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Ubiquitous Computing Technology Announces the Launch of "Nano120 IoT-Engine Starter Kit"

IoT-Engine Starter Kit for "Nano120 IoT-Engine" from Nuvoton Technology Corporation

TOKYO, JAPAN –(UCT) – Ubiquitous Computing Technology Corporation (UCT) announces the launch of a development kit for a new "IoT Engine" product. "IoT-Engine" is a universal platform for open IoT (Internet of Things), standardized by TRON forum and promoted by 7 world-wide semiconductor manufacturers. The development kit exploits brand-new "Nano120 IoT-Engine" from Nuvoton Technology Corporation (Nuvoton), which is based on the Nano120 ARM Cortex-M0 microcontroller. The price of the development kit is 198,000 yen (excluding sales tax), and the kit is available from July 31, 2017.

The development kit includes an evaluation board for developing IoT devices, an integrated development environment, software libraries, and the UCT 6LoWPAN Border Router that seamlessly bridges wireless PAN and wireless LAN. A low-power 920 MHz wireless module is pre-mounted to the IoT-Engine, which allows the IoT-Engine to connect to the Internet directly by connecting to the UCT 6LoWPAN Border Router. The application model realized by the IoT-Engine development kit inspires developers to quickly develop IoT applications that sensor/actuator devices collaborate with the Internet and computing resources on the cloud.

The NuMicro® Nano120 microcontroller series based on ARM® Cortex® -M0 Core operates at a wide voltage range from 1.8V to 3.6V and runs up to 42 MHz frequency, with 32/64/128 Kbytes embedded Flash and 8/16 Kbytes SRAM. When the Nano120 operates in power-down mode, the standby current can be lowered to less than 1uA with RAM retention function. The operating current can be less than 100uA/MHz during idle mode. The ultra-low-power consumption features makes the Nano120 widely applicable to battery-powered devices - especially IoT related applications such as the smart door locks, smart card readers, healthcare products, as well as metering products. To further enhance its functions, the Nano120 has integrated USB full speed interface for data communication, ISO-7816 interface for CPU card communications and EBI (External Bus Interface) for external memory-mapped device access. The diversified peripherals also include 2xUART, 3xSPI, 2xI^2C, I^2S, GPIOs, etc. Nuvoton offers the Nano series, including Nano100, Nano102, Nano110, Nano112, Nano120 and Nan130, to target the market's huge demand for ultra-low power applications.

The “IoT-Engine” is the standard platform for developing open-IoT-devices that realizes the “Aggregate Computing” (Figure 1), advocated by Ken Sakamura who is the chairman of the TRON Forum. The TRON Forum is currently working on the standardization of the “IoT-Aggregator” which is the collaborative cloud-based environment. IoT-Engine nodes from various manufacturers cooperates with each other by establishing connections to the “IoT-Aggregator”, which provides an inter-cloud collaborative function.

Along with the development and the sales of IoT-Engine related products for various microcontroller manufacturers, UCT offers consulting services for the “IoT-Aggregator” and the cloud-service development.

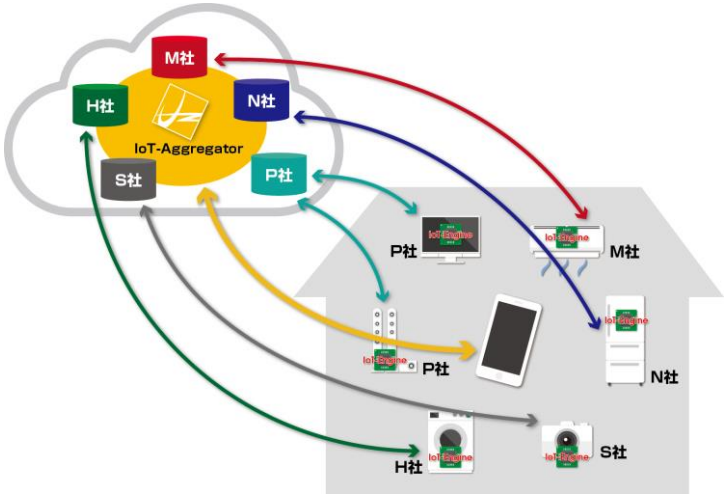

Fig. 1. Concept of the “Aggregate Computing”

”’IoT-Engine’ is the standard platform environment for open IoT paradigm, to realize the ‘Aggregate Computing’.” said Ken Sakamura, the chairman of the TRON Forum. “Since UCT has developed and released ‘The Nano120 IoT-Engine Starter Kit’ targeted for ‘Nano120 IoT-Engine’ from Nuvoton and microcontrollers of Nuvoton are widely used in embedded systems, I expect that ‘IoT-Engine’ is acknowledged and accepted worldwide by IoT researchers and developers.”

Mr. Jason Lin, the Vice President of Microcontroller Application Business Group at Nuvoton Technology says that "Nuvoton is glad to work with UC Technology in providing the Nano120 IoT-Engine Starter Kit for the new emerging aggregate computing. This Starter Kit provides a low-power, high security IoT engine with a 6LoWPAN connectivity module to connect to the server with IoT aggregator for data intelligence processing. It serves the light-weight edge nodes requirement for the present and the future of smart world.”

"Nano120 IoT-Engine" Key Features

■Nuvoton Nano120 Microcontroller

- The exceptional ultra-low power consumption less than 1uA under Power-down mode
- Supports 6LoWPAN 802.15.4 low-powered and secure communication
- Rich peripherals available

■Standardized connector

- A 100 pin connector with 0.4 mm pitch
- Signal pin assignment that has degrees of freedom to support various microcontrollers
- Signal pin assignment that supports Arduino compatible I/O, effective for low-cost and short-term development

■Real time operating system (RTOS) "UCT μT-Kernel 2.0"

- The “UCT μT-Kernel 2.0” based on the low-power RTOS distributed by the TRON Forum is installed to the “Nano120 IoT-Engine”, which facilitates implementation of high-level control logics by exploiting the multi-task programming feature.

■IoT-Aggregator ready

- Connectable to the cloud environment “IoT-Aggregator” which is in the standardization process by the TRON Forum.

"Nano120 IoT-Engine Starter Kit" Key Features

■ Small and low power Wireless Personal Area Network (WPAN) radio module

- The radio module conforms to the ARIB STD-T108 standard (which supports IEEE 802.15.4g standard) that exploits 920 MHz frequency band

■ Integrated package including hardware and software necessary for the IoT device development

- Allows developers to work on IoT-Engine to develop IoT devices
- Rich sensors and actuators mounted on the Starter Board
- Includes an integrated development environment (IDE) and GNU GCC development tools

■ UCT μT-Kernel 2.0 RTOS, 6LoWPAN protocol sets, and CoAP for bridging WPAN and the Internet seamlessly and for supporting Web-based API.

- Connect IoT-Engine nodes directly to the cloud via the 6LoWPAN border router
- Control IoT-Engine nodes from the cloud using ready-to-use CoAP/UDP API sets

Price: 198,000 yen (excluding tax)

Available on: July 31, 2017

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*Please refer to the attached document for details on the Nano120 IoT-Engine Starter Kit.

References

1) Ubiquitous Computing Technology Corporation

   Ubiquitous Computing Technology Corporation (UCT) offers solutions for the IoT (Internet of Things) and M2M (machine-to-machine) field, by applying the most advanced ubiquitous computing technology and proven experiences in embedded systems and location based services. UCT provides wide varieties of technologies and services including embedded systems, system integration, and content production. For more details, please visit http://www.uctec.com/.

2) IoT-Engine

   IoT-Engine is the standard platform for developing open-IoT-devices that realizes the "Aggregate Computing", advocated by Ken Sakamura who is the chairman of the TRON Forum. The IoT-Engine standard specification specifies an on-board connector and a real-time operating system (RTOS) installed to a target MPU. In addition, the standard requires an IoT-Engine node to be able to connect to the Internet. The RTOS specified by the standard is the μT-Kernel, which is an open-source RTOS distributed by the TRON Forum. IoT-Engine nodes act as a component constituting the next-generation information processing system based on the "Aggregate Computing" model, which envisions seamless connections of edge nodes via the cloud. As of December 2016, seven semiconductor manufacturers announce to participate the IoT-Engine projects, namely Toshiba Microelectronics, Cypress, Imagination Technologies, Nuvoton Technology, NXP Semiconductors, and STMicroelectronics.

3) Nuvoton Technology Corporation

   Nuvoton Technology Corporation (NTC) was founded to bring innovative semiconductor solutions to the market. NTC was spun-off as a Winbond Electronics affiliate in July 2008 and became public in September 2010 on the Taiwan Stock Exchange (TSE). Nuvoton Technology focuses on development of analog/mixed signal, microcontroller, cloud and computing products and has strong market share in Industrial, Consumer and Computer markets. Nuvoton owns a wafer fab, featuring customized processes for analog, power and MCU products. Besides in-house IC products, the wafer fab also provides part of its capacity for foundry services. Nuvoton Technology provides products with a high performance/cost ratio for its customers by leveraging flexible technology, advanced design capability and integration of digital and analog technologies. Nuvoton values long term relationships with its partners and customers and is dedicated to continuous innovation of its products, processes and services. The company has established subsidiaries in the USA, China, Israel and India to strengthen regional customer support and global management. For more information, please visit http://www.nuvoton.com

4) 6LoWPAN

   6LoWPAN is an acronym of IPv6 over Low-power Wireless Personal Area Network. 6LoWPAN is a set of communication specifications for utilizing IPv6 over a network consisting of low power wireless modules with limited computing capabilities. To reduce a communication overhead caused by using IPv6 on this type of network, specification sets on 6LoWPAN technology are standardized by IETF (Internet Engineering Task Force). 6LoWPAN is a key

technology to let low power wireless devices to participate the Internet of Things (IoT). 6LoWPAN exploits wireless communication protocol specified by the IEEE 802.15.4 standard.

Nano120 IoT-Engine Starter Kit overview

Hardware

- Nano120 IoT-Engine
  - Nano120(NANO120KE3BN) (ARM Cortex-M0 base) from Nuvoton Technology
- RF module
  - Supports 920 MHz frequency band (conforms to IEEE 802.15.4g)
  - Fully controllable by the UCT 6LoWPAN protocol stack
- IoT-Engine Starter Board
  - Equipped with Arduino I/F, temperature sensor, optical sensor, motion sensor, joystick, RC servo motor I/F, USB serial, LEDs, and switches
- 6LoWPAN border router
  - Seamlessly bridges WLAN and wireless PAN

Software

- GCC/Eclipse development environment
  - GCC compiler and Eclipse IDE
  - Pre-configured and ready-to-use development environment
- UCT μT-Kernel 2.0 real-time operating system
- UCT 6LoWPAN protocol stack API library
  - 6LoWPAN HCI/UDP/CoAP
  - CoAP Server/Client Sample
- Packet sniffer
- Periphery I/O driver (T-Kernel driver interface compliant)
  - I2C driver, analog to digital convertor, GPIO, serial, Arduino I/F, analog joystick, LED, and environment sensor
- Sample software for the cloud connection
- Software development license for IoT-Engine
  - 3 months of free technical support
  - Technical support is extendable every 6 months with additional fee

User Manuals

Options

- SEGGER JTAG-ICE “J-Link”

Nano120 IoT-Engine Starter Kit