Reference designs of high-precision measurements and the solution kit.

Sensor Measurement Solution

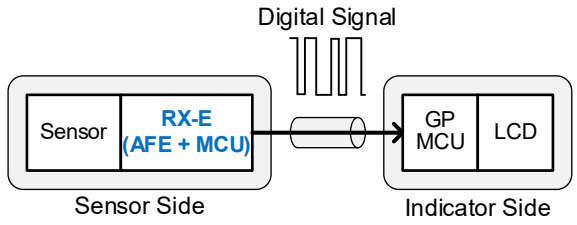
RX23E-A/RX23E-B offers a high-precision Analog Front End (AFE) with a 24-bit ΔΣ A/D converter in a compact package for industrial sensor measurement analog/digital conversion solution.

Features

Due to trends in factory automation and IoT, sensor devices are evolving towards miniaturization, digitalization, multi-sensing, distributed processing, and wireless capabilities. We offer solutions from the aligned with these latest technology trends.

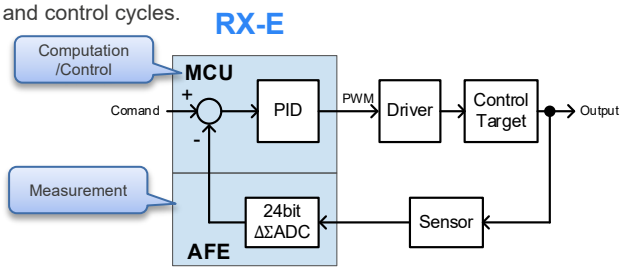
Digitalizing Sensor Modules By Compact Circuit

The RX-E series, integrating a high-precision AFE and a high-performance RX CPU onto a single chip, can realize intelligent digital sensors that balance digitalization and miniaturization



Measurement, Computation/ Control Into A Single Chip

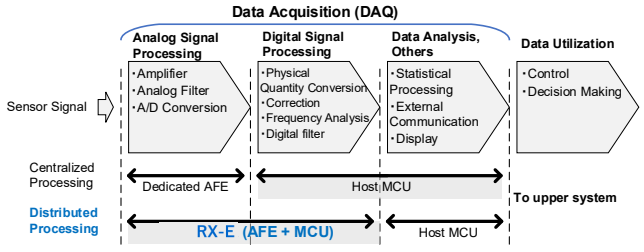
The roles of dedicated AFE and general-purpose MCU combine into one chip RX-E series. No need to handle communication between the AFE-MCU and easy to synchronize measurement and control cycles.



Data Acquisition (DAQ*) And Distributed Processing

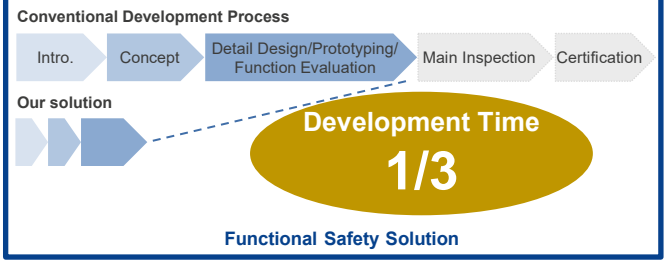
Distribute analog/digital signal processing on the sensor side and reduce the processing load on the host MCU.

*DAQ: A function that collects, analyzes, and displays data from various sensors



Connectivity and Industrial Functional Safety Support

Support connectivity such as IO-Link and wireless (Wi-Fi, Bluetooth) aligning with the advancement of sensor intelligence. Also compile with functional safety requirements such as the European standard (IEC61508)



RX-E Microcontroller Lineup

RX23E-A 32MHz, 256KB Flash

RXv2	Single precision FPU	24 bit delta-sigma × 2 units	Fully-differential PGA	Excitation current source × 4 channels	Integrated voltage reference source	BIAS voltage generator circuit	On-chip temperature sensor

RX23E-B 32MHz, 256KB Flash

RXv2	Single precision FPU	24 bit delta-sigma	Fully-differential PGA	16 bit DAC	Excitation current source × 2 channels	Integrated voltage reference source	BIAS voltage generator circuit	On-chip temperature sensor

(※)24bit ΔΣ maximum data rate RX23E-A: 15.6ksps, RX23E-B: 125ksps/31.25ksps

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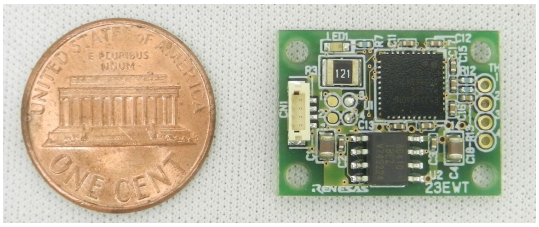
2024.07

Reference Designs

Tiny Board for Digital Loadcell (RX23E-A / RX23E-B)

RX23E-A/-B with high-precision AFE aids in circuit board miniaturization. Achieve 22mm x 16mm size integrable with a loadcell.

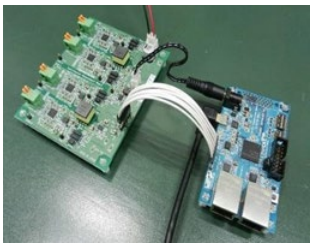


Thermoelectric Peltier Controller

Temperature control using the Peltier effect for heating and cooling. Single RX23E-A can implement the measurement, computation, and control.

Muti-channel Isolated Analog Measurement

Four RX23E-A isolated between channels are mounted, enabling 4-channel synchronous measurement.
Utilize RX23E-A's processing capability for distributed processing.



IO-Link Solution / Functional Safety Solution

IO-Link (IEC61131-9) reference designs and functional safety solutions for functional safety standards (IEX61508) are available.

I/O-Link Solution

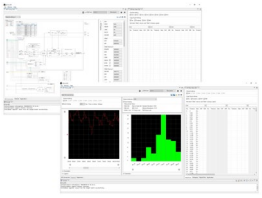
Functional Safety Solution

Development Tools

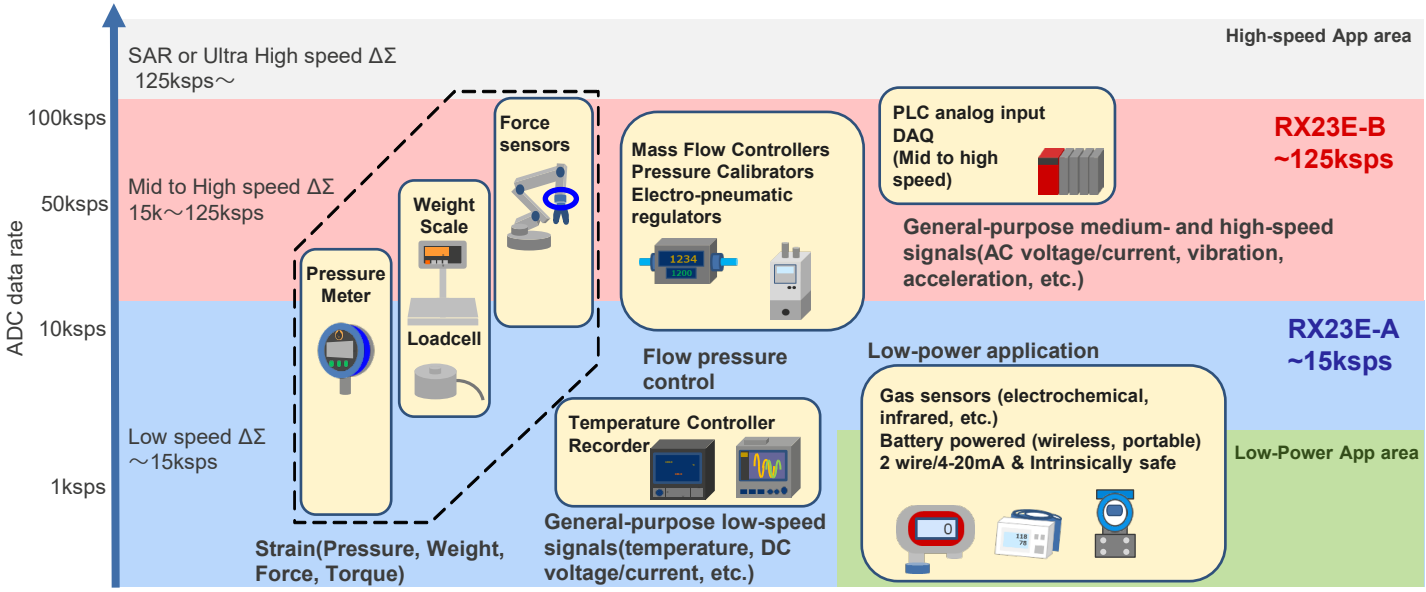
RX-E Development Tools(Renesas solution Starter Kit for RX23E-A / RX23E-B)

Evaluation kit for RX-E introduction: equipped with RX-E series and sensor measurement circuits, GUI tool and reference software
Without software development, evaluating AFE functions with the packaged sensor is possible

On-board circuit-supported sensor types: thermocouple, temperature resistance detector (RTD), strain gauge.
GUI function: Parameter setting via GUI, waveform of A/D conversion values, histogram display, etc



RX-E Target Applications



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