

Simplify Prototype and End-Product Development using Renesas Synergy™ Solutions

Integrated hardware/software solutions help shorten the design cycle

THE FUNDAMENTAL philosophy underlying the Renesas Synergy Platform is to offer IoT and embedded developers a comprehensive solution that will reduce their development cycle, lower total cost of ownership, and eliminate many of the traditional barriers to entry. By giving developers a qualified platform that accelerates embedded development, the Renesas Synergy Platform offers them more time to innovate and to, in the process, differentiate their end-product from the competition.

Renesas Synergy Solutions play a key role in meeting those goals. These fully integrated, tested and documented design examples give embedded product developers a crucial head start in their race to market. By carefully selecting the right external hardware components, integrating firmware with application software, and extensively testing hardware and software, Renesas Synergy Solutions enable engineers and developers build feature-rich,

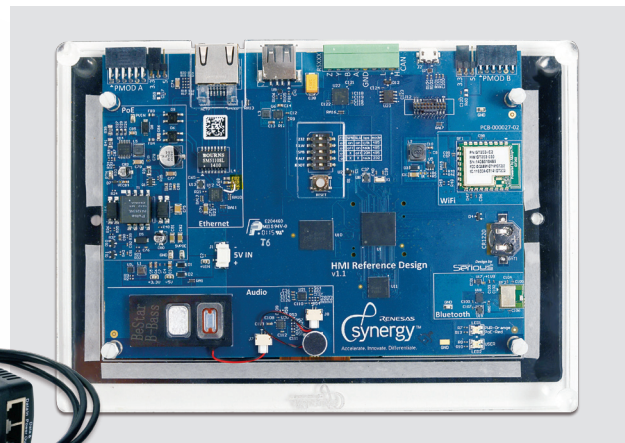
compelling end-products in the shortest amount of time.

For developers seeking guidance on how to quickly and efficiently implement a particular end-product or technology, Renesas offers two types of solutions: Product Examples (PEs) and Application Examples (AEs). Both play a key role in accelerating development and reducing resources spent by developers.

Product Examples

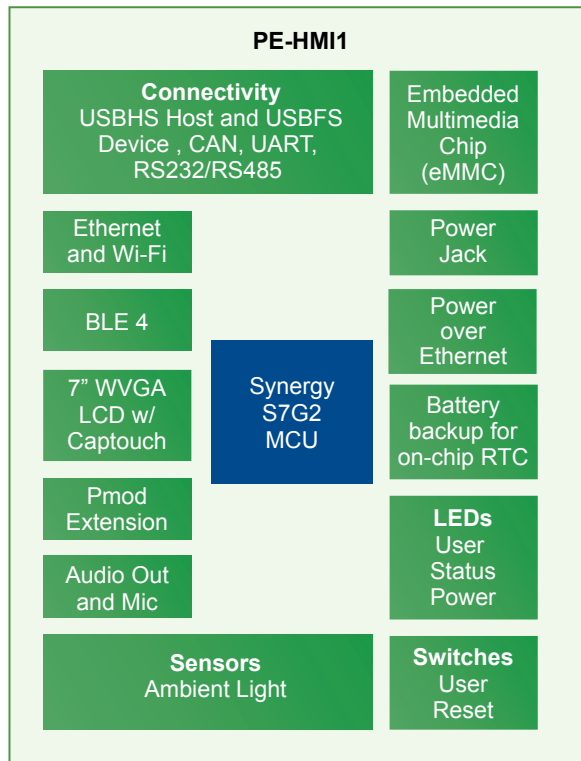
PEs are targeted at developers who want to begin writing application code as early in the design cycle as possible and get to market quickly. They offer a complete hardware and software solution featuring a Renesas Synergy MCU and the Synergy Software Package (SSP) as a foundation on which a specific design is built for one of many examples of real products. The optimized hardware design includes full documentation, a bill of materials (BoM) and Gerber files for circuit board layout. PEs represent an implementation of a particular end-product. Developers can re-use portions of a PE design

directly in their end-product and take advantage of its documented design journey to make well-informed decisions about how to modify the PE design to suit their specific requirements. The design journey document offers an inside view of the reasoning and methodology that engineers followed to select components, design circuitry, and develop and integrate software. With this knowledge Renesas Synergy Platform customers can design their own product based on PEs even if their end-product differs from the original PE design.



PE-HMI1 Circuit Board

The PE-HMI1 offers a complete Human Machine Interface with color graphic LCD and capacitive touch panel



The time PEs save can be significant. Take the PE-HMI1, for example. It represents a compelling and easy-to-use Human Machine Interface (HMI) that can be used in a variety of connected applications. Out of the box, the PE-HMI1 features a 7-inch WVGA color TFT display with capacitive touch and a CMOS camera that takes advantage of the

Renesas Synergy S7 series MCU's graphics manipulation capability. It also adds Wi-Fi and Bluetooth® connectivity and multiple wired connectivity options such as Ethernet and USB High Speed.

Other PEs are built upon typical IoT applications. The PE-DAQ1 functions as an environmental data monitor and logger using a S3 Series Renesas Synergy MCU that performs sensor fusion of multiple inputs from 3-axis motion, humidity, pressure, temperature, and ambient light sensors and high resolution A/D converters. This PE transmits sensor data wirelessly over a 6LoWPAN-based mesh network using a 2.4GHz IEEE 802.15.4 radio transceiver. A segment LCD and capacitive touch pads serve as the native user interface.

A third PE, the PE-SNS1, functions as a representative motion detection sensor used in a home or commercial building sensor network. This battery-powered PE employs the ultra-low power S1 Series Renesas Synergy MCU and connects to other sensors and the network coordinator using a 6LoWPAN-based meshed network with a 2.4GHz IEEE 802.15.4 radio transceiver.

PE-DAQ1 and PE-SNS1 will be available in Q1 2016.

Find out more about Renesas Synergy PEs [here](#).

Application Examples

Application Examples, or AEs, showcase a particular technology or collection of technologies. AE's are typically comprised of several circuit boards and hardware components that may include products from third-parties, Renesas Synergy Development Kits (DK), Starter Kits (SK) or even Renesas Synergy PEs. AEs are targeted to provide application guidance for a broad range of technologies such as a low-power local area network (LAN) with cloud connection, security and root-of-trust, industrial connectivity, various types of motor control, capacitive touch implementations, and more. Third-party plug-in components easily connect through Pmod™ and Arduino™ Shield connectors. Software for these solutions starts with the SSP as a baseline and takes advantage of integrated Verified Software Add-on (VSA) and Qualified Software Add-on (QSA) software components as needed to

implement the complete demonstration. AEs are documented with an application note and are delivered with a complete software project that can be re-built and modified within the Renesas Synergy Software development environment. Combining all of these elements in a pre-tested and optimized package, Application Examples give developers a massive head start on their next project.

Renesas is offering a variety of AEs including the AE-CAP1 for capacitive touch technology based on the Renesas Synergy S1 and S3 Series MCUs, the AE-IND1 for demonstrating Ethernet-IP industrial networking protocols using the S7 Series MCU with dual Ethernet MACs and IEEE-1588 PTP, and the AE-IOT1 for demonstrate wireless connectivity for a typical IoT application.

Learn more about Renesas Synergy's AEs [here](#).

Conclusion

In the rapidly evolving IoT market, product developers who can't get to market first and at a competitive cost will likely pay a penalty in market share. In that environment, any solution that helps them shorten time-to-market or reduce total cost of ownership will prove very valuable. By packaging fully integrated

hardware with qualified and verified software that enables faster, production-ready designs, Renesas Synergy PEs and AEs offer IoT developers a crucial advantage.

Contents of this article are subject to change.
© 2015 Renesas Electronics America Inc. (REA). All rights reserved.
All trademarks are the property of their respective owners.