

---

## 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**

<b>Date</b>	<b>Revision</b>	<b>Changes</b>
2022.6.10	2.0.0	Initial release

**IMPORTANT NOTICE – PLEASE READ CAREFULLY**

Purchasers are solely responsible for the selection and use of ARTERY's products and services, and ARTERY assumes no liability whatsoever relating to the choice, selection or use of the ARTERY products and services described herein.

No license, express or implied, to any intellectual property rights is granted under this document. If any part of this document deals with any third party products or services, it shall not be deemed a license grant by ARTERY for the use of such third party products or services, or any intellectual property contained therein, or considered as a warranty regarding the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

Unless otherwise specified in ARTERY's terms and conditions of sale, ARTERY provides no warranties, express or implied, regarding the use and/or sale of ARTERY products, including but not limited to any implied warranties of merchantability, fitness for a particular purpose (and their equivalents under the laws of any jurisdiction), or infringement of any patent, copyright or other intellectual property right.

Purchasers hereby agrees that ARTERY's products are not designed or authorized for use in: (A) any application with special requirements of safety such as life support and active implantable device, or system with functional safety requirements; (B) any air craft application; (C) any automotive application or environment; (D) any space application or environment, and/or (E) any weapon application. Purchasers' unauthorized use of them in the aforementioned applications, even if with a written notice, is solely at purchasers' risk, and is solely responsible for meeting all legal and regulatory requirement in such use

Resale of ARTERY products with provisions different from the statements and/or technical features stated in this document shall immediately void any warranty grant by ARTERY for ARTERY products or services described herein and shall not create or expand in any manner whatsoever, any liability of ARTERY.

© 2023 Artery Technology -All rights reserved