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WWDG (Window Watchdog)

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Introduction

- The Window Watchdog (WWDG) is another watchdog timer available in STM32 microcontrollers, including the STM32F4 series.
- Like the Independent Watchdog (IWDG), the WWDG is designed to ensure system reliability by generating a system reset if the microcontroller fails to reload the watchdog counter within a specified timeframe.
- However, the WWDG has the additional feature of a window-based monitoring mechanism, allowing for more flexible and precise control over the watchdog operation.



Applications

- **Real-Time Systems**

- In systems where precise timing is essential, the WWDG can be configured to monitor a specific time window, ensuring that the microcontroller resets if not refreshed within the defined window.

- **Communication Systems**

- Applications involving communication protocols with strict timing requirements can benefit from the WWDG to detect and recover from potential software failures.

- **Safety-Critical Systems**

- In safety-critical systems, such as automotive safety applications or medical devices, the WWDG adds an extra layer of protection to detect and respond to software malfunctions.

- **Embedded Systems with Critical Timing Tasks**

- Systems with critical timing tasks, where failure to complete tasks within a specified timeframe could lead to undesirable consequences, can utilize the WWDG for enhanced reliability.



Registers

- **WWDG_CR (Control Register)**
 - Configures the WWDG operation, including the counter value and the window value.
- **WWDG_CFR (Configuration Register)**
 - Configures the WWDG prescaler value and sets the Early Wakeup Interrupt (EWI) bit.
- **WWDG_SR (Status Register)**
 - Indicates the status of the WWDG, including whether a reset is pending.
- **WWDG_RLR (Reload Register)**
 - Specifies the value to be loaded into the WWDG counter.