
Wrong clock configuration or crystal selection causes MCU running exception

Questions :

In the case of incorrect clock configuration or inappropriate crystal oscillator, after downloading code to an evaluation board, it is likely to make it unable to perform debug or download function.

Scenario 1: configure wrong clock frequency multiplication code and download it to an evaluation board;

Scenario 2: download official BSP Demo to a user-designed board but use a crystal oscillator much higher than 8 MHz.

Answer:

Although enabling hardware access protection (this is a special case) will make it unable to perform debugging or download operation, in most cases, this issue is mainly due to the use of maximum frequency outside corresponding threshold.

In the above scenario 2 case, our official BSP demo uses 8 MHz external crystal oscillator and multiplies it to or close to the maximum frequency of a MCU device. For users, only increasing external crystal oscillator frequency without modifying corresponding code may cause the maximum frequency to be out of spec and trigger unexpected results.

Users are advised to pay attention to the following two points:

1. Check if the external input clock is clean and its frequency is within spec.
2. Write a new clock configuration code based on the *corresponding CRM_Start_Guide* file of our Application Note. Besides, you can also use our clock configuration tool (AT32_New_Clock_Configuration) to generate code automatically.

If users want to resume download in the wake of above-mentioned issue, the following methods can be used.

Solution 1:

Use V3.0 and above ICP host software and AT-Link. If there is a prompt indicating “there is a need to update AT-Link firmware”, do it. Then connect to a target MCU device, select Flash mass erase, and perform reset. By doing so, you can start to download.

Solution 2:

Remove (desolder) the external crystal oscillator or disconnect external high-speed clock, reset the MCU device. After connecting to the MCU device, select Flash mass erase or download correct code, then solder the external crystal oscillator onto MCU or connect the external high-speed clock, and restart the device. By doing so, you can resume download.

Solution 3:

Keep the BOOT0 pin high, reset the MCU device. After connecting the MCU device, select Flash mass erase or download correct code, then ground the BOOT0 and return to “Boot mode from Flash memory”, and then restart the MCU device.

Type: MCU application

Applicable products: AT32F4xx series

Main function: System clock configuration

Other function: None

Document revision history

Date	Revision	Changes
2022.6.10	2.0.0	Initial release

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