



Ashling announce *RiscFree*[™] C/C++ SDK support for the Zephyr Real-Time Operating System (RTOS)

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[Ashling](#) announced today that Ashling's *RiscFree* SDK now provides support for the [Zephyr](#) RTOS running on RISC-V and Arm based IP cores and devices.

RiscFree debug support for the Zephyr RTOS presents a powerful and comprehensive debugging solution for developers working with the open-source Zephyr platform. This advanced debugging toolset is designed to streamline the development process for embedded systems utilizing RISC-V and Arm cores, allowing engineers to more efficiently build, test, debug and optimize software running on the Zephyr RTOS.

RiscFree's Zephyr-specific views provide developers with valuable insights into the behavior and status of their embedded systems running the Zephyr RTOS. These views help to identify potential bottlenecks, synchronization issues, and other problems, thereby streamlining the development and debugging process.

The **Thread** View (shown below) in *RiscFree* offers a comprehensive overview of all active threads in the system, displaying crucial information such as thread state, priority, stack usage, and other relevant data. This enables developers to easily monitor the status of each thread, identify potential issues, and optimize their system's performance.

Name	Handle	Priority	Start of Stack	Stack Size	Status
Philosopher 5	0x1001c140	-2	0x10020b60	2048	Pending
Philosopher 4	0x1001bdd0	-2	0x10020360	2048	Suspend
Philosopher 3	0x1001ba60	0	0x1001fb60	2048	Pending
Philosopher 2	0x1001b6f0	1	0x1001f360	2048	Suspend
Philosopher 1	0x1001b380	2	0x1001eb60	2048	Suspend
Philosopher 0	0x1001b010	3	0x1001e360	2048	Pending
idle	0x1001c6c0	40	0x10022360	4096	Running

Figure 1. *RiscFree* Thread List View

The **Mutex** View, another vital component of *RiscFree's* Zephyr-specific views, provides a detailed overview of all mutexes in the system. This view displays mutex ownership, waiting threads, and priority inheritance information. By monitoring mutex usage, developers can identify contention points and deadlocks, ensuring efficient resource allocation and optimal synchronization between threads.

Handle	Thread Owner	Lock Count	Priority
0x1001ce68	Philosopher 4	1	-1
▼ Wait threads			
Thread Name	Handle		
Philosopher 5	0x1001c140		
0x1001ce40	Philosopher 4	1	-1
▼ Wait threads			
Thread Name	Handle		
Philosopher 3	0x1001ba60		
0x1001ce18	Philosopher 3	1	0
0x1001cdf0	Philosopher 1	1	2
0x1001cdc8	Philosopher 1	1	2
0x1001cda0	Philosopher 5	1	-2
▼ Wait threads			
Thread Name	Handle		
Philosopher 0	0x1001b010		
0x1001cf38	0x0	0	0
0x1001ce90	0x0	0	0

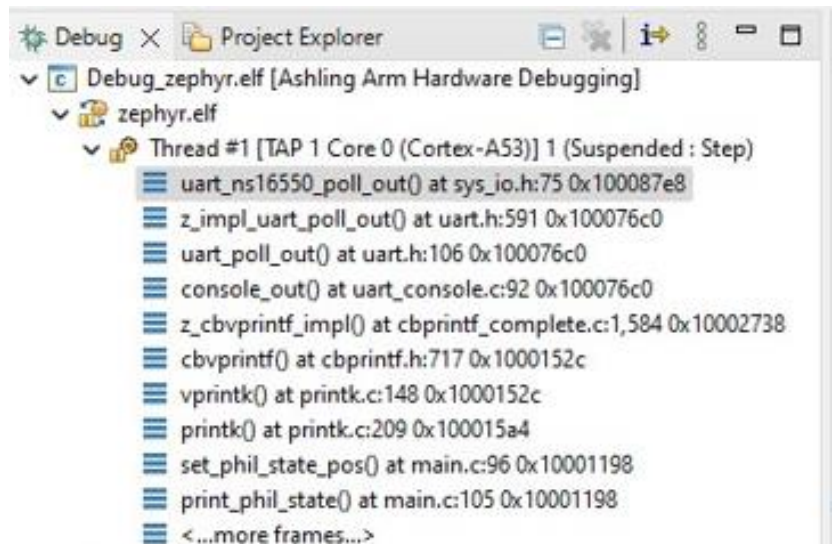
Figure 2. *RiscFree* Mutex List View

Lastly, the Semaphores View in *RiscFree* offers insights into semaphore usage within the Zephyr RTOS. This view displays information on the current value, maximum value, and waiting threads for each semaphore in the system. Developers can use this information to analyze semaphore usage, identify potential bottlenecks, and ensure that resources are effectively managed throughout the system.

Handle	Count	Limit
0x1001de40	1	1
0x1001de20	0	1
0x1001de00	0	1
▼ Wait threads		
Thread Name	Handle	
Philosopher 2	0x1001c6f0	
0x1001dde0	0	1
0x1001ddc0	0	1
0x1001dda0	0	1
▼ Wait threads		
Thread Name	Handle	
Philosopher 5	0x1001d140	

Figure 3. *RiscFree* Semaphore List View

RiscFree's Debug View offers extensive support for thread management and analysis, allowing developers to efficiently monitor and control threads while working with the Zephyr RTOS. The Debug View provides a comprehensive look at the system's current thread allowing developers to pause, resume, or step through it. This fine-grained control enables precise debugging and analysis, ensuring that developers can identify issues and address them effectively. In combination with other **RiscFree** features such as breakpoints and watchpoints, the thread listing in the Debug View presents a comprehensive debugging environment tailored to the unique requirements of the Zephyr RTOS.



About Ashling

Ashling have been a leading provider of Embedded Development Tools & Services since 1982 with design centres in Limerick Ireland and Kochi India and sales and support offices in Europe, Asia Pacific, the Middle East and America. Visit www.ashling.com for more details and for more information on Ashling's **RiscFree** see: <https://www.ashling.com/ashling-riscv/>

About Zephyr

The Zephyr Project, hosted by the Linux Foundation, is an open-source, real-time operating system for IoT and embedded devices, emphasizing security, modularity, and resource efficiency. Visit <https://zephyrproject.org/> for more details.

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