

# Atmel®



## Atmel AvantCar™ Concept

Driving Futuristic Human-Machine Interface Concepts Using  
Atmel Solutions



## Modern Automotive Designs Require New Technologies

Fully-integrated centerstacks are prevalent in modern automobiles, allowing a single display to function as the primary interface for both driver and passengers. Users can interact with various menus to access the navigation system, radio, MP3 library, address book, and climate control system. In addition to a touchscreen, mechanical buttons or rotary knobs may still be in use to control seat position, heating, radio volume, and more. Today, state-of-the-art vehicles are equipped with multi-touch capacitive sensors found in smartphones and tablets, along with capacitive buttons to create a modern look and intuitive use.

As drivers demand a wide range of new features the next generation of cars will offer additional technological upgrades. These will be influenced by trends in the consumer market such as slick and curved centerstack designs, as well as customization by appearance, color, navigation, and interaction with a smartphone or tablet.

Atmel® offers a number of comprehensive platforms and solutions to address the current and future requirements of a modern in-vehicle human-machine interface (HMI).

The Atmel AvantCar™, Atmel's first fully functional concept showcasing groundbreaking solutions within the automobile. This is the first of many automotive concepts to highlight the innovative Atmel solutions that offer drivers an advanced, contemporary experience in the car.

### Atmel AvantCar Centerstack Demo

| Applications              | Atmel Technologies   |
|---------------------------|--|
| Two large touchscreens    | maXTouch products for Automotive   |
| Touch buttons and sliders | QTouch technology and automotive-qualified microcontrollers              |
| Proximity detection       | Dedicated algorithms running on Atmel's touch chips and microcontrollers |
| Ambient lighting          | Dedicated LIN-based ambient lighting control solutions                   |

### Automotive maXTouch Products

The Atmel maXTouch® family, known for its superior performance and rich feature set, is also qualified for automotive applications including in-vehicle touchscreens and touchpads. maXTouch supports screens and pads from 2 inches up to 12 inches in size and is ideally suited for center stack displays as well as navigation systems, radio human-machine interfaces (HMIs), and rear seat entertainment systems.

maXTouch devices provide unlimited touch identification, fast response time, precise operation, and low power consumption for touch-based designs.

#### Key Features

| Key Features  | Benefits   |
|---|--|
| Automotive qualified  | Compliant to Automotive reliability and EMI requirements from -40° to +105°C                     |
| High level of analog filtering                              | Supports single layer shield-less sensors  |
| High signal-to-noise ratio (SNR) through high voltage drive | Supports gloved-hand operation   |
| Embedded post processing                                    | Supports single- and dual-touch gestures<br>Suppresses unintended touches such as a resting hand |
| High scan speed   | Up to 280Hz scan speed, supports character recognition for in-host processor                     |



Atmel maXTouch enables gloved operation

# Atmel AvantCar Concept

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### Atmel QTouch Technology for Replacing Mechanical and Optical Interfaces

The Atmel QTouch® library makes it simple for developers to embed capacitive-touch button, slider, wheel, and proximity functionality into microcontroller applications. The library helps you design touch panels in the centerstack as well as overhead or door panels. The royalty-free QTouch Library provides several library files for each device and supports a number of touch channels, enabling both flexibility and efficiency in touch applications. In addition, Atmel provides a number of fixed-function products from 1 to 48 channels, some of them qualified for the automotive market.

#### Key Features

| Key Features              | Benefits  |
|---------------------------|---|
| Profusion of combinations | Implement buttons, sliders, wheels, and proximity sensing on a single interface                     |
| Broad controller support  | QTouch Library supports all Atmel automotive-qualified microcontrollers                             |
| Numerous channels         | Supports up to 64 channels; 256-level sliders or wheels requires only 3 channels                    |
| Common API                | A common API (Application Programming Interface) across all library versions simplifies development |
| Ignore bounce             | Full debouncing reports for touch buttons helps ensure single, clean contact detection              |

### Atmel Automotive-qualified Microcontroller Portfolio

The automotive market for electronics is growing rapidly as the demand for comfort, safety and reduced fuel consumption increases. All of these new functions require local intelligence and control, which can be optimized by the use of small powerful microcontrollers. In conjunction with Atmel's touch library, our automotive-qualified microcontrollers are ideal for driving new and futuristic capacitive-based control panels in current and future cars.



#### Key features

- Automotive qualification - AEC Q100 qualified and available in various temperature ranges (up to +150°C).
- With unsurpassed experience in embedded Flash memory microcontrollers, including Atmel AVR® microcontrollers from 8- to 32-bits, we offer a broad range of innovative solutions for HMI applications, sensor or actuator control and more sophisticated networking applications.
- Atmel microcontrollers are engineered to fulfill OEM zero-defect quality requirements.

### Atmel LIN-based Ambient Lighting Solution

With 30 years experience in body electronic and power-train designs, Atmel is a market leader in numerous areas such as the ever-growing LIN bus system. Atmel offers products at all integration levels— from simple transceiver ICs to complex system basis chips (SBC) and system-in-package solutions including the Atmel AVR ATA664251 for ambient lighting control.

#### Key features

- 16K Flash microcontroller with LIN transceiver
- 5V regulator, watchdog, 16 bit SPI
- Interface with 8 current sources for 3-phase LED control



