# Renesas Ready Ecosystem Partner Solution

# PX5 RTOS

## Solution Summary

PX5 RTOS is an advanced, 5th generation RTOS that features a native implementation of the industry standard POSIX pthreads API and best-in-class size and performance. As for safety and security, the PX5 RTOS is certified for use in safety-critical applications requiring IEC 61508 SIL 4, IEC 62304 Class C, ISO 26262 ASIL D, and EN 50128 SW-SIL 4 certification. The PX5 RTOS is available today on the full range of the RA Family MCUs, RX Family of MCUs and RZ Family of MPUs. and RISC-V Family of MCUs and MPUs. The example code can be downloaded from here by free of charge.

## Features/Benefits

- Advanced, simple-to-use 5th generation RTOS
- Native implementation of the POSIX pthreads API instantly enables developers and makes firmware more portable
- IEC 61508 SIL 4, IEC 62304 Class C, ISO 26262 ASIL D, and EN 50128 SW-SIL 4 safety certified
- The small footprint and fast execution enables multi-threading in memory-constrained environments
- Enhanced safety and security via unique Pointer/Data Verification (PDV) (patent pending)
- Royalty-free

## Diagrams/Graphics
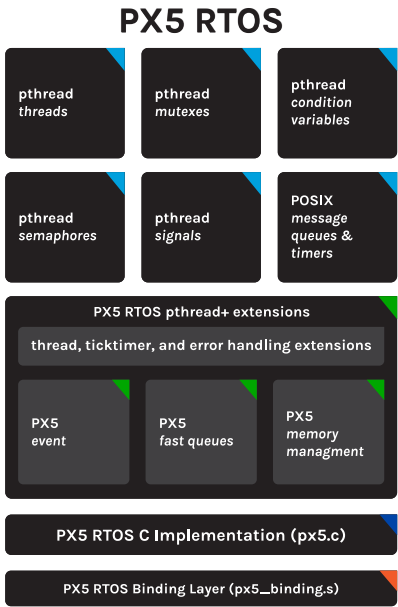


## Target Markets and Applications

- Automotive
- Industrial IoT
- Smart cities
- Smart homes
- Smart sensors
- Consumer electronics

https://px5rtos.com/px5-rtos/

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## Enhance \ Simplify \ Unite
# EMBEDDED IoT DEVELOPMENT
Advanced PX5 RTOS uniting embedded industry with standard POSIX pthreads API

**Advanced 5th Generation RTOS**

| Native RTOS Implementation of POSIX pthread API and real-time extensions | Best-of-class RTOS |
|---|---|
| Protects firmware development investment by making firmware portable | Certified for use in safety-critical applications |
| Enables code sharing with embedded Linux Reduces developer training via industry-standard API | Small footprint (minimal 1KB Flash) Fast execution (sub 1us APIs) Pointer/Data Verification (PDV) Extensive open-source middleware integration including former Azure RTOS middleware |

### OUR MISSION

Our "why" at PX5 is to make embedded development easier and faster than ever before. Developers using the PX5 RTOS have fewer problems and can deliver better-quality products to market in record time.

### UNITING EMBEDDED

The PX5 RTOS features a native implementation of the industry-standard POSIX pthreads API, which instantly enables a vast number of developers who are already fluent with POSIX pthreads. In addition to the native POSIX pthread support (semaphore, mutex, message queue, etc.), the PX5 RTOS also offers real-time extensions such as event flags, fast queues, tick timers, memory management, and more.

### FUNCTIONAL SAFETY CERTIFICATION

The PX5 RTOS is certified for use in safety-critical applications requiring IEC 61508 SIL 4, IEC 62304 Class C, ISO 26262 ASIL D, and EN 50128 SW-SIL 4 levels of certification. The PX5 RTOS provides advanced Pointer/Data Verification (PDV) technology, which developers can leverage at run-time to verify function return addresses, function pointers, system objects, global data, and memory pools. This technology is unique to the PX5 RTOS.

### ADVANCED TECHNOLOGY

The PX5 RTOS also offers best-of-class size and performance and is designed for hard real-time environments. Its memory usage is minimal – taking as little as 1KB of FLASH and 1KB of RAM. Best of all, the PX5 RTOS memory usage automatically scales based on what the developer uses. No more dead code or complicated configuration options that might result in wasted memory. Performance is both fast and deterministic, with many API calls and context switching taking less than one microsecond.

### SIMPLE TO USE

The PX5 RTOS is simple to use. It consists of just two C and assembly source files, so adding it to any application build environment is easy. It is also fully integrated with all the most popular development tools.

### DOWNLOAD TO EVALUATE

Check out the free PX5 RTOS evaluation demonstrations to see for yourself what the PX5 RTOS can do for you. Please download and try one today here!

### CONTACT

PX5 Real-Time Operating System (RTOS) Support (px5rtos.com)