RENESAS

Smart Energy Solutions

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Why Renesas?

> Huge choice of products enables you to find the perfect fit to optimise cost
> Extensive roadmaps helping you future proof your application
> Solutions and reference designs to help reduce your time to market
> Highest quality, designed for even the most demanding applications

Renesas' global leadership in semiconductor devices for Smart Energy applications is no accident, built on a solid foundation of world leadership in microcontrollers and offering:

> Embedded flash from 1 KB to 2 MB and RAM from 128 KB to 2.5 MB
> The industry's broadest choice of integrated peripherals including:
  - Dedicated metrology peripherals with high resolution ADCs
  - Display Controllers and Drivers for Energy Monitor applications
  - High accuracy PWM for lighting control, with DALI/DMX/RDM support
  - Advanced timer blocks for inverter applications
  - Communications PHYs for ZigBee™, Powerline, Ethernet …
> Outstanding EMC performance

Whether you need the highest performance with zero wait state flash at 200 MHz or 0.5 µA power consumption in stop mode, Renesas has the MCU to fit your needs. And Renesas helps you complete the solution with memory devices for data storage, power stages for lighting and solar inverters, optocouplers for high voltage isolation, Application Specific devices and ASICs.

Commitment to Smart Energy

Smart Home
Smart Car
Smart Factory
Smart Building
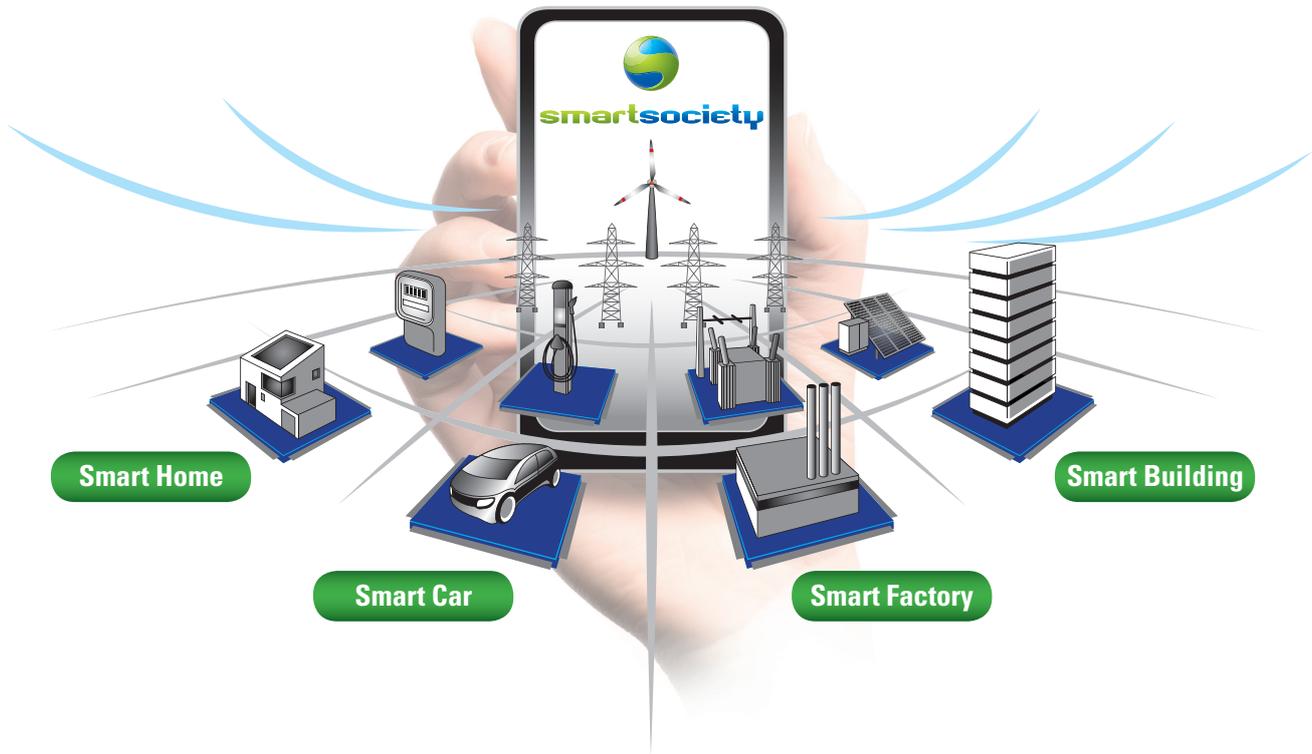
A core value at the very heart of Renesas is its commitment to a 'Green Society', enabling fast and effective implementation of new social infrastructure, built around the concept of Smart Grid and powered by Smart Energy.

In order to achieve this aim, Renesas is also committed to providing dedicated system solutions for energy efficient applications, such as LED lighting and Smart Metering, coupled with the provision of the most energy efficient, eco-friendly technologies.

Combined with our pioneering know-how, large network of partners, and contribution to major smart grid rollouts, you can be confident in Renesas as a long term partner for Smart Energy solutions and the development of the Smart World.

eco Toward Green Society   eco Green Systems   eco Green Devices

Alliance Partner Program

To enable fast time to market and bring together diverse expertise built around Renesas solutions for Smart Energy applications, the Alliance Partner Program provides the Industry's largest 3rd party network, with over 700 hardware, software and tools vendors as members.

Industry Body Membership

Renesas actively participates in a number of industry and standards bodies, as well as working groups dedicated to the specification of local smart grid projects and proof of concept trials. These include:

System Solution for LED Lighting

Renesas Electronics are committed and continuously providing dedicated ASSP solutions for intelligent Lighting systems. Integrated features allow design of low power, low BOM cost, high performance and intelligent solutions.

LED Lighting Microcontrollers (ASSPs) RL78/I1A

> Single chip solution, driving up to 6 channels of LEDs and PFC control

> Dedicated GUI tools for easy development of colour mixing & flashing sequences

> 16-bit channel individual PWM and analog dimming supported

> Integrated extended DALI functions and DMX512, RDM communications

> Integrated soft start, overcurrent protection and dithering function

> Ultra low power consumption and high temperature support of up to 125°C

Dedicated Lighting GUI Tools

Applitet EZ GUI
Easy-to-use application code generator

DMX512

Generate C code for DALI communications

Generate C code for DMX512 & RDM communications

Generate C code for remote dimming

Dimming

Generate C code for variable current and colour mixing
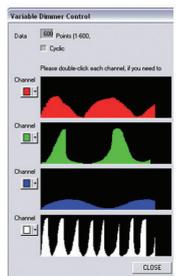
DALI Master GUI Controller Tool
DMX512 Master GUI Controller Tool

Graphically configure your LED lighting system and automatically generate code for Renesas Lighting microcontrollers (ASSPs).

Demonstration Kits

RL78/I1A DC/DC LED Control
Based on the RL78/I1A
3 channels of LEDs
DALI & DMX supported
Order Code: Y-78K0IX2-LED

Lighting Communication
DALI & DMX master
communications with GUI
Order Code:
Y-78K0-LIGHTCOMMS

For more information, please see our brochure 'The "Smart" in Smart Lighting'.

Renewable Power Generation

Power conditioners, converting solar-cell DC into domestic-use AC, are key technologies for delivering efficient power generation through Smart Grids, facilitating energy creation, storage and sale. Whether a standard system, or Maximum Power Point Tracking (MPPT), our high performance microcontroller & ASIC families are ideally suited to handle complex inverter algorithms, A/D functions and precise PWM outputs required for the conditioner's DC/DC and DC/AC conversions, as well as associated communications functions.

Power Generated by Solar Cells (DC)

Junction Box

Power Conditioner

Converted Power from Power Conditioner (AC)

Distribution Board

Electricity Meter

Controlled by One Chip

Maximum Solar Power Generation

Inverter & Grid Connection

Battery Discharge
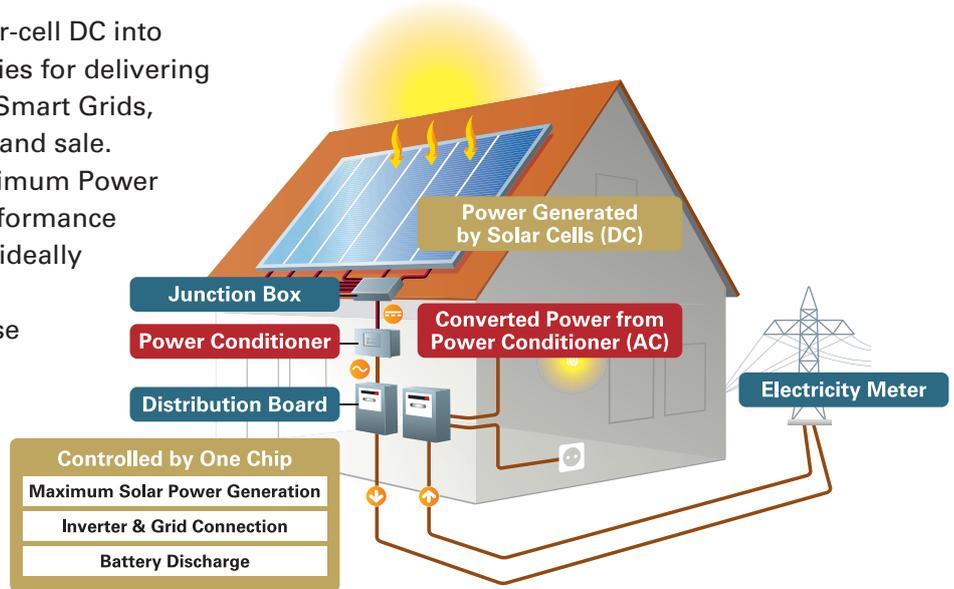
SH7216
Very precise A/D conversion, high volume data processing, vector & filter computation

RENESAS SuperH

200 MHz; on-chip FPU; up to 1 MB flash memory (no-wait access); Ethernet/USB; high-performance 3-phase timers; 12-bit analogue to digital converters and more.

RX62T/RX63T
Huge analog input support & dedicated timers for DC/DC PWM phase shifting

RENESAS RX

100 MHz; up to 512 KB flash memory; 48- to 144-pin packages; high performance 3-phase timers; 12-bit A/D conversion; PGA and more

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Cell-Based ASIC
Custom functions & range of ultra high performance cores

ASIC

>300 MHz ARM Cortex A series; down to 40 nm; eDRAM; Dynamic power control; A/D converters; LCD controller; Ethernet/USB; large portfolio of BGA package and more


System Components
Optocouplers offering high-switching speed in combination with high output voltage, half the mounting space of conventional devices, and meeting all safety standards for worldwide use. IGBTs offering low saturation voltage for low conduction losses, built-in FRD for miniaturisation, and high-load short-circuit capability for improved reliability.
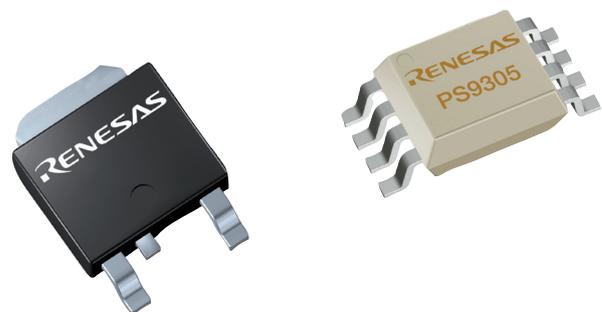
Metering

With more than 30 years of metering experience, Renesas is a full metering building-block solution supplier, from dedicated system-on-chip devices to reference designs, to shorten time to market.

Applications

| Metrology | House-keeping |
| Communication | Security |
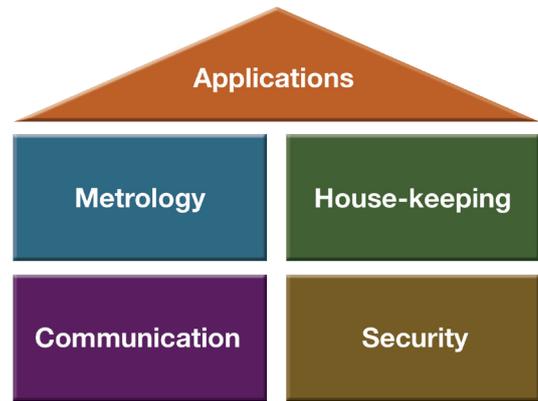
Renesas offers the perfect fit for:

Smart electricity meters and data concentrators

RENESAS RX RX600   RENESAS RX RX200

> Highly innovative microcontroller families
> Ultra low power
> High performance CPU
> Integrated DSP functions
> FPU and Ethernet options
> Up to 2 MB Flash with Memory Protection unit and security features
> Full calendar RTC with Vbat
> Anti tamper functions

Metrology, single and polyphase

> RX200 with dedicated peripherals
> 7 channel 24-bit ADC
> Hardware encryption
> Temperature sensor

Housekeeping & Data Collector

> High performance SuperH and RX cores with up to 960 DMIPS
> Up to 2 MB Flash and 256 KB RAM
> Rich peripheral integration (Ethernet, direct TFT drive)
> Full OS support

Gas, water and heat meter

RENESAS RL78   RENESAS RX RX100

> Low voltage
> World leading low power operation
> Direct segment LCD drive
> Rich set of peripherals

Communications

> Advanced single chip RF solutions
> Flexible multi chip RF solutions
> Highly robust PLC solutions
> ZigBee™ + Smart Energy Profile
> Wireless M-Bus
> Ethernet

Security

> Provision of ready to use libraries optimized for multiple MCU cores

And… a broad solution portfolio of:

> Optocouplers
> EEPROM
> SRAM
> Low voltage Power MOSFET

Energy Monitor Displays

Renesas provides a full portfolio of scalable micro-controller-based solutions for low-end segment LCD to high-end full multimedia TFT user interfaces including powerful graphics accelerators and up to 1 MB integrated frame buffer.

All building blocks from graphical libraries, a wide range of supported Real Time Operating Systems, to middleware solutions for audio/video support are available from Renesas & its partners for various classes of energy monitor.

Multi-Function Full Multimedia	**SH-4 SuperH Processors**	> Direct colour TFT support up to SXGA > Linux, WinCE & QNX RTOS support > Audio/Video playback
Mid-Range With Additional Functions	**SH-2 & 2A SuperH Controllers, RX600**	> Direct color TFT support up to VGA > RTOS and graphical libraries (Segger, Micrium, Altia) > Linux support on SH2-A > Animation and Font support
Standalone Single Function	**RL78/Lx**	> Embedded segment LCD driver > Ultra low power for battery operated systems

We're here to support you...

Backed up by our European Design Centres, Renesas has a Europe wide team of sales, marketing and applications specialists able to provide support in your local language. Complemented by a fully trained network of franchised distributors and a comprehensive Eco System, Renesas truly is a Partner for Life!

The Renesas Eco System

Renesas on the Web
www.renesas.eu

Online technical training
www.renesasinteractive.com

Personalised news & services
www.renesas.eu/myrenesas

Engineering community
www.renesasrulz.com

Facebook group
www.facebook.com/renesaseurope

RenesasPresents video channel
www.youtube.com/RenesasPresents

3rd Party network
www.renesas.eu/alliance

Twitter news feed
www.twitter.com/renesas_europe

Social networking service
www.renesas.eu/googleplus

Before purchasing or using any Renesas Electronics products listed herein, please refer to the latest product manual and/or data sheet in advance.

FSC
www.fsc.org
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Paper from responsible sources
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