KINGSTAR 3.8

MOTION SDK

INSTALLATION GUIDE

KS-DOC-x64-0003-R23

IntervalZero

KINGSTAR IntervalZero

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KINGSTAR Motion

KINGSTAR Motion provides two installations: a Runtime and a Software Development Kit (SDK). The Runtime supplies the KINGSTAR Motion Subsystem that will be deployed as part of your application, while the SDK supplies headers and libraries for you to develop your own KINGSTAR applications.

KINGSTAR also provides Runtime Merge Modules components for you to incorporate Runtime into your installer.

KINGSTAR Motion Software Development Kits (SDK) contains:

- Headers and libraries used to develop KINGSTAR Motion applications.
- Support the following developer tools: Visual Studio 2019, 2017, 2015, 2013, and 2012.
- Source code for sample applications.

Product editions and requirements

The difference between product editions and the hardware, software requirements for KINGSTAR are listed below.

Product editions

KINGSTAR Motion provides the following Runtime editions.

Edition	Supports
ENTRY	• 1-millisecond timer, and 1 core dedicated to real-time I/O and motion control. • Motion capabilities, including T-Curve, S-Curve, aliasing, basic ladder logic and PLCopen. • EtherCAT capabilities with simulated drives and I/Os support.
PRO	• 100-microsecond timer, and up to 3 cores dedicated to real-time I/O and motion control. • Motion capabilities, including T-Curve, S-Curve, aliasing, basic ladder logic, PLCopen, torque and Tuning Console. • EtherCAT capabilities with simulated drives and I/Os, and 3rd party EtherCAT master support. • PLC and EtherCAT safety add-on.

Hardware requirements

This section lists hardware requirements for KINGSTAR and the considerations about processors.

Drives and I/O

KINGSTAR supports many servo drives, stepper drives, EtherCAT I/O modules and EtherCAT couplers. For the up-to date list, see the KINGSTAR Supported Hardware PDF file at kingstar.com.

Network interface card (NIC)

KINGSTAR requires a dedicated NIC. The NIC is configured when the Install Wizard is run. For the up-to-date list, see the KINGSTAR Supported NIC PDF file at kingstar.com.

EtherCAT

KINGSTAR uses EtherCAT technology for communication. Do the following to set up the EtherCAT network:

1. Make sure your computer and devices have the network interface cards (NICs) or chips that support the EtherCAT protocol. The EtherCAT protocol allows up to 65,535 devices to be connected. To know whether the hardware supports EtherCAT:

    - Computers: In Windows, go to **Device Manager** and find the NIC under **Network adapters**. Make a note of the model number of the NIC. Check the KINGSTAR online help from kingstar.com > **Support** > **Soft Motion Help** > **Network interface cards**, or check the offline help by clicking **Start** > **KINGSTAR Runtime** > **Help System** > **Network interface cards**. If your NIC is listed in the document, it supports EtherCAT.

    - Devices: See the manual of your device, or contact the device manufacturer.

2. Prepare the Ethernet cables that are CAT-5 (Category 5) or higher. The transmission rate needs to be at least 100 Mbps.

3. Connect your computer and devices using the Ethernet cables.

Hardware considerations

KINGSTAR requires a multiprocessor platform that supports 64-bit Windows 10 with Update, Windows 10 IoT Enterprise, Windows 8.1 with Update or Microsoft Windows 7 with Service Pack 1. Uniprocessor systems are not supported. At minimum, two cores are required; one core must be dedicated to Windows and another core must be dedicated to the KINGSTAR Subsystem. Systems with up to 64 cores are supported.

NOTE: If your system is hyper-threaded, you should assign an even number of processors between Windows and KINGSTAR real-time components. The Windows logical processor and real-time logical processor must not share the same physical processor.

Some hardware configurations are not supported by the KINGSTAR Runtime installations. Although KINGSTAR runs on most x64 platforms, unique attributes of some processors require special consideration before using them in your system.

- For a comprehensive list of approved and supported hardware, see the Windows hardware certification web page:
- https://docs.microsoft.com/en-us/windows-hardware/drivers/dashboard/windows-certified-products-list
- For a comprehensive list of system requirements for Windows 10, see the Windows 10 System Requirements web page:
- https://www.microsoft.com/en-us/windows/windows-10-specifications
- For a comprehensive list of system requirements for Windows 8.1, see the Windows 8.1 System Requirements web page:

  https://support.microsoft.com/en-us/help/12660/windows-8-system-requirements

Software requirements

This section lists software requirements for KINGSTAR and things to know before you install the software.

Operating system requirements

KINGSTAR are supported on 64-bit multiprocessor configurations for the following operating systems:

- Windows 10 November 2019 Update Version 1909
- Windows 10 May 2019 Update Version 1903
- Windows 10 Spring Creators Update Version 1803
- Windows 10 Fall Creators Update Version 1709
- Windows 10 IoT Enterprise Long Term Servicing Channel (LTSC) Version 1607
- Microsoft Windows 8.1 with Update
- Windows Embedded 8.1 (must support MSI installation to allow RTX64 to be installed)
- Microsoft Windows 7 with SP1
- Windows Embedded Standard 7 with SP1 (must support MSI installation to allow RTX64 to be installed)

Microsoft Visual Studio

Microsoft Visual Studio 2019, 2017, and 2015 with at least Update 3, must be installed in your system if you want to develop KINGSTAR applications.

Microsoft .NET Framework

Microsoft .NET Framework 4.5.1 is required. It the client is not detected, the Install Wizard installs the client for you.

Real-Time Subsystem

KINGSTAR requires, at minimum, RTX64 3.7.1 Runtime. If it is not already installed in your system, the product installer installs and configures the RTX64 real-time Subsystem for you.

Real-Time Software Development Kit

KINGSTAR SDK is required for KINGSTAR application development. If it is not already installed in your system, the Install Wizard will install and configure the SDK for you.

Administrator privileges

Administrator privileges are required for installing and uninstalling the KINGSTAR, which provides local Windows Groups to control user access to KINGSTAR features. By default, all users can access the KINGSTAR features. You should modify groups to limit the access to specific users.

Request a free trial

For access to evaluation kits, go to http://kingstar.com/download-trial/. In the form that appears, select KINGSTAR from the product choices, fill out the contact information, and then click **Start Trial**.

Install KINGSTAR Motion SDK

After purchasing KINGSTAR Motion SDK, you will receive an email confirmation that includes the activation key and a link to the KINGSTAR Motion download page. After downloading the file, complete the steps that follow to install KINGSTAR Motion SDK.

In this guide, our operating system is Windows 10.

NOTE: If you are using Visual Studio as your development environment and you want to create your application in the RT interface, you need to install Visual Studio before you install SDK. KINGSTAR will find the installation path of Visual Studio and install RTX64 extensions for Visual Studio automatically. If you install SDK first, you need to install RTX64 extensions manually: Go to `C:\Program Files\IntervalZero\RTX64 SDK\<Version Number>\VSExtensions`. Double-click `RTXProjectWizard.vsix` to install the RTX64 templates.

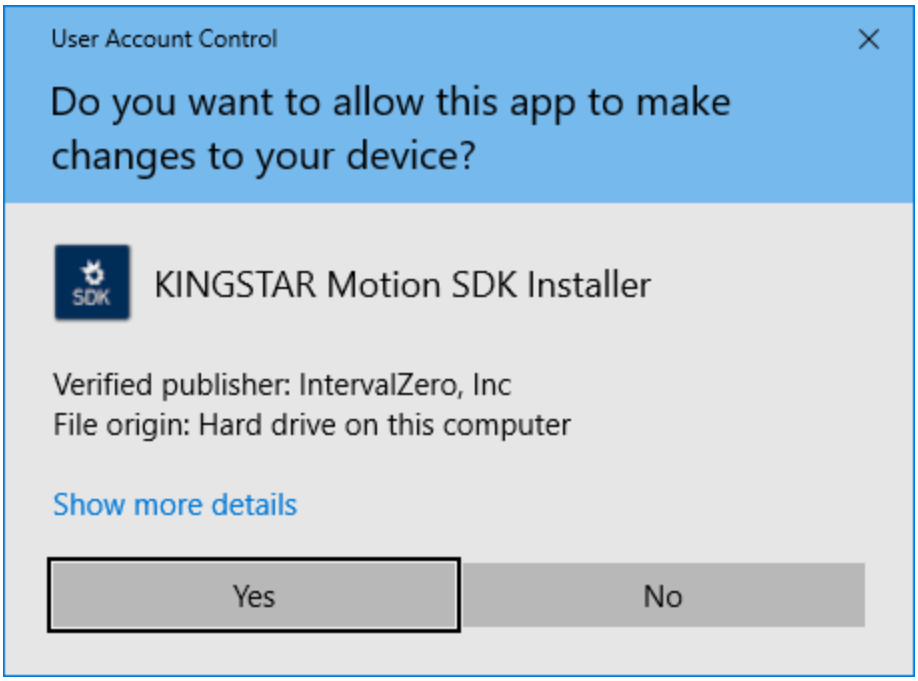
NOTE: If you are using Visual Studio 2017 and the `RTXProjectWizard.vsix` installation is failed, double-click `RTX64VSSupport.vsix`, which installs RTX64 files for Visual Studio.

1. Go to **Control Panel** > **Uninstall a program**. Select the previous version of KINGSTAR Motion SDK from the list and uninstall it. The RTX64 SDK should be uninstalled together with KINGSTAR Motion SDK. If not, uninstall it manually.

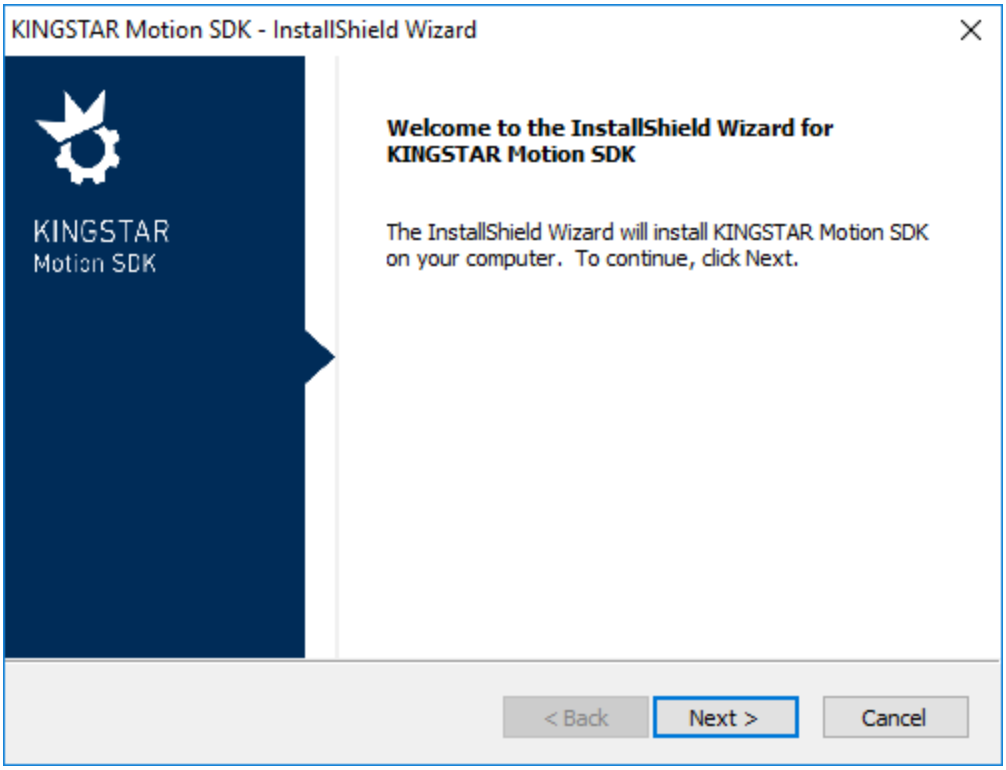
   IMPORTANT: Because KINGSTAR Motion SDK 3.8 is incompatible with its previous versions, you need to uninstall the previous KINGSTAR Motion SDK version before installing v3.8.

2. Double-click `KINGSTARMotionSDKInstaller.exe`.

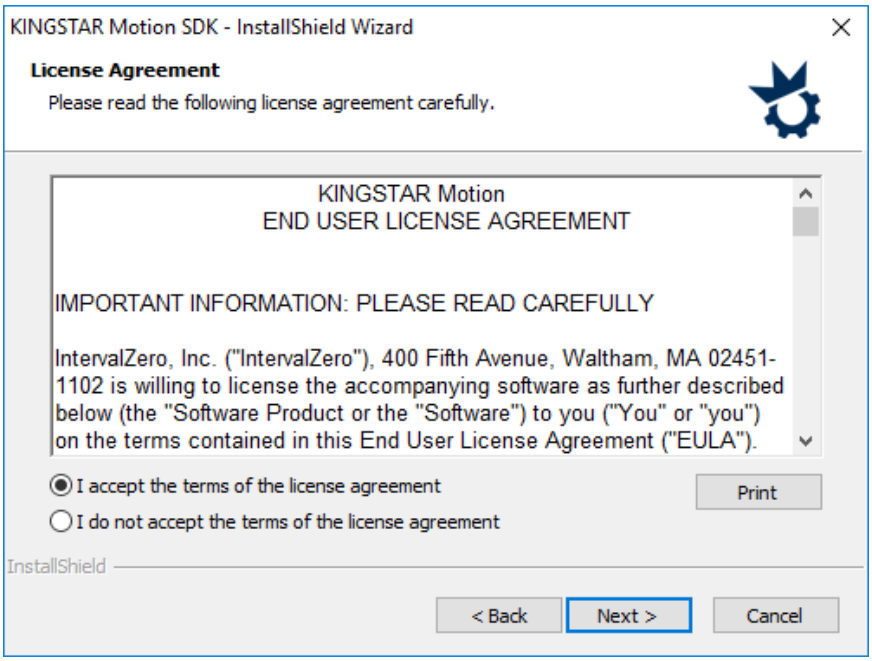
   NOTE: You must have the administrator permission to install KINGSTAR Motion SDK. Before the installation begins, the **User Account Control** dialog box may ask if you want the installer to make changes to your computer. Click **Yes** to continue the installation.



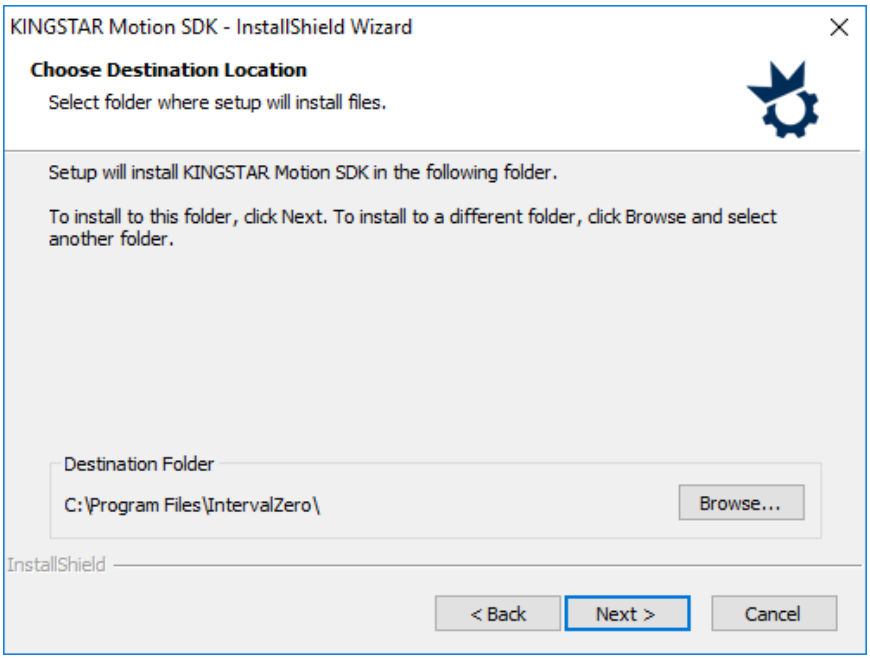
3. In the **KINGSTAR Motion SDK - InstallShield Wizard** dialog box, click **Next** to begin the installation.



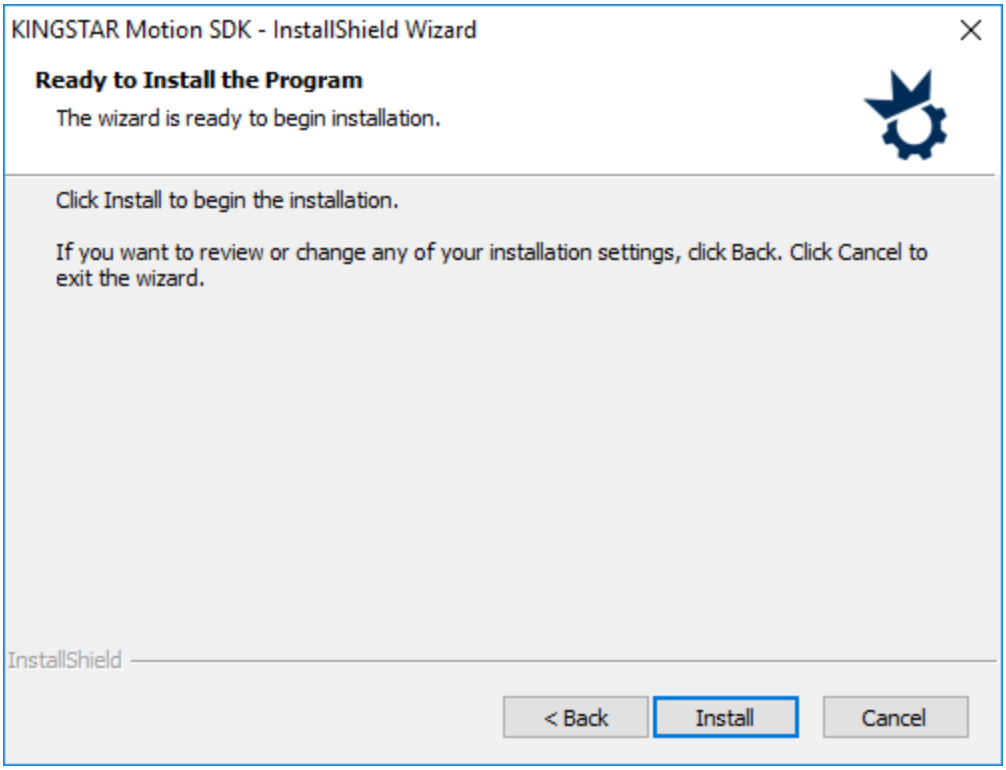
4. Read the End User License Agreement, select **I accept the terms of the license agreement** and click **Next**.



5. Choose the location you want to install KINGSTAR Motion SDK. You can accept the default installation path, or click **Browse** to choose a different location. When you are done, click **Next**.

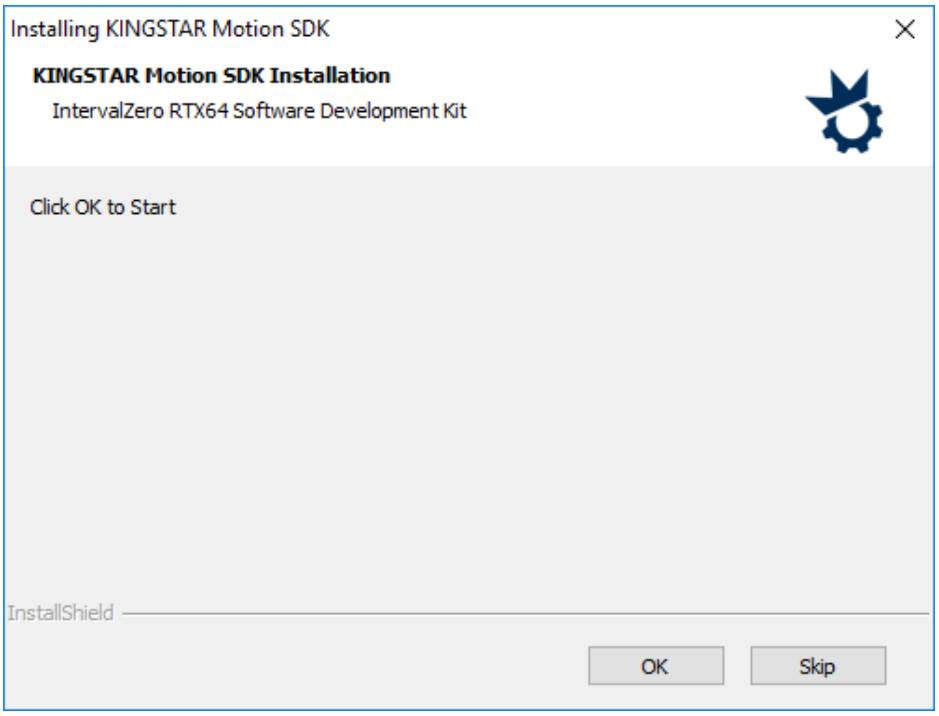


6. Click **Install** to install KINGSTAR Motion SDK.

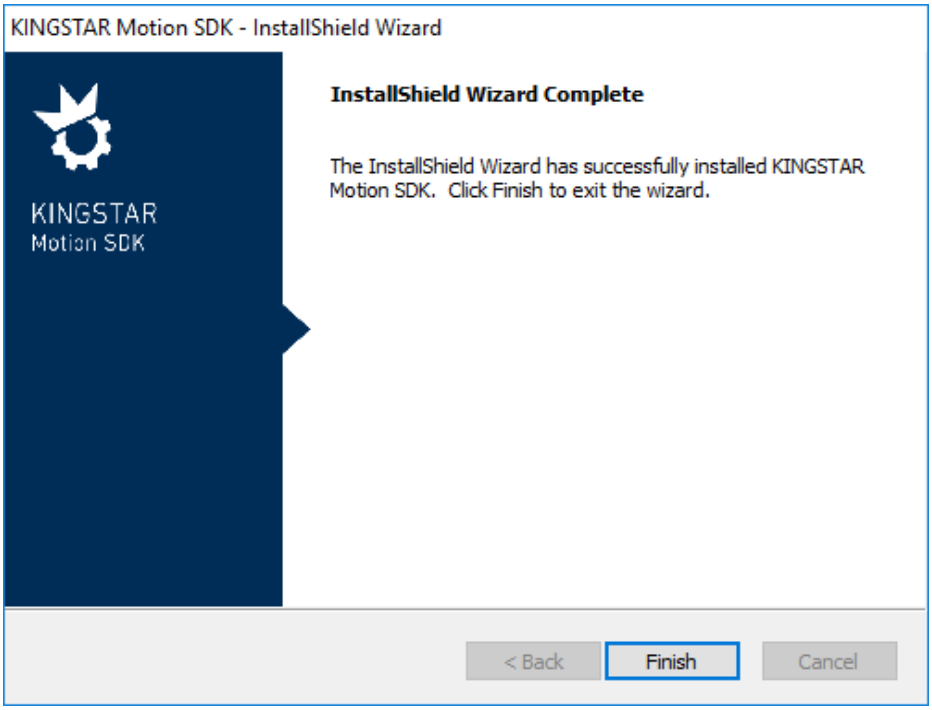


7. In this step, you may choose whether to install RTX64 SDK.

   - If you've already installed an old version of RTX64 SDK and don't want to update to the latest version, click **Skip**.
   - If you've already installed the latest RTX64 SDK, click **Skip**.
   - If you've already installed an old version of RTX64 SDK and want to update to the latest version, click **OK**.
   - If you didn't install RTX64 SDK, click **OK**.



8. After the installation is complete, click **Finish** to close the wizard. For more information about activating your KINGSTAR Motion components, see Activate and configure KINGSTAR.



Activate and configure KINGSTAR

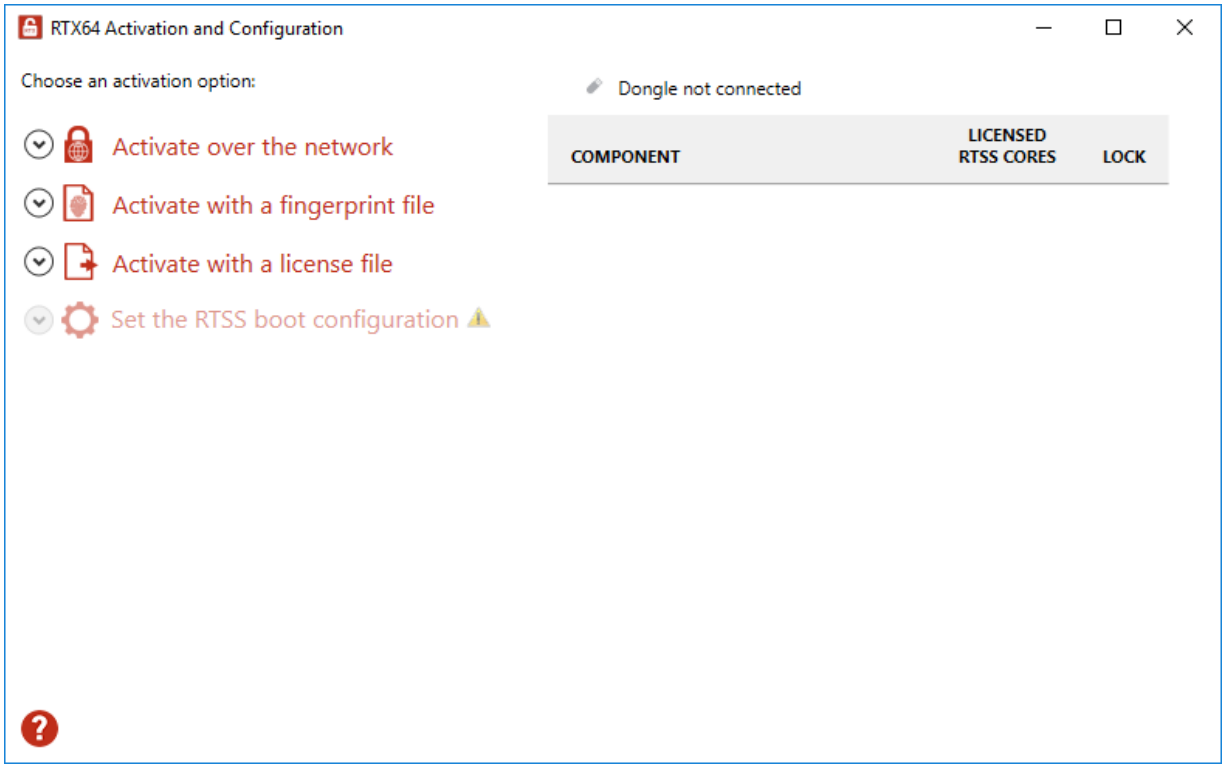
The following steps to activate and configure KINGSTAR is applicable to KINGSTAR 3.5 and later version.

Activate over the internet

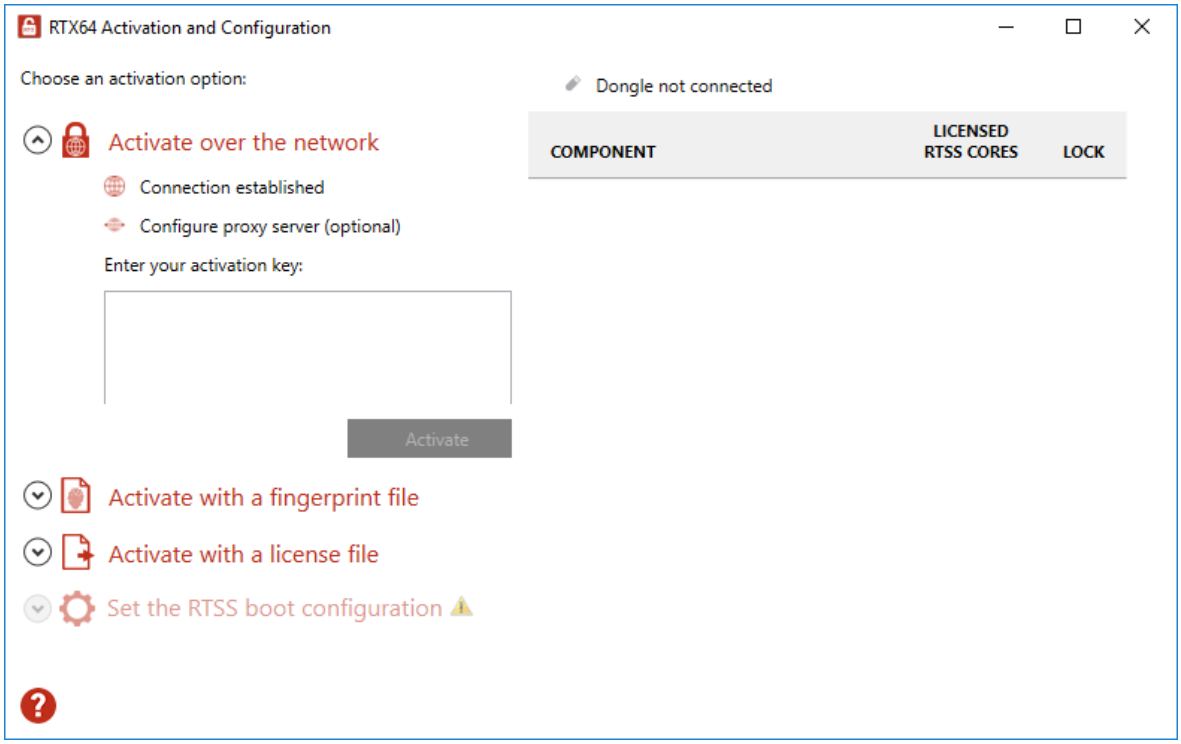
Follow the steps below if you can access the IntervalZero license server. If you do not have the internet access, see the section Activate by the file.

1. On the taskbar, click **Start** > **RTX64 3.7.1 Runtime** > **Activation and Configuration**. The **RTX64 Activation and Configuration** dialog box appears.

   NOTE: You must have administrative permissions to launch this utility. Before the utility starts, the **User Account Control** dialog box may ask if you want to allow this app to make changes to your device. Click **Yes** to continue.



2. Click **Activate over the network**. Make sure your machine is connected to the internet with access to the IntervalZero license server. If a connection is available, you will see **Connection established**. If the connection is not available, make sure all network cables are plugged in and click Unable to establish a connection to refresh. If the connection is still not available, you may need to configure a proxy server.



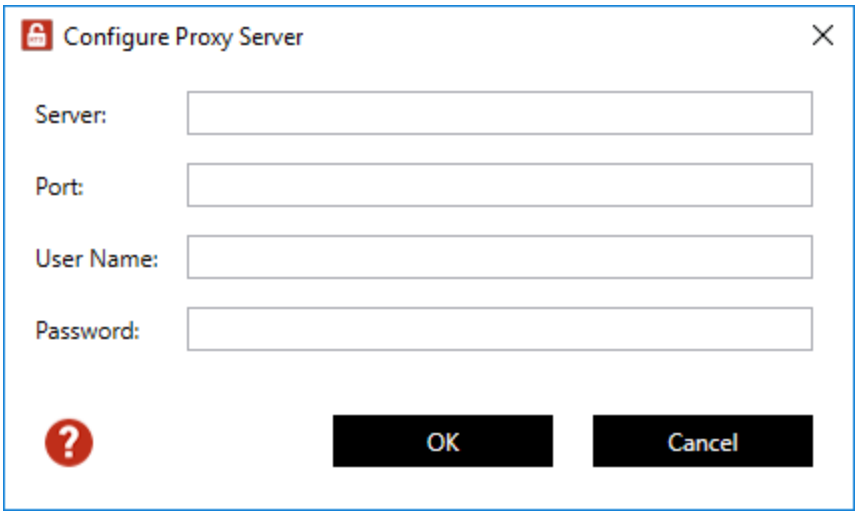
3. To configure a proxy server:

   a. Click **Configure proxy server**.

   b. In the **Configure Proxy Server** dialog box, enter the information in the empty boxes and click **OK**. The information should be available from your IT department.

      NOTE: The proxy server must be able to process HTTP connections. SOCKS proxies are not supported.

      NOTE: If no network connection can be established, see the section Activate by the file.



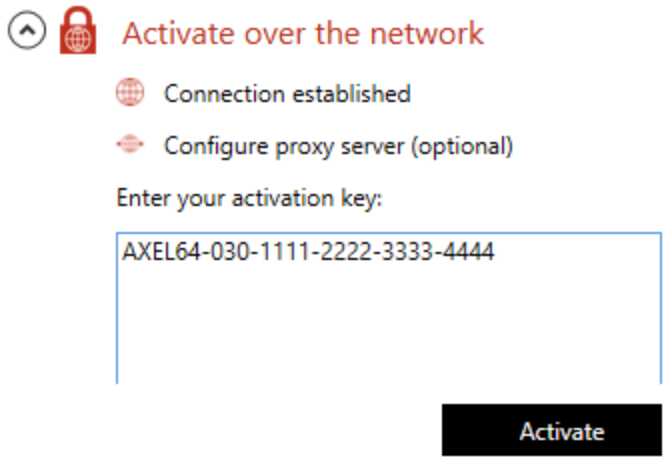
4. Back to the **RTX64 Activation and Configuration** dialog box, in the **Enter your activation key** box, enter your activation key and click **Activate**.

   The product components activated by your key are listed on the right. You should see the following components:

   - RTX64 SDK (this component is dimmed if you didn't purchase the license)
   - RTX64 KingStar PLC (this component won't be displayed if you didn't purchase the license)
   - RTX64 KingStar Motion (KINGSTAR Motion)
   - RTX64 KingStar IO (KINGSTAR Fieldbus)
   - RTX64 Runtime
   - RTX64 RT-TCP/IP Stack

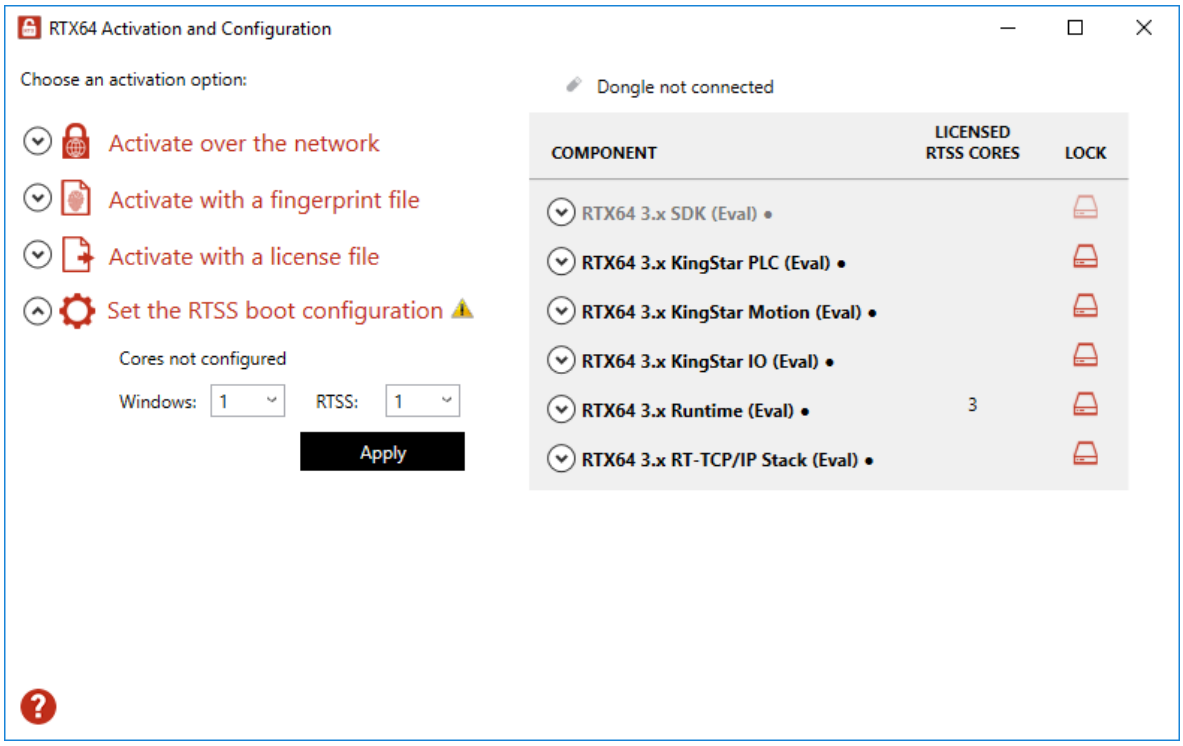
     NOTE: The order of component varies between keys.

   NOTE: If you want to activate part of the product, copy part of the activation key and paste it to the **Enter your activation key** box and click **Activate**. For example, if you want to activate axel64 (KINGSTAR PLC Runtime), paste the axel64 key to the activation box and activate it:

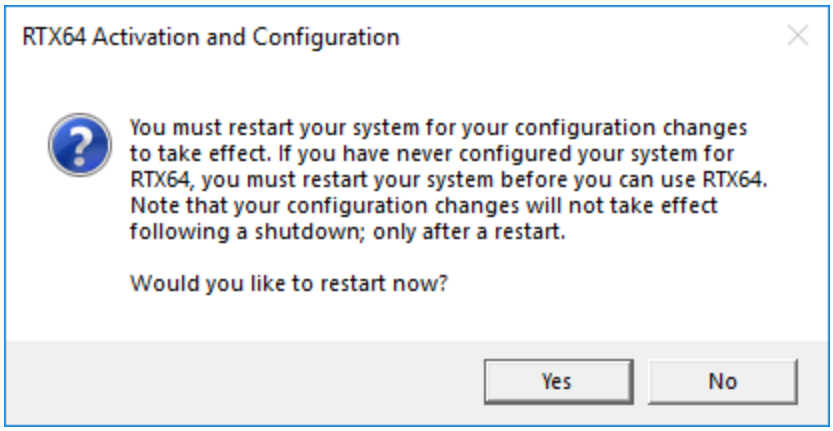


5. Click **Set the RTSS boot configuration**. Assign processors between Windows and RTX64 (RTSS). There must be at least one processor for Windows. You must configure this setting before you use KINGSTAR. Click **Apply** after you complete the configuration.

    - If you have purchased the KINGSTAR ENTRY edition, you can assign one processor to RTX64.
    - If you have purchased the KINGSTAR PRO edition, you can assign up to three processors to RTX64.



6. When you are prompted to restart your computer, click **Yes**.



7. Choose the RTX64 boot configuration at system startup:
   - Windows 10: Windows 10 – RTX64
   - Windows 8: Windows 8 – RTX64
   - Windows 7: Windows 7 – RTX64

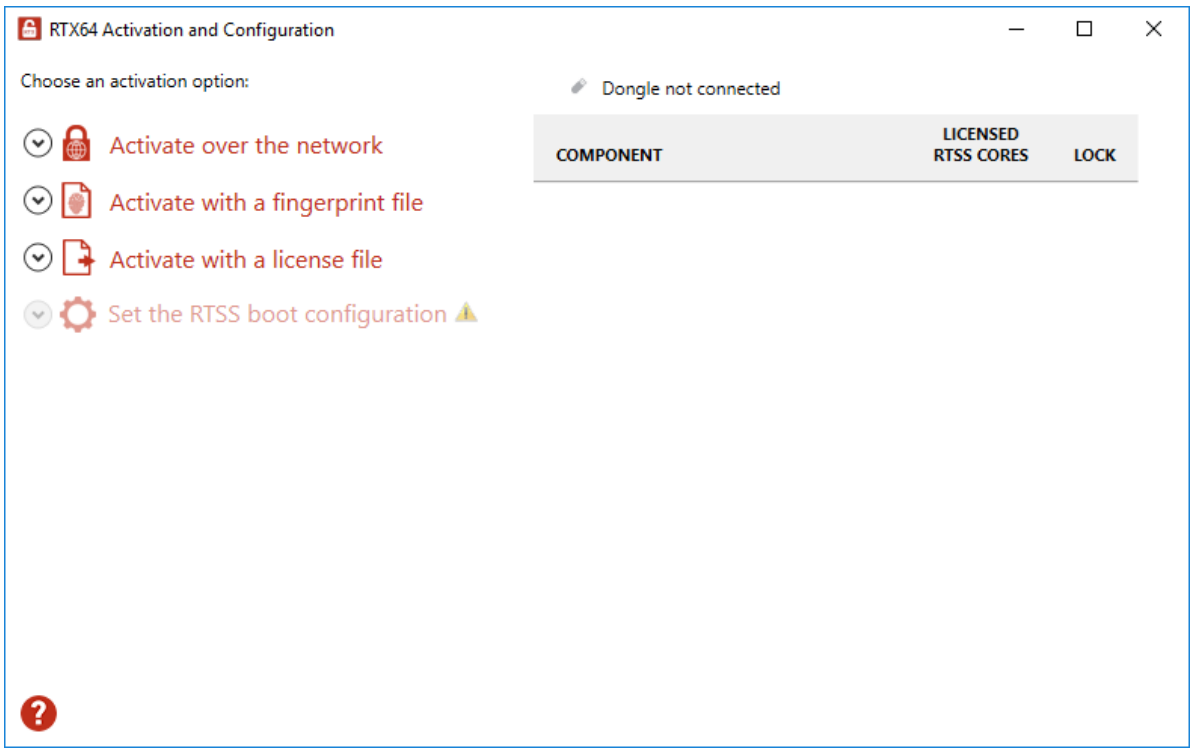
NOTE: If you start your system with a configuration other than RTX64, KINGSTAR won't work properly.

Activate by the file

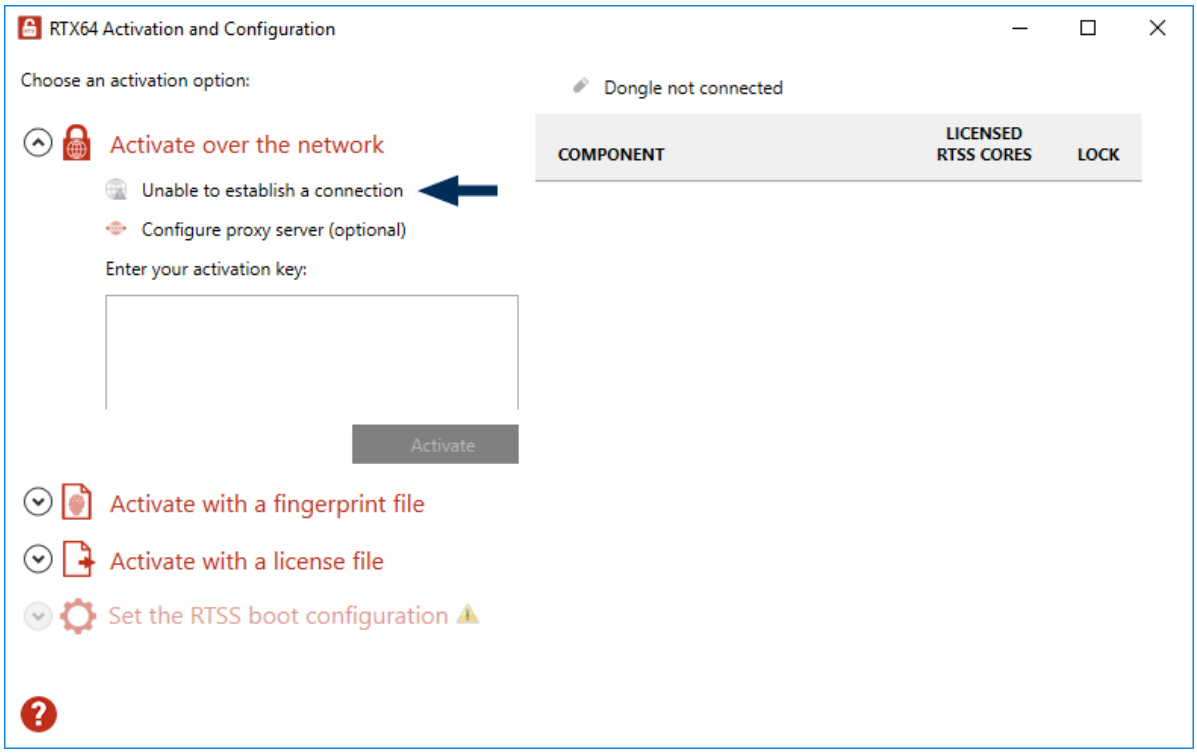
Follow the steps below if you can't access the IntervalZero license server.

Step I. Create a fingerprint file

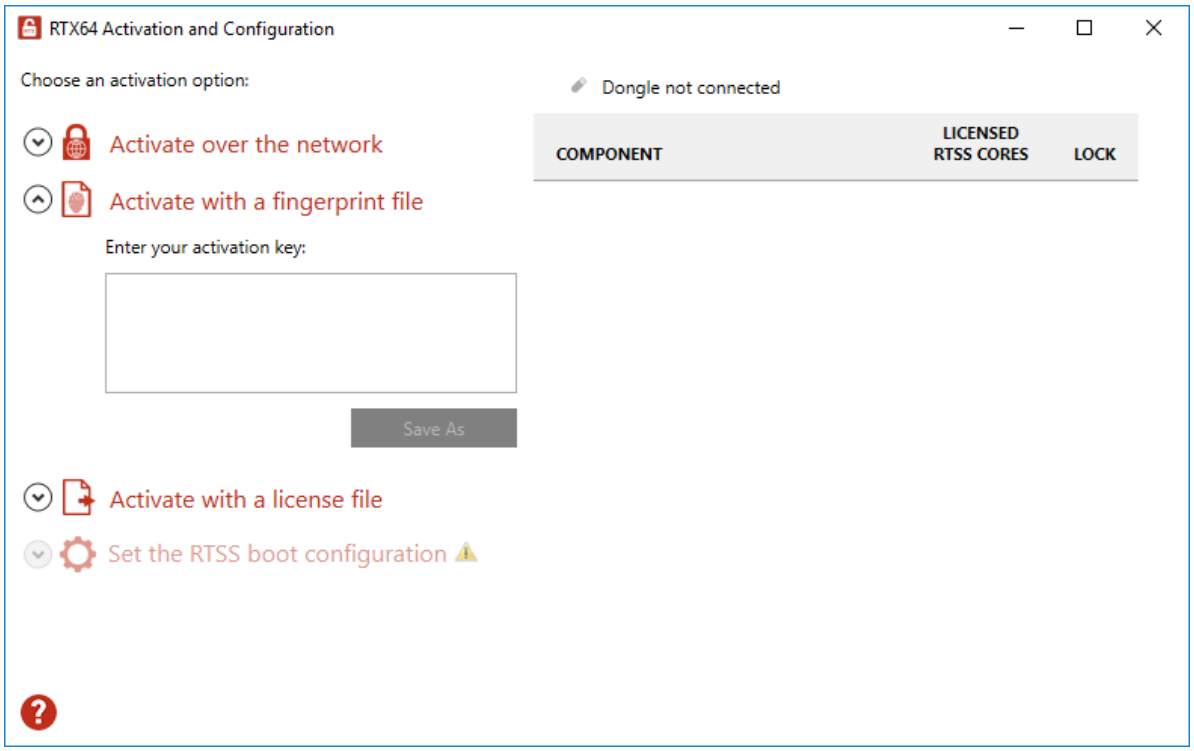
1. On the taskbar, click **Start** > **RTX64 3.7.1 Runtime** > **Activation and Configuration**. The **RTX64 Activation and Configuration** dialog box appears.



2. Click **Activate over the network**. If it doesn't connect to the IntervalZero license server, you'll see **Unable to establish a connection**. If the connection is available, you will see **Connection established**. For further details, see the section Activate over the internet.

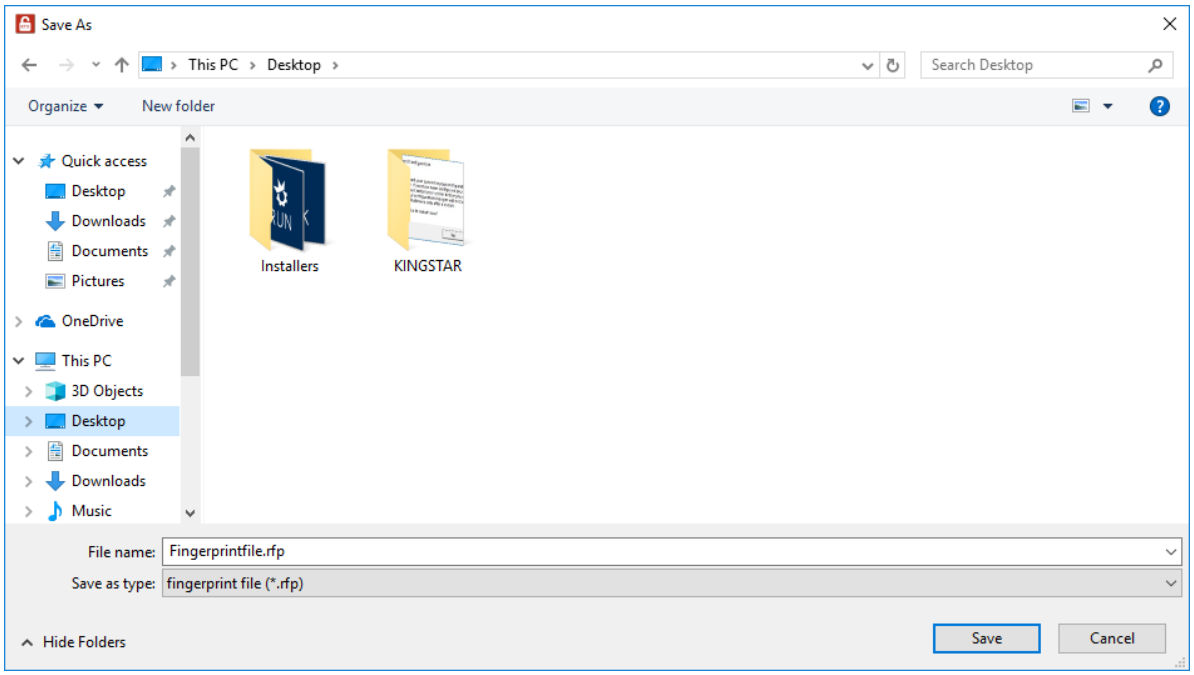


3. Click **Activate with a fingerprint file**.



4. In the **Enter your activation key** box, enter your activation key and click **Save As**.

5. In the **Save As** dialog box, the file is automatically named `Fingerprintfile.rfp`. Click **Save**. By default, the file is saved to the desktop.

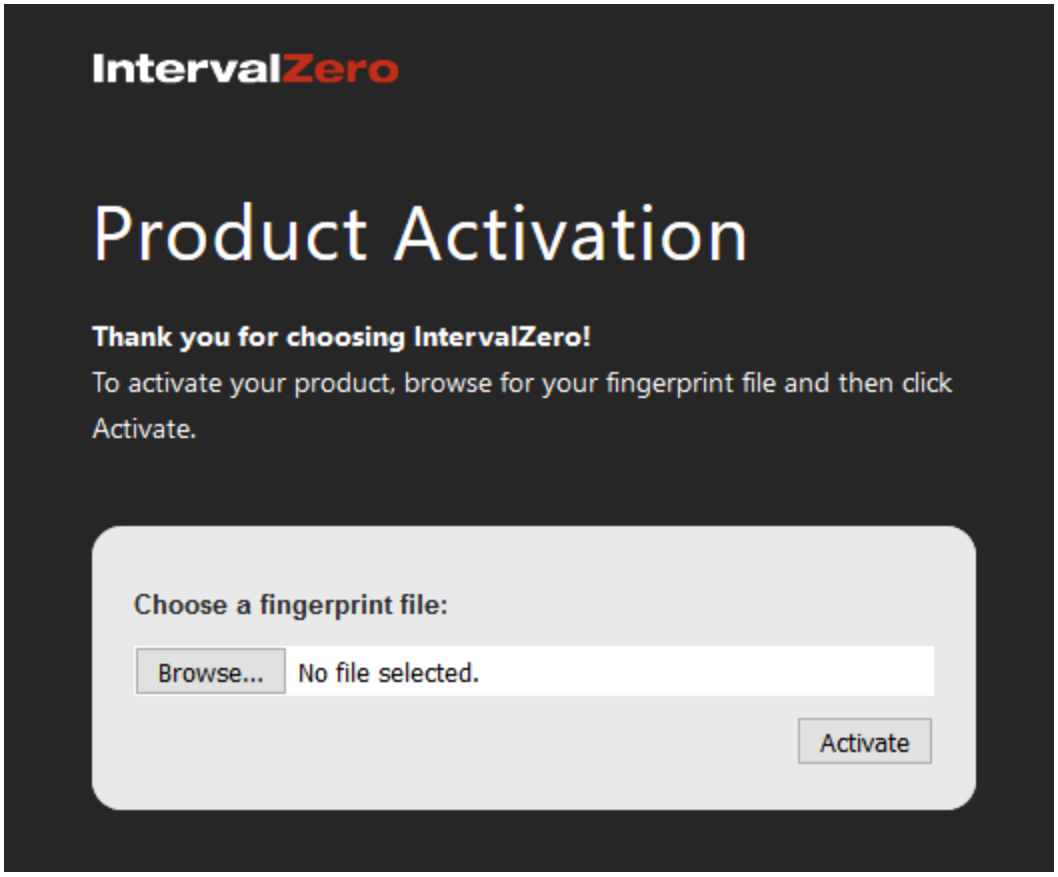


6. Navigate to the desktop, and copy the `Fingerprintfile.rfp` file to your USB flash drive.

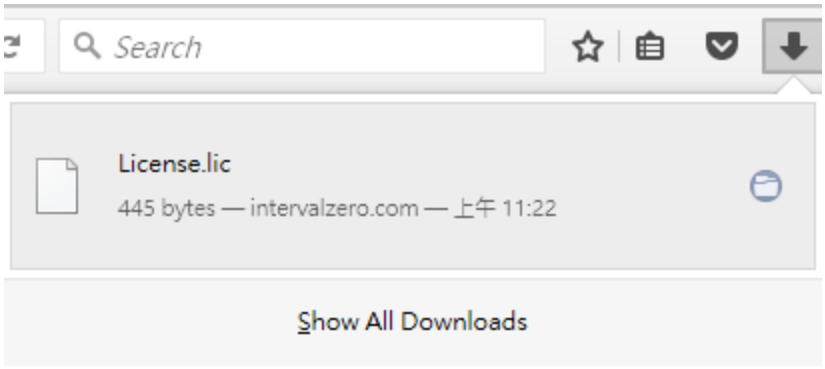
7. Plug the flash drive into a machine with internet connectivity.

Step II. Create the license file and activate the product

1. Launch a web browser, and go to http://activation.intervalzero.com.

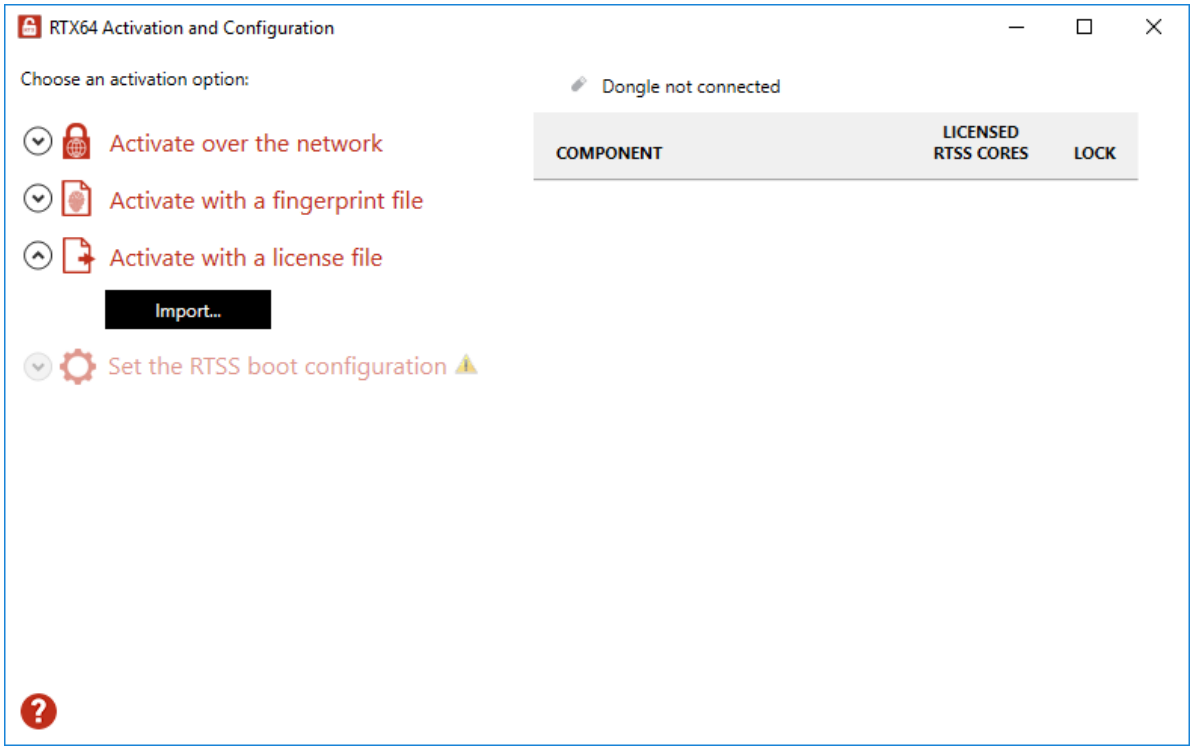


2. Click **Browse**, browse to and open the file `Fingerprintfile.rfp`.
3. Click **Activate** to generate a license (.lic) file.
4. Download the `License.lic`. Depending on your browser, you may be prompted to save the file.



5. Copy the file `License.lic` to your USB flash drive, and use it to transfer the license file to the machine on which KINGSTAR is installed.

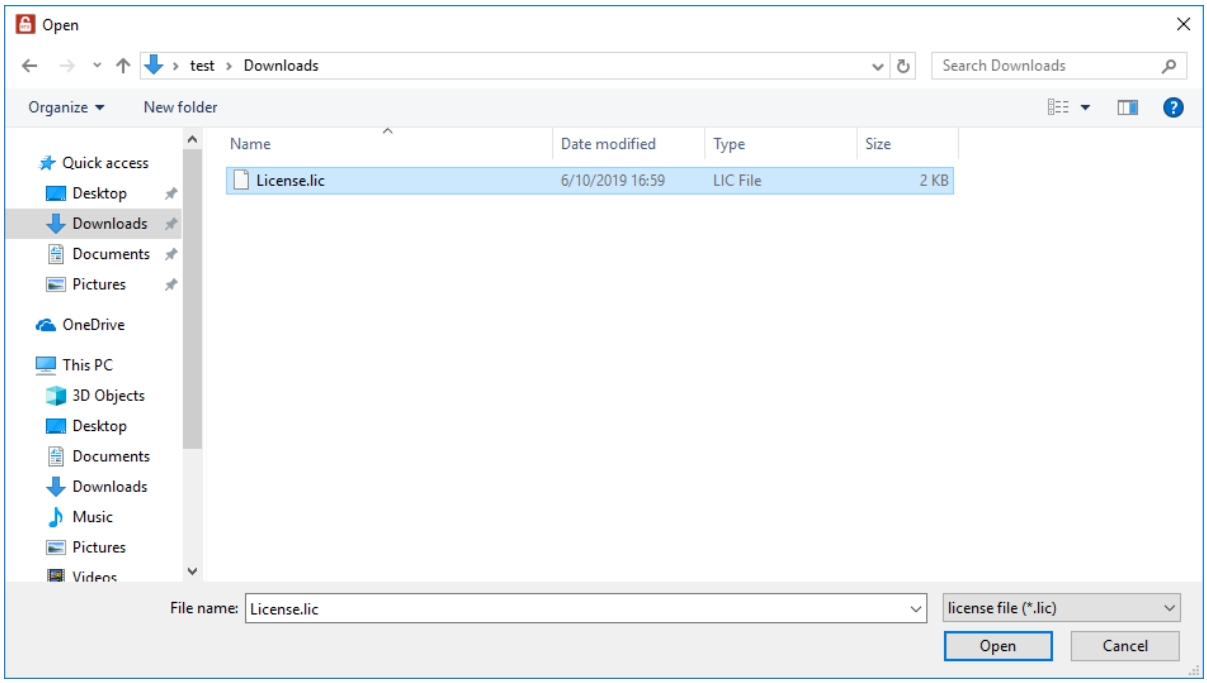
6. In the **RTX64 Activation and Configuration** dialog box, click **Activate with a license file** and click **Import**.



7. In the **Open** dialog box, browse to `License.lic` and click **Open**. The product components activated by your key are listed on the right. You should see the following components:

- RTX64 SDK (this component is dimmed if you didn't purchase the license)
- RTX64 KingStar PLC (this component won't be displayed if you didn't purchase the license)
- RTX64 KingStar Motion (KINGSTAR Motion)
- RTX64 KingStar IO (KINGSTAR Fieldbus)
- RTX64 Runtime
- RTX64 RT-TCP/IP Stack

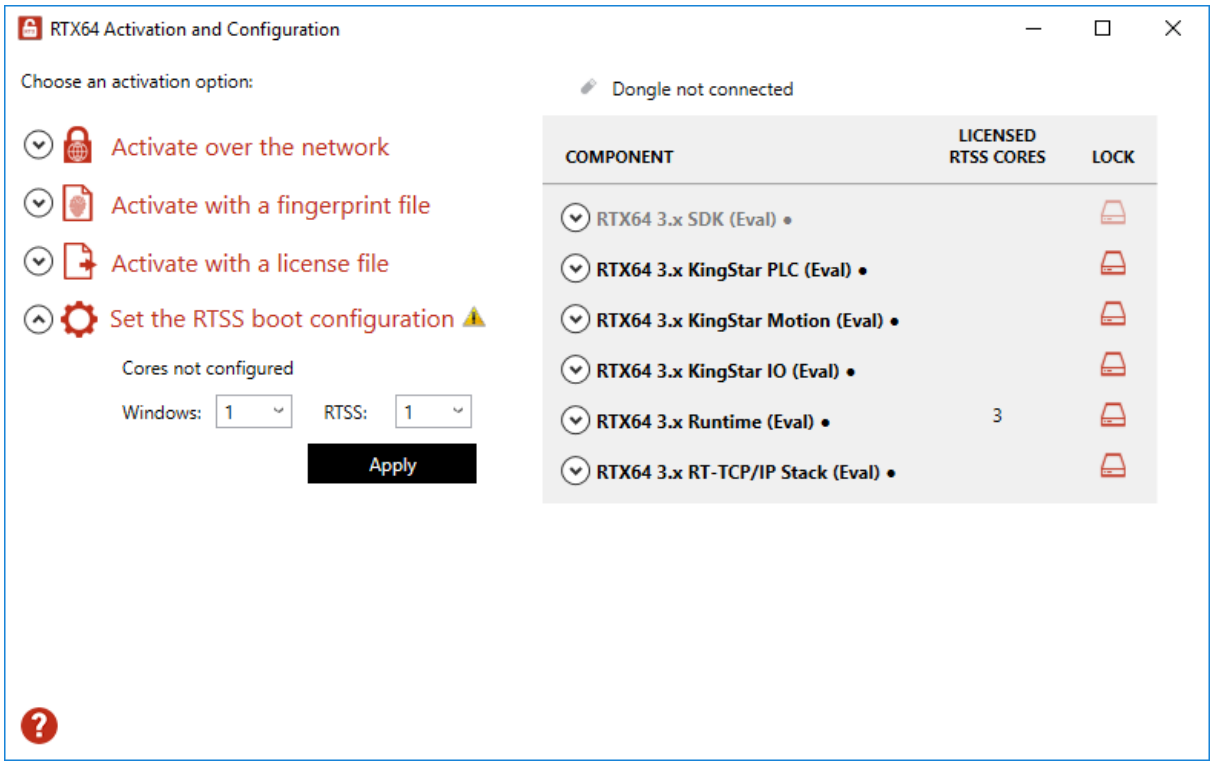
NOTE: The order of component varies between keys.



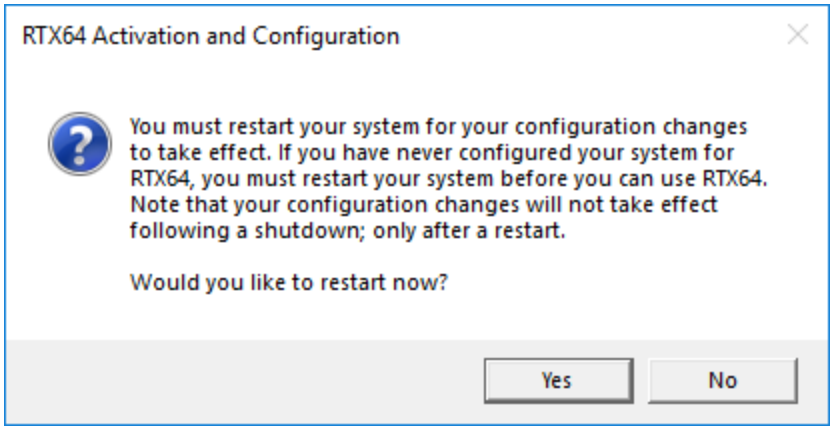
8. Click **Set the RTSS boot configuration**. Assign processors between Windows and RTX64 (RTSS). There must be at least one processor for Windows. You must configure this setting before you use KINGSTAR. Click **Apply** after you complete the configuration.

   - If you have purchased the KINGSTAR ENTRY edition, you can assign one processor to RTX64.

- If you have purchased the KINGSTAR PRO edition, you can assign up to three processors to RTX64.



9. When you are prompted to restart your computer, click **Yes**.



10. Choose the RTX64 boot configuration at system startup:

- Windows 10: Windows 10 - RTX64
- Windows 8: Windows 8 - RTX64
- Windows 7: Windows 7 - RTX64

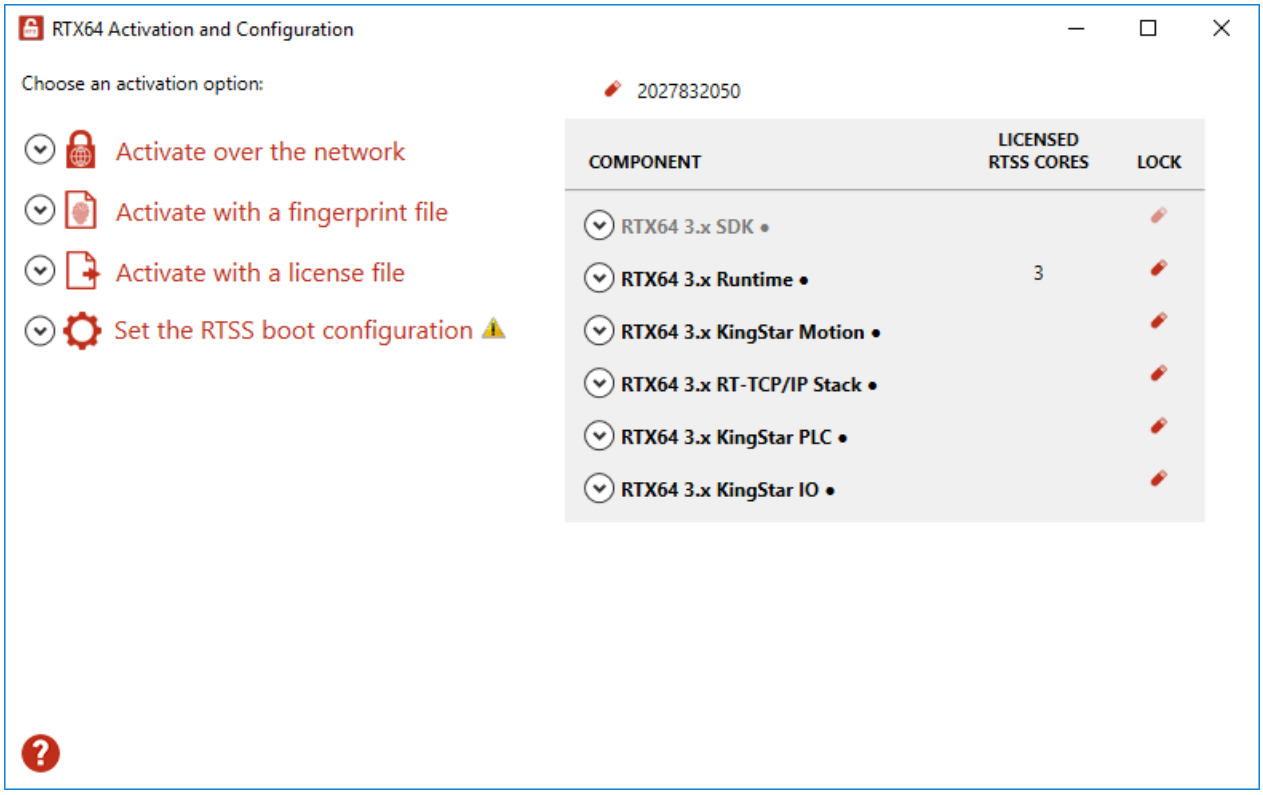
NOTE: If you start your system with a configuration other than RTX64, KINGSTAR won't work properly.

Activate using the dongle

A dongle is a USB flash drive specifically designed for containing KINGSTAR license. It is convenient for people who need to take the license with them. When you purchase the KINGSTAR license, it's optional to purchase a dongle.

- If you purchase the KINGSTAR licenses with the same number of dongles, we'll put the license files in the dongles and activate them in advance. When you get the dongles, just plug them into the computers that have the corresponding KINGSTAR products and the activation is done. After assigning the processors to Windows and RTX64, and restart your computer, you can start to use KINGSTAR.
- If you purchase the KINGSTAR licenses with the different number of dongles, we'll give you empty dongles so you can decide which dongle you want to put the license in and activate it. Once you activate a dongle, just plug it into a computer that has the corresponding KINGSTAR product and the activation is done. After assigning the processors to Windows and RTX64, and restart your computer, you can start to use KINGSTAR. For more information about activating a dongle, visit the IntervalZero website (www.intervalzero.com), go to **Downloads** > **Add-Ons, Tools & Utilities** and download **Dongle Activation Utility**. It includes the file and manual.

After the dongle is plugged in, a dongle icon is displayed above the component list.


RTX64 Activation and Configuration
Choose an activation option:
Activate over the network
Activate with a fingerprint file
Activate with a license file
Set the RTSS boot configuration
2027832050
COMPONENT
LICENSED RTSS CORES
LOCK
RTX64 3.x SDK
RTX64 3.x Runtime
3
RTX64 3.x KingStar Motion
RTX64 3.x RT-TCP/IP Stack
RTX64 3.x KingStar PLC
RTX64 3.x KingStar IO

Uninstall KINGSTAR

Before uninstalling consider the following:

- When RTX64 Runtime is uninstalled from a system, any device given to RTX64 will no longer have an associated driver and should be returned to Windows using the Windows **Device Manager**. For more information about how to return the NIC, see Give the NIC back to Windows.
- RTX64 **Control Panel** must be closed.
- KINGSTAR applications must not be running.
- If the RTX64 boot configuration is the only boot configuration present on uninstall, it will be retained so that you can start your system.

To uninstall KINGSTAR, take the following steps:

1. Double-click the KINGSTAR installer to uninstall, or go to **Control Panel** > **Programs and Features**. Select the KINGSTAR software from the list and uninstall it.
2. After uninstalling KINGSTAR, restart your computer.

Get support

KINGSTAR offers a number of support options for KINGSTAR users, including third-party, online and phone support.

Third-party support

If you are a customer who purchased a KINGSTAR product through a third-party reseller, contact the reseller for support.

Online support

The KINGSTAR Customer Support web page is located at:

http://kingstar.com/support/

The KINGSTAR support web pages provide electronic access to the latest product releases, documentation, and release notes. You can access the online support ticketing system to submit issues or questions.

Before calling technical support

Please have the following information ready before calling KINGSTAR Technical Support:

The version number of your RTX64 and KINGSTAR software

To obtain the RTX64 version number:

1. Click **Start** > **RTX64 3.7.1 Runtime** > **Control Panel**.
2. In the **RTX64 3.7.1 Control Panel**, record **Version** shown in the **Runtime Information** area.

To obtain the KINGSTAR version number:

1. In **Windows Explorer**, browse to `C:\Program Files\IntervalZero\KINGSTAR\bin`.
2. click the `ksm64.rtdll` file, and right-click the same file again.

3. On the shortcut menu, click **Properties**.
4. In the **ksm64.rtdll Properties** dialog box, click the **Details** tab, and record **Product version**.

Phone support

For technical support related to installing and using KINGSTAR, please call technical support at this number:

+886-2-2556-8117

Hours are Monday – Friday from 9:30 to 17:30, UTC+08:00, excluding holidays.