

NEXCOBOT

Intelligent Solutions for IoT Automation

NexECM
EtherCAT Master Configuration
User Manual for INtime

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Revision History

Rev.	Description
1.0	First released.





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1. NexECM Installation

1.1. Hardware Requirements

1. Standard 32-bit or 64-bit PC / IPC, and equipped more than one Ethernet communication port
2. At least 40MB of free RAM for INtime and your real-time applications
3. At least 250MB hard disk space

1.2. Software Requirements

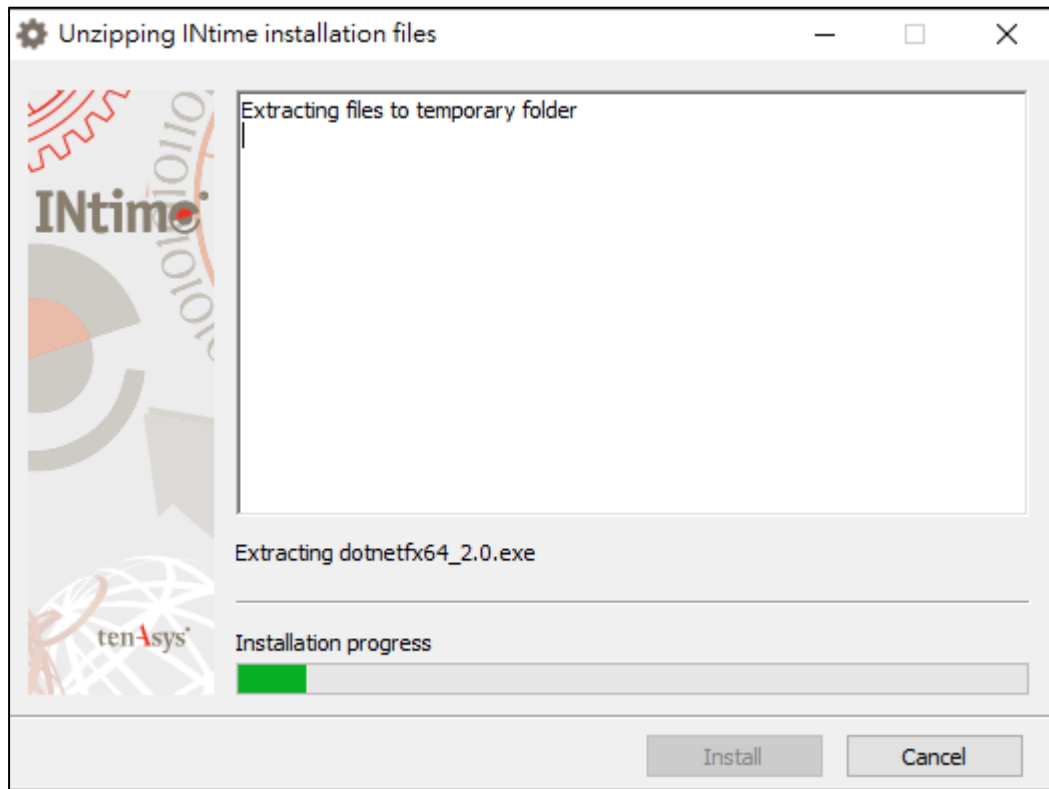
Make sure that the development platform meets the above hardware requirements, and check the following software:

1. Windows 10, Windows 7, or Windows XP with Service Pack3
(Both 32- and 64-bit versions of Windows are supported)
 2. Visual Studio (2017, 2015, 2013, 2012, 2010 and 2008)
 3. NexCOBOT NexECM installation file
 4. INtime6.3 or later
 5. Microsoft .Net framework 4.5.2 or later
 6. Visual Basic Power Packs 10.0 or later
- INtime 6.3 official download:
<https://www.tenasys.com/products/intime-rtos/>.
 - Microsoft .Net framework 4.5.2 official free download:
<https://www.microsoft.com/en-us/download/details.aspx?id=42642>
 - Visual Basic Power Packs 10.0 official free download:
<https://go.microsoft.com/fwlink/?LinkID=145727&clid=0x804>

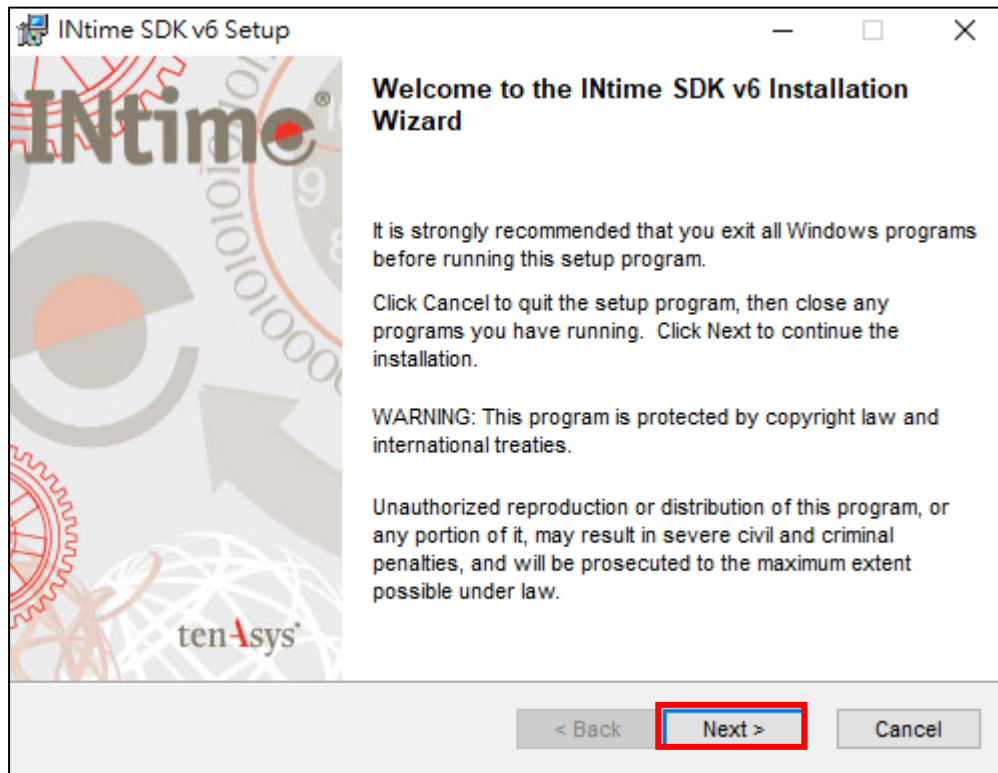
1.3. INtime Installation

Make sure that the development platform meets the above both hardware and software requirements before install INtime. (Take Windows 10, 64-bit, as an example here.)

1. Execute INtime installation files



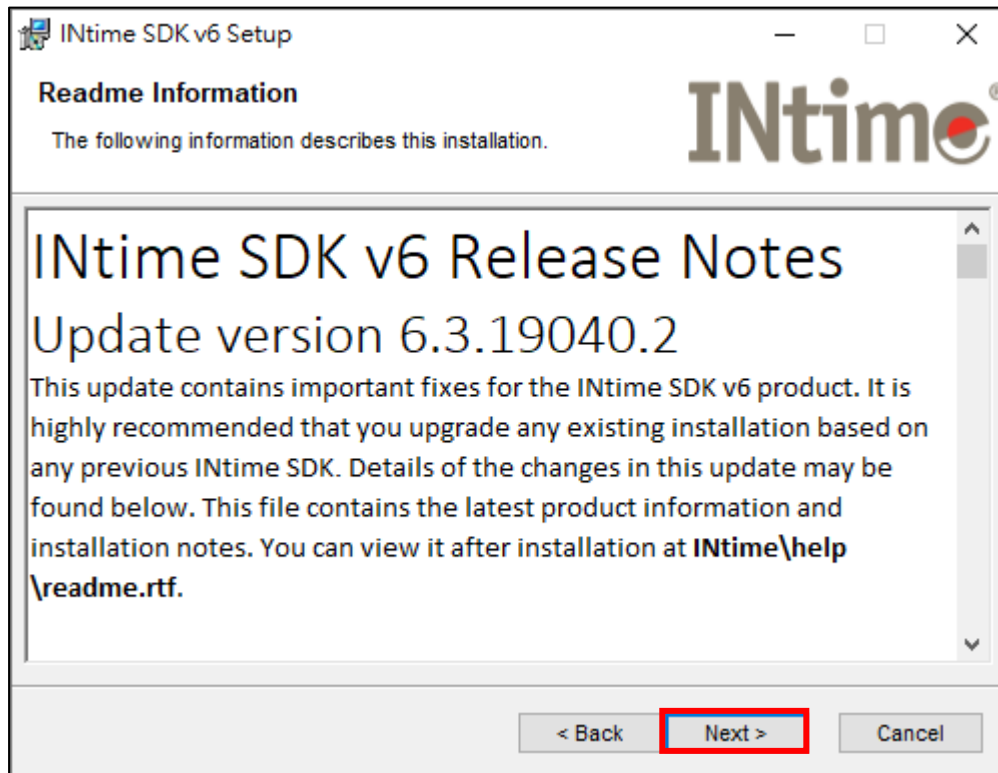
2. Click "Next >" to next step



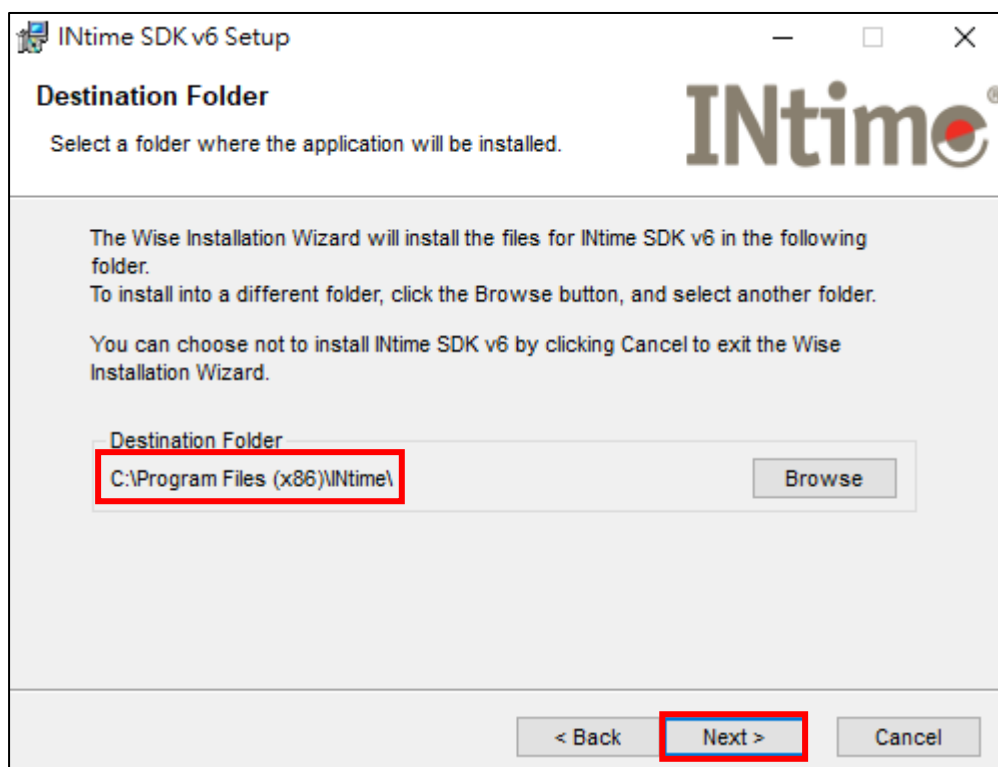
3. Select "I accept the license agreement", then click "Next >" to next step



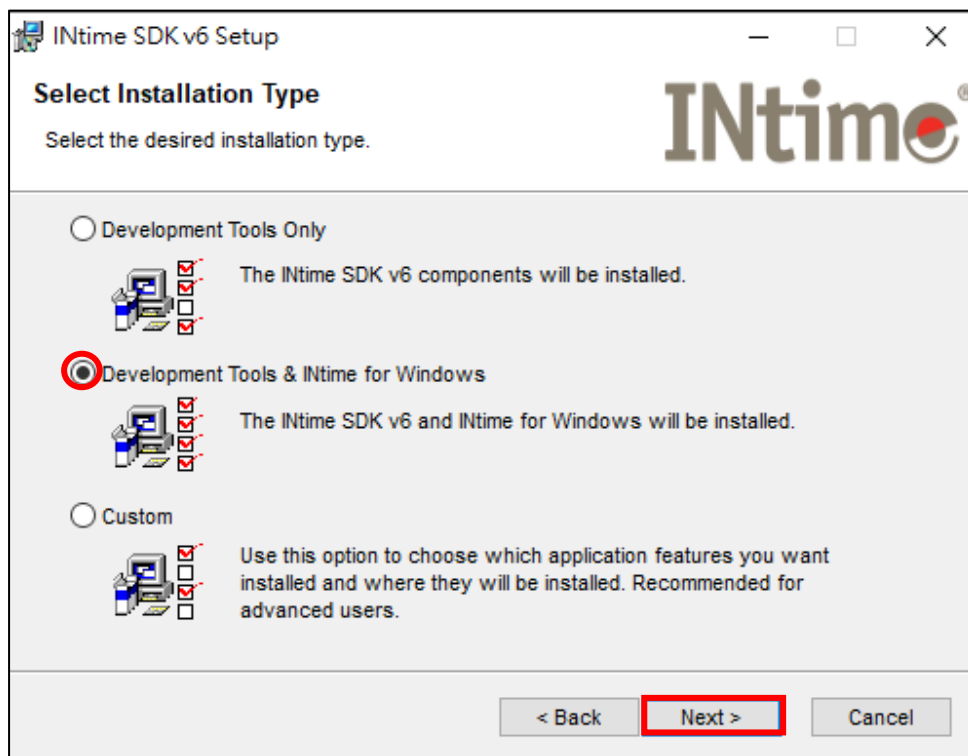
- Click "Next >" to next step



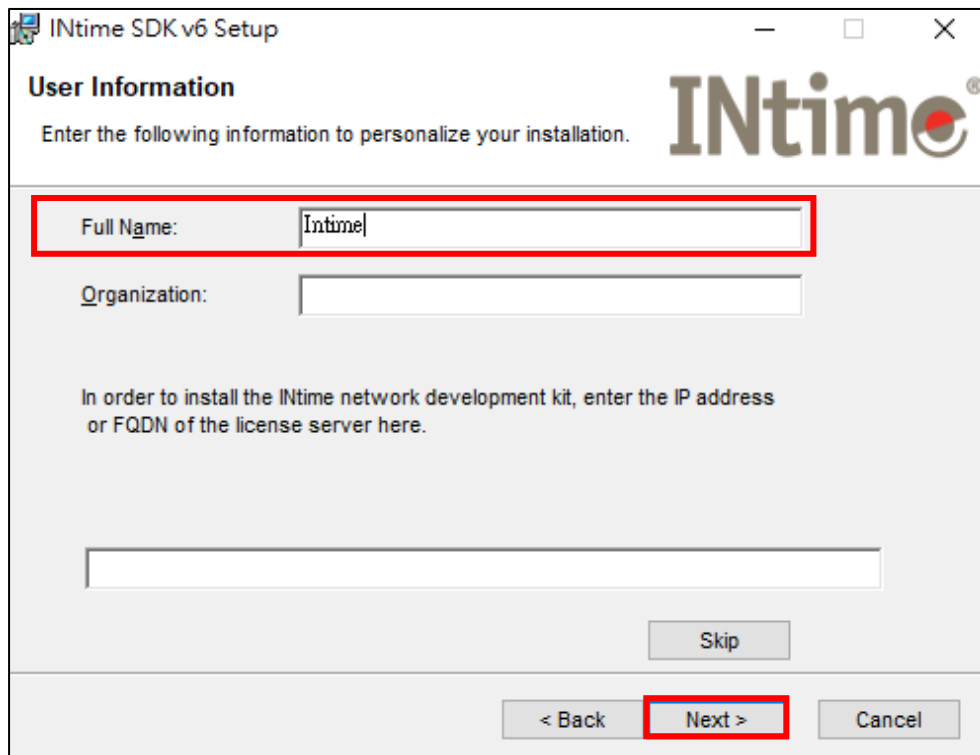
- Pick the destination folder as C:\Program Files (x86)\INtime\ (Default Path), then click "Next >" to next step



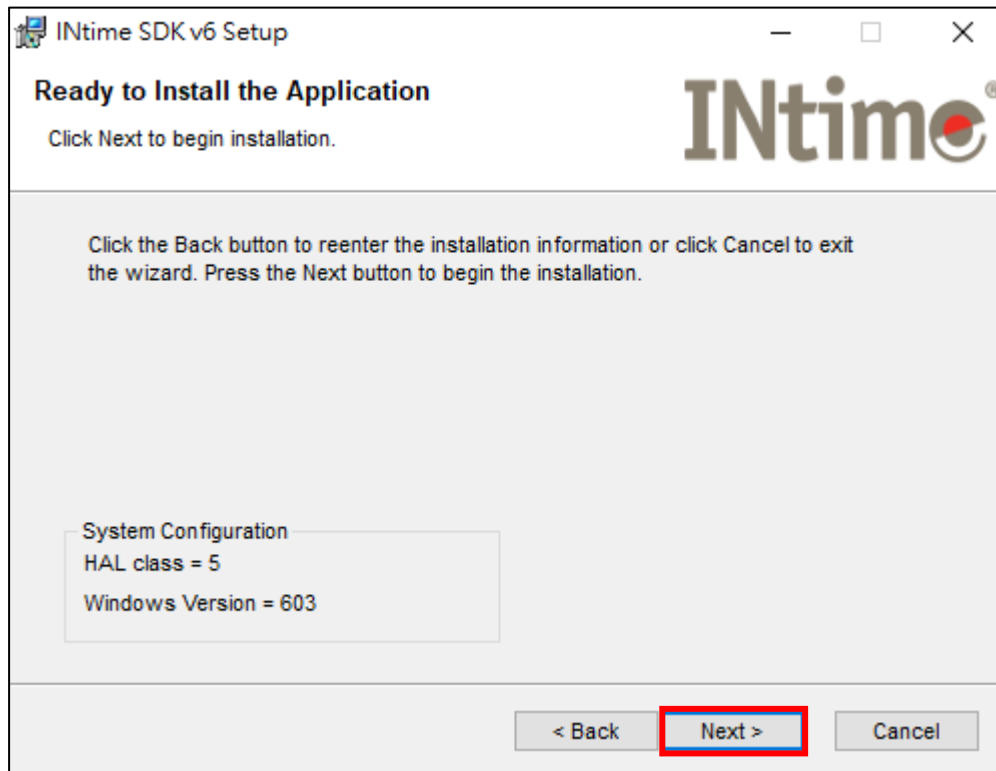
6. Select “Development Tools & INtime for Windows”, then click ”Next >” to next step.



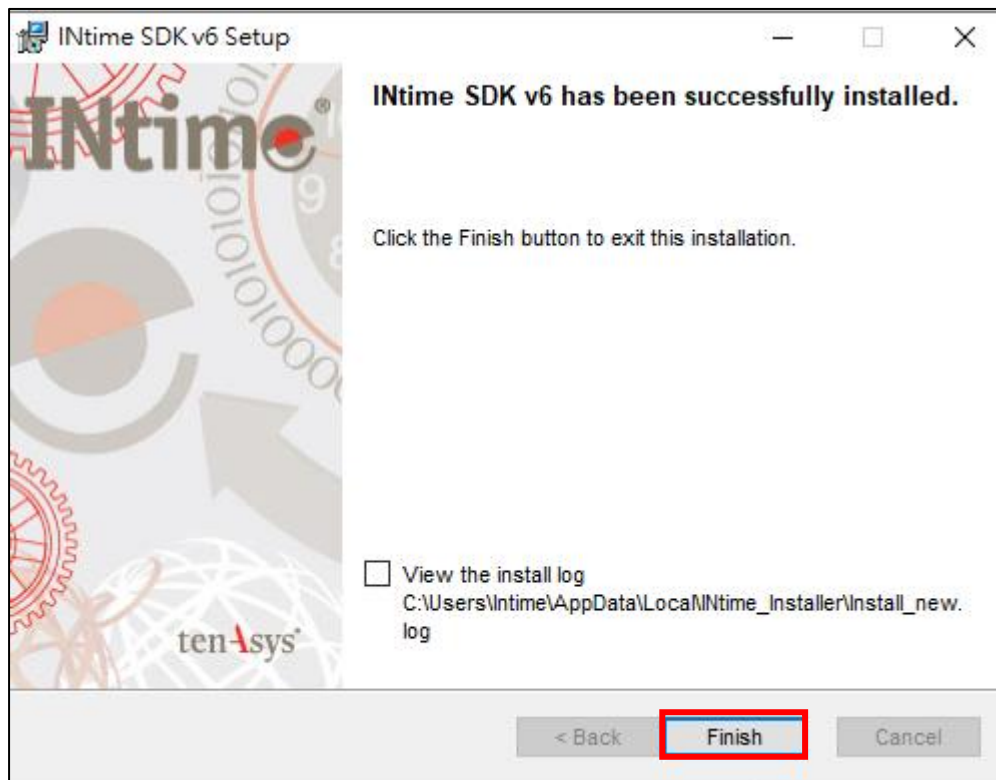
7. Input “User Name”, then click ”Next >” to next step.



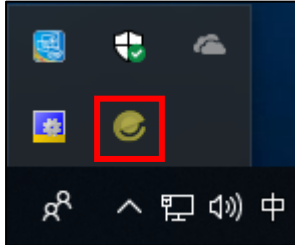
- Click "Next >" to install



- INtime has been successfully installed, click "Finish" and restart your computer.



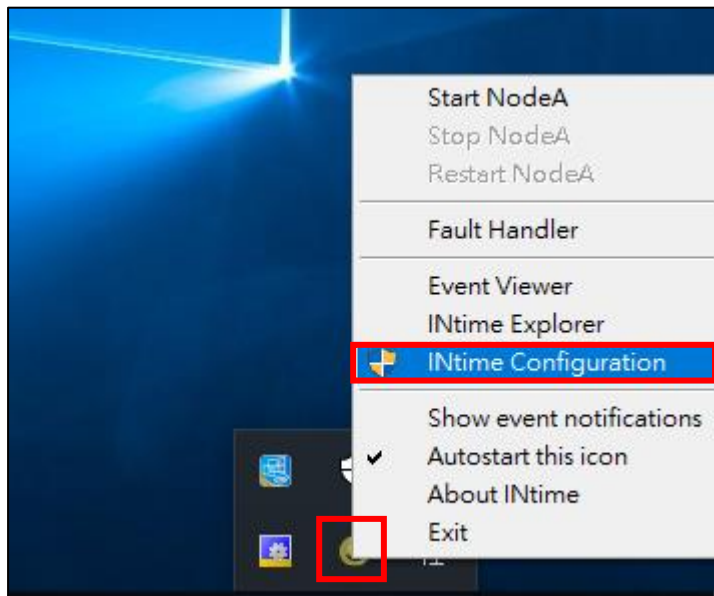
10. After restarting your computer, you can find the INtime (e icon) in the Windows Toolbar.



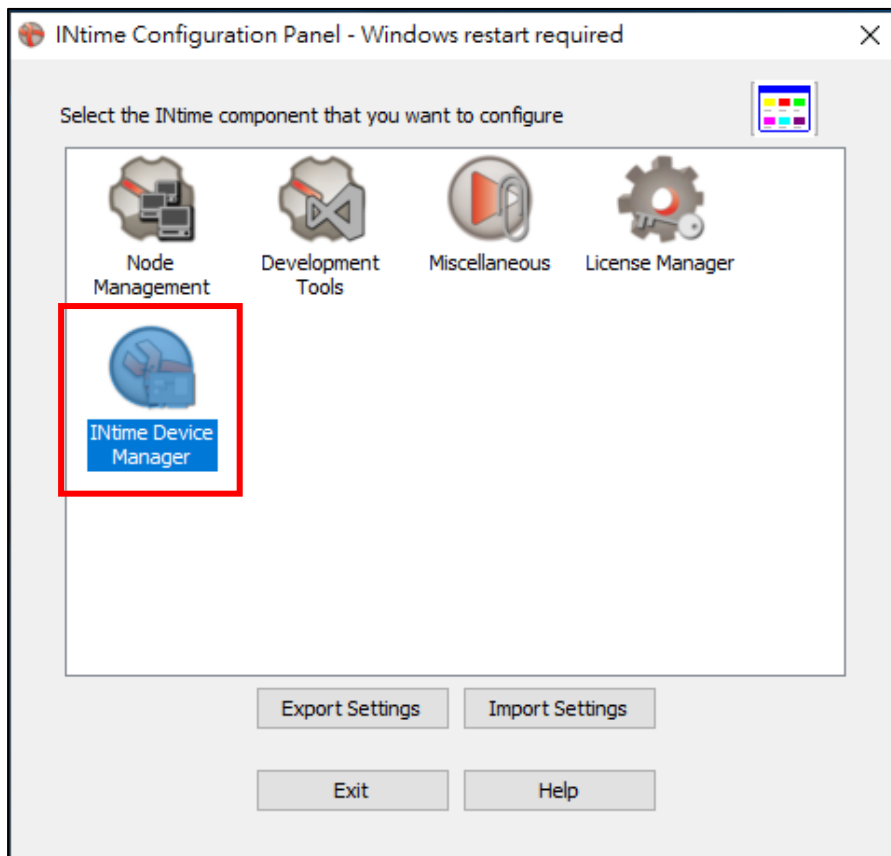
2. NexECM Network Interface Card Setting

2.1. INtime NIC Driver Installation

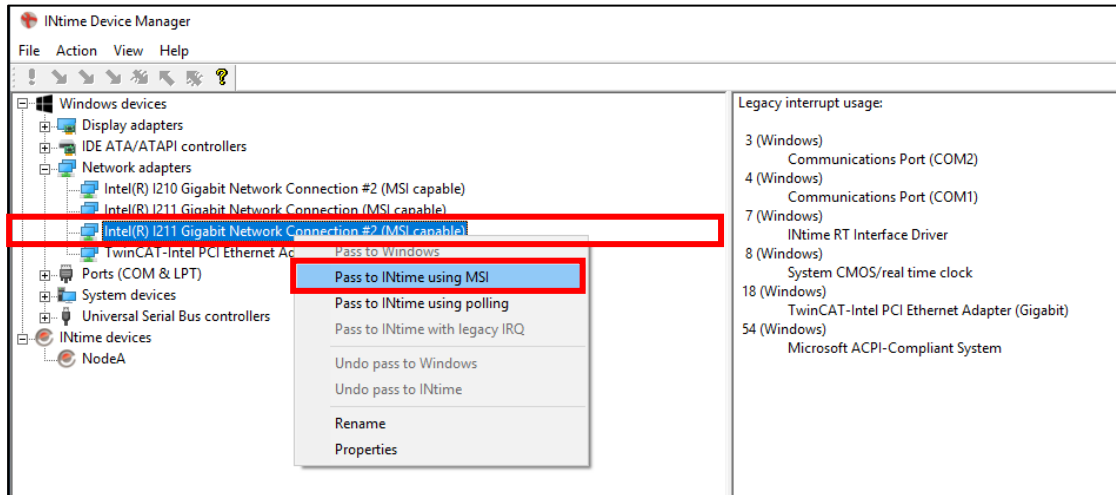
1. After finishing INtime installation, right click the hidden icon in the Windows Toolbar and then select "INtime Configuration"



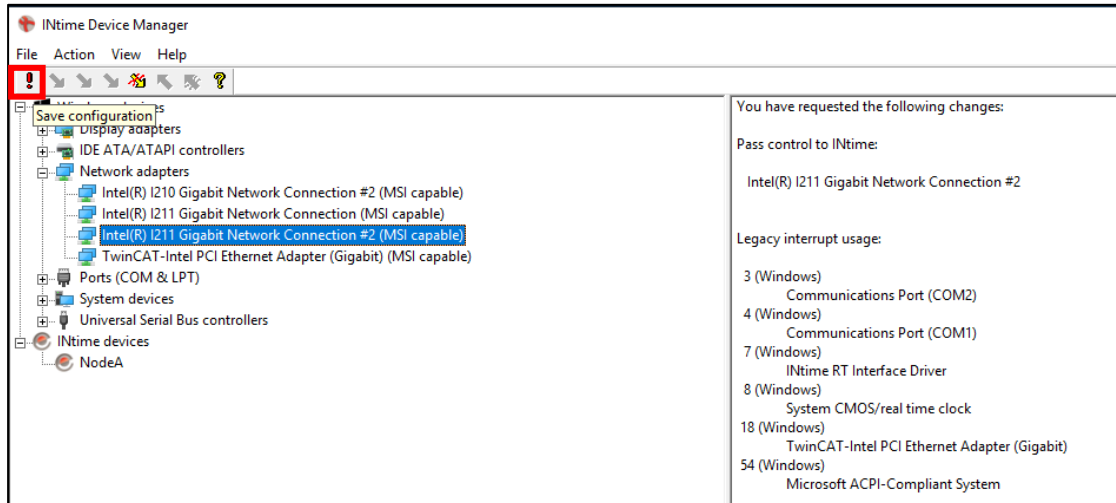
2. Select "INtime Device Manager"



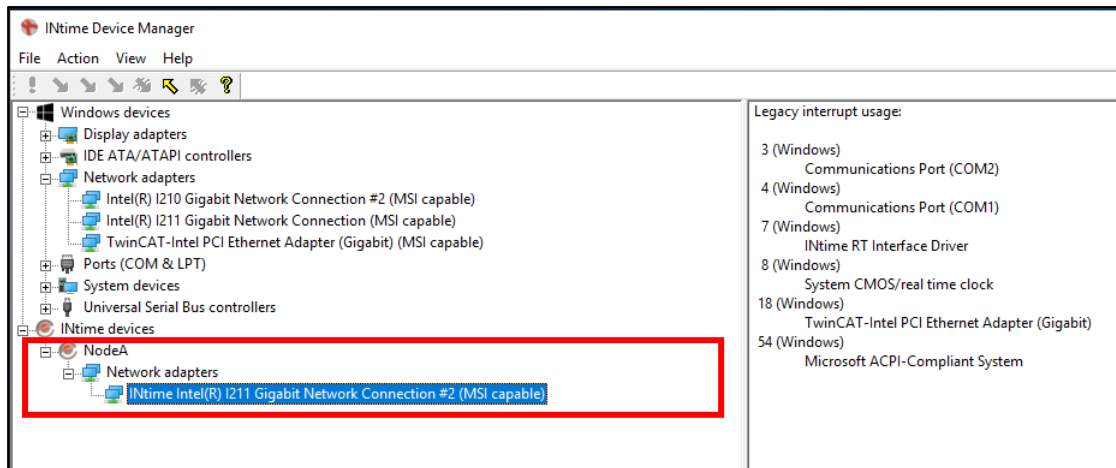
- Right click on NIC device that you want to install INtime NIC driver and select "Pass to INtime using MSI"



- Click "Save configuration", and then restart your computer

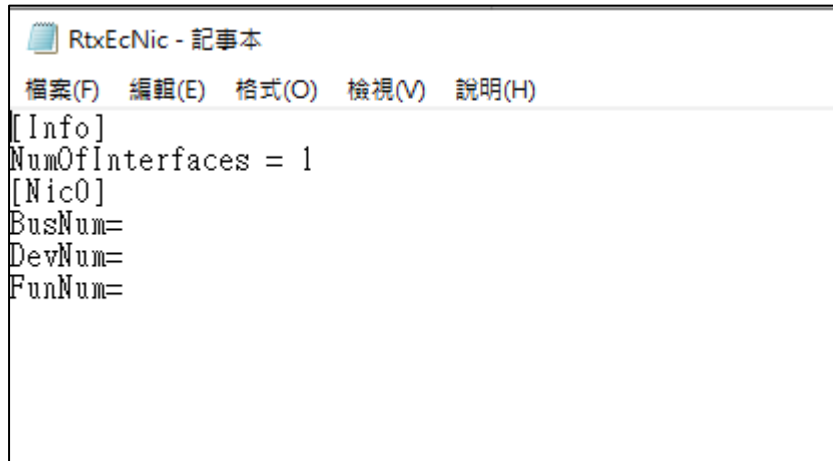


- After restarting your computer, you could confirm the INtime driver is installed correctly in "INtime Device Manager" page



2.2. Configure the INI file "C:\NEXCOBOT\RtxEcNic.ini"

Open the INI file " C:\NEXCOBOT\RtxEcNic.ini" by text editor as follow:

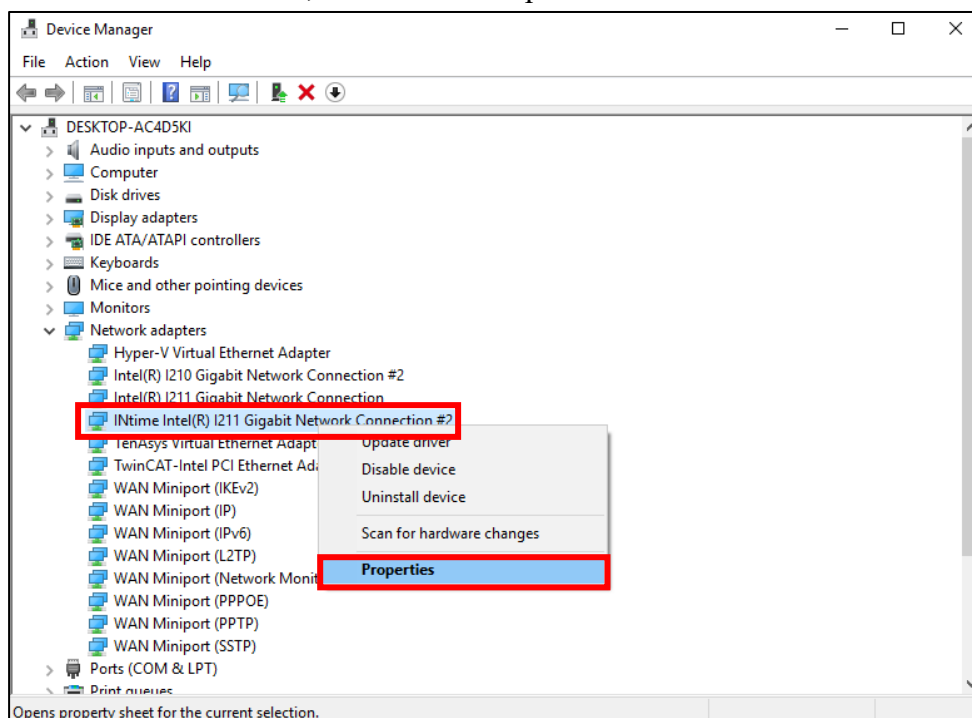


NumOfInterfaces: The total number of EtherCAT network interface card

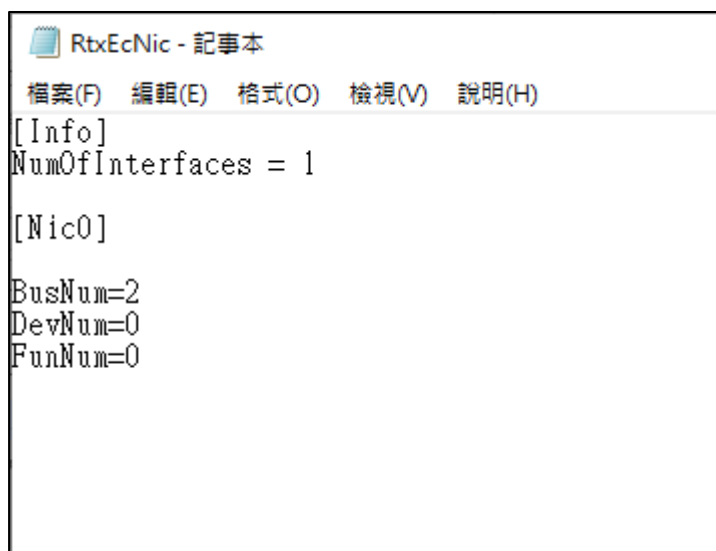
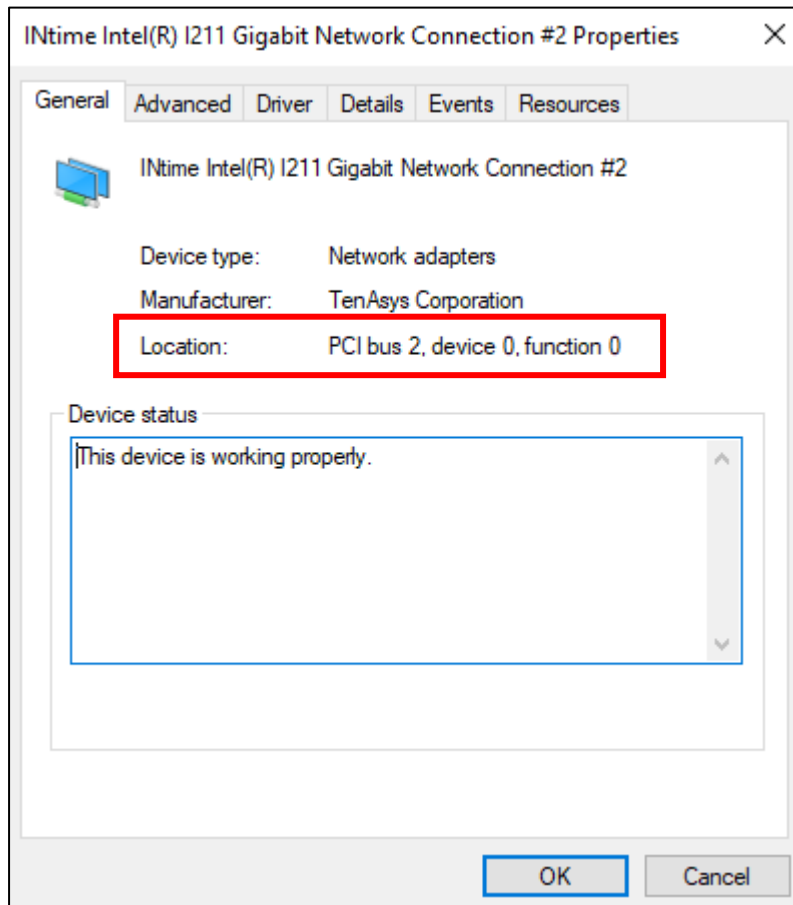
[Nic0] : The first network card information

The value of "BusNum", "DevNum" and "FunNum" – PCI location information can be check via following steps:

1. Open the "Device Manager" and right click the NIC device that is installed INtime NIC driver, then select "Properties"



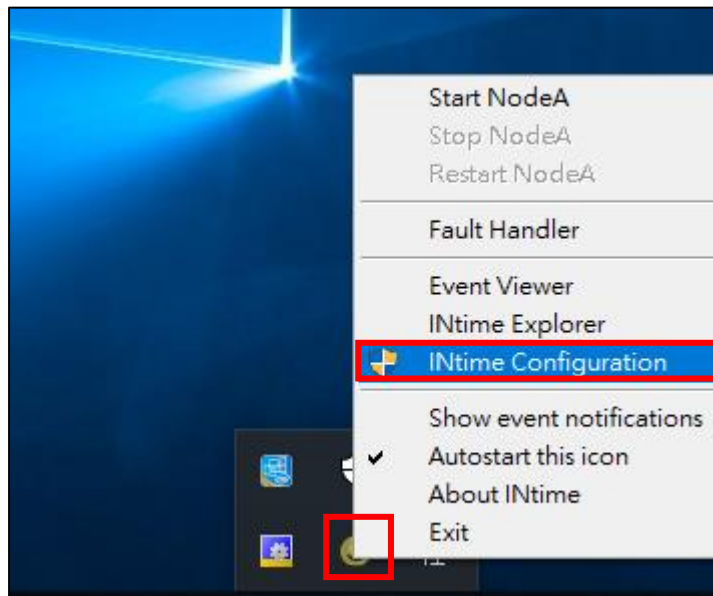
2. Record the "Location" information and then fill in the INI file



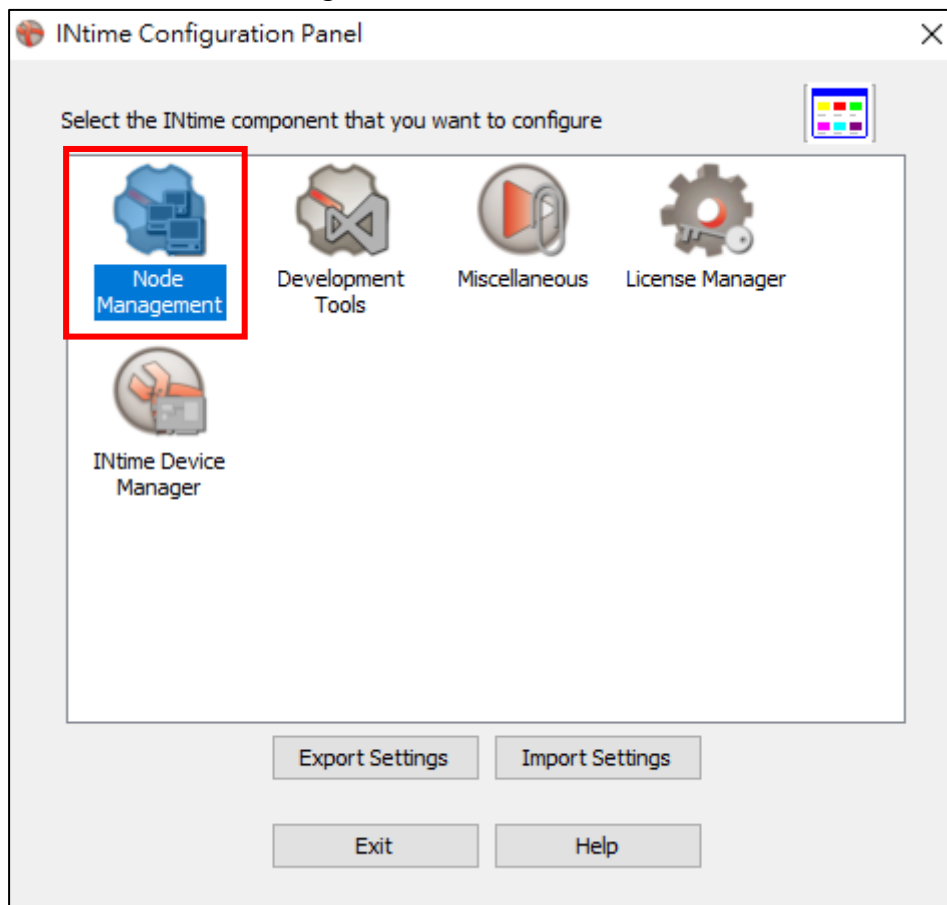
Note: This INI file must be placed in the following path
 "C:\NEXCOBOT\RtxEcNic.ini"

3. INtime Kernel Management

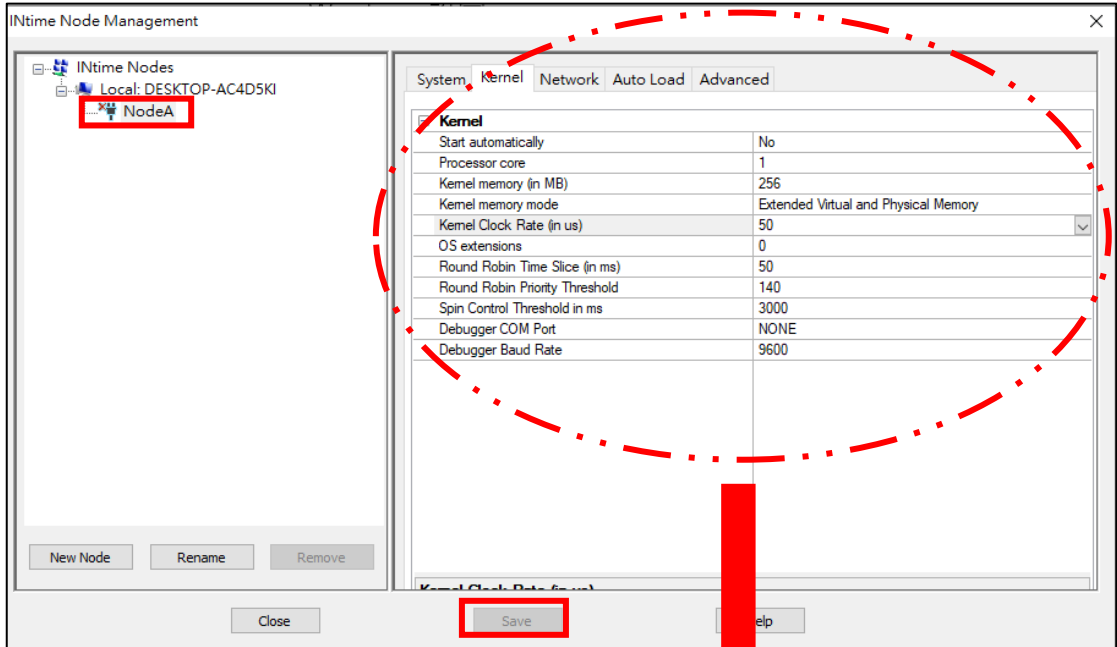
1. Right click the hidden icon in the Windows Toolbar and then select "INtime Configuration"



2. Select "Node Management"



3. Select "NodeA" and then in "Kernel" Tab, change "Kernel memory" to 256MB (depends on your real-time application) and change "Kernel Clock Rate" to 50us. (as shown in Figure below)

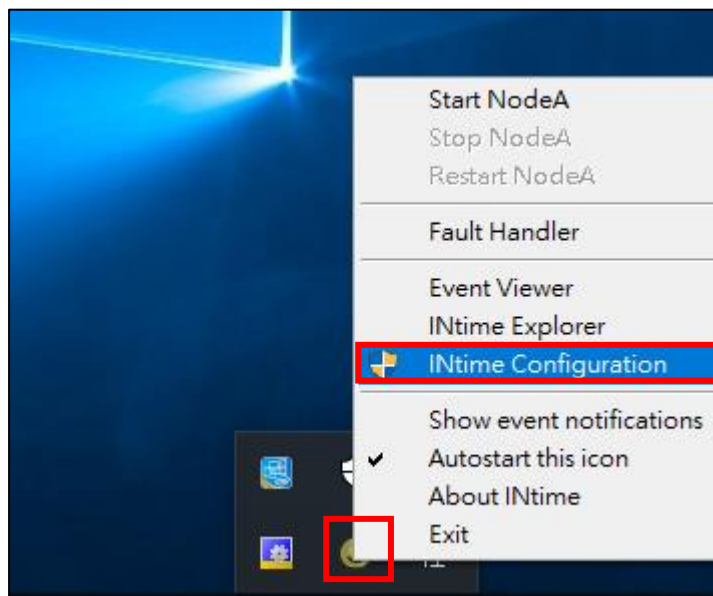


Kernel	
Start automatically	No
Processor core	1
Kernel memory (in MB)	256
Kernel memory mode	Extended Virtual and Physical Memory
Kernel Clock Rate (in us)	50
OS extensions	0
Round Robin Time Slice (in ms)	50
Round Robin Priority Threshold	140
Spin Control Threshold in ms	3000
Debugger COM Port	NONE
Debugger Baud Rate	9600

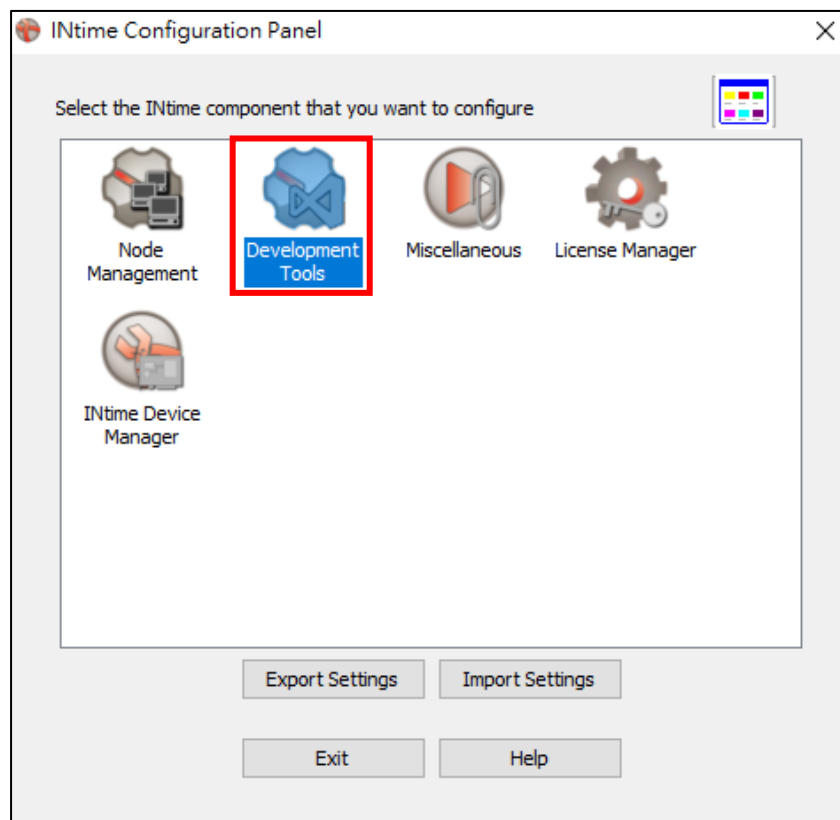
4. Set up INtime Development Environment on Visual Studio

4.1. INtime Development Tools Configuration

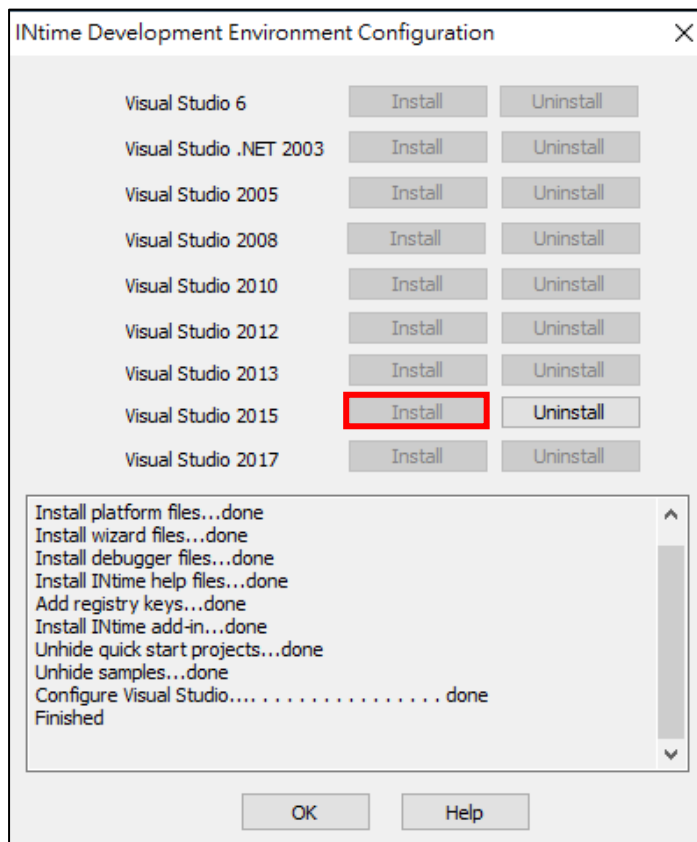
1. Right click the hidden icon in the Windows Toolbar and then select "INtime Configuration"



2. Select "Development Tools"



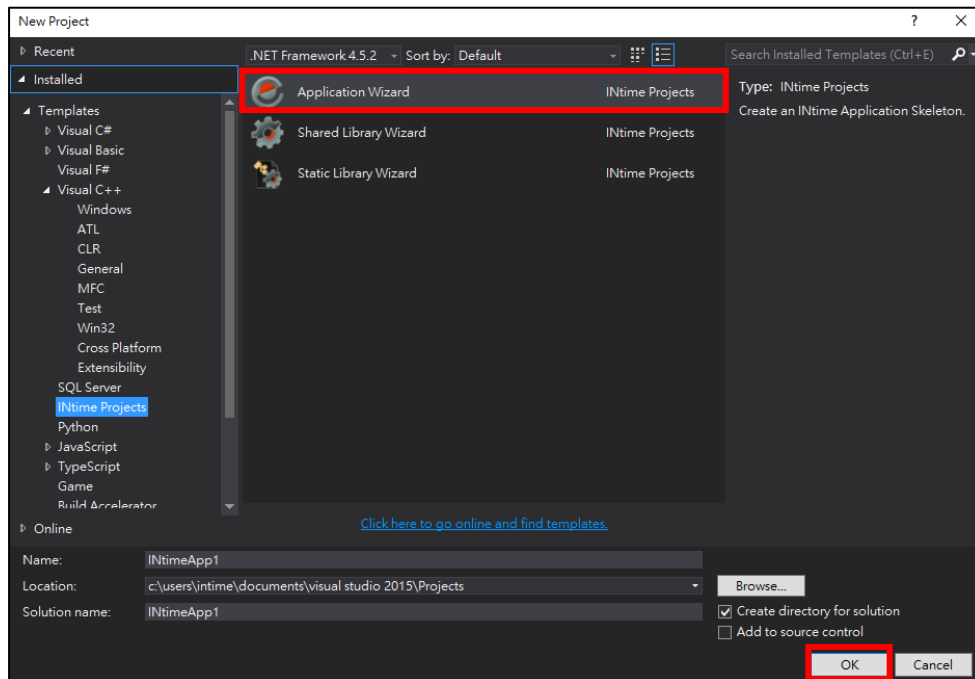
3. Install Visual Studio 2015 (Take Visual Studio 2015 as an example here)



4.2. INtime Development Environment Setting up

The following steps describe how to set up the INtime development environment on Visual Studio. For examples, how to create an INtime project, how to set up the path of header and library. (Take Visual Studio 2015 as an example here)

1. Create a new project (File/New), select “Application Wizard”, and then input a project name.



2. Setup INtime Application settings, as below



This page is the same as Default value, click “OK” to next step

INtime Application Wizard - INtimeApp1

Options that affect the whole process

Maximum memory pool size in Kbytes (max 2,097,151 or 0x1FFFFFF):

Best priority of threads in this process (Range: 0 - 253):

Use Windows or C++ exception handling:

Use C++ namespaces:

Use extended Memory mode:

Sponser names for this process:

This process depends on:

Click ”OK” to open project

INtime Application Wizard - INtimeApp1

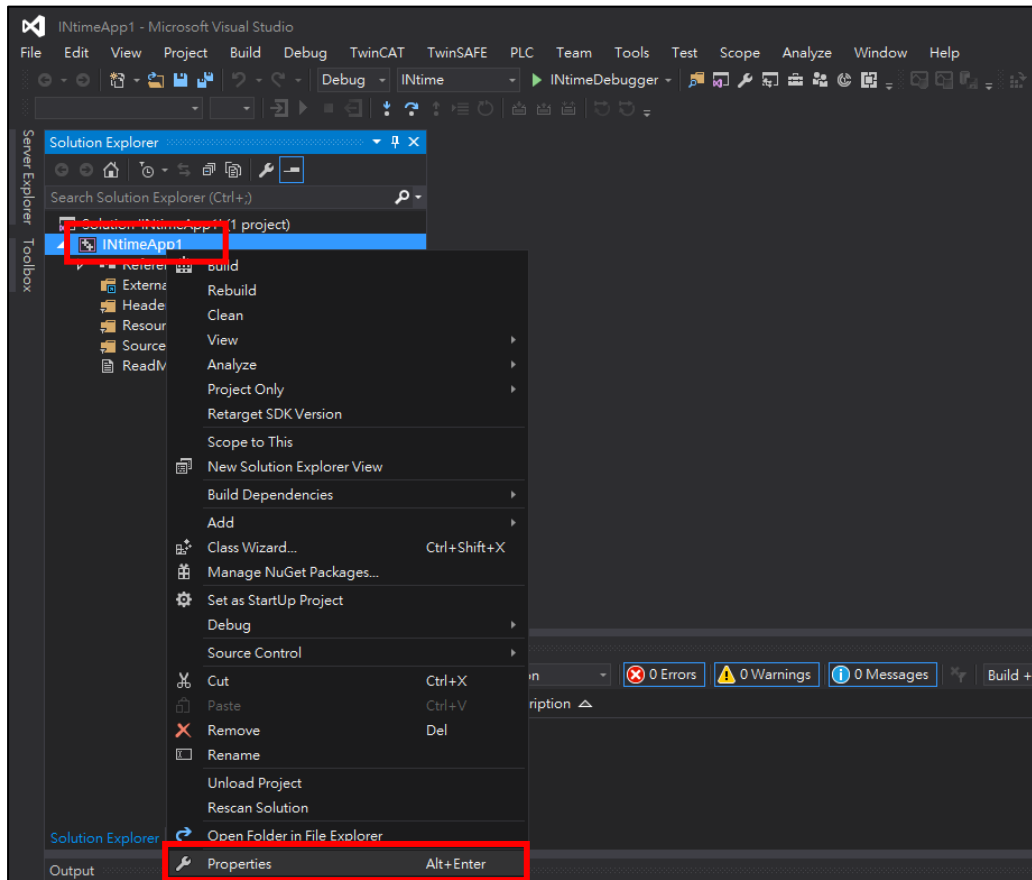
INtime Application Wizard will create a new skeleton project with the following specifications.

Generated Features:

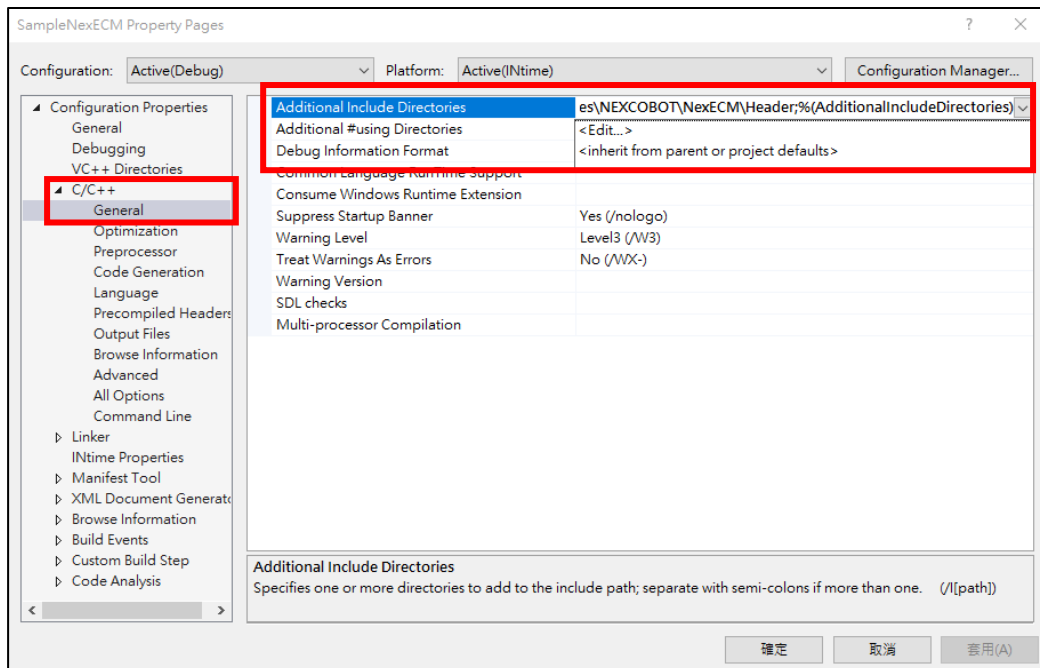
An Empty Project - with appropriate settings for Debug & Release Configurations.
No source code was generated for this project.

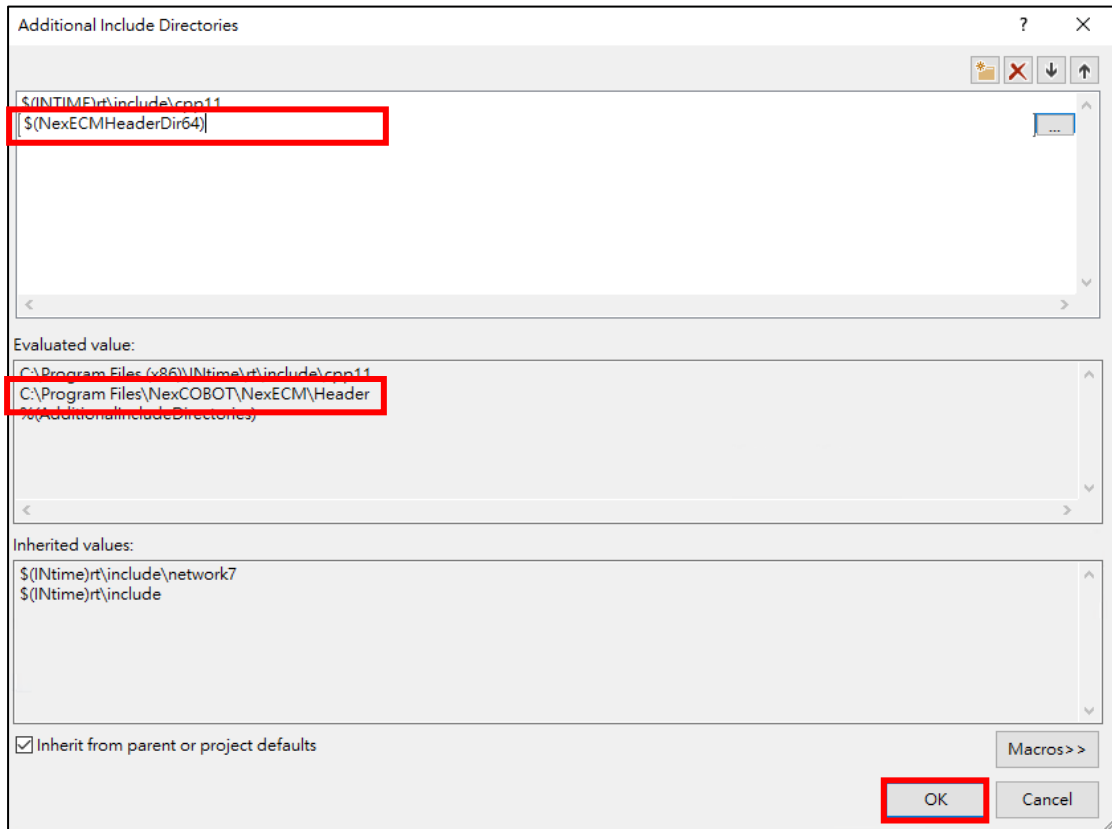
You use C++ as your programming language.
The class name is INtimeApp1
Modules can be added or extended as necessary.

- To set up the path of header and library, right click on the project and then select “Properties”.

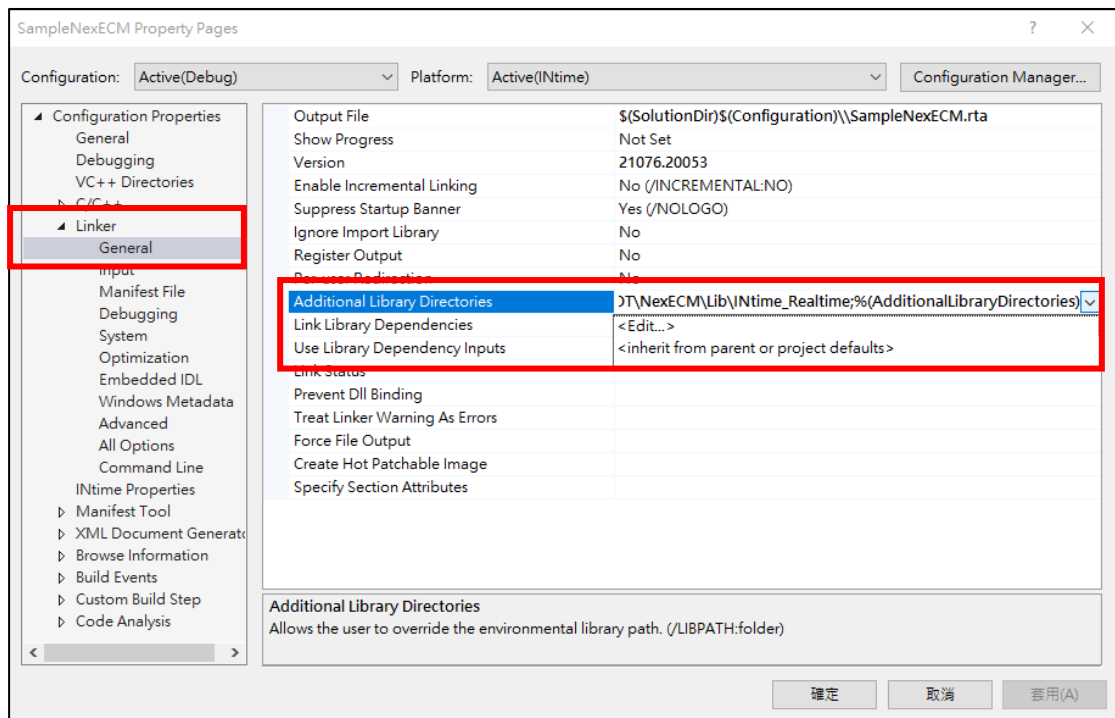


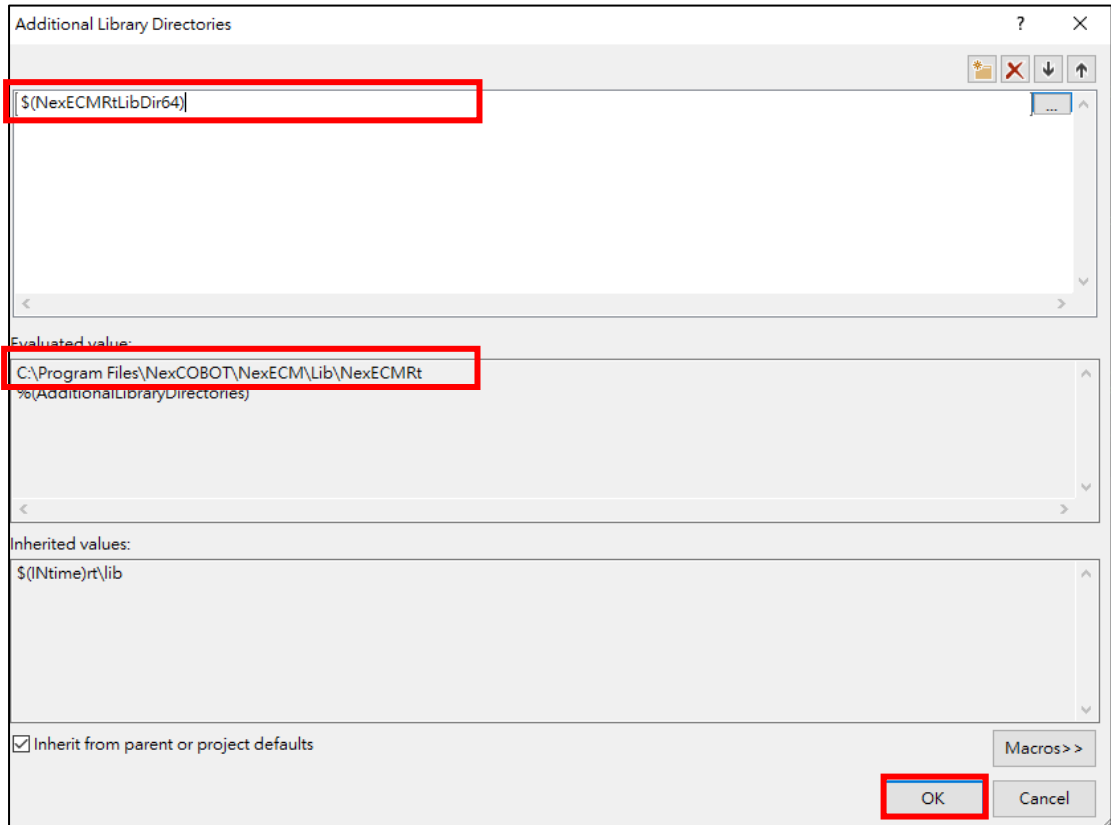
In C/C++ \ General, set up the path of header : \$(NexECMHeaderDir64)
(as shown in Figure below)



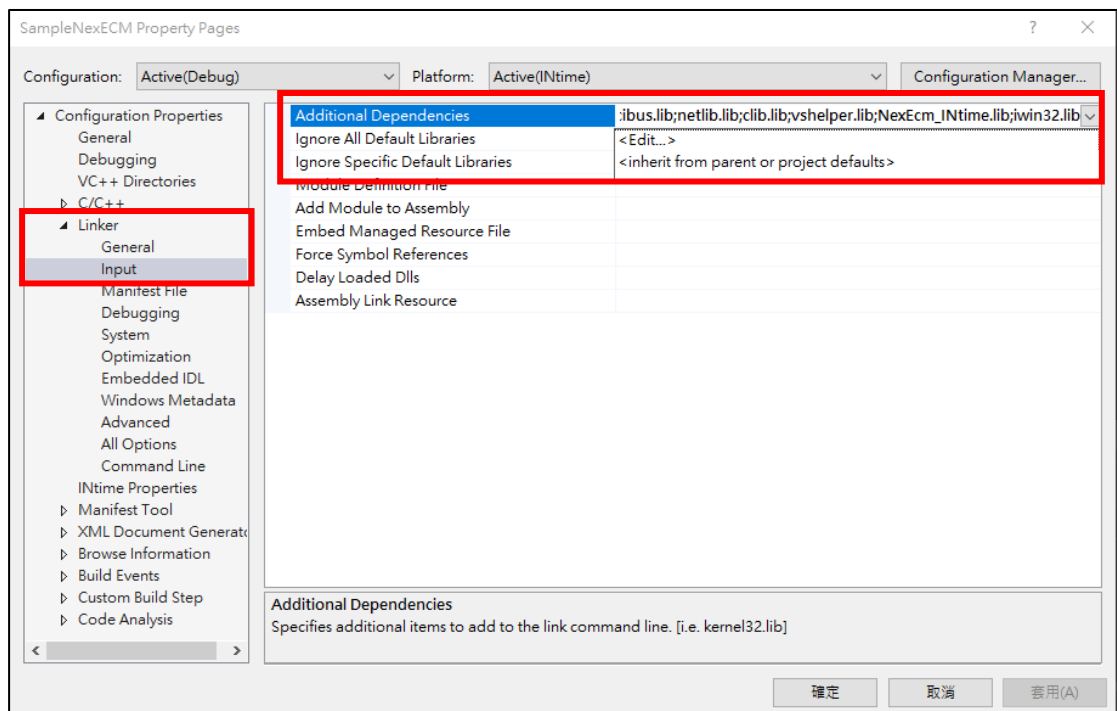


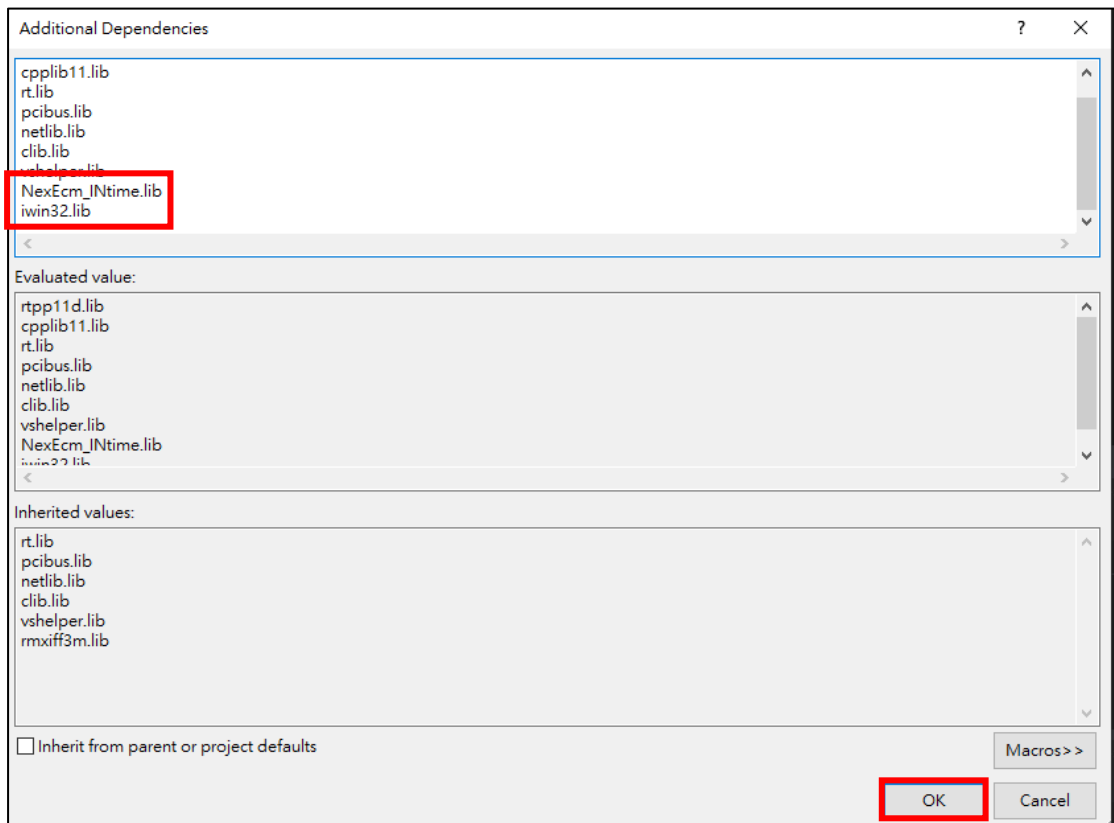
In Linker\General, set up the path of NexEcm_INtime.lib :
 \$(NexECMRtLibDir64) (as shown in Figure below)





In Linker\Input, set up the library “NexEcm_Intime.lib”
(as shown in Figure below)

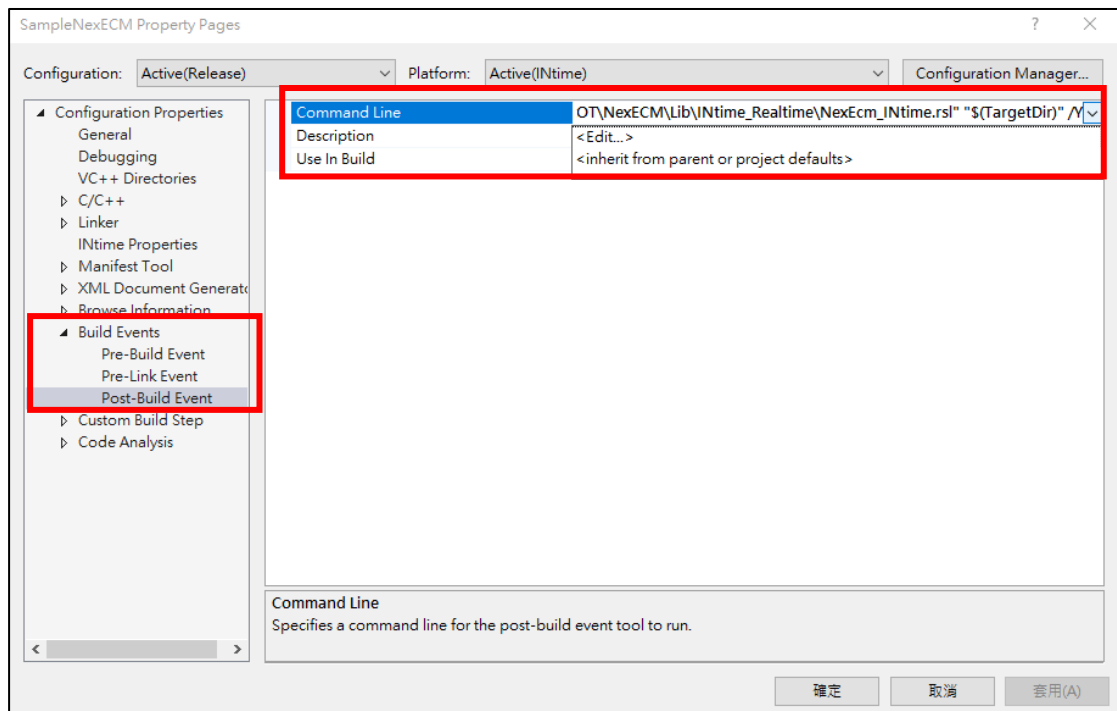


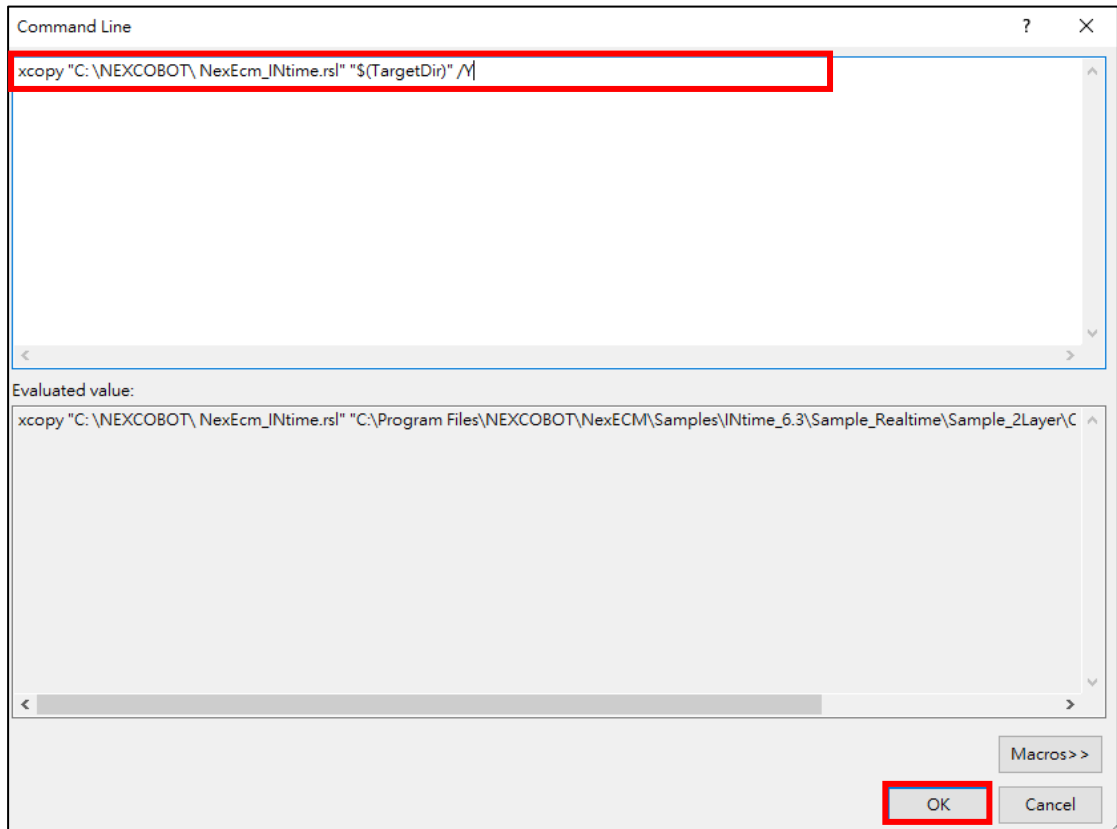


In Build Events\Post-Build Event, copy the file " NexEcm_INtime.rsl" to the target position by inputting the command:

" xcopy "C: \NEXCOBOT\ NexEcm_INtime.rsl" "\$(TargetDir)" /Y "

(as shown in Figure below)





4. Build and compile the INtime application

