Standard Products

Development Platform Evaluation Kit for Automotive Applications

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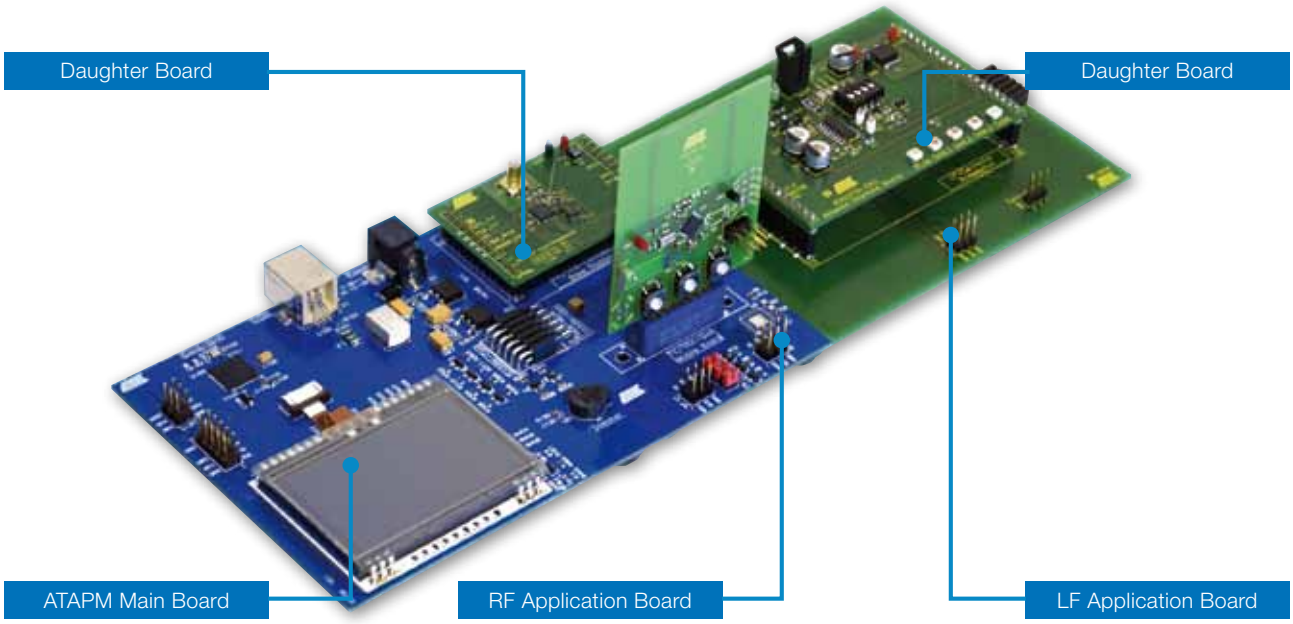
With automotive applications, the increasing level of integration on the chip side demands a corresponding increased effort on the application tool side. While customers, in general, do not like dealing with different stand-alone tools for each new application, there is an increasing need to evaluate complete sub-systems. Atmel's new automotive application development kit, ATAPMxx addresses these needs. This is a tool that helps customers not only to develop their application but also to evaluate application performance in a single environment. It is flexible and modular, and allows easy extension for new devices. All former tools from the car access area have been integrated into this new kit. Together with the upcoming AES devices Atmel is able to offer a system that can set up a complete Remote Keyless Entry (RKE) or a Passive Entry/Go (PEG) application for both the car and the key side. This kit is also currently being expanded to include LIN networking capabilities so that the evaluation of complete LIN bus product portfolio – standard transceivers and system basis chips as well as LIN system-in-package solutions – is supported.

The new evaluation kit is a modular, flexible application system to support customers in developing and evaluating their new applications. However, does flexible also mean complicated and cumbersome to use? Not with Atmel! The ATAPMxx was also designed to be easy-to-handle. "Out of the box" operation was one of the main development goals. Customers familiar with the former car access application tool "RF design kit" do not need to relearn completely new operation software as a nearly identical user interface is also supported by ATAPMxx. The system offers the hardware and software to develop and demonstrate complete system solutions. Hardware and software documentation serves as a useful starting point for customers' development.

The development kit comprises a main board as well as a selection of application and daughter boards, depending on the designated application. The most important part is the main board ATAPMMB with system controller, LCD display and touch screen, USB interface for PC connection, two-wire-serial interface (TWI) as connector for various application boards, an SD card slot, power supply connector, and a beeper. While the daughter boards function as RF transmitter or transceiver, the application boards act as an interface for the daughter boards to the system's two-wire serial bus. The main board can manage and control a complete application with different daughter boards as a stand-alone system. This is particularly useful if customers need to conduct a brief evaluation of functions and performance, or if a ready-to-run demonstrator is needed, which does not require a complex set-up procedure.

For more elaborate evaluation, the main board can also be used as an interface to a PC. Using the PC-based GUI, the system performance can be evaluated in all details, new configurations can be downloaded to certain components, and received or transmitted data can be displayed. The board is powered by an AT90USB128 AVR® microcontroller which serves as USB connection to the PC, and handles the touch panel and the communication with the application boards that are connected via the TWI.



As shown in figure 1, a number of different application boards are available. These boards carry the daughter boards for the required application and are equipped with TWI connectors on both ends so that practically an unlimited number of application boards can be attached in a row to a single main board. The standard RF application board contains its own AVR microcontroller (ATmega168) to handle the RF application as well as the communication to the main controller on ATAPMMB. Various daughter boards can be connected via two rows of connectors on top of the application board. A wide variety of daughter boards with RF receivers or transceivers are already available from the well-known RF design kit, and the number of boards continuesly grows. An additional connector can also be used to attach a transmitter or transceiver board for configuration purposes. This can be disconnected from the RF application board once it is configured and can operate as a battery-powered mobile device.

Some functions in remote keyless entry or passive entry (go) applications such as authentication/ immobilizer, system wake-up or inside/ outside detection of the key are often realized by LF links. The LF application board that supports these functions is quite similar to the RF application board, it contains its own microcontroller (ATmega168), which is responsible for the application and the communication with the main board via two-wire-serial interface. Currently, the LF application board supports two different functionalities, depending on the attached daughter board; it can operate as immobilizer base station (powered by U2270B), or it can be used in a PEG application with a 6-fold antenna driver (ATA5279).

To create a complete application, the appropriate parts and corresponding boards must be selected. For example, to design a bi-directional PEG system with RF/RF-authentication channels, a mobile board with the new, upcoming AES IC plus ATA58xx transceiver used as “key” are required. In addition, the main board, an RF application board, and two LF application boards plus two LF daughter boards are also needed. The main board and application boards – equipped with the appropriate daughter boards and plugged together via TWI – represent the “car” side of the system. Other configurations with mixed

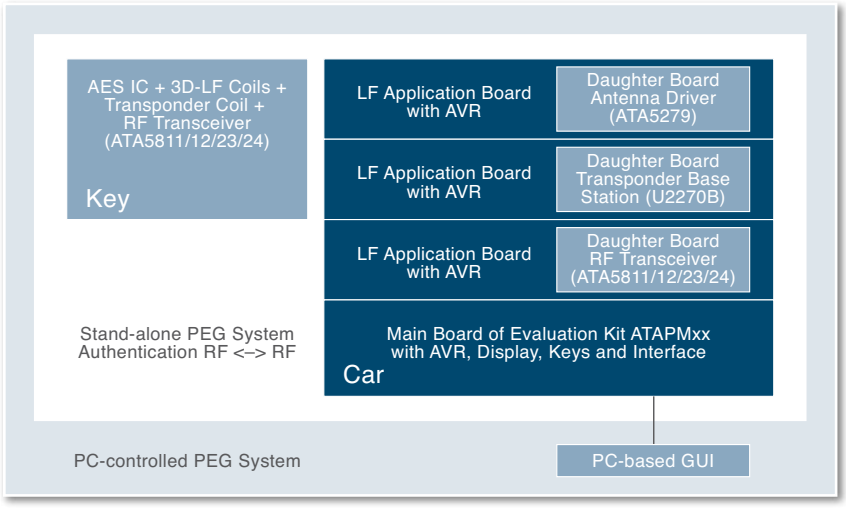
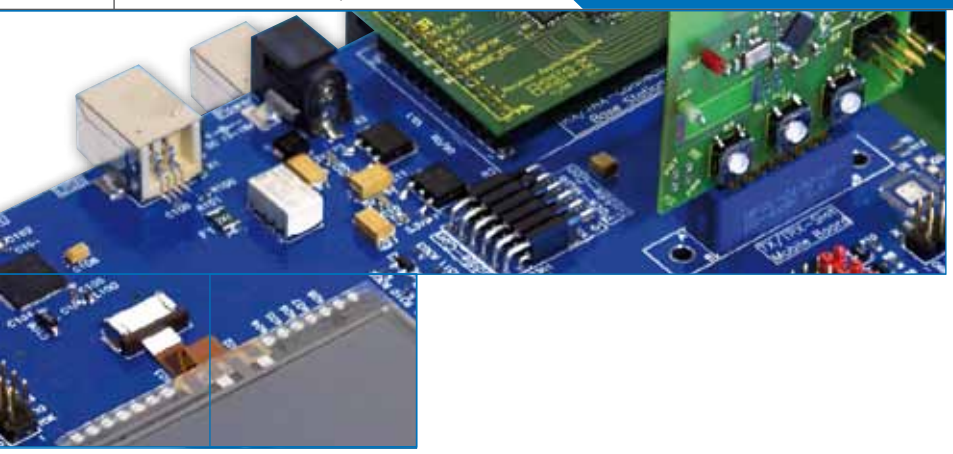


Figure 2. System Hardware Configurations for PEG



RF/LF authentication channels are also possible.

While the new application platform incorporates a fully modular concept so that can be freely configured according to individual needs, Atmel also offers a number of fixed configurations for applications that are requested more frequently, for example, remote keyless entry or passive entry go systems. These fixed configurations facilitate to address certain applications without the need to study selection guides or to get familiar with the details of the ATAPMxx development platform. They are an ideal starting point for newcomers, yet still offer full flexibility in that they can be extended or adapted to other application needs at any time by simply ordering additional components.

The ATAPMxx has exhibited at the Automotive Electronic Show in Shanghai in April 2009 where it

		Content of Pre-configured ATAPM System Kits for Remote Keyless Entry						
Part Number of Single Boards \ Complete Kits ➡ ⬇		RF 1-way			RF 2-way		RKE1	
	Comment	ATAPMRF11-DK1	ATAPMRF12-DK1	ATAPMRF13-DK1	ATAPMRF21-DK1	ATAPMRF22-DK1	ATAPMRKE1-DK1	ATAPMRKE2-DK1
Automotive Evaluation Kit System Controller								
ATAPMMB-DK	ATAPM main board	LCD, touch screen, USB-AVR, interface to PC & application	ATAPMMB-DK	ATAPMMB-DK	ATAPMMB-DK	ATAPMMB-DK	ATAPMMB-DK	ATAPMMB-DK	ATAPMMB-DK
Application Boards								
ATAPMRFS-DK1	RF application board	Standard for RKE & PEG	ATAPMRFS-DK1	ATAPMRFS-DK1	ATAPMRFS-DK1	ATAPMRFS-DK1	ATAPMRFS-DK1	ATAPMRFS-DK1	ATAPMRFS-DK1
ATAPMLFS-DK	LF application board	For immobilizer base station & 3D-LF base station						ATAPMLFS-DK	ATAPMLFS-DK
RF Daughter Board with								
ATA5745/46-EK	ATA5745/46	RF-Rx						ATA5746-EK	ATA5745-EK
ATAB5760-S	ATA5760	RF-Rx with SAW filter			ATAB5760-S				
ATAB5761-N	ATA5760	RF-Rx							
ATA5723/24-DK	ATA5723/24	RF-Rx	ATA5723-DK	ATA5724-DK	ATA5724-DK				
ATAB5811/12-B	ATA5811/12	RF-TRx				ATAB5812-B	ATAB5811-B		
ATAB5823/24-B	ATA5823/24	RF-TRx							
LF Daughter Board with								
ATA2270-EK2	U2270B	Immobilizer base station							
ATAB5279	ATA5279	6-fold LF antenna driver							
Mobile Parts with								
ATAB5753/54	ATA5753/54	RF transmitter for RKE	ATAB5753	ATAB5754					
ATAB5756/57	ATA5756/57	RF transmitter for TPMS							
ATAB5749	ATA5749	RF transmitter for RKE							
ATAB5811/12-RS	ATA5811	RF transceiver for remote start				ATAB5812-RS	ATAB5811-RS		
ATA5771/73/74-DK1	ATA5771/73/74	Tx-MCM			ATA5771-DK1				
ATA5795-EK1	ATA5795	for RKE incl. Transponder function						ATA5795-EK1	ATA5795-EK1
ATA5790-EK1	ATA5790 + TX ATA5749	for PEG using RF/LF-authentication link							
ATA5790-3/-4-EK2	ATA5790 + TRX ATA5823/4	for PEG using RF/RF-authentication link							

Table 1. Complete Configuration for Remote Keyless Entry Applications

served as the heart of a demonstrator for a remote keyless entry and immobilizer system. This development platform, however, is not restricted to applications in the car access application field. While its current applications target the car access market (remote keyless entry, passive entry/go, immobilizer, and remote start), the next steps involve additional functions such as LIN bus connectivity, high-voltage systems and further configurations of existing application boards and daughter boards. Currently, Atmel provides several well-accepted stand-alone development tools for LIN transceivers, system basis chips and system-in-package (SiP) ICs as well as development boards and kits for a variety of Atmel's load drivers. Due to the advance of LIN SiPs and the need to cross-link different electronic control units it is useful to bridge LIN and car access systems. Therefore, a dedicated LIN application board will be available within short. This board, together with the main board, will convert the kit into a LIN master node with minimum effort as the basic software routines are bundled with the LIN board. In addition, the integration of the load driver family into this development platform will enable the evaluation of complete door modules.

All kits come along with a selection guide, descriptions of hardware and software, software library functions, and guidelines for system set-up.

			Content of Pre-configured Complete ATAPM System Kits for Passive Entry Go Application			
Part Number of Single Boards \ Complete Kits ➡ ⬇			PEG1		PEG2	
		Comment	ATAPMPEG-DK1	ATAPMPEG-DK2	ATAPMPEG-DK3	ATAPMPEG-DK4
Automotive Evaluation Kit System Controller						
ATAPMMB-DK	ATAPM main board	LCD, touch screen, USB-AVR, interface to PC & application	ATAPMMB-DK	ATAPMMB-DK	ATAPMMB-DK	ATAPMMB-DK
Application Boards						
ATAPMRFS-DK1	RF application board	Standard for RKE & PEG	ATAPMRFS-DK1	ATAPMRFS-DK1	ATAPMRFS-DK1	ATAPMRFS-DK1
ATAPMLFS-DK	LF application board	For immobilizer base station & 3D LF base station	2xATAPMLFS-DK	2xATAPMLFS-DK	2xATAPMLFS-DK	2xATAPMLFS-DK
RF Daughter Board with						
ATA5745/46-EK	ATA5745/46	RF-Rx			ATA5746-EK	ATA5745-EK
ATAB5760-S	ATA5760	RF-Rx with SAW filter				
ATAB5761-N	ATA5760	RF-Rx				
ATA5723/24-DK	ATA5723/24	RF-Rx				
ATAB5811/12-B	ATA5811/12	RF-TRx				
ATAB5823/24-B	ATA5823/24	RF-TRx	ATAB5823-B	ATAB5824-B		
LF Daughter Board with						
ATA2270-EK2	U2270B	Immobilizer base station	ATA2270-EK2	ATA2270-EK2	ATA2270-EK2	ATA2270-EK2
ATAB5279	ATA5279	6-fold LF antenna driver	ATAB5279	ATAB5279	ATAB5279	ATAB5279
Mobile Parts with						
ATAB5753/54	ATA5753/54	RF transmitter for RKE				
ATAB5756/57	ATA5756/57	RF transmitter for TPMS				
ATAB5749	ATA5749	RF transmitter for RKE				
ATAB5811/12-RS	ATA5811	RF transceiver for remote start				
ATA5771/73/74-DK1	ATA5771/73/74	Tx-MCM				
ATA5795-EK1	ATA5795	for RKE incl. transponder function				
ATA5790-EK1	ATA5790 + TX ATA5749	for PEG using RF/LF-authentication link			ATA5790-EK1	ATA5790-EK1
ATA5790-3/-4-EK2	ATA5790 + TRX ATA5823/4	for PEG using RF/RF-authentication link	ATA5790-3-EK2	ATA5790-4-EK2		

Table 2. Complete Configuration for Passive Entry Go Applications

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Atmel:
ATA5771-DK1