OS Enhancement Utility
User Manual

V1.3

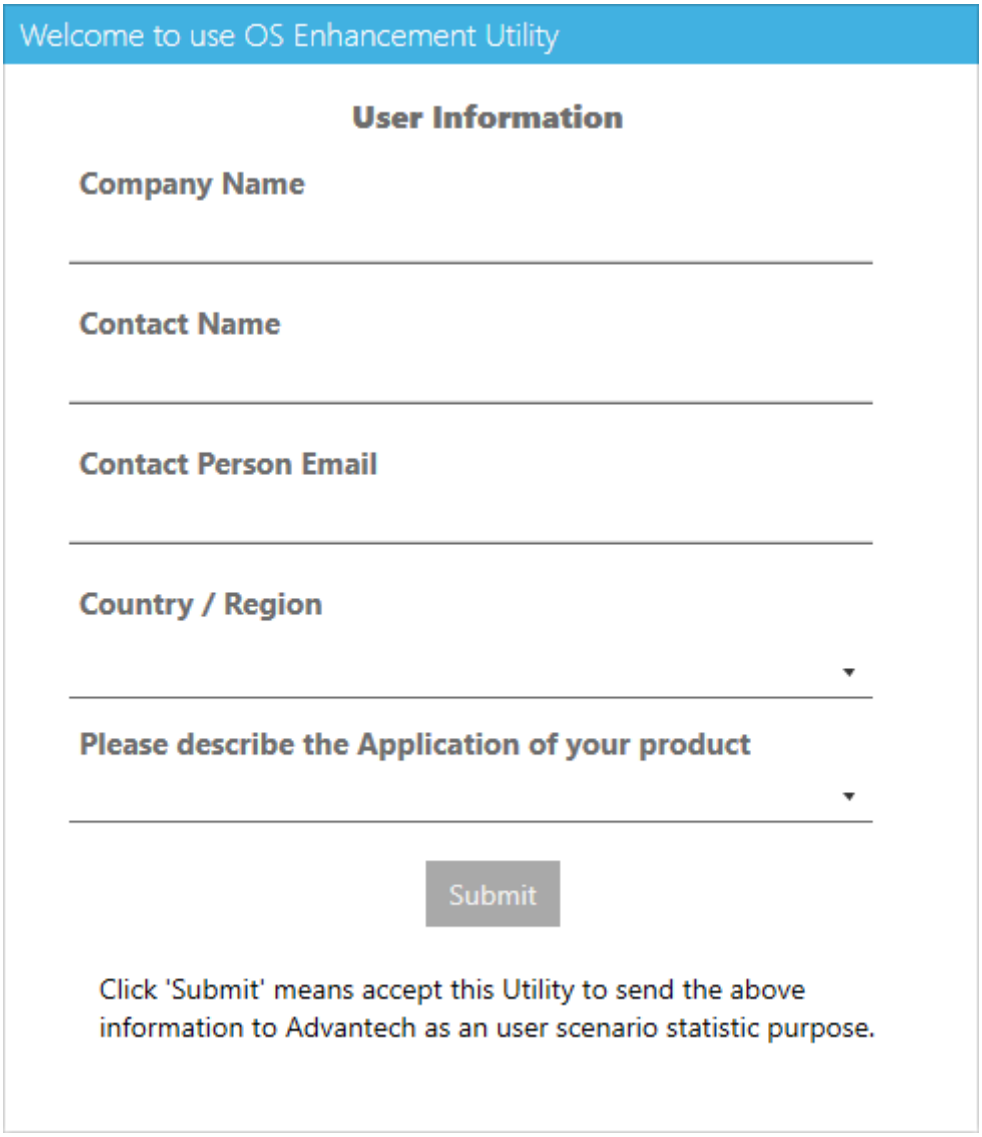
OS Enhancement Utility User Manual

Foreword

In Windows 10 IoT Enterprise, Microsoft provides many useful and helpful feature for users, however, it's not intuitive to use these features. Therefore, Advantech designs OS Enhancement Utility for users to access these features more quickly and easily.

Requirements

I. Windows 10/11 IoT Enterprise
II. Corresponding to OS Enhancement Utility v1.3
III. The user account must have administrator privileges
IV. Before starting to experience this tool, please fill-in user information start to use this tool.



Limitation

After sysprep, the setup of below items would be removed:

Section

2.2 - Notification Settings

2.4 - Windows Settings: Hibernate

2.5.2 - No Action Center: If the user account changes after sysprep, then this setting won’t be kept.

2.7 - Device Control

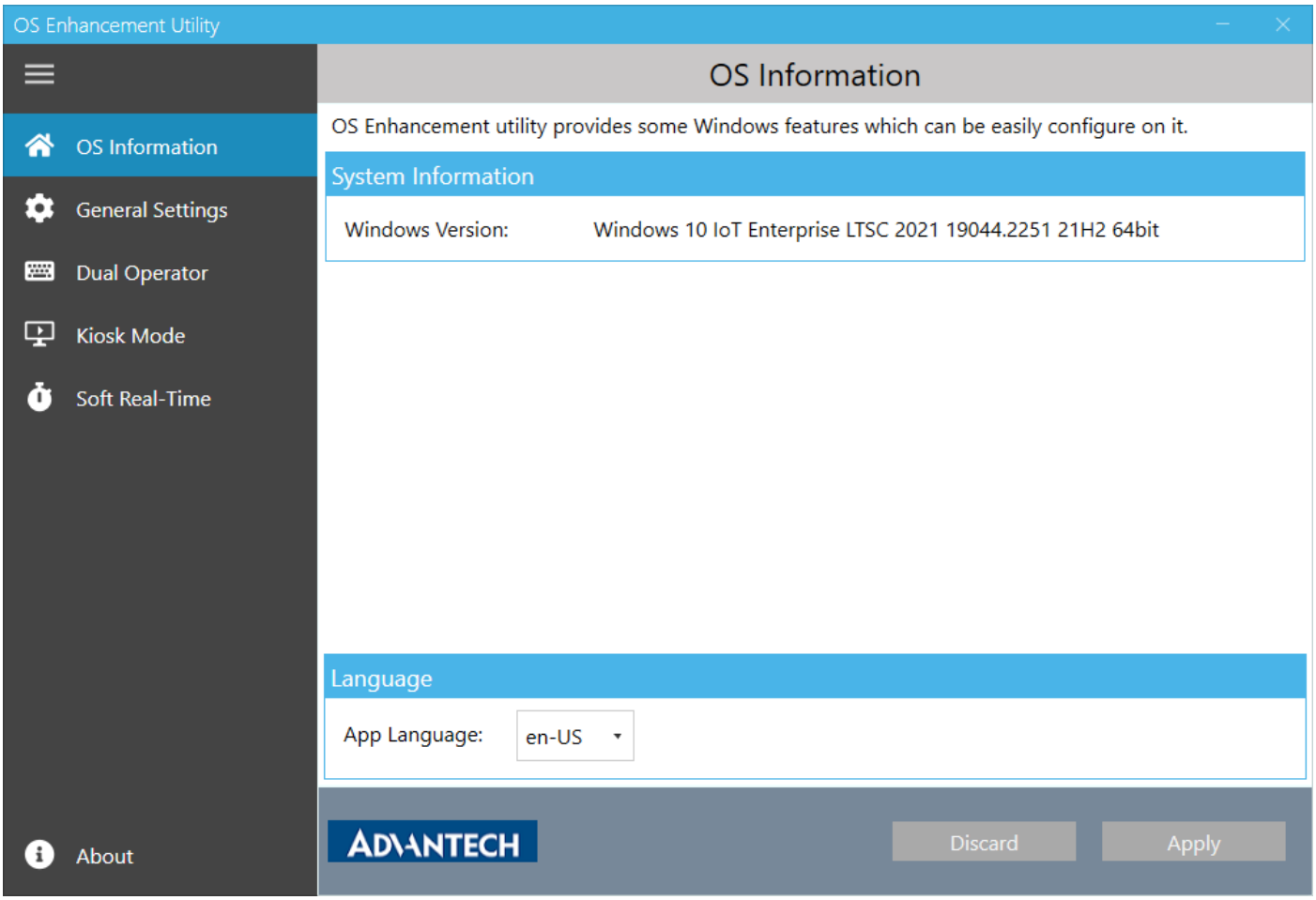
3 - Dual Operator

4 - Kiosk Mode

5 - Soft Real-Time

Introduction

1. OS Information



1.1 System Information

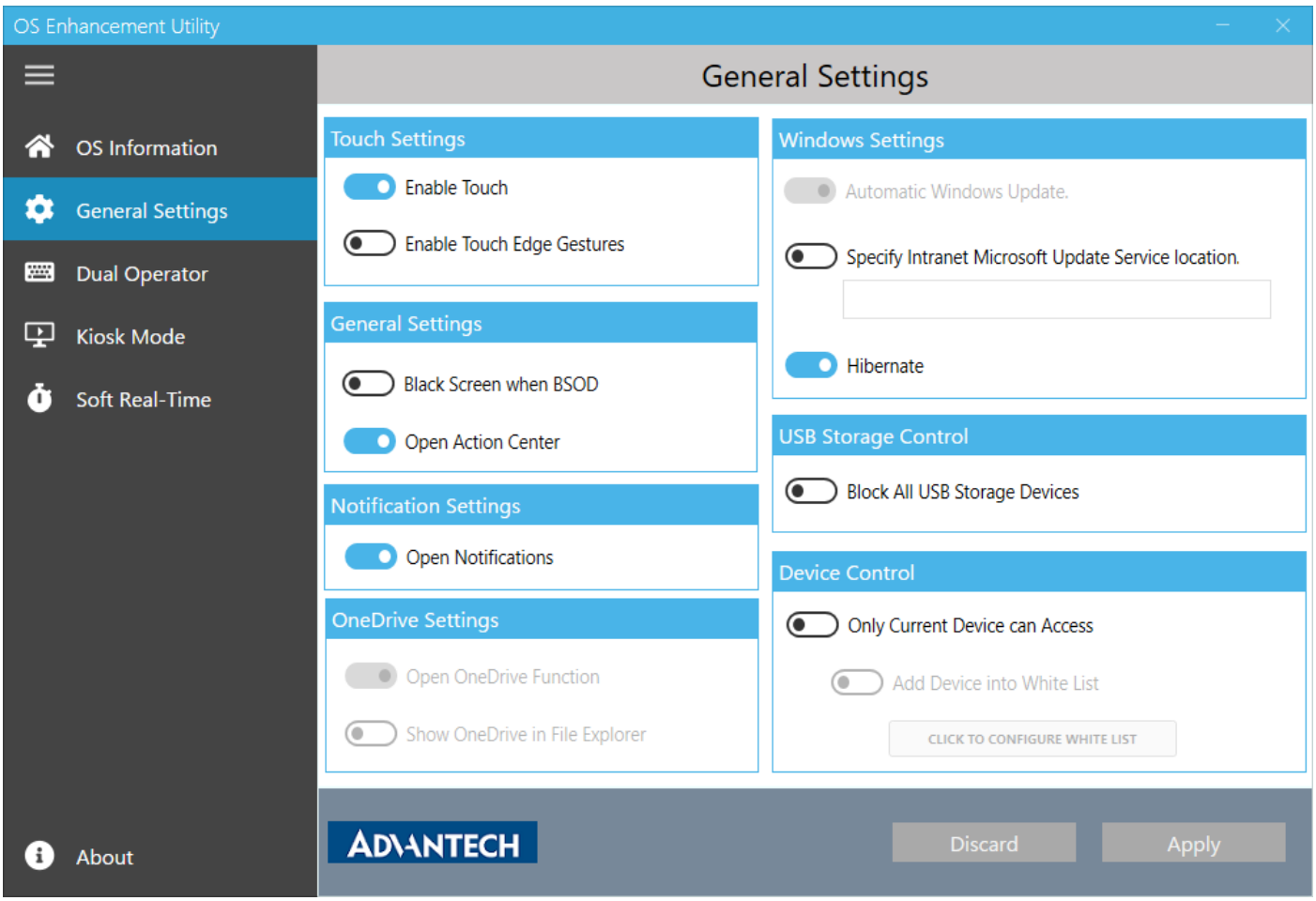
It shows Windows version and build numbers of your device. OS Enhancement Utility only supports build version later than 14393(RTM).

1.2 Language

OS Enhancement Utility is multilingual, you could choose the desired language and restart the utility to see it's changed to the selected language.

∗**Note:** OS Enhancement Utility is currently available in English, Traditional Chinese, Simplified Chinese, Japanese and Korean language. Your language is not yet included? Please contact your local FAE to add your language.

2 General Settings



In General Settings, we include some Windows features which can be easily configured on the utility.

2.1 Touch Settings

Enable or disable Touch function (only support capacitance touch device)

Enable or disable Touch Edge Gestures

2.2 Notification Settings

Enable or Disable Notifications

∗ **Note:** After system prepare, the setup of notification setting would be removed.

2.3 OneDrive Settings

Enable or disable OneDrive Function

Show or hide OneDrive in file explorer

∗ **Note:** Utility will auto detect whether your device install OneDrive or not.

2.4 Windows Settings

2.4.1 Win10 IoT Ent 2016 LTSB:

I. Default setting: enable Windows update or ;

II. Disable Automatic Windows Update (quality and security update), or;

III. Specify an intranet URL as a new location for Windows update (quality and security update).

∗ **Note:** Disable “Automatic Windows Update” would block operating system from adding Windows KB into it.

2.4.2 Win10 IoT Ent 2019/2021 LTSC:

I. Default setting: enable Windows update or ;

II. Specify an intranet URL as a new location for Windows update (quality and security update).

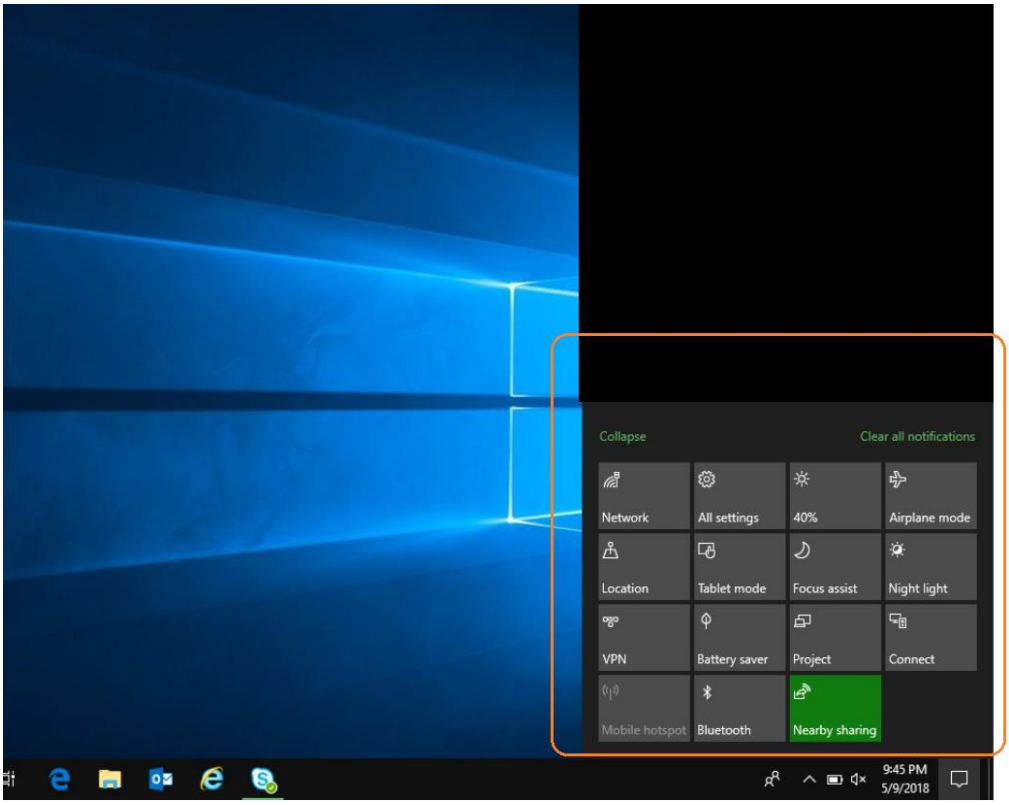
2.4.3 Enable or Disable Hibernate function

∗ **Note:** After sysprep, the setup of hibernate would be removed.

2.5 General Settings

2.5.1 Black screen when BSOD: After enable this feature, screen will become black when system occurs BSOD instead of blue screen.

2.5.2 Action center: Disable this feature to hide action center.



2.6 USB Storage Control

Access or Block All USB Storage Devices

2.7 Device Control

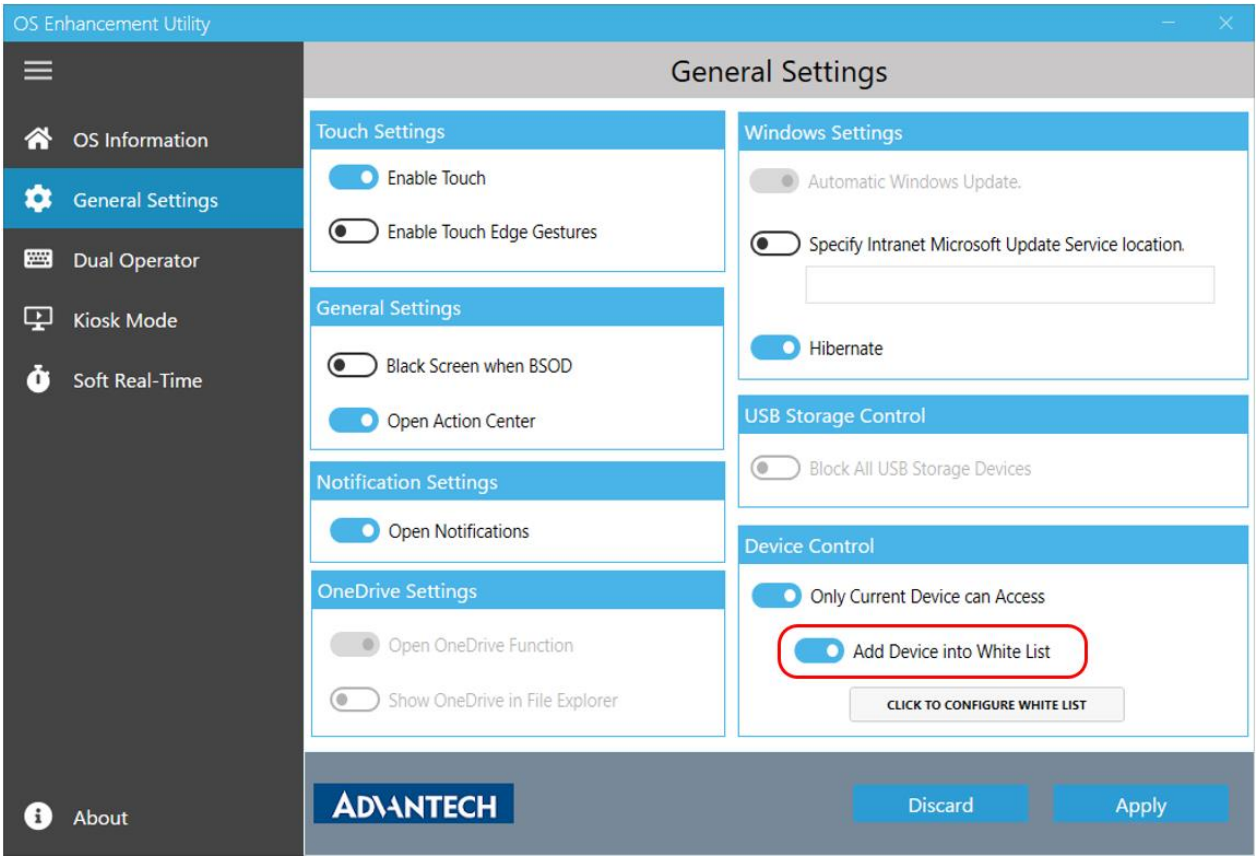
2.7.1 Only current device can access:

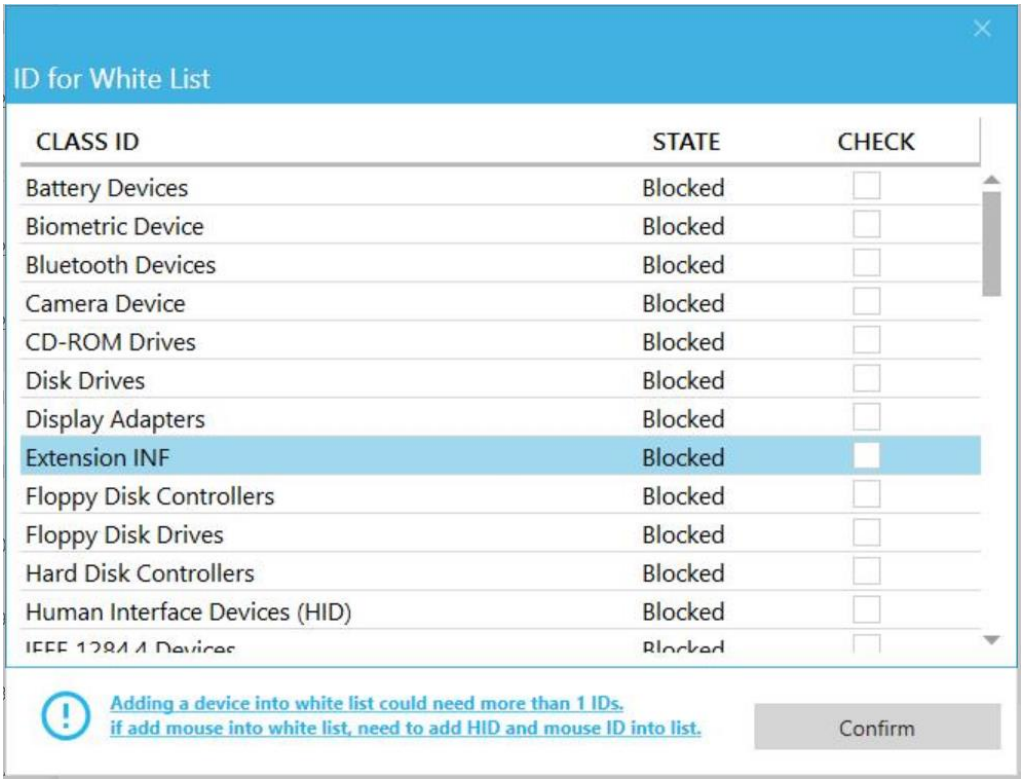
This feature is controlled based on device. If enable this feature, only the device that had working/existing in this computer could work, no new device could work further. For example, if a mouse-A already exist/working in this computer, after enable this feature, no other mouse or device could work in this computer.

2.7.2 Add device into white list:

This feature is controlled based on device ID. If enable this feature, you may decide which device ID you would like to add into white list and work on this computer. For example, if you want to add keyboard into white list, go to “Click to Configure White List” button and choose the device ID of keyboard, check it (the state will become “Allowed”), and click “Confirm” and “Apply” to add into white list.

Please note that a device may need more than one ID to be added into white list to make it workable successfully. For example, if you want to add mouse device into white list as a new device, besides adding mouse ID into list, you also need to add HID into white list to make mouse ID effective.

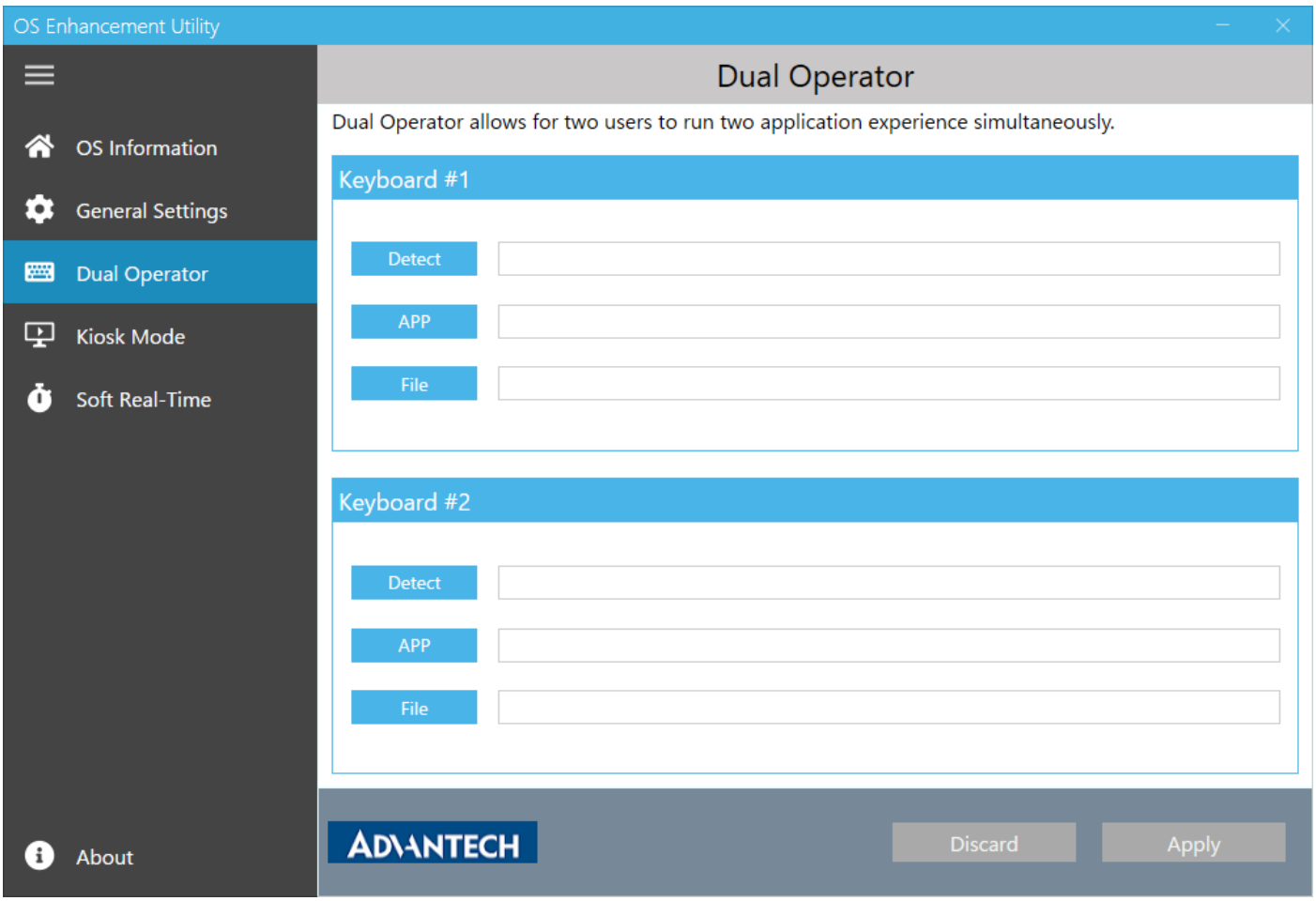




Please visit here to get more information about class ID: https://reurl.cc/9ZnpaO

***Note:** "USB Storage Control" and "Device Control" cannot work at the same time. Please only choose one option to do the configuration.

3 Dual Operator



In Dual Operator, we let two users run two applications with individual keyboard.

3.1 Keyboard #1 Setting

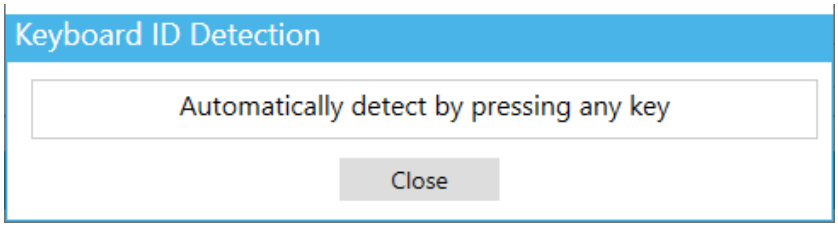
3.1.1 Detect:

Configure Keyboard ID automatically (refer to Fig3.1-1):

The text “Automatically detect pressing any key” receives the key event automatically when pressing any key in this position of text.

(Required)

(**Fig3.1-1**)



3.1.2 APP:

Select application (exe file location) combine with keyboard.

(Required)

3.1.3 File:

Select specific file executed by application (refer to 3.1.2).

(Optional)

3.2 Keyboard #2 Setting

(Refer to 3.1)

3.3 Apply

Save the current setting and execute.

(Keyboard #1 and Keyboard #2 must be set completely)

3.4 Limitation

After the system restarts, the function of Dual Operator doesn’t work automatically.

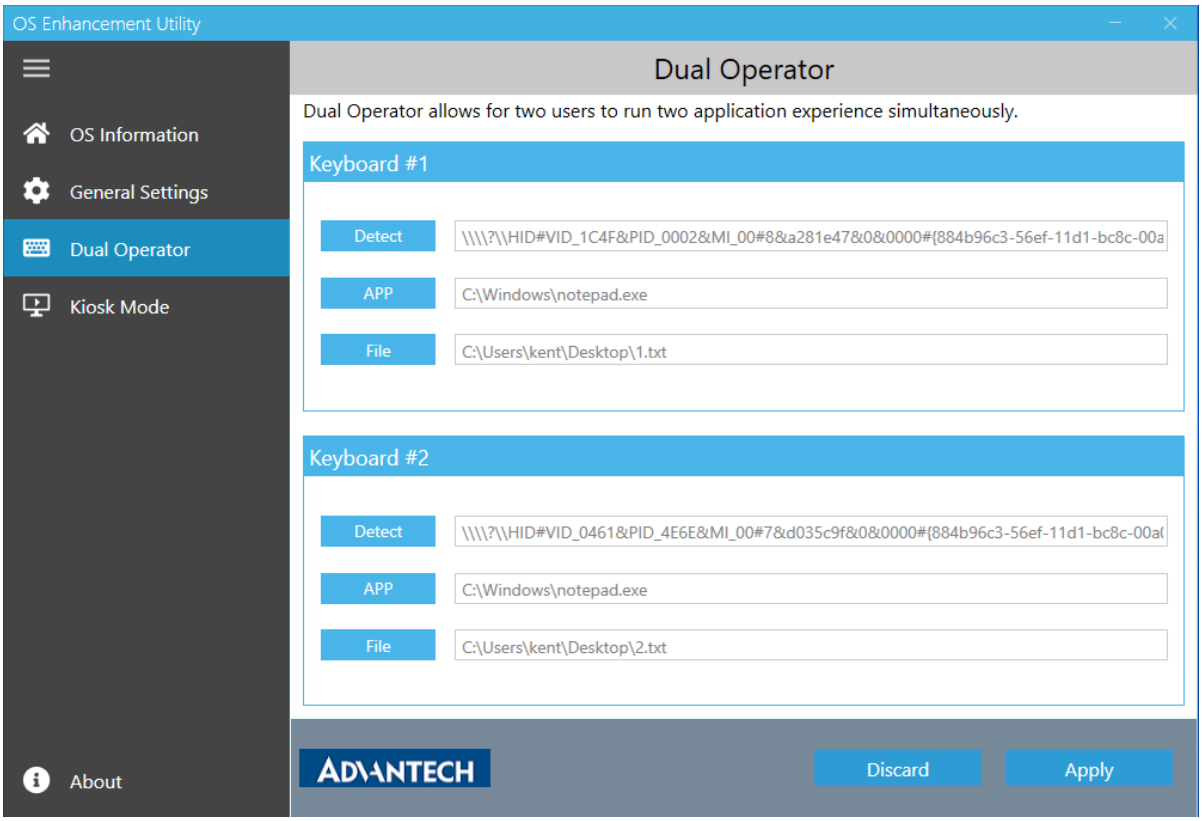
If the function of Dual Operator needs to work correctly after system restarts, please refer to 3.1-3.3.

3.5 Example

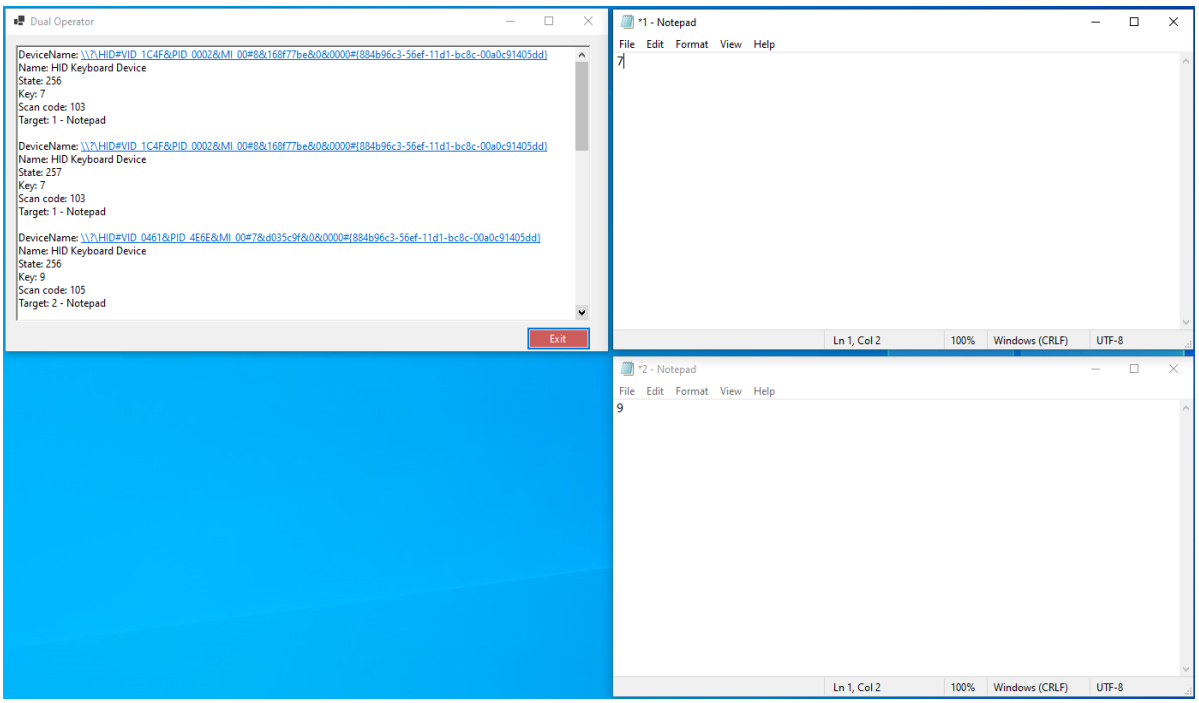
Fig3.5-1: Use two applications (notepad.exe) to combine individual keyboards.

Fig3.5-2: Display the result.

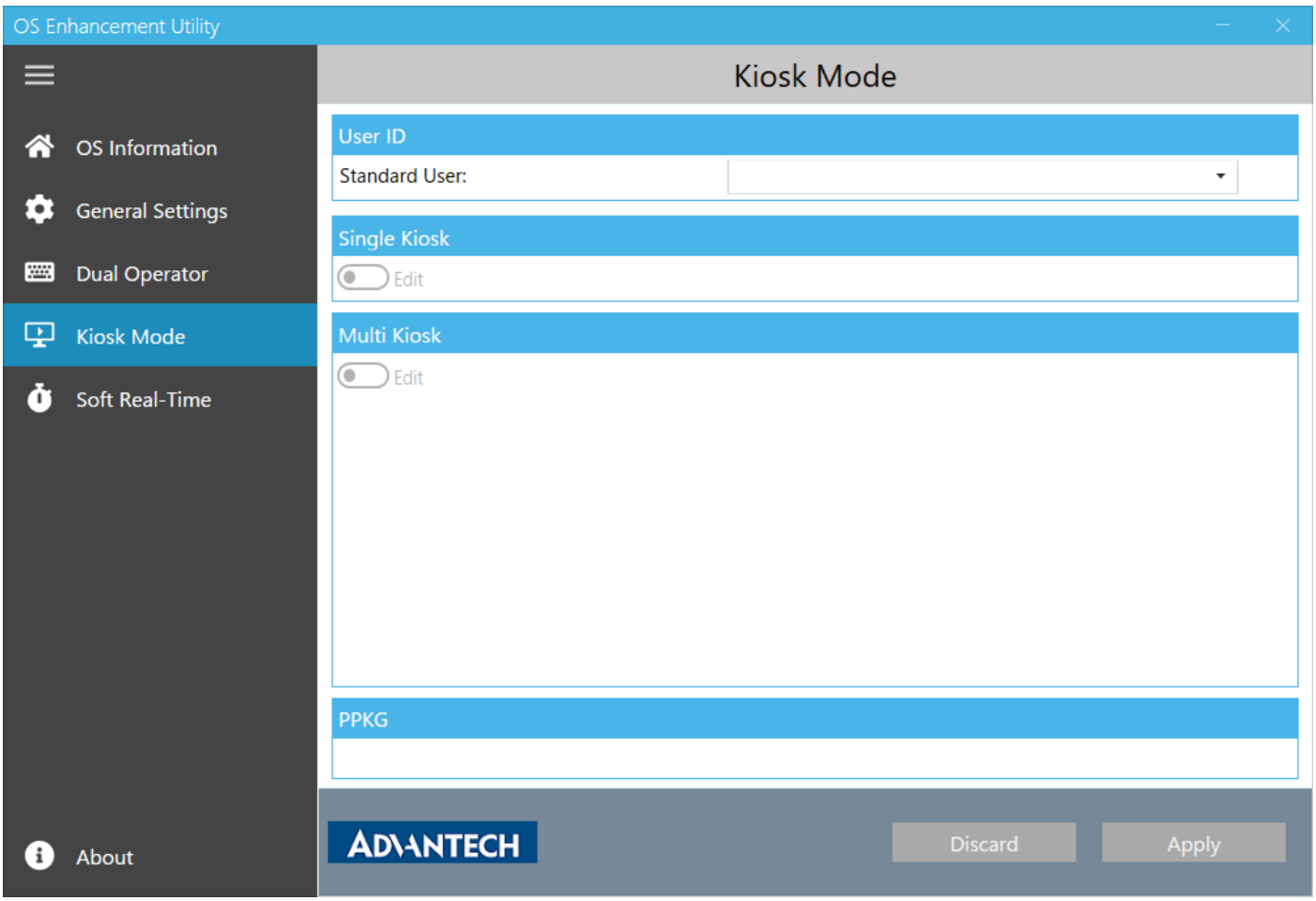
(**Fig3.5-1**)



(**Fig3.5-2**)



4 Kiosk Mode



4.1 Kiosk Mode Introduction

Kiosk mode is a common way to lock down a Windows device when that device is used for a specific task or used in a public setting.

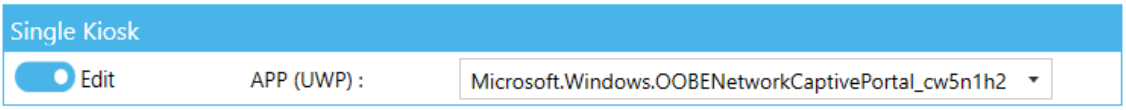
4.2 User ID

Select local account.

(Select Single Kiosk or Multi Kiosk)

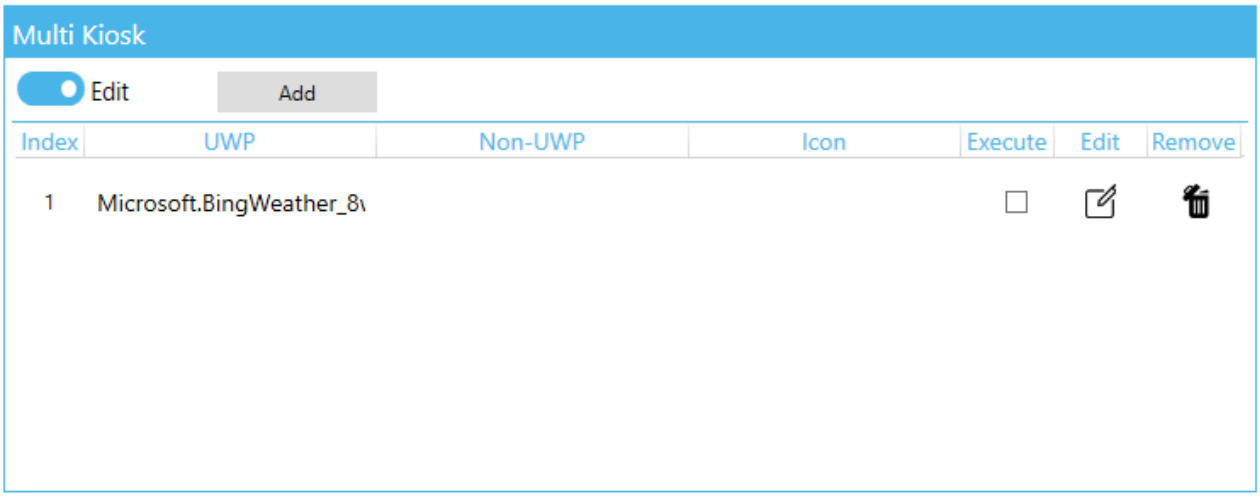
4.3 Single Kiosk

Select UWP application.



4.4 Multi Kiosk

Select more UWP applications or Non-UWP applications to the list.

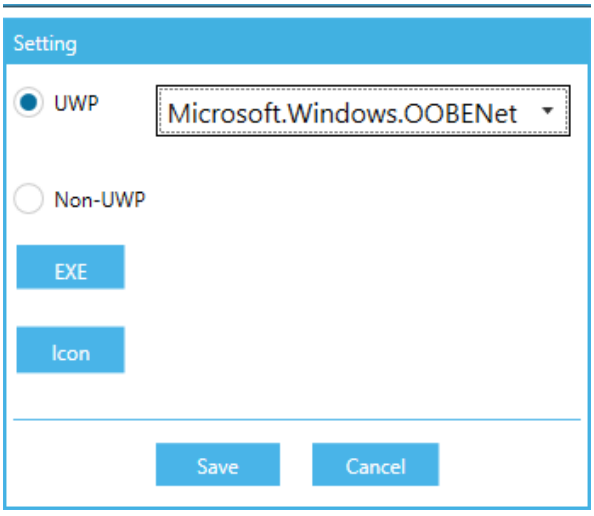


4.4.1 Add:

Display a dialog for selecting UWP or Non-UWP application information to the list.

4.4.2 UWP / Non-UWP application:

Select UWP application (AUMID).

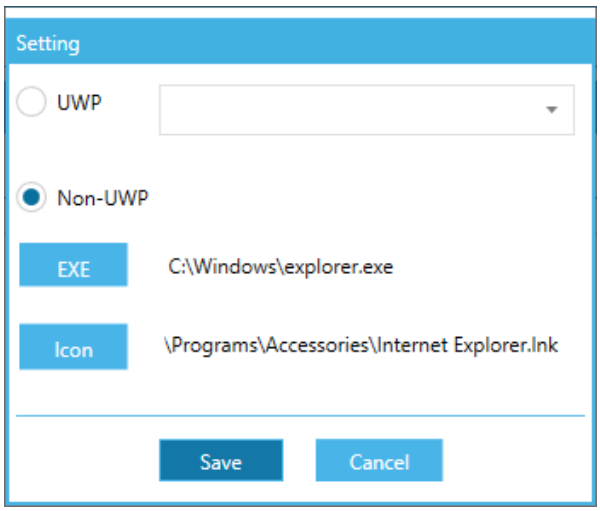


Select “Save” button: Add UWP application to the list.

<Note: Cant' select the same UWP application if you already selected it into the list>

Select Non-UWP application:

1. Exe: *.exe file location
2. Icon: *.lnk file location



Select “Save” button: Add Non-UWP application and icon information to the list.

<Note: Cant' select the same Non-UWP application if you already selected it into the list>

4.4.3 Applications list:

Index: Display the number of applications.

UWP: Display the AUMID of UWP application.

Non-UWP: Display the location of Non-UWP application.

Icon: Display the location of Non-UWP application link.

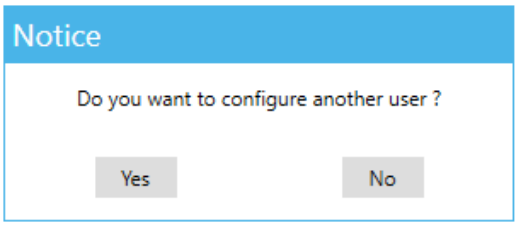
Execute: Select one application to run automatically when system boot up. You could also leave all Execute checkbox unchecked according to your design.

Edit: Edit this item.

Remove: Remove this item.

4.5 Apply

If you have more than one user in your system, this notification window will pop up



4.5.1 Yes:

1. Save the current user's setting.
2. Start a new setting for another user.

4.5.2 No:

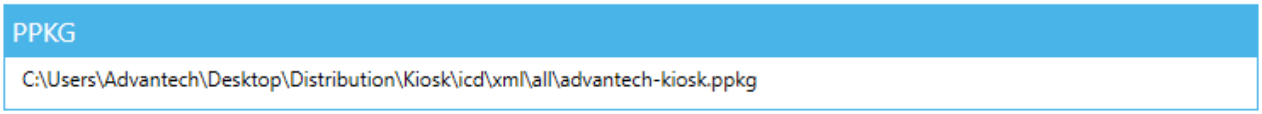
1. Save the current user's setting.
2. Export a ppkg file and install ppkg to current system.
3. Make sure the user's status is **Sign-out**.

4.6 Discard

Delete setting data according to the current user.

4.7 PPKG

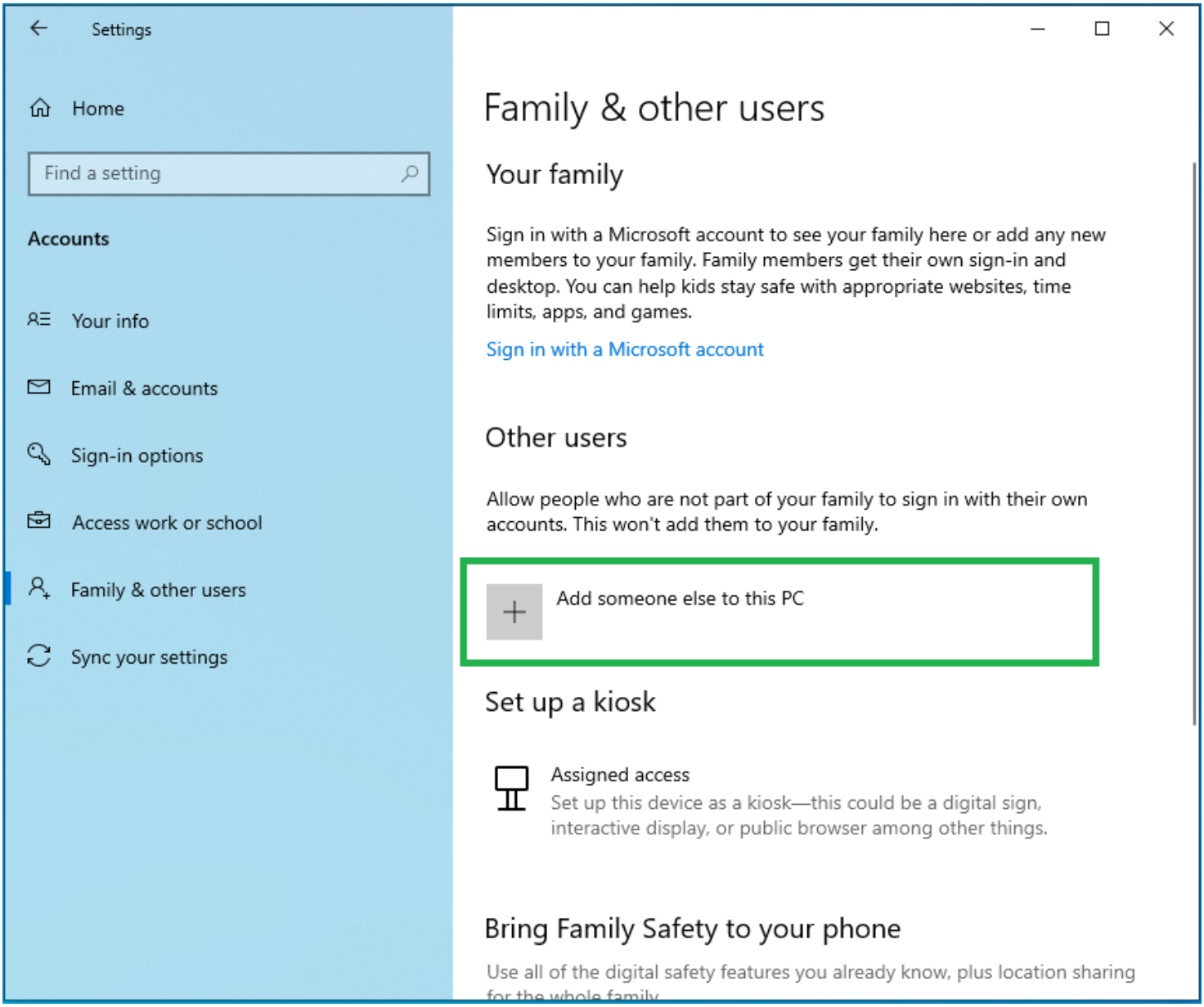
Display the location of ppkg exported.



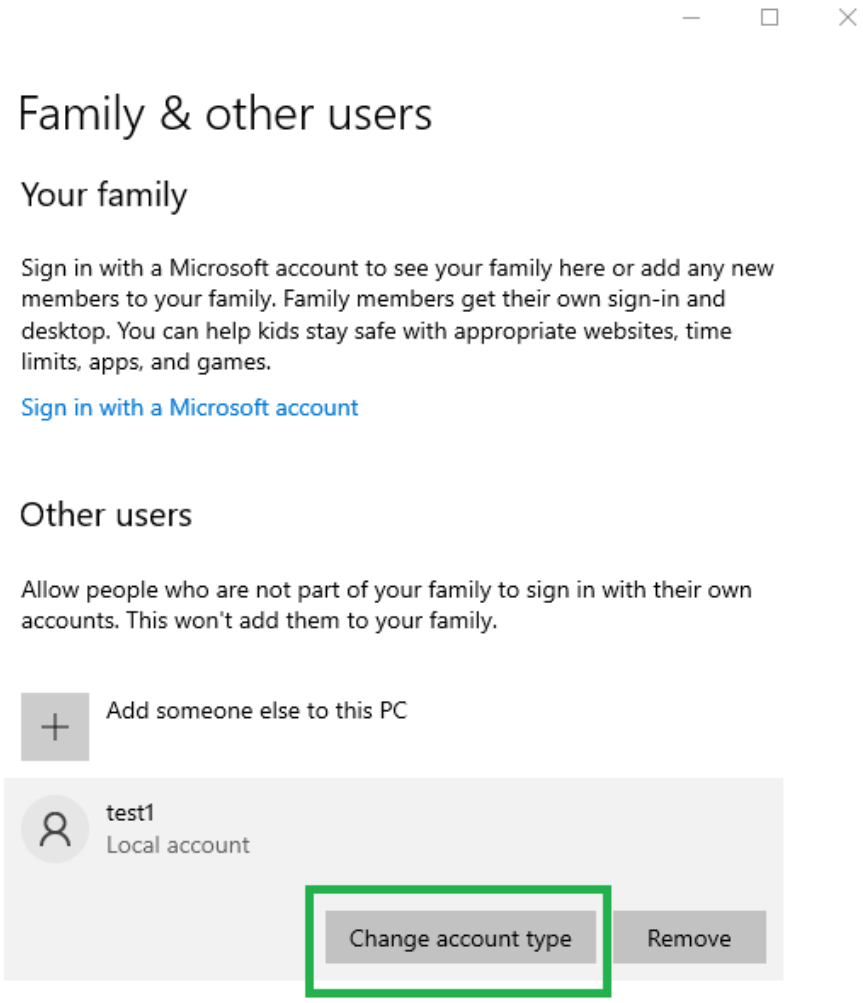
4.8 Local user: Add and Configure

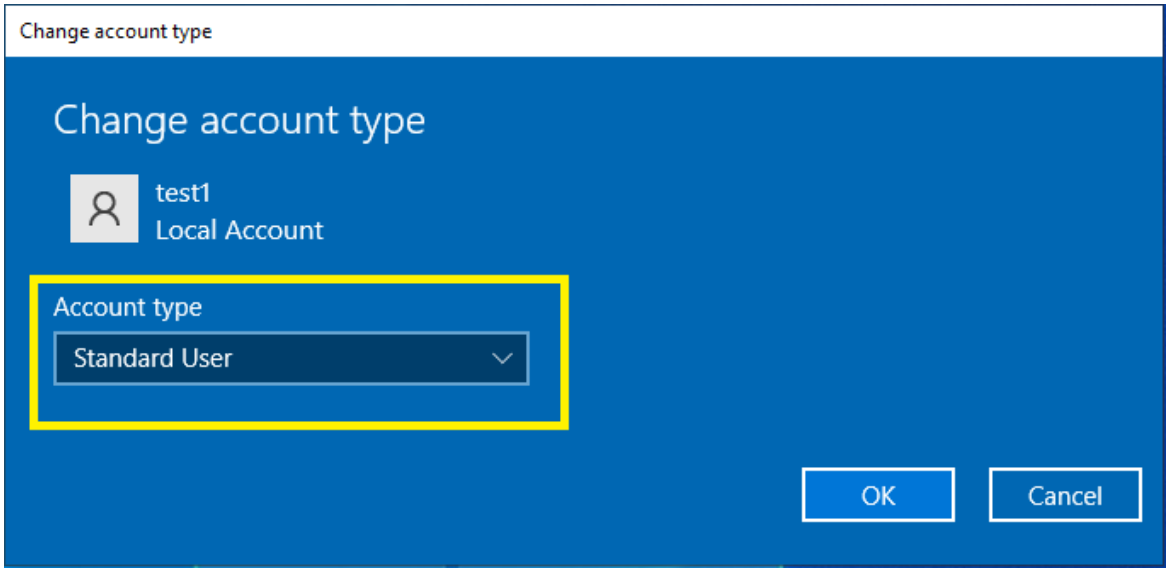
The following figures are methods about creating a new account in windows for Kiosk Mode.

4.8.1 Add a new account:

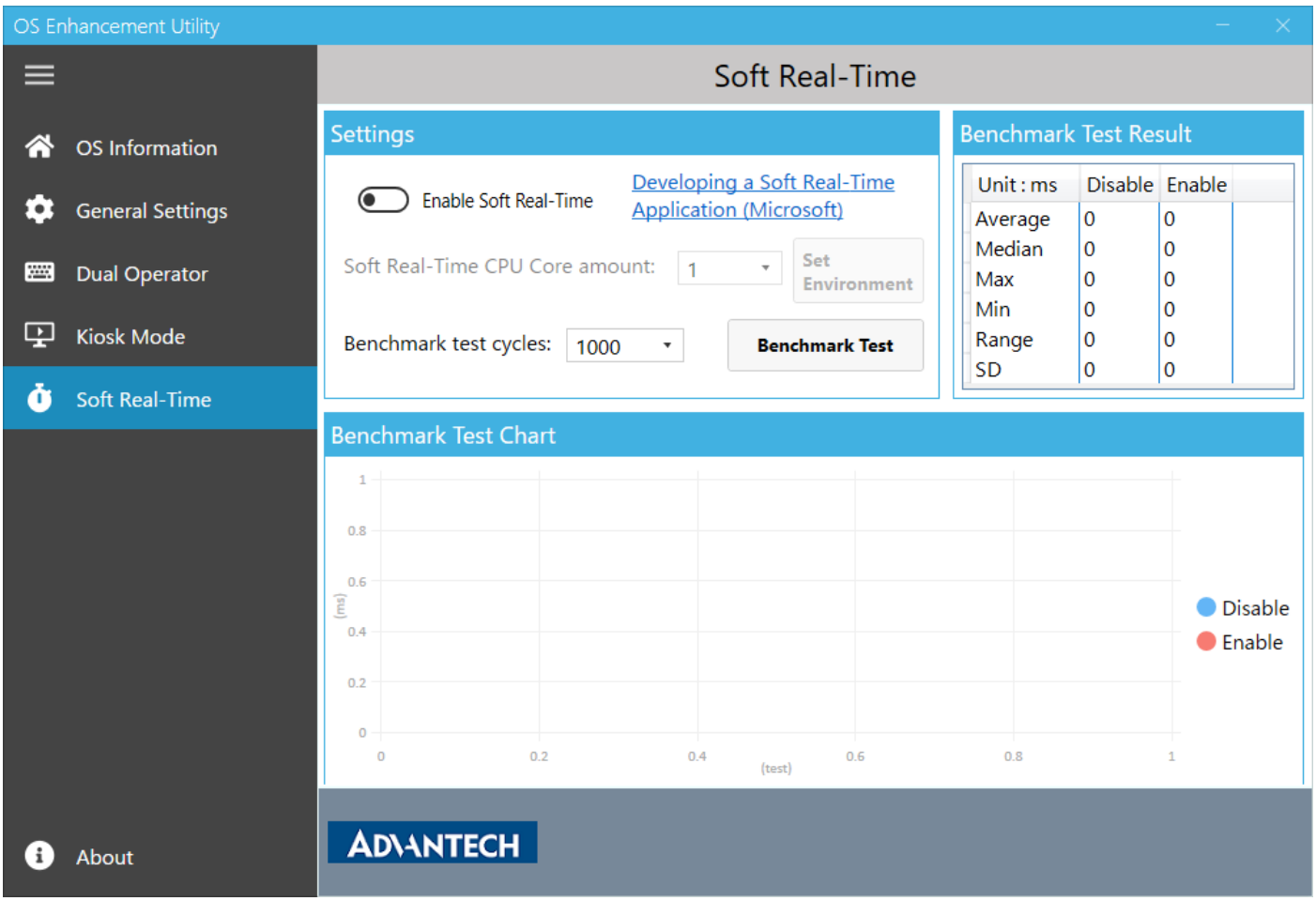


4.8.2 Configure account's type:





5 Soft Real-Time

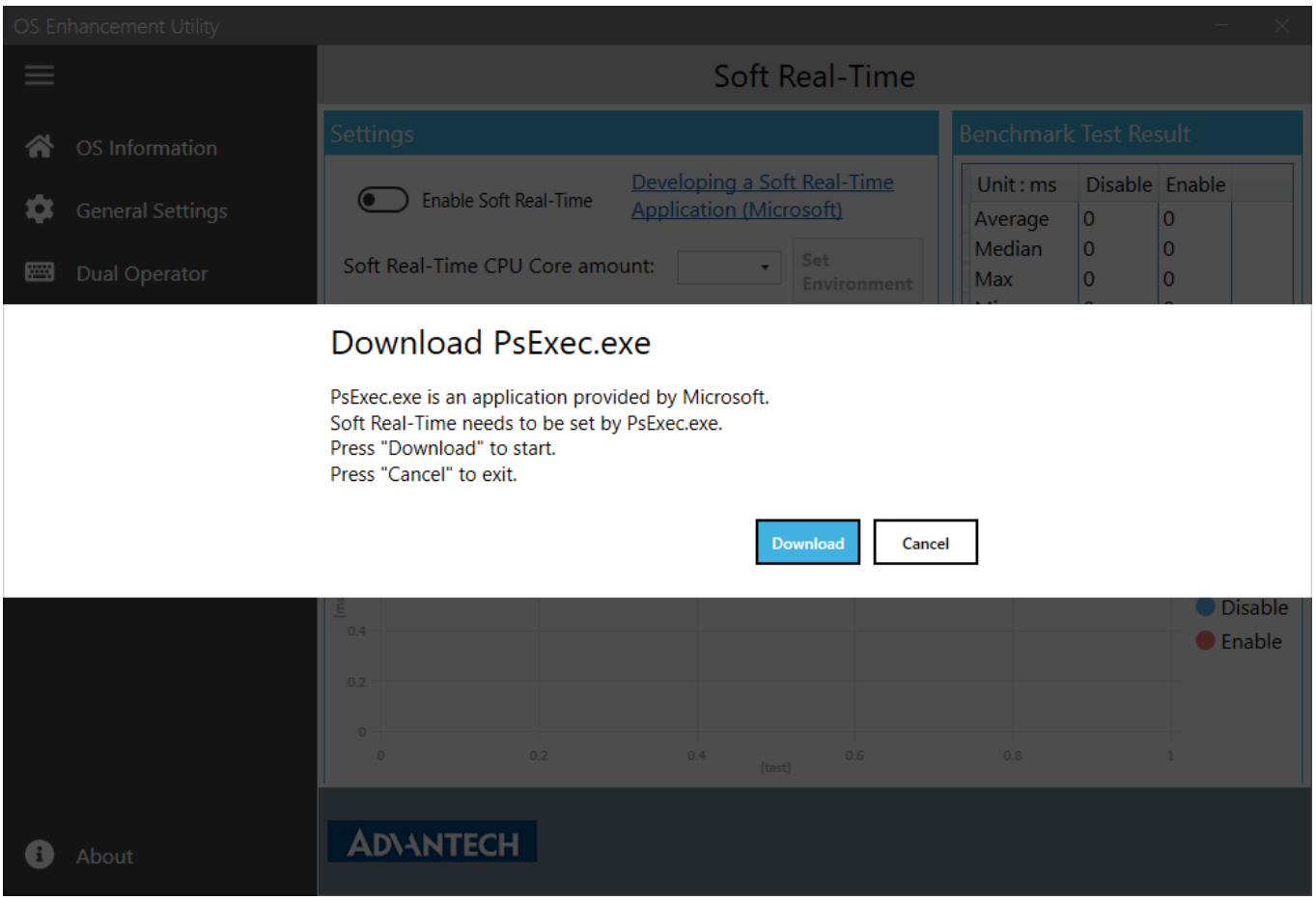


5.1 Soft Real-Time Introduction

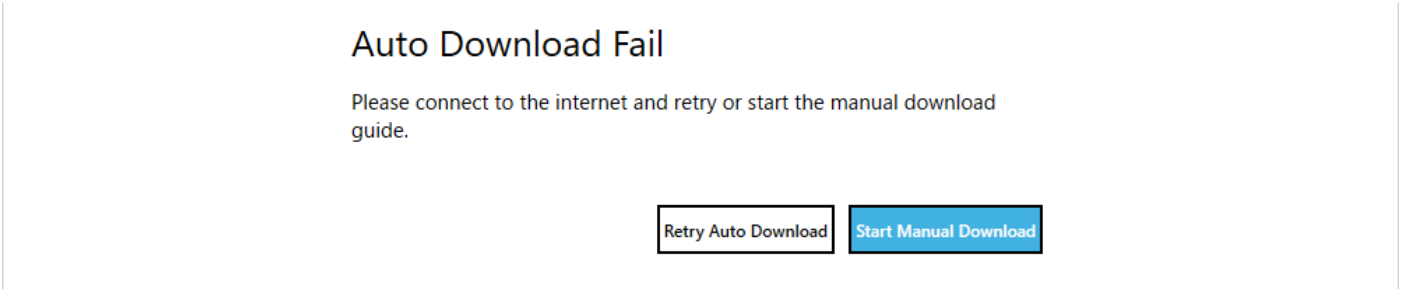
Soft Real-Time is a new feature provided with Windows 10 IoT Enterprise 21H2. OS Enhancement Utility gives an easy way to help you enable and test the Soft Real-Time feature.

5.2 Start up Soft Real-Time Page

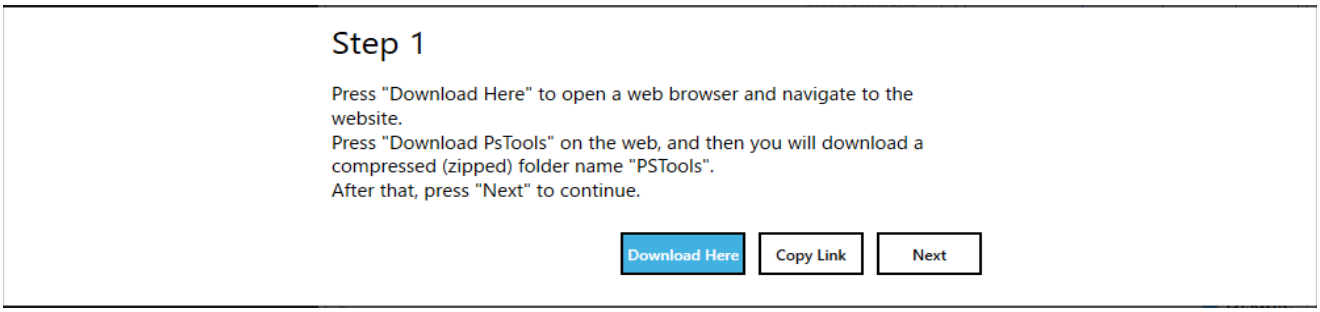
When the first time selects the Soft Real-Time page, the "Download PsExec.exe" guide page will pop up. PsExec.exe is a tool provided by Microsoft that can be used to set Soft Real-Time. Please connect to the internet and press the “Download” button to auto-download.



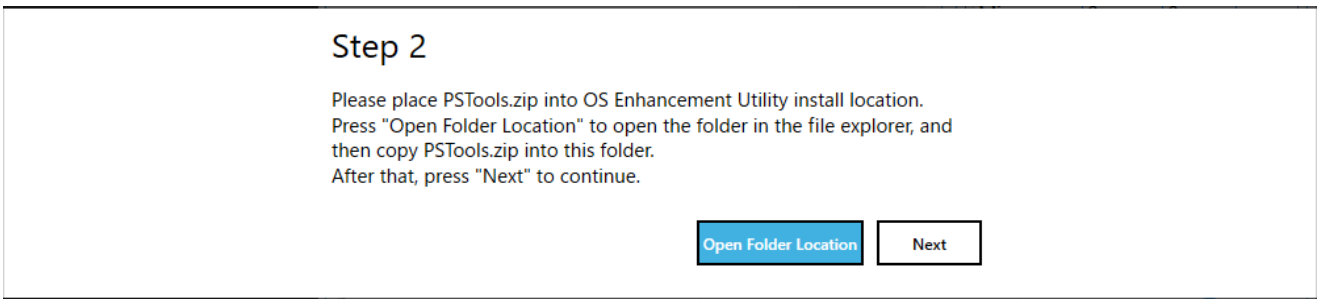
If you don't have the internet on your current computer or the auto-download fail, you can start the manual download guide.



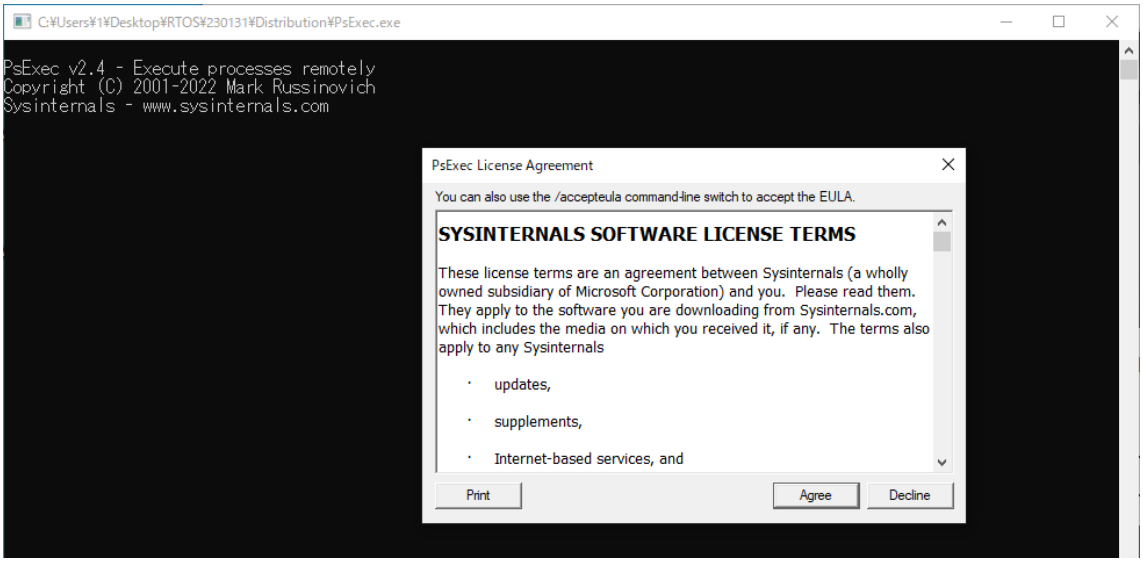
Please follow steps 1 and 2 to download the PsExec.exe manually.
You can press the “Copy Link” button and then paste the link to use in another computer with internet.
You can also download it from the below hyperlink:
https://docs.microsoft.com/en-us/sysinternals/downloads/psexec



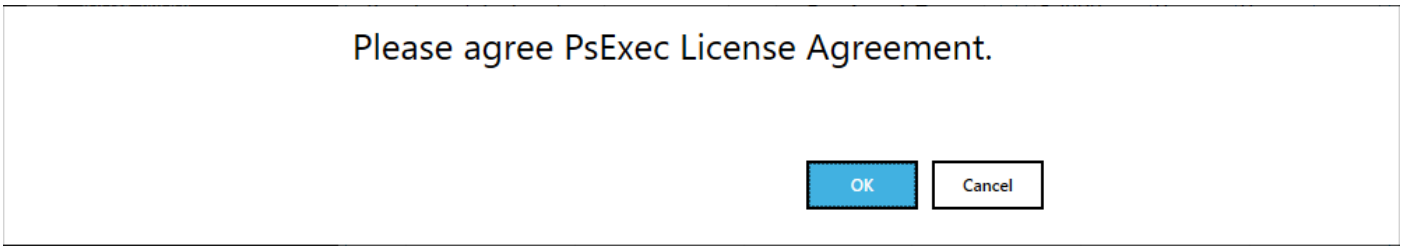
Please follow step 2 to put the PSTools.zip into OS Enhancement Utility install location and press "next." OS Enhancement Utility will auto-unzip the PSTools.zip and extract the PSTools.



After downloading PSTools, OS Enhancement Utility will start up the PsExec.exe. The license page of PsExec.exe will pop up. Please agree with the license to use PsExec.exe.

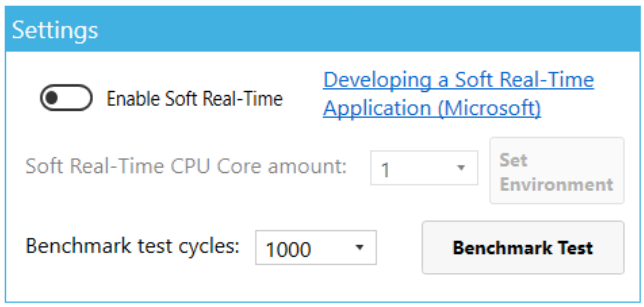


You can also press the "OK" button to execute PsExec.exe again if you close the license page accidentally.



5.3 Soft Real-Time Settings

The following subsection introduces “Settings.”



5.3.1 Enable Soft Real-Time

We suggest you test the benchmark before enabling soft real-time to compare the difference.

!!Notice: Enabling soft real-time is a NOT reversible setting. This setting will force the restart of the machine.

The settings below will be set by OS Enhancement Utility simultaneously.
!!Notice: These settings must to be set and maintain, otherwise, the system will malfunction and require reimaging to recover.

1. Disable the current power plan’s idle states.
2. Disable the following services:
   a. SysMain (Superfetch)
   b. DPS (Diagnostic Policy Service)
   c. Audiosrv (Windows Audio)
   d. wuauserv(Windows Update)
3. Disable Windows Update.
4. Configure network interface controller Receive Side Scaling (RSS), during the setting might cause an internet disconnect for a few seconds.

5.3.2 Developing a Soft Real-Time Application (Microsoft)

This hyperlink will take you to the Microsoft website and guide you on how to develop your own soft real-time application.

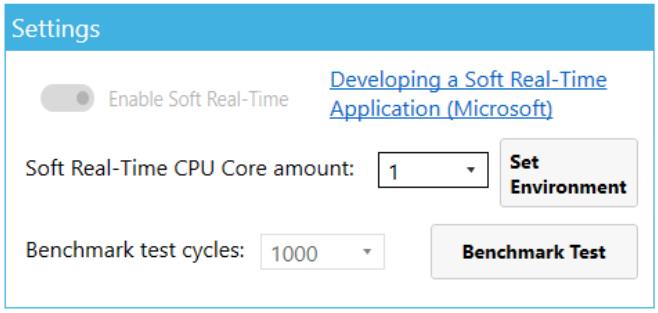
The hyperlink is as below:

https://learn.microsoft.com/en-us/windows/iot/iot-enterprise/soft-real-time/soft-real-time-application

5.3.3 Soft Real-Time CPU Core amount

After enabling the soft real-time, "Soft Real-Time CPU Core amount" can be set. This setting determines the current amount of soft real-time CPU core. It is set immediately after your selection.

!!Notice: This setting will force the restart of the machine.



Soft real-time CPU core maximum amount is CPU physical cores amount subtract 1. The core 0 will leave for system and non-real-time tasks. So physical two core CPU will only show one core at this setting. The soft real-time core amount setting will start with the highest core and go downwards. For example, when the "Soft Real-Time CPU Core amount" is set as 3 cores, at 4 core CPU will set cores 3, 2, and 1 to run as soft real-time and leave core 0.

Only support one CPU.

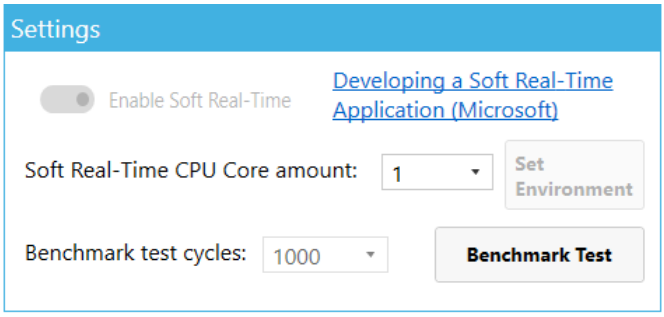
Support from 2 to 64 physical cores.

5.3.4 Set Environment

The “Set Environment” button is available when the soft real-time is enabled with the environment checks failing. Whenever this page loads with soft real-time enabled, OS Enhancement Utility scans whether the environment keeps. Some environment settings will be changed by Windows. If you are not using the related environment settings, please press the “Set Environment” button when available.

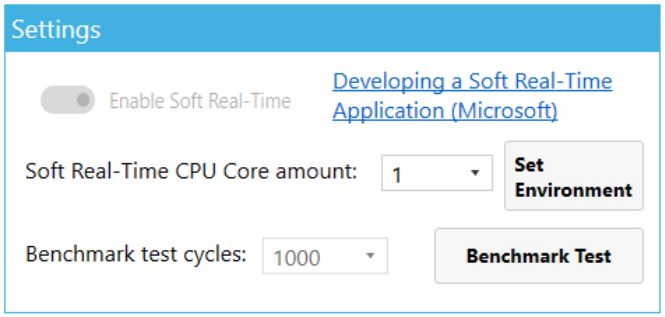
Environment scans pass:

No need to set.



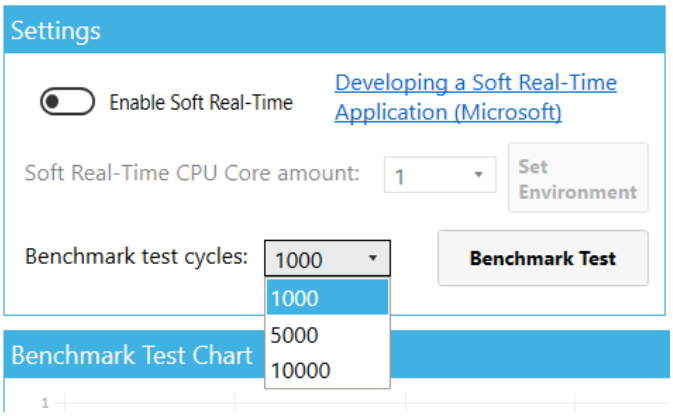
Environment scans fail:

Please press the “Set Environment” button to set the environment again.



5.3.5 Benchmark test cycles

Benchmark test cycles can set the testing time as 1000, 5000, or 10000. This effect the benchmark test running time and the result's reliability. The number means how many times the testing code will be run and create how many test results.



This value will be fixed at the last time test cycles. If the benchmark has never been tested the current selection will be fixed.

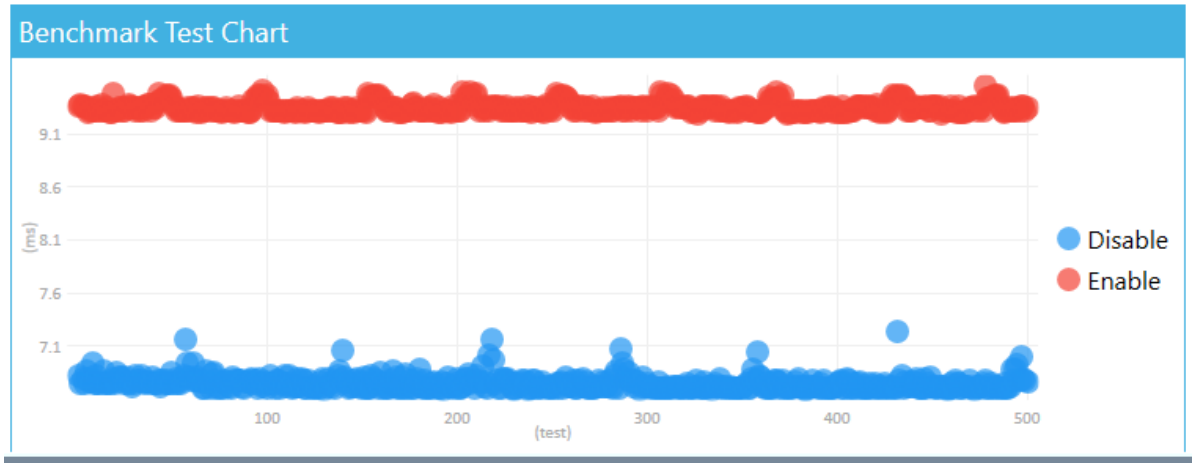
5.3.6 Benchmark Test

Benchmark test will use the I/O port 0x80 to test. Please make sure the I/O port 0x80 is not in use during the test. CPU will be full load during the benchmark test. OS Enhancement Utility might not respond, please wait for it or select "Wait for the program to respond." The Benchmark test relies on a Secured & Unified Smart Interface (SUSI) to run. SUSI is an application provided by Advantech, so please ensure that it is installed before running the OS Enhancement Utility.

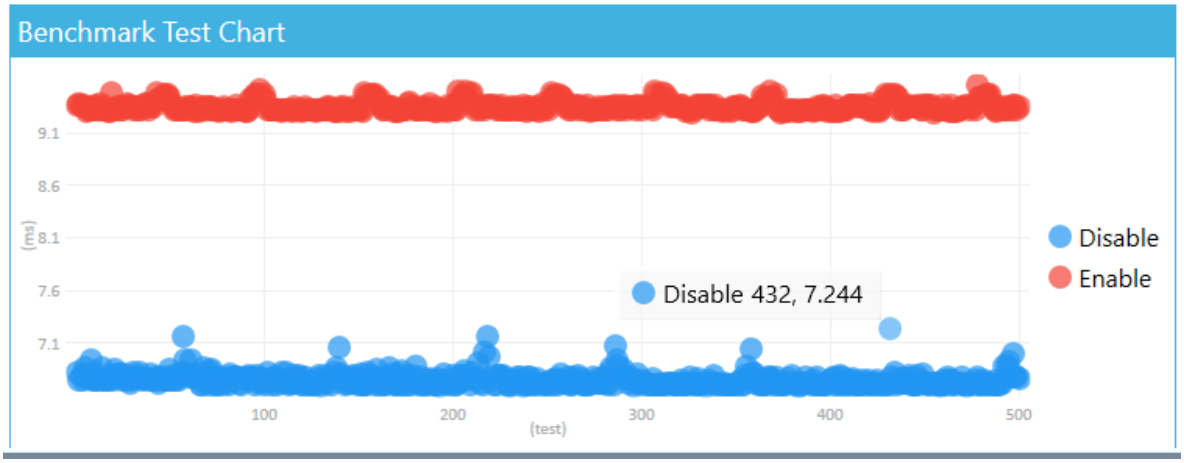
Benchmark testing time depends on the test cycles selected and CPU performance. Benchmark test will run the testing code and measure the running time.

5.4 Benchmark Test Chart

Not all test results will be shown in this chart. The benchmark test chart will pick the result's maximum and minimum 250 test points of Disable and Enable to show the trend of the result. The result points will be shown by the test order. The horizontal axis represents the test order. The vertical axis shows the running time in milliseconds.



You can put the cursors on the result point to show the value.



5.5 Benchmark Test Result

Benchmark test result shown in milliseconds. This result is calculated by all benchmark test cycles results.

Average is the arithmetic mean of the result.

Max is an abbreviation for maximum.

Min is an abbreviation for minimum.

Range is the maximum subtract minimum.

SD is an abbreviation for corrected sample standard deviation. Standard deviation is a measure of the amount of dispersion of results.

Benchmark Test Result

Unit : ms	Disable	Enable
Average	6.741	9.338
Median	6.727	9.33
Max	7.244	9.549
Min	6.693	9.291
Range	0.551	0.258
SD	0.049	0.035

Average, Median, Max, and Min at enabled might be longer than the disabled. This is reasonable. Soft real-time feature provides predictable and more stable performance but might not be faster. If the Range and SD at enabled are faster than disabled are in line with our expectations. The comparing result depends on the CPU, network interface, computer utilization, and other reason.

You can develop a soft real-time application that follows the Microsoft soft real-time development guide to test your task's performance.

Through the configuring on the utility, you can efficiently customize and build up your Windows 10 IoT Enterprise image. Should you have any suggestion, please feel free to feedback to us Suggestion Link.

APPENDIX

Change History

Version	Change content	Status
V1.0	First version	Released
V1.1	Add Dual Operator & Kiosk Mode feature	Released
V1.2	Add Soft Real-Time	Released
V1.3	Support Windows 11 IoT Enterprise	Released