1. **News Release**

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**Renesas Electronics Delivers Blood Pressure Monitoring Evaluation Kit for Immediate Evaluation**

*Easy-to-Use Evaluation Kit Combines Hardware and Development Tools for System Manufacturers Developing Blood Pressure Monitor Applications*

**Düsseldorf, April 19, 2018** - Renesas Electronics Corporation (TSE: 6723), a premier supplier of advanced semiconductor solutions, today announced an expansion of its healthcare solution lineup with the launch of a new blood pressure monitoring evaluation kit. The new [blood pressure monitoring evaluation kit](http://www.renesas.com/products/software-tools/boards-and-kits/renesas-solution-starter-kits/bpm-evaluation-kits-rl78h1d.html) comprises hardware and software elements needed to jump start blood pressure measurement design. The kit includes a pressure sensor, arm cuff, pump, electronically controlled valve, LCD panel, and a reference board that incorporates an RL78 Microcontroller(MCU)-based ASSP (application specific standard product) that includes analog functions required for blood pressure measurement. Reference software and graphical user interface (GUI) development tool are also part of the new evaluation kit. Using the new evaluation kit, system manufacturers can immediately begin their system evaluations and significantly reduce their development time.

The Internet of Things offers consumers connected tools with which to manage their personal healthcare more efficiently. For instance, blood pressure monitors are already popular personal medical devices and the market is expected to grow further as blood pressure monitoring functions are incorporated into wearable devices. The growth of this market offers new business opportunities, but can also be challenging, particularly for system manufacturers who are new to the connected healthcare device ecosystem and may not have the built-in application-specific expertise. Blood pressure measurement requires a specific expertise, including filtering functions for extracting the waveforms required for measurement, making it extremely time consuming to start studying this area from the very beginning.

Renesas has developed the new blood pressure monitoring evaluation kit to alleviate the development pain points, providing functions close to those used in actual blood pressure monitors thus accelerating blood pressure measurement system development.

**Key features of the blood pressure monitoring evaluation kit**

* **One-stop solution that enables immediate evaluation at the system level**

The new blood pressure monitoring evaluation kit comprises hardware and software

elements needed to jump start blood pressure measurement design, including:

* + A full range of hardware components, including a pressure sensor, arm cuff, pump, electronically controlled valve, LCD panel, and a reference board that incorporates the newly-developed [RL78/H1D](http://www.renesas.com/products/microcontrollers-microprocessors/rl78/rl78h1x/rl78h1d.html) ASSP with the analog functions required for blood pressure measurement.
  + Reference software that provides the algorithms required for blood pressure measurement and that can be easily modified, as well as access to smartphone applications, and a graphical user interface (GUI) tool.
  + A Bluetooth Low Energy (BLE) module, which enables the measured data to be transmitted to a smartphone under the Continua standard blood pressure monitoring (BPM) profile is also provided in the new evaluation kit.
* **Development support with GUI tool, specialized for blood pressure measurement**
  + The pressure sensor, pump, electronically controlled valve components, and pulse width modulation control can be set from the GUI tool. If the system structure is the same, the GUI tool can also be used for system evaluation of the actual application the system manufacturer is developing.
  + The IIR digital filter calculations required for extracting the pulse waveform from the cuff pressure output waveform during blood pressure measurement can also be simulated using the GUI tool. The digital filter constants calculated based on this simulation can be written from the GUI tool to the RL78/H1D firmware and verified in the actual application being developed. This significantly reduces the number of steps in the development process.
* **RL78/H1D ASSP with optimized analog functions for healthcare applications**
  + The RL78/H1D is a new ASSP of the RL78 Family of MCU. The RL78/H1D, designed to control systems required for blood pressure measurement with a single chip. It incorporates rich analog functions including high-resolution delta sigma A/D converters, programmable gain instrumentation amplifiers, D/A converters, operational amplifiers, and other circuits required for blood pressure measurement, as well as timers for PWM (pulse-width modulation) control.
  + In addition to the delta sigma 24-bit A/D converters, the RL78/H1D also provides 10-bit sequential comparison A/D converters that operate asynchronously. This simplifies implementation of systems providing temperature measurement and battery voltage monitoring while measuring the blood pressure.
  + The Rich analog functions make the new ASSP ideal not only for blood pressure monitoring systems but also for a wide array healthcare application including biosensors.
  + Samples of the RL78/H1D ASSP are available now. Pricing varies depending on the memory capacity, package and number of pins. For example, the R5F11NMG 80-pin LQFP package type with 128 KB flash ROM capacity is priced at US$3.50. The R5F11NMG includes an LCD controller for arm- and wrist-type blood pressure monitors, and a 4mm x 4 mm miniature ball grid array (BGA) package for use in wearable devices. (Pricing and availability are subject to change without notice.)

Renesas plans to expand its range of solutions for the healthcare field and will continue to contribute to the realization of a safe and secure smart society, including the development of smart connected devices for the industrial and healthcare industries.

**Pricing and availability**

The new blood pressure monitoring evaluation kit is scheduled to be available for order from May 10 priced at US$600.00 per unit. (Pricing and availability are subject to change without notice.)

Please refer to the [separate sheet](https://www.renesas.com/en-eu/media/about/press-center/news/2018/news20180419/20180419-blood-pressure-monitoring-evaluation-kit-specs.pdf) for product specifications of the blood pressure monitoring evaluation kit and RL78/H1D.

(Note) The blood pressure monitoring evaluation kit cannot be used as medical equipment.

**About Renesas Electronics Corporation**

Renesas Electronics Corporation ([TSE: 6723](https://urldefense.proofpoint.com/v2/url?u=http-3A__www.jpx.co.jp_english_&d=DwMFAg&c=9wxE0DgWbPxd1HCzjwN8Eaww1--ViDajIU4RXCxgSXE&r=mWLUx0QVt25BWK-MZ29zLPLQHyv8UpUkXzcgXaA3aWQ&m=DYdTH9hu-7LaulV1SVM6YKpZz_t6AqnyxumFHk-LqFg&s=UlMPBZIH1yicvEPu6e6QHB45plYIXPqV-0XV5KGZZl0&e=)) delivers trusted embedded design innovation with complete semiconductor solutions that enable billions of connected, intelligent devices to enhance the way people work and live—securely and safely. A [global](https://urldefense.proofpoint.com/v2/url?u=https-3A__www.renesas.com_en-2Dhq_about_company_profile_global.html&d=DwMFAg&c=9wxE0DgWbPxd1HCzjwN8Eaww1--ViDajIU4RXCxgSXE&r=mWLUx0QVt25BWK-MZ29zLPLQHyv8UpUkXzcgXaA3aWQ&m=DYdTH9hu-7LaulV1SVM6YKpZz_t6AqnyxumFHk-LqFg&s=QqlGBR6MYbo1eiGXo2ZMywSeWE80hPtBOrhrwz73p94&e=) leader in microcontrollers, analog, power and SoC products and integrated platforms, Renesas provides the expertise, quality, and comprehensive solutions for a broad range of Automotive, Industrial, Home Electronics, Office Automation and Information Communication Technology applications to help shape a limitless future. Learn more at [renesas.com](https://urldefense.proofpoint.com/v2/url?u=http-3A__www.renesas.com_&d=DwMFAg&c=9wxE0DgWbPxd1HCzjwN8Eaww1--ViDajIU4RXCxgSXE&r=mWLUx0QVt25BWK-MZ29zLPLQHyv8UpUkXzcgXaA3aWQ&m=DYdTH9hu-7LaulV1SVM6YKpZz_t6AqnyxumFHk-LqFg&s=K6LsuehJosLLwcPcYTcAHq30edFyKPiV7ZQDlE_PO1A&e=).

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