

How to Ensure a Stable WDT Reset & Why Avoid Modifying CONFIG via Software

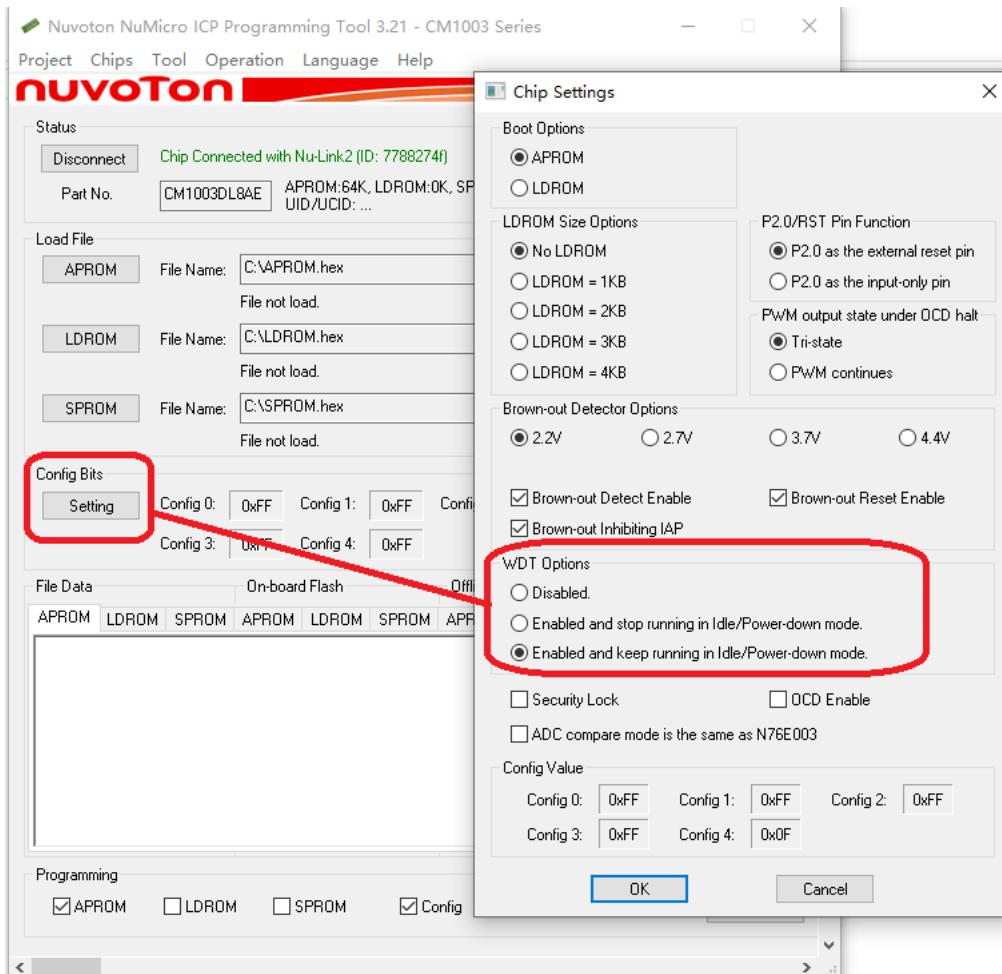
The NuMicro 8051 series provides one Watchdog Timer (WDT).

As default WDT configured as a general purpose timer, of which the periodic interrupt serves as an event timer or a durational system supervisor in a monitoring system, which is able to operate during Idle or Power-down mode but NO reset function.

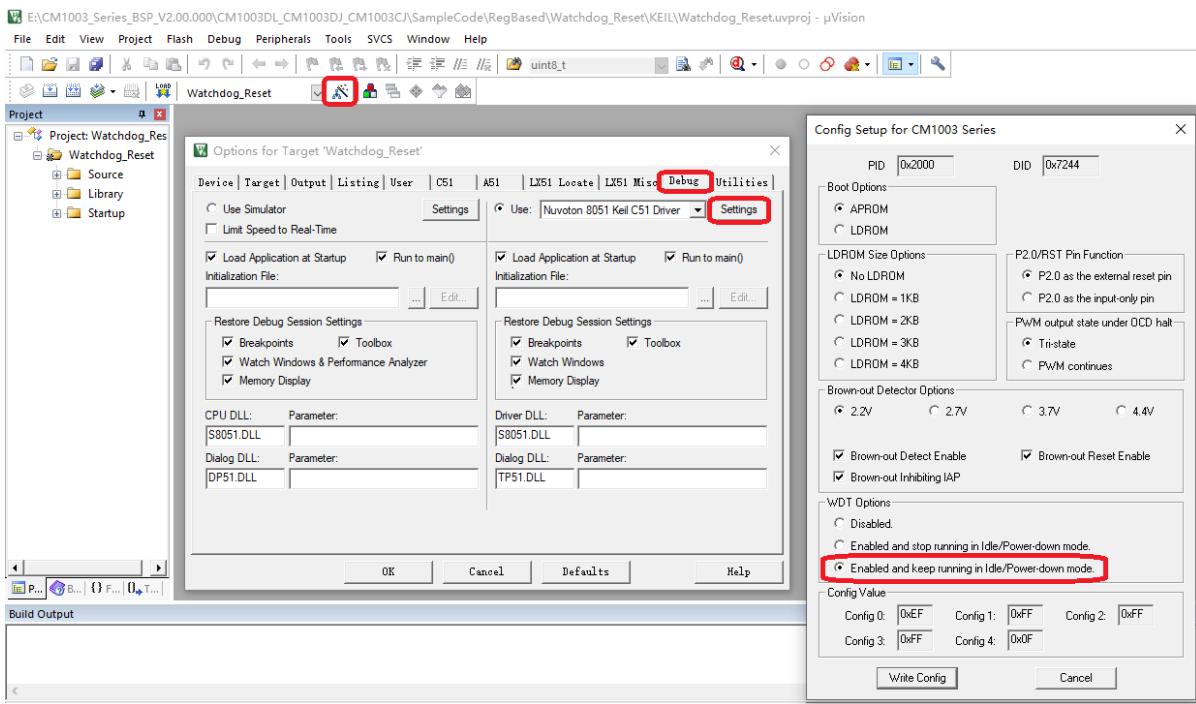
To utilize the WDT reset function, it is necessary to enable WDT reset in the CONFIG bytes.(Refer to Technical Reference Manual (TRM) section 6.1.4 Config bytes). The WDTEN[3:0] (CONFIG4[7:4]) initialize the WDT to operate as a time-out reset timer. **We strongly recommend directly modifying the CONFIG to enable WDT Reset during ICP programming.**

The following diagram illustrates how to change the configuration in the tool.

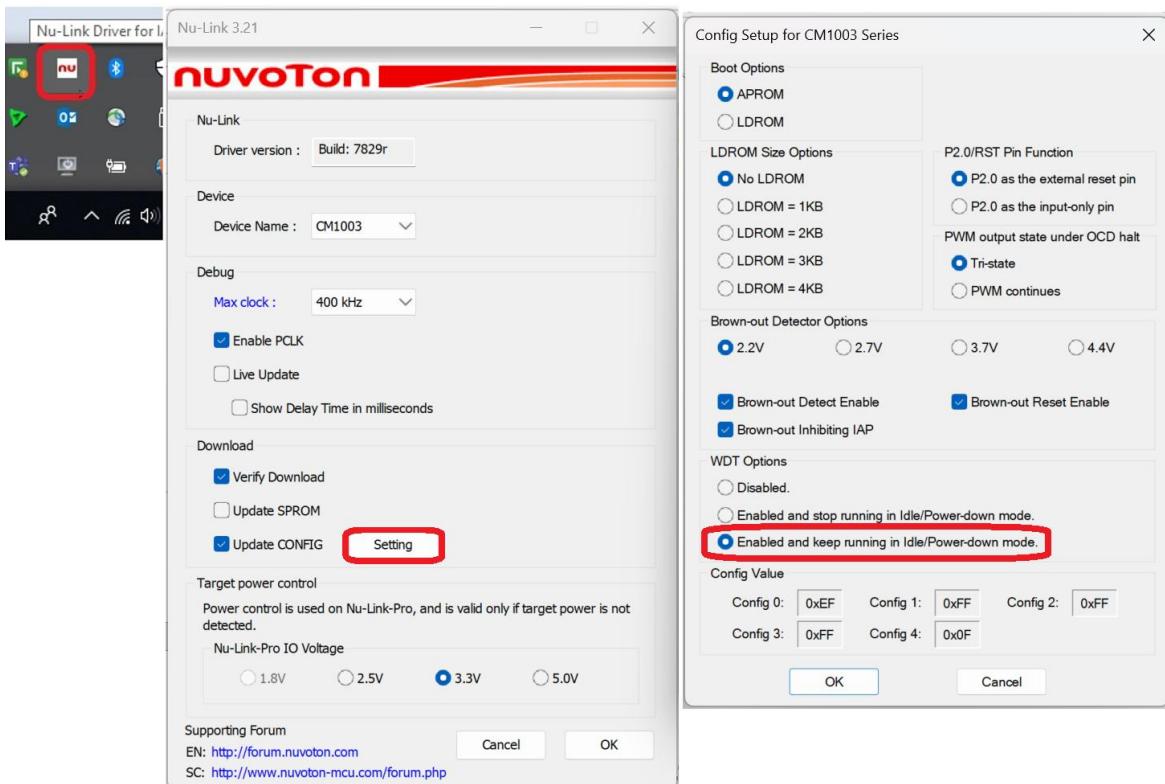
ICP Programming Tool



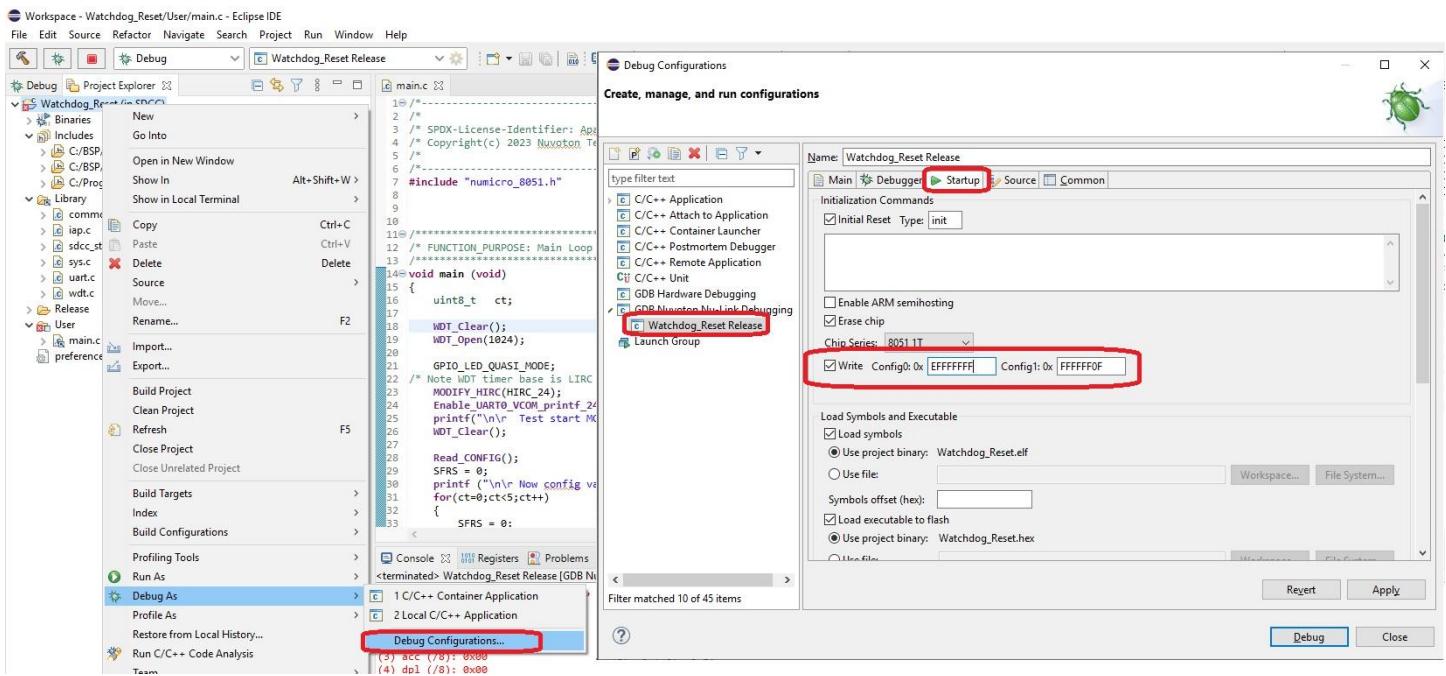
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Avoid using software modification by IAP.

We strongly advise against using coding to rewrite CONFIG in order to enable WDT. The reasons are as follows:

1. After CONFIG is modified through software, a reset is required for the changes to take effect. Therefore, the program must include checks to verify whether the modification has been successful, to avoid redundant alterations. All resets, including power-on reset, reset pin, BOD reset, and WDT reset, need to be taken into consideration.
2. In practical applications, power sources typically fluctuate. Additionally, the system may experience interference, such as EFT (Electrical Fast Transient) interference, causing the IC to reset and then repeatedly reset again after operating for tens to hundreds of milliseconds.
3. The process of modifying CONFIG involves several steps: saving the original data, modifying the new data, erasing the CONFIG area, and rewriting the new data. When the conditions 1 and 2 occur simultaneously, a reset is highly likely to happen during any of these steps, making it uncertain that the entire rewriting process can be correctly completed each time.
4. Writing CONFIG through ICP programming and not rewriting CONFIG through software coding, CONFIG will only be written once and will not be altered by other actions. However, if the software rewrites CONFIG, it may be rewritten multiple times during the system's operation, increasing the factors of system instability.

Based on the reasons mentioned above, we found that in mass-produced end customer products, system errors frequently occur in end products due to rewriting CONFIG. **So please avoid modifying CONFIG by software code.**