Accelerate IoT product development
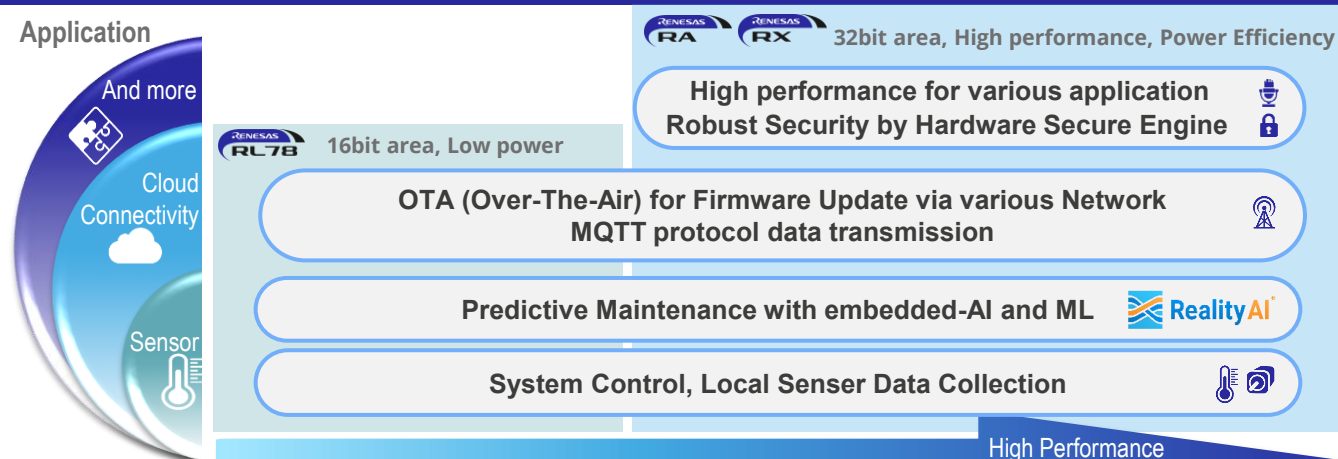# MCU Cloud Solution

renesas.com/iot-cloud-solutions

Remote monitoring and control, predictive maintenance, AI/ML, firmware updates, the need for functional expansion which closely linked to cloud environment is growing, so that introducing IoT products into market rapidly expanding.

Renesas provides MCU cloud solution seamlessly for RA family, RX family and RL78 family. This allows you to easily implement cloud functionality by selecting an MCU that matches the functionality and performance of your target product.

From 16bit MCU to 32bit MCU, Seamless Solution lineup

Application

And more

Cloud Connectivity

Sensor

RENESAS RA RENESAS RX 32bit area, High performance, Power Efficiency

**High performance for various application
Robust Security by Hardware Secure Engine**

RENESAS RL78 16bit area, Low power

**OTA (Over-The-Air) for Firmware Update via various Network
MQTT protocol data transmission**

Predictive Maintenance with embedded-AI and ML RealityAI

System Control, Local Senser Data Collection

High Performance

Various software which makes IoT product development easier

Various software such as AWS FreeRTOS, drivers for several communication method, OTA FW update and security feature which are mandatory for IoT equipment are provided.

IoT mandatory feature		RA	RX	RL78
Cloud Connectivity	Quick Start Example project for MQTT communication with AWS	●	●	●
	Ethernet / Wi-Fi*1 / Cellular*2 support	●/●/●	●/●/●	- /●/●
OTA(Over-the-Air) Firmware update	OTA Firmware update sample project via AWS	●	●	●
	Sample project for secondary device Firmware update	-	●	●
Security	TLS for HW Security IP	●(SCE9)	● (TSIP)	-
	Secure FW update & Secure boot	●(MCUboot)	●(FWUP / MCUboot*3)	● (FWUP)
Mass Production	AWS Fleet Provisioning	Under Planning	●	-
TCP/IP stack	Only for RA/RX MCU with Ethernet	● (IwIP or FreeRTOS-Plus-TCP)	● (IwIP*4 or FreeRTOS-Plus-TCP)	-
	Kits for IoT	CK-RA6M5 V2	CK-RX65N V2	RL78 FPB + Wi-Fi Pmod(Sold separately)

*1 Wi-Fi : Supports DA16600-PMOD
*2 Cellular: RYZ014A and RYZ024A are already production is discontinued, but they are functionally compatible with Sequans products GM01Q and GM02S.
*3 TSIP/RSIP are supported in following devices: RX261(RSIP), RX65N/1(TSIP), RX72N(TSIP), RX72M(TSIP), RX671 (TSIP) , RX66N (TSIP)
*4 IwIP FIT sample project for RX is currently only supported non-OS version. FreeRTOS version is planned to be released in the end of Jan 2026.

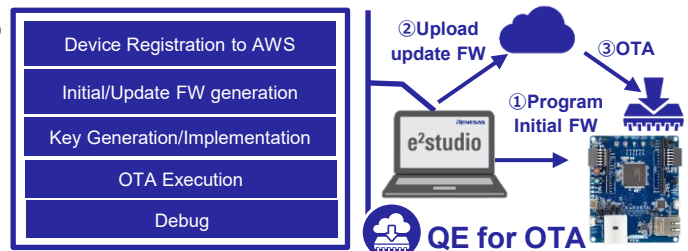## Firmware update (FW UP) Solution which also supports OTA

Providing sample programs and development assistance tool, QE for OTA, Firmware update in various system structure can be easily realized.

	Firmware Update without Cloud			OTA Firmware update with Cloud		
QE for OTA Supports						
Update device	Primary	Primary	Secondary	Primary	Primary	Secondary
Support MCU	RA6M5, RX65N, RL78/G23	RX65N	RX23E-B, RX66T, RX660, RX261, RX140, RL78/G23	RA6M5, RX65N, RL78/G23	RX65N	RX23E-B, RX66T, RX660, RX261, RX140, RL78/G23
RTOS	non-OS	FreeRTOS non-OS	non-OS	FreeRTOS	FreeRTOS	non-OS
Update Method	<RA, RX> Dual Bank update <RL78> Partial update	FW update at primary device will be supported in 2026/1Q (Only Dual Bank update)	Dual bank update Partial update Full update	<RA, RX> Dual Bank update <RL78> Partial update	Dual Bank update	Dual bank update Partial update Full update
Communication	Serial (FW UP Comm module is used :RX, RL78)			<RA,RX>Ethernet <RL78> Cellular		Serial

RX family supports OTA using TLS with Trusted Secure IP(TSIP), so that the secure IoT system can be realized .

Tools to help development: QE for OTA

- ✓ OTA support tool (free) "QE for OTA" allows you to implement OTA only with simple GUI operation.
- ✓ Compared to manual implementation case, the time required for OTA execution can be reduced by 86%.
- ✓ V2.2.0 supports FW update for MCU which is not connected to the cloud. **NEW**

Device Registration to AWS
Initial/Update FW generation
Key Generation/Implementation
OTA Execution
Debug

②Upload update FW
③OTA
①Program Initial FW
e²studio
QE for OTA

Evaluation kits which enables easy development & evaluation

RA/RX/RL78

✓ **Turnkey solution for IoT product development**

aws qualified device FreeRTOS

- Supported AWS certified FreeRTOS and IoT Library
- Sample program for Sensor data upload and monitoring in cloud
- Sample Program for OTA Firmware update
- Various application note and sample programs

RA/RX

US159-DA16600EVZ (Wi-Fi module)

CK-RA6M5 V2 / CK-RX65N V2

✓ Main feature of the kits (RA/RX)
- Wi-Fi module (DA16600 Pmod) included
- MQTT communication, TLS, OTA, client certification are implemented in RA/RX.
- TCP/IP is implemented in Wi-Fi module
- Various sensors suitable for IoT equipment.
- MEMS Micx2, Ethernet
- USB2.0 Full speed Host and device.

RL78

RL78/G23-128p Fast Prototyping Board

US159-DA16600EVZ (Wi-Fi module)

✓ Main feature of the kits
- Fast Prototyping Board and Wi-Fi module (sold separately)
- MQTT and OTA control are implemented in RL78
- TLS and TCP/IP are off loaded in Wi-Fi module
- Expansion interface such as Arduino, PMOD are supported