented with a RAM/Debug Top Board for calibration and debugging tasks.



### CALIBRATION ADAPTER KEY FEATURES

- Power switch with LED indicators
- Onboard 3.3 V voltage regulator
- Monaco or Andorra in CSP496 package
- Up to 2 MB of onboard 16-/32-bit SRAM, depending on target device
- Calibration bus with latch between CPU and RAM
- Mictor and ERNI debug connectors
- High-speed CAN transceiver L9616

## CALIBRATION ADAPTERS

| Part number     | Description                                                | Supported devices |
|-----------------|------------------------------------------------------------|-------------------|
| SPC563M64CAL144 | Calibration System for SPC563M64 in QFP144 target package. | SPC563M64L5       |
| SPC563M64CAL176 | Calibration System for SPC563M64 in QFP176 target package. | SPC563M64L7       |
| SPC564A70CAL176 | Calibration system for SPC564A70 in QFP176 target package. | SPC564A70L7       |
| SPC564A80CAL176 | Calibration system for target SPC564A80 in QFP176 package. | SPC564A80L7       |

## VertiCal MODULES

| Part number     | Description                                                                                    | Devices     |
|-----------------|------------------------------------------------------------------------------------------------|-------------|
| SPC563M64AVB144 | Vertical base board for target SPC563M64 in QFP144 package                                     | SPC563M64L5 |
| SPC563M64AVB176 | Vertical base board for target SPC563M64 in QFP176 package                                     | SPC563M64L7 |
| SPC564A80AVB176 | Vertical base board for SPC564A80 in QFP176 target package                                     | SPC564A80L7 |
| SPC564A80AVB324 | Vertical base board for SPC564A80 in BGA324 target package                                     | SPC564A80B4 |
| SPC564A70AVB176 | Full Vertical kit for SPC564A80 in QFP176 target package. Includes poly-pod and RAM Top Board. | SPC564A80L7 |
| SPC564A70AVB324 | Full Vertical kit for SPC564A80 in BGA324 target package. Includes poly-pod and RAM Top Board. | SPC564A80B4 |
| SPC56XVTOP-A    | RAM/Debug Top Board for SPC564A VertiCal base boards                                           | SPC564Axx   |
| SPC56XVTOP-M    | RAM/Debug Top Board for SPC563M VertiCal base boards                                           | SPC563Mxx   |

## ACCESSORIES

| Part number   | Description                 | Supported devices |
|---------------|-----------------------------|-------------------|
| POLYPOD-TQ144 | Poly-Pod for QFP144 targets | All               |
| POLYPOD-TQ176 | Poly-Pod for QFP176 targets | All               |
| POLYPOD-BG324 | Poly-Pod for BGA324 targets | All               |

## SOFTWARE TOOLS FOR THE SPC56 FAMILY

There are a range of software tools for developing AUTOSAR solutions with the SPC56 family. Full information on these software tools can be found in a companion document: SPC56 MCU family software components for AUTOSAR-enabled systems, available on [www.st.com/automotive](http://www.st.com/automotive)



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