

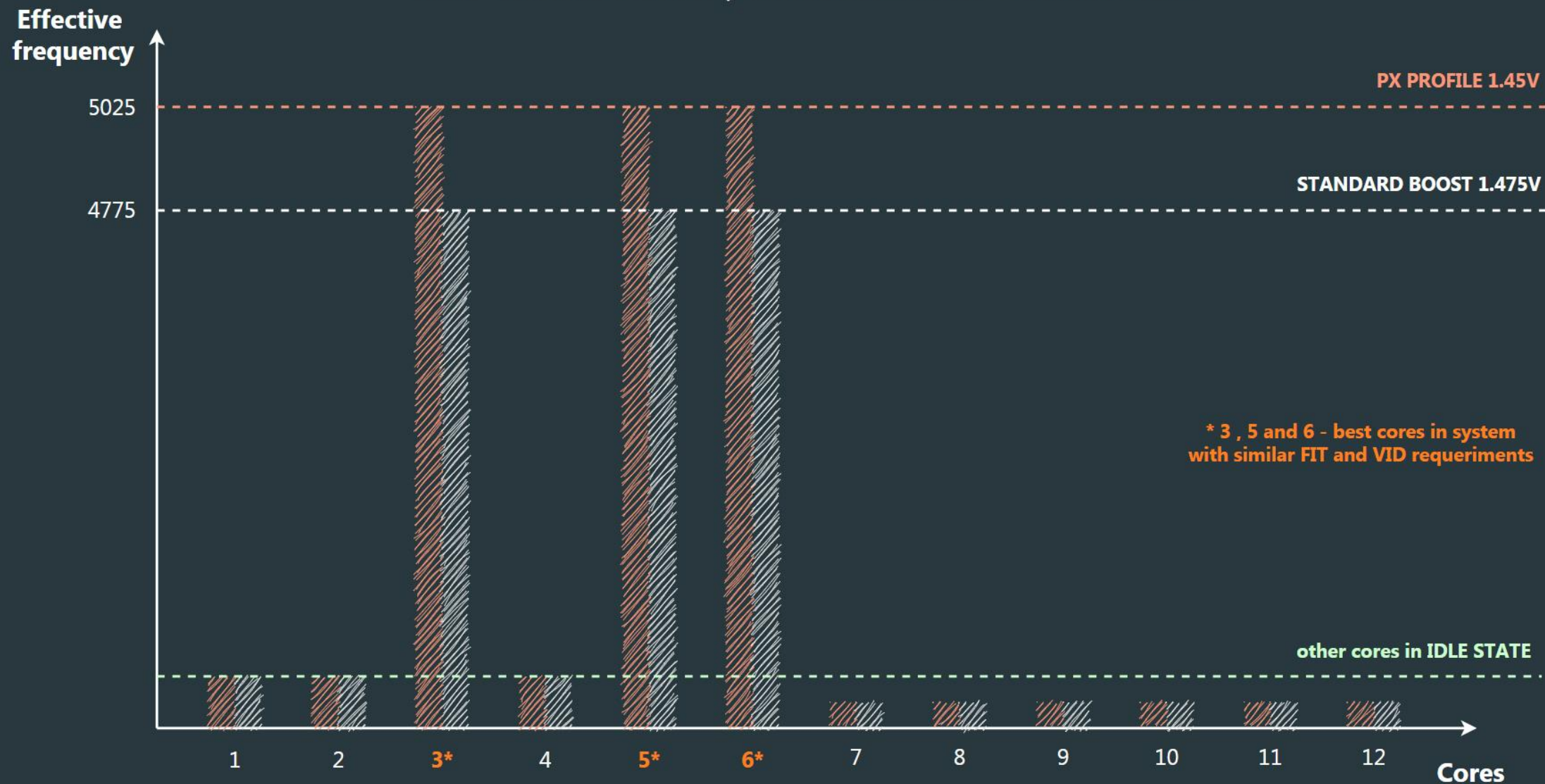


Clock Tuner for Ryzen™ 2.1 – NEW HYBRID OC

- PX PROFILE is the **best solution for games, benchmarks and workload**. Stable fixed effective frequency, which is not affected by any limits. No EDC throttling, no temperature throttling and no stretching. The recommended voltage is 25mV lower than the standard voltage. Safe and easy.

CTR 2.1 PX PROFILE for HYBRID OC

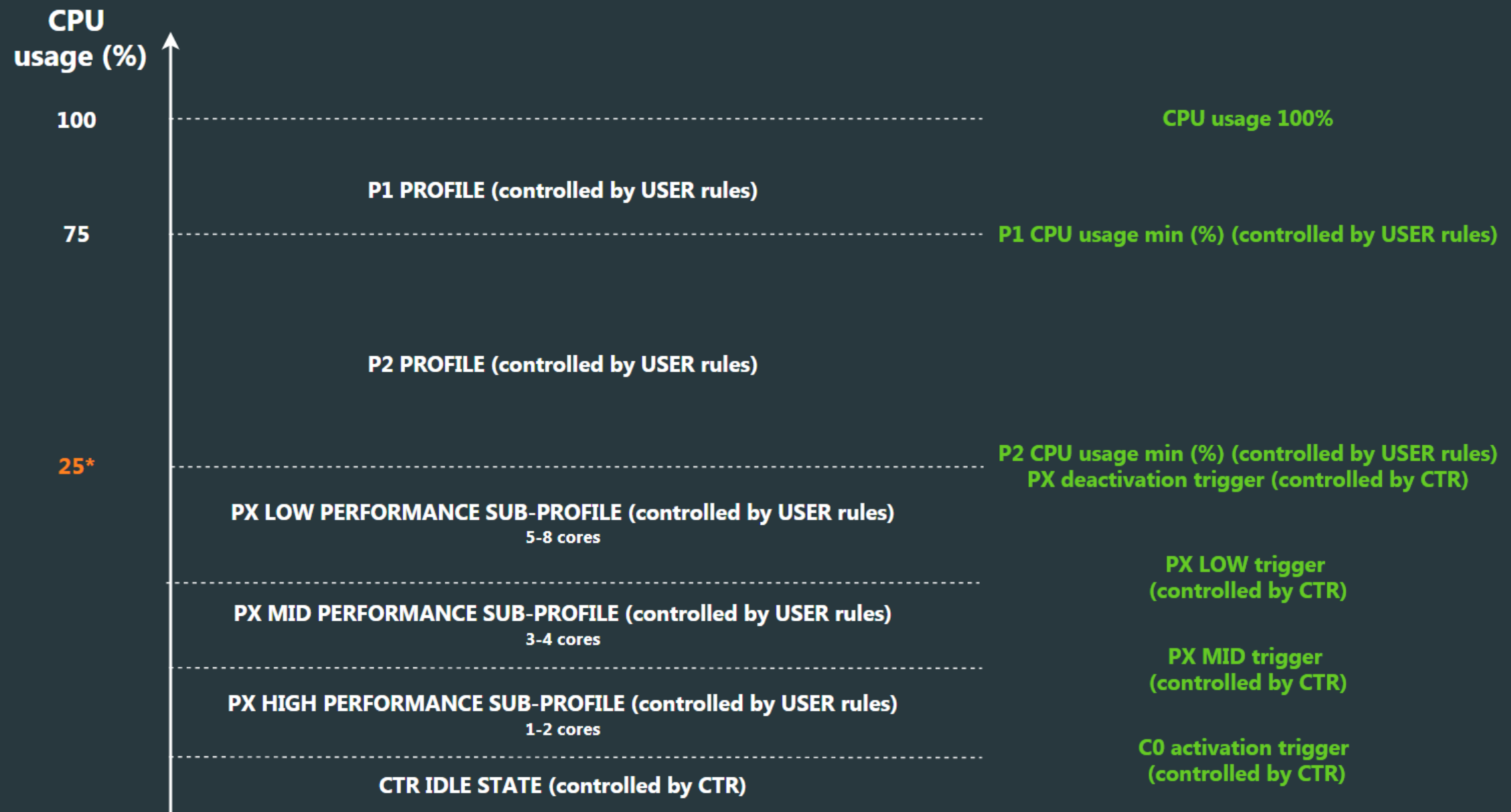
AMD RYZEN 9 5900X, CINEBENCH R20 - 3 THREADS





HYBRID OC – PROFILES STRUCTURE

- PX PROFILE consists of **three sub-profiles**. This allows efficient use of cores for a load that does not exceed 8 threads. The number of cores involved depends on the processor.



25* - CTR automatically calculates this values



Clock Tuner for Ryzen™ 2.1 – INTRO

System requirements:

- .NET Framework 4.8
- BIOS for Zen 3 with AGESA 1.1.0.0 path D or newer
- BIOS for Zen 2 with AGESA (any)
- BIOS for APU with AGESA 1.2.0.0 or newer
- Windows 10 x64 (with all updates)
- BIOS settings **without** manual CPU OC, **without** PBO (Fmax too) and **without** Performance Enhancer (or other similar technologies)
- **FCLK 1800-1900 (stable range for PX). AMD guaranteed only FCLK 1800. Explanation on page 9.**
- **CPPC** – Enabled
- **VRM settings** - Auto
- **CBP (Core boost performance)** – Enabled
- **Preferred cores** – Enabled
- **Cool & Quiet** – Enabled
- **C-state** – Enabled
- **Power plan** – Balanced (Zen 3) / Ryzen balanced (Zen 2)
- **Stable RAM overclocking!**
- **My advice is to have all settings in Auto mode, except the settings for RAM.**

Supported CPU:

- Zen 3: Ryzen 9 5950X, Ryzen 9 5900X, Ryzen 7 5800X, Ryzen 5 5600X
- Zen 2: Threadripper 3970X, Threadripper 3960X, Ryzen 9 3950X, Ryzen 9 3900X, Ryzen 9 3900XT, Ryzen 9 3900, Ryzen 7 3800XT, Ryzen 7 3800X, Ryzen 7 3700X, Ryzen 5 3600XT , Ryzen 5 3600X, Ryzen 5 3600, Ryzen 5 3500X, Ryzen 5 3500, **Ryzen 3 3300X, Ryzen 3 3100**
- APU: Ryzen 7 PRO 4750G , Ryzen 7 PRO 4650G, Ryzen 3 PRO 4350G



Clock Tuner for Ryzen™ 2.1 – NEW HYBRID OC

- CTR will automatically find the frequency for **PX PROFILE** during the diagnostic (for 5900X and 5600X – 6 maximum, for 5950X and 5800X – 8 and for Zen 2 – 2 temporary maximum). There is no increase in diagnostic time. You will see the result on the **PROFILES** page.
- Since the processor very often works with a combined load of 1-8 cores, a high speed of load evaluation is needed to switch profiles as accurately as possible. New HYBRID OC is the most sensitive, the sensor polling period is **50ms(!)** (250ms old version).
- **CTR IDLE STATE**. The maximum voltage peaks are 1.1V.
- The average profile activation time is **1ms(!)**. Thanks to the active pre-loading profile system.
- Ultra low background activity. No effect on single-threaded tests and load.
- Updated priority system. P1 PROFILE has a higher priority than P2. P2 PROFILE has a higher priority than PX. This makes it possible to avoid frequent or false profile switching. It also allows you to significantly reduce the temperature of the processor.
- PX PROFILE has holding settings just like the other profiles. This will avoid false shutdown of the profile if the load on the cores is pulsed.
- PX is activated automatically. CTR also controls the switching between all PX sub-profiles.
- Improved security. While HYBRID OC is running, CTR will monitor the current voltage. If this value exceeds 1.525V - CTR will automatically restart the system without user confirmation. I believe that some users may ignore the instructions, so I have updated the rules for the security system.
- Checking stuck sensors. There are situations when a sensor stops responding. At this point, the user may see an abnormal temperature, frequency, or voltage value. I have implemented a system that analyzes the state of the sensor.



Clock Tuner for Ryzen™ 2.1 – NEW PROFILES TAB

- Minimalism is what everyone needs. Not just for beginners. I have completely redesigned the profile system so that you (even without a manual) can interact comfortably with CTR.
- Each button now has two functions. For example: **ACTIVATE PX PROFILE / DEACTIVATE PX PROFILE** and **FILL & SAVE P2 PROFILE / SAVE P2 PROFILE**. **FILL & SAVE P2 PROFILE** will only be available when you have finished tuning or **PHOENIX** has created a profile. In all other cases only **SAVE P2 PROFILE**.
- The **ROCKET icon** will tell you which profile is currently active.
- Now all the profile settings are on one page.

The screenshot displays the CTR 2.1 beta 5 interface. On the left is a sidebar with navigation options: TUNER, PROFILES, RESULTS, ABOUT & HELP, SCREENSHOT, DONATE & UPGRADE, MINIMIZE, and EXIT. The main content area is titled 'CTR 2.1 beta 5 Optimization for ZEN2+ CPUs'. It features three profile sections: PX PROFILE (activated), P2 PROFILE (activated), and P1 PROFILE (activated). Each profile section includes input fields for VID (mV), Holding time (ms), and various state frequencies (HIGH, MID, LOW for PX; CCX1-8 for P2 and P1). Below these are 'SAVE' and 'DEACTIVATE' buttons for each profile. A 'SECTION ONLY FOR CTR 2.1!' label is present in the top right of the profile area. At the bottom, there is a 'PROFILE SETTINGS' section with toggle switches for 'Autoload profile with OS' and 'CTR HYBRID OC'. The footer of the sidebar contains the copyright notice: 'Copyright 1usmus© 2019-2021'.



How to configure PX PROFILE? STEP-1

- P1 and P2 PROFILES from CTR 2.0 RC3 or CTR 2.1 beta (1-2-3) are fully compatible with CTR 2.1 beta 4. Just copy the values manually.
- If you don't already have a profiles, create them. You can find a detailed instruction here [https://www.guru3d.com/articles_pages/clocktuner_2_for_ryzen_\(ctr\)_guide,7.html](https://www.guru3d.com/articles_pages/clocktuner_2_for_ryzen_(ctr)_guide,7.html)

CTR 2.1 beta 5
Optimization for ZEN2+ CPUs

PX PROFILE : activated! SECTION ONLY FOR CTR 2.1!

VID (mV)	1450	Holding time (ms)	3000	SAVE PX PROFILE	
HIGH STATE (MHz)	5025	MID STATE (MHz)	5000	DEACTIVATE PX PROFILE	
LOW STATE (MHz)	4975				

P2 PROFILE : activated!

VID (mV)	1275	CPU usage min (%)	28	Holding time (ms)	2000	SAVE P2 PROFILE	
CCX1 (MHz)	4750	CCX3 (MHz)	0	CCX5 (MHz)	0	CCX7 (MHz)	0
CCX2 (MHz)	4625	CCX4 (MHz)	0	CCX6 (MHz)	0	CCX8 (MHz)	0
DEACTIVATE P2 PROFILE							

P1 PROFILE : activated!

VID (mV)	1175	CPU usage min (%)	75	Holding time (ms)	2000	SAVE P1 PROFILE	
CCX1 (MHz)	4650	CCX3 (MHz)	0	CCX5 (MHz)	0	CCX7 (MHz)	0
CCX2 (MHz)	4525	CCX4 (MHz)	0	CCX6 (MHz)	0	CCX8 (MHz)	0
DEACTIVATE P1 PROFILE							

PROFILE SETTINGS

Autoload profile with OS CTR HYBRID OC

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How to configure PX PROFILE? STEP-2

- All settings for the PX PROFILE are created automatically during the diagnostic phase. Perform the diagnosis by pressing the **DIAGNOSTIC** button.

CTR 2.1 beta 5
Optimization for ZEN2+ CPUs

TUNER
PROFILES
RESULTS
ABOUT & HELP
SCREENSHOT
DONATE & UPGRADE
MINIMIZE
EXIT

PX PROFILE : activated! SECTION ONLY FOR CTR 2.1!

VID (mV)	1450	Holding time (ms)	3000	SAVE PX PROFILE		
HIGH STATE (MHz)	5025	MID STATE (MHz)	5000	LOW STATE (MHz)	4975	DEACTIVATE PX PROFILE

P2 PROFILE : activated!

VID (mV)	1275	CPU usage min (%)	28	Holding time (ms)	2000	SAVE P2 PROFILE		
CCX1 (MHz)	4750	CCX3 (MHz)	0	CCX5 (MHz)	0	CCX7 (MHz)	0	DEACTIVATE P2 PROFILE
CCX2 (MHz)	4625	CCX4 (MHz)	0	CCX6 (MHz)	0	CCX8 (MHz)	0	

P1 PROFILE : activated!

VID (mV)	1175	CPU usage min (%)	75	Holding time (ms)	2000	SAVE P1 PROFILE		
CCX1 (MHz)	4650	CCX3 (MHz)	0	CCX5 (MHz)	0	CCX7 (MHz)	0	DEACTIVATE P1 PROFILE
CCX2 (MHz)	4525	CCX4 (MHz)	0	CCX6 (MHz)	0	CCX8 (MHz)	0	

PROFILE SETTINGS

Autoload profile with OS CTR HYBRID OC

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How to configure PX PROFILE? STEP-3

- Activate **CTR HYBRID OC** as well as all profiles. All buttons are multifunctional, if you press **ACTIVATE**, the button will change its function to **DEACTIVATE** (for the next press). That's all 😊
- If you want to change something, first **DEACTIVATE** the profile and then change the settings in it.

The screenshot displays the CTR 2.1 beta 5 interface with a sidebar on the left containing navigation options: TUNER, PROFILES, RESULTS, ABOUT & HELP, SCREENSHOT, DONATE & UPGRADE, MINIMIZE, and EXIT. The main area is divided into three profile sections, each with a 'DEACTIVATE' button highlighted in red:

- PX PROFILE : activated!**
 - VID (mV): 1450
 - Holding time (ms): 3000
 - HIGH STATE (MHz): 5025
 - MID STATE (MHz): 5000
 - LOW STATE (MHz): 4975
 - Buttons: SAVE PX PROFILE, DEACTIVATE PX PROFILE
- P2 PROFILE : activated!**
 - VID (mV): 1275
 - CPU usage min (%): 28
 - Holding time (ms): 2000
 - CCX1 (MHz): 4750, CCX2 (MHz): 4625, CCX3 (MHz): 0, CCX4 (MHz): 0, CCX5 (MHz): 0, CCX6 (MHz): 0, CCX7 (MHz): 0, CCX8 (MHz): 0
 - Buttons: SAVE P2 PROFILE, DEACTIVATE P2 PROFILE
- P1 PROFILE : activated!**
 - VID (mV): 1175
 - CPU usage min (%): 75
 - Holding time (ms): 2000
 - CCX1 (MHz): 4650, CCX2 (MHz): 4525, CCX3 (MHz): 0, CCX4 (MHz): 0, CCX5 (MHz): 0, CCX6 (MHz): 0, CCX7 (MHz): 0, CCX8 (MHz): 0
 - Buttons: SAVE P1 PROFILE, DEACTIVATE P1 PROFILE

At the bottom, the **PROFILE SETTINGS** section includes two toggle switches: 'Autoload profile with OS' (disabled) and 'CTR HYBRID OC' (enabled), both highlighted with a red box.

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How to configure PX PROFILE? TIPS

- I do not recommend using **Curve with PX PROFILE**. For some unknown reason these settings may negatively affect the stability of PX PROFILE. My recommendation for Curve - 0 and PBO is Auto.
- If the PX profile is unstable. Try lowering the frequency for all PX sub-profiles by 25MHz. Check your BIOS settings. I recommend **VDDG CCD 0.95V** and **SOC 1.15 - 1.2V**. If all of the above does not help, **lower the FCLK**.
- Applications that use **affinity masks** will not work correctly with PX PROFILE. One such program is **CPU-z**.
- **After you have activated the profiles, save them.** Why save the profile a second time? You must save the activation status otherwise the profile will not be loaded (the next time you start Windows) and will not be used by **HYBRID OC**. Read this sentence several times. This is the main problem 90% of users have.
- Also don't forget to enable **Autoload profile with OS** or else the profile or profile won't load.
- My advice. First, turn on **Autoload profile with OS, CTR HYBRID OC** then activate the profiles and only then save the profiles.
- **Do I have to set up the PX PROFILE myself?** In most cases CTR will do it better than you, but keep in mind that there is now a small margin of stability. You can try increasing the frequency by 25-50 MHz. If the attempt is unsuccessful, return all settings or re-run the diagnostics.
- **Why should I lower the frequency of FCLK?** PX profile increases L3 cache frequency and in most cases FCLK cannot cover this performance.



Clock Tuner for Ryzen™ 2.1 – NOTES

- Is PX PROFILE better than PBO + CO? Definitely. PX PROFILE is not limited by PBO/PB limits and there is no EDC throttling, temperature throttling and frequency stretching. The effective frequency always reaches the requested value.
- Windows dispatches which cores to use. No affinity masks, no extra CPU resources are needed for this.
- PX PROFILE available only for HYBRID OC and only for early access subscribers.
- CTR 2.1 is under development. The final concept is subject to change.
- PX PROFILE will require more calibration. All values that CTR offers you can change at will.
- Zen 3 has the best compatibility with PX PROFILE. Zen 2 requires research.
- I haven't given up on the idea of **automatic curve-tuning**. At the moment there is no access to this feature from Windows because the feature is still under development. It all depends on AMD, but I think it will be in March or April.
- In addition to all these changes, there are many minor bug fixes (CPPC detection, addition stability for CTR config, the ability to run only one CTR sample, etc).