

NIT Quick start guide



Documents

Date	Modification	Revision
17/11/2022	Document creation	V1.0
20/10/2023	Creation of §5.1 "Software installation" §5.1 renumbered 5.2, §5.2 renumbered §5.3 §5.2: minor modifications to address the installer	V1.1

User guide for SWIR cameras



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1. Introduction

Thank you for purchasing an NIT camera. This document is a quick start guide intended to provide directions in order to start rapidly and effectively your NIT camera. It will help you set up your work environment, connect the camera to a computer and acquire images. If a problem occurs, please refer to the troubleshoot paragraph at the end of the document.

2. Symbols

 *This symbol represents a noteworthy item; ignoring it might cause issues.*


 **This symbol represents a warning; ignoring it might have dire consequences.**

XXXXXX This marks the version of software, voluntarily not specified to accommodate every situation.


For example, the USB key provided with your camera might contain NITVision v1.3.1, which folder is named “9S21002W_131000”. But in order to be compatible with every NITVision version, we will refer to this folder as “9S21002W_XXXXXX” in this document.

All documentation and software described in this guide can be downloaded in your customer space on New Imaging Technologies website: <https://new-imaging-technologies.com/wp-login.php>. When creating your account, you can choose to be notified when new updates are available.


3. Warnings

 **Your camera contains some fragile components, handle it with care. Do not open it under risks of material degradation and voiding your warranty.**

 **Do not touch, wipe or try to clean by yourself the sensor’s window or the sensor itself.**


 **Your camera is an electronic component. Do not handle it with wet hands under risk of electrical injury. Do not power it with another power supply than the one provided without cautiously checking the voltage and current needed.**

 **Do not apply excessive stress on your camera’s connectors, nor on the C-mount or other screw holes. Do not drop the camera.**

 **Do not expose the camera to extreme conditions: check the operating conditions specified for the model you purchased. Do not expose the camera to strong electromagnetic fields or hazardous chemical environments (e. g. ATEX atmosphere).**

4. Material list

Before getting started, please make sure that you have all the material needed to do so. Here is what you will need depending on the connection type of your camera. If you chose the sensor without window option, please read the Annex concerning it for further information.

 *A computer is considered a common requirement for all camera types. Check the material requirements in the reference guide of each application.*

4.1.1. USB 3.0

The material needed to operate a USB 3.0 camera is:

- A USB 3.0 Camera.
- A USB 3.0 cable provided.
- The power supply and power cable provided (for camera with Hirose connector).

4.1.2. GigE

The material needed to operate a GigE camera is:

- A GigE Camera.
- An Ethernet cable category 5e or above.
- The power supply and power cable provided (unless you took the option to have Power over Ethernet).

4.1.3. Camera Link

The material needed to operate a Camera Link camera is:

- A Camera Link camera.
- A Camera Link cable.
- A frame grabber:
 - o Non embedded models (M-S & M-ST series): provided GUI is compatible with grabbers from Teledyne Dalsa (suggested model: Xtium CL-MX4).
 - o Embedded models (M-SE & M-STE series): provided control software (NITLink) requires the frame grabber to be configured to show up as a Windows COM Port (most frame grabbers support this functionality).
- The power supply and power cable provided (unless you took the option to have Power over Camera Link).

4.1.4. SDI/Analog

The material needed to operate an SDI or Analog camera is:

- An SDI or Analog Camera.
- A compatible display (SDI display, CRT screen, analog/digital video converter, etc.).
- An RS232 interface. Please note that a Harwin to RS232 (DB9 connector) is provided with the camera.

5. Getting started

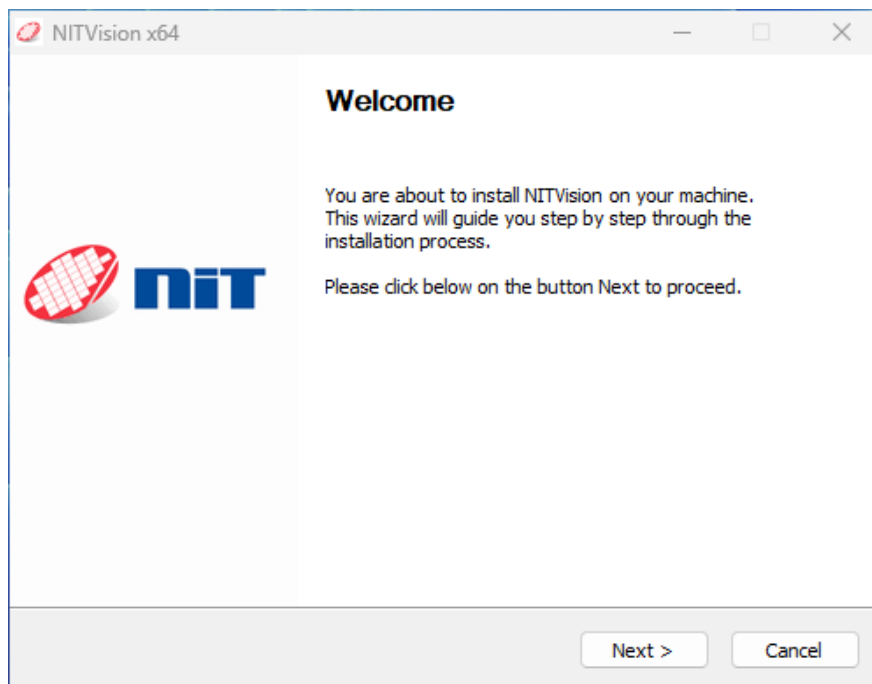
5.1. Software installation (NITVision)

All USB 3.0, GigE and SenS 1280M-ST cameras are provided with a USB key that contains the installer for NITVision, and in the case of SWIR cameras their NUC and BPR folder named “SNYYYYYY” (Ys representing the serial number of the camera).

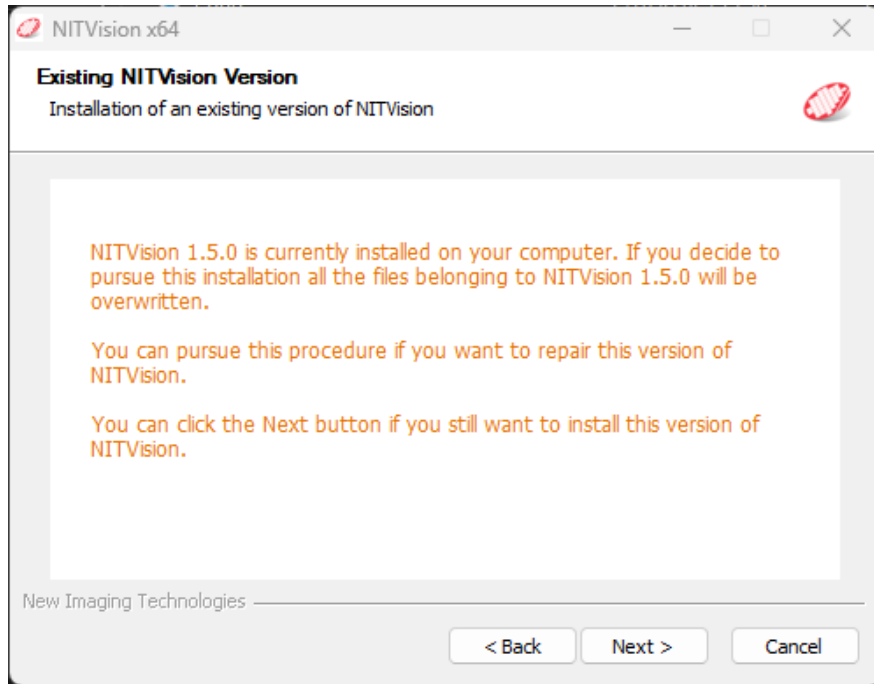
⚠ *If the USB key provided with your order doesn't include this version of the Quick start guide, there is a good chance that you were provided with a ready-to-copy version of NITVision and not an installer. In this case this section is not applicable. Please refer to the sub-section of §5.2 corresponding to your camera connection type.*

Here is the procedure to set up your instance of NITVision:

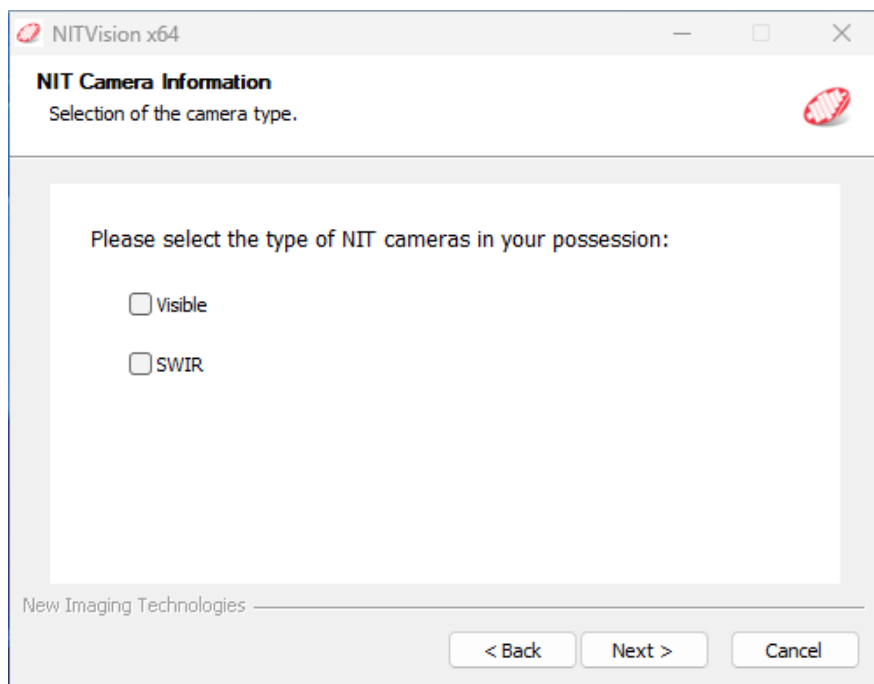
1. Plug the USB key to the computer with which you plan to use the camera. You will find the installer for NITVision called “NITVision-X_X_X-Installer-Z.Z.Z.exe” in the folder “9S21002W_XXXXXX”. Please note that the installer will require that you possess administrator rights.
2. The first window opens. Click next.



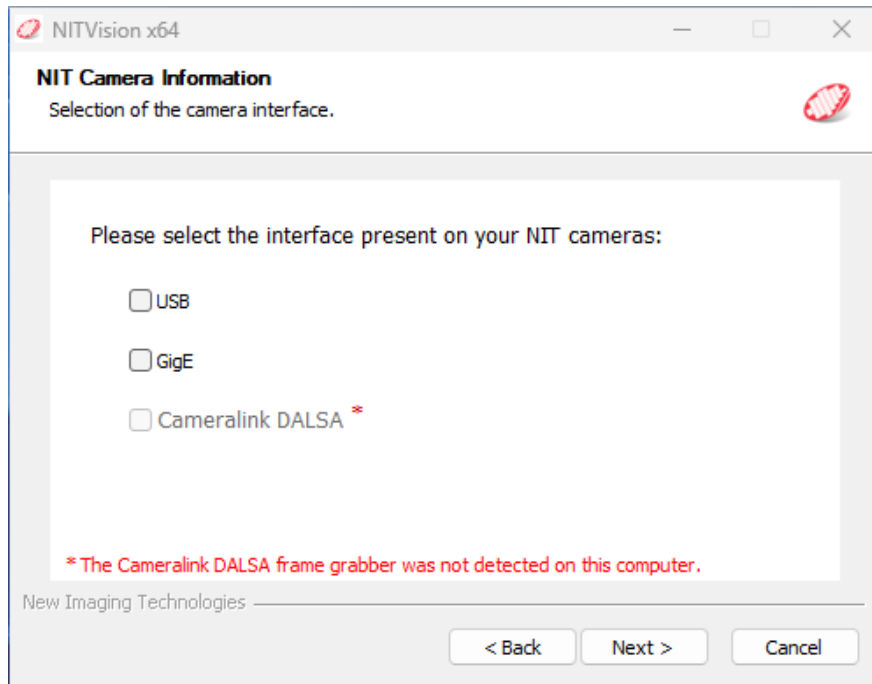
3. If you already have an installer version of NITVision installed, it will detect it, as shown below. Click next if you wish to reinstall the software. User data such as snapshots, videos or NUC files will not be erased. If a previous version of NITVision is already installed, the previous version will not be removed and will need to be uninstalled manually if you wish to removed it. If it is your first installation of NITVision, this window will not appear.



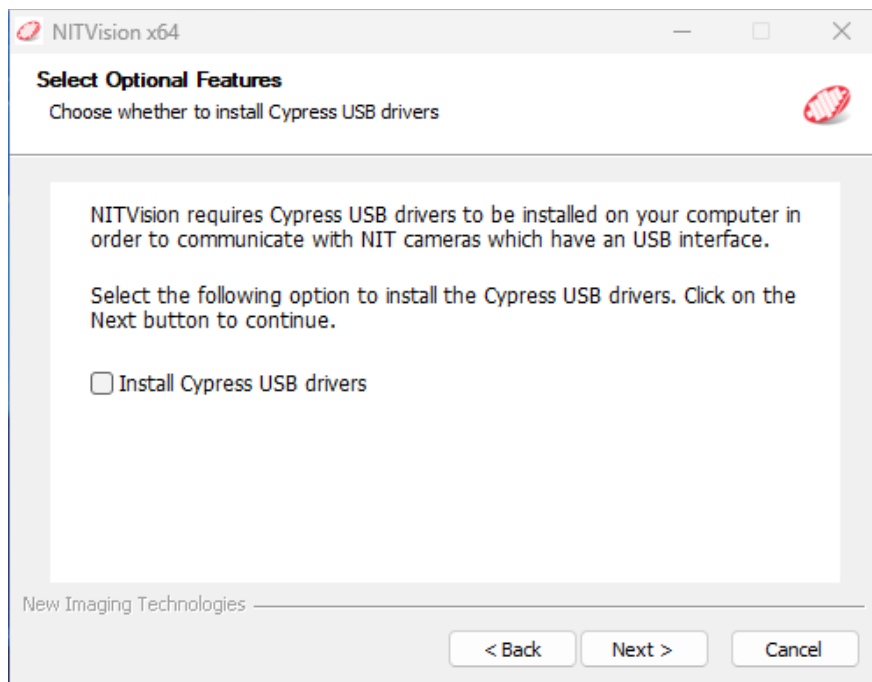
4. Next the installer asks to choose what kind of camera you have: whether Visible, SWIR or both (you can tick both boxes). Once your choice is done, click "Next".



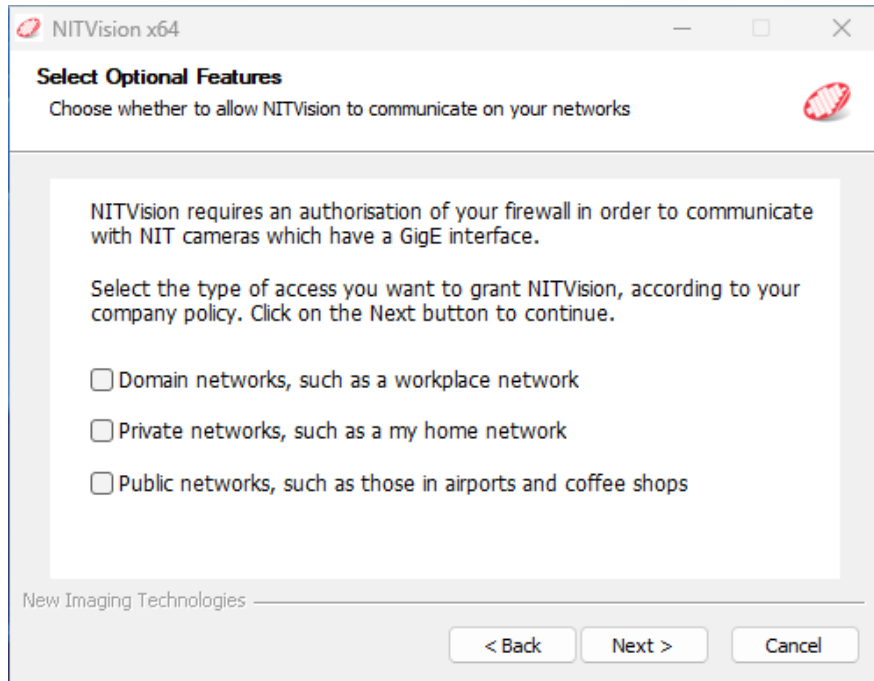
5. Now, you need to indicate what kind of communication interface you will use your camera with. As for the previous step you can tick all the boxes. Camera Link will be available only if you possess a Teledyne Dalsa Frame Grabber and have Sopera version 8.X (above 8.3) installed. Please note that only the SenS 1280M-ST cameras are compatible with NITVision. Once your choice is done, click “Next”.



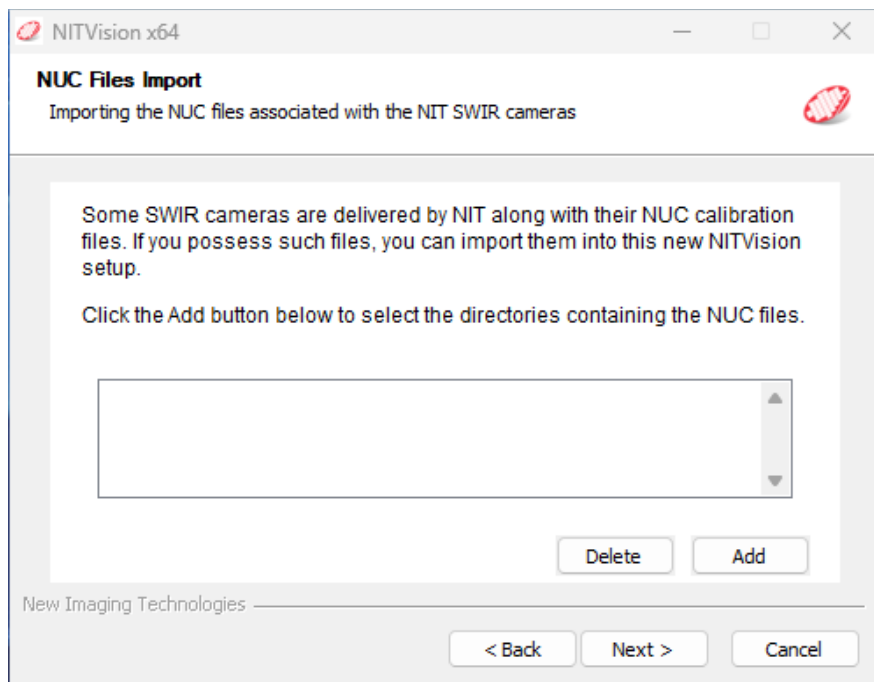
6. You will need to decide if you need to install the Cypress USB driver. If it is your first installation, or if you are not sure if you have already installed it or not, we advise to install it. This driver installation is not necessary for GigE or Camera Link cameras and will be proposed only if you ticked USB at the previous step. Once your choice is done, click “Next”.



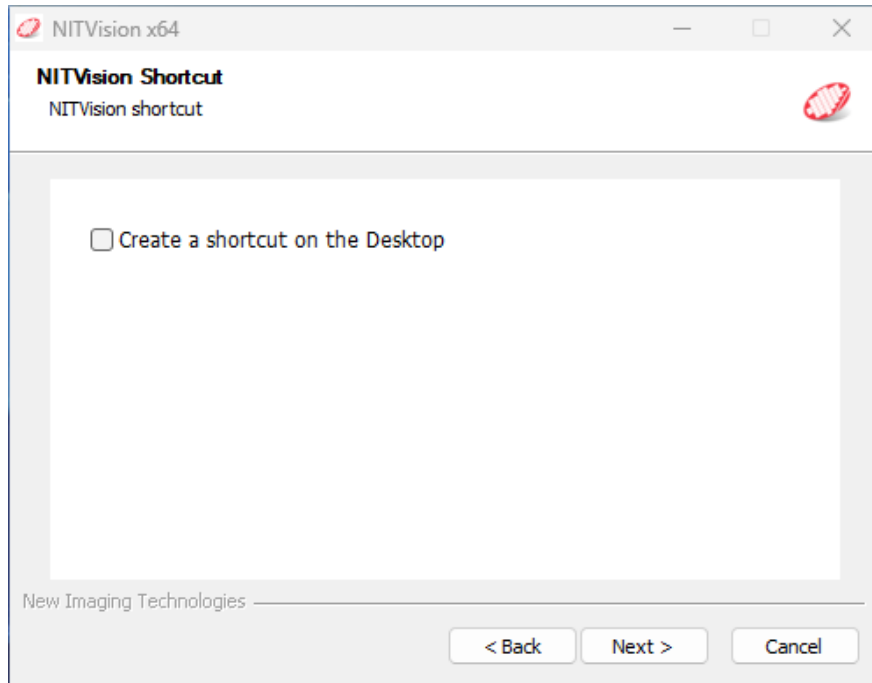
7. If you have selected GigE at step 5, this window appears. GigE cameras need to have an exception added to the firewall in order to communicate. Please choose the kind of network for which you wish to validate the exception. If you do not have a firewall, this step is not mandatory. Once your choice is done, click “Next”.



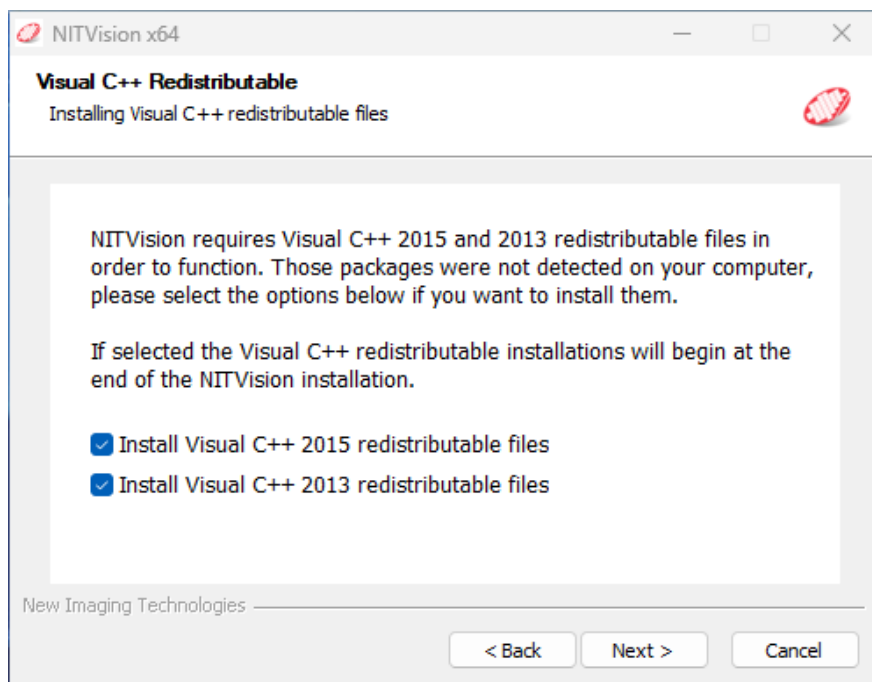
8. If you selected the option “SWIR” at step 4, this window appears. It allows you to copy the NUC files from the USB key to your future NITVision folder. This will assure that NUC and BPR compensations are automatically activated in NITVision. Click “Add” to indicate the NUC folder location. A pop-up opens to allow you to choose the folder you wish to have copied. If you wish to copy the folder by yourself later on, it is also possible. Once it is done, click “Next”.



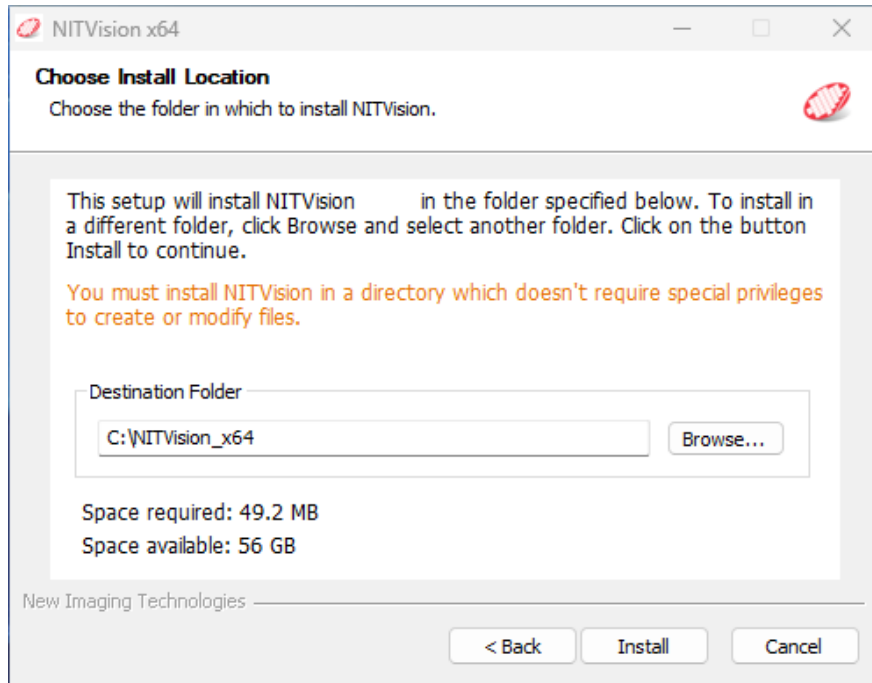
9. Now, you can choose whether you wish to have a desktop icon for NITVision or not. Once your choice is done, click “Next”.



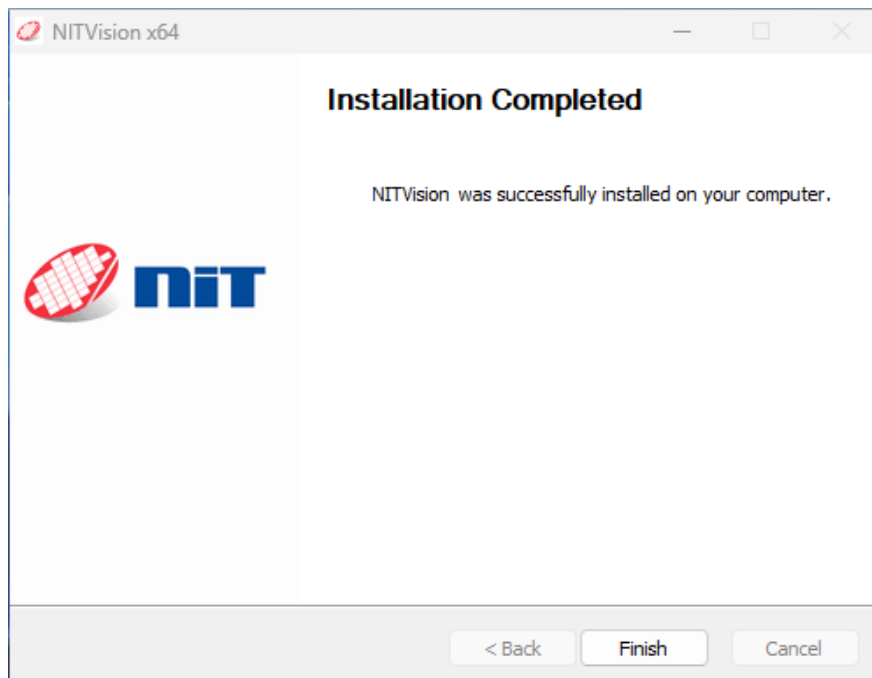
10. NITVision needs to have Visual C++ Redistributable 2013 and 2015-2022 installed on your computer to work. As it is a dependency that many other applications share, you might already have it installed and this window will not appear. If you wish to install them on your own, you can decide to not tick the boxes. But, if this window opens it is highly recommended to tick the boxes and have Visual C++ Redistributable installed, or your NITVision will not run. Once your choice is done, click “Next”.



11. Finally, you can choose the location of your NITVision install. If the default location doesn't suit you, you can click on "Browse" to choose another one. Once done, click "Install".



12. Installation will now run. Once it is done this window will appear, confirming installation was successful:




13. You can now click on "Finish". The installer window will close, and if you chose to install Visual C++ at step 10, its installation window will open. Else, NITVision is now ready to be used.

5.2. Hardware setup

5.2.1. USB 3.0


This paragraph presents the steps to connect your USB 3.0 camera on your computer.


 *Steps 1 and 4 are not needed if you have an installer version of NITVision.*


1. Take the provided USB key and plug it to the computer. If you plan to use the Graphical User Interface (GUI) NITVision, then copy the folder “9S21002W_XXXXXX” (Xs represent the software version) at any location which doesn't require special privileges to create or modify files.
2. Take the USB cable provided and plug it in the camera connector. Make sure to tighten the screws in order to avoid a bad connection.



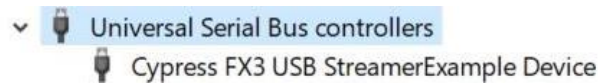
3. Plug the other side of the cable on your computer on a USB 3.0 port. There should be an “SS” mark over the USB trident (for Super Speed) and the plastic stripe in the port is blue (but it may not always be the case).

 *Please note that you need to plug the connector firmly and quickly to avoid Windows labelling the connection as USB 2.0 instead of USB 3.0.*

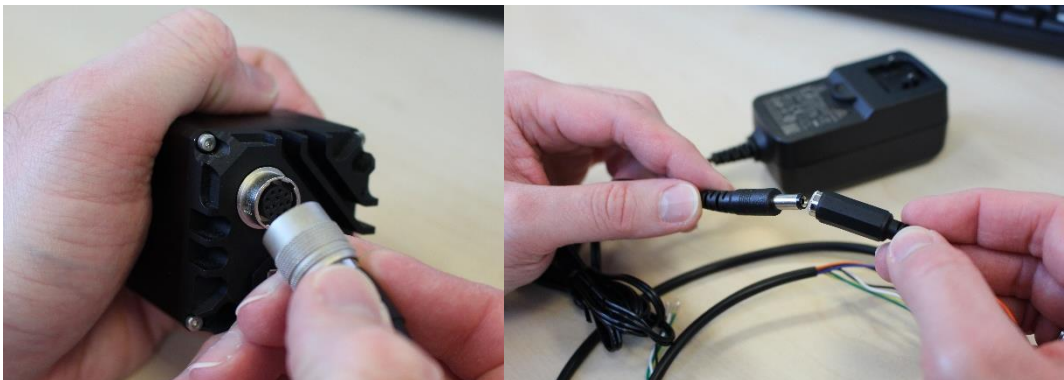
 *If you are using a desktop computer it is recommended to plug the camera in USB ports on the back panel as they are directly wired to the motherboard.*

 *It is not recommended to use USB hubs as bandwidth will be shared with the other connected devices, which can cause issues.*

4. After connecting the USB 3.0 on the computer, a dialog box inviting the user to install a new device driver should pop up. In the event this screen does not show up you can have access to the new device in the system device manager (found in system options). You just need to follow the installation procedure as below:
 - a. In the Windows search bar type “Device Manager”.
 - b. In the “USB controllers” section, find the unknown device and right click on it and select “Properties”.
 - c. In the “Driver” tab, click on “Update driver software”.
 - d. Select “Browse my computer for driver software”.
 - e. Browse the correct platform driver from “9S21002W_XXXXXX \Windows\DRIVERS” in the USB key provided.
 - f. Verify in Windows Device Manager that you now have a “Cypress FX3 USB StreamerExample Device” in the “Universal Serial Bus controllers” list, as shown below:




5. If your camera has a Hirose 10 pin circular connector (see image below), then you also need to plug the power cable in order to power the Thermo-Electric Cooler (or TEC). Take the power/trigger cable provided and connect the Hirose connector on the camera. Then connect the jack connector on the power cable to the cable of the power supply provided.



6. Now you can plug the power supply in a power outlet.

5.2.2. GigE


This paragraph presents the steps to connect your GigE camera on your computer.

 *Step 1 is not needed if you have an installer version of NITVision.*

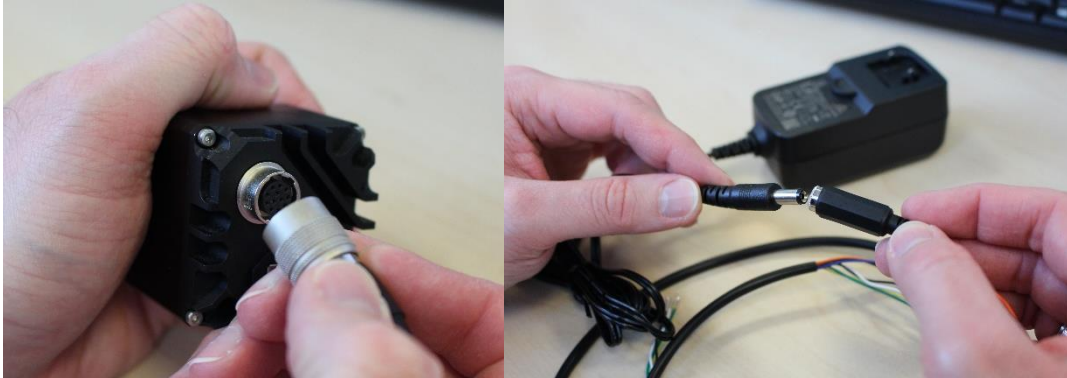
1. Take the provided USB key and plug it to the computer. If you plan to use the Graphical User Interface (GUI) NITVision, then copy the folder “9S21002W_XXXXXX” (Xs represent the software version) at any location which doesn't require special privileges to create or modify files.
2. For best performance and reliability, it is recommended to set your network adapter settings as below:
 - a. Go in your Device Manager.
 - b. Right click on your network adapter, then click on “Properties”.
 - c. Click configure.
 - d. Adjust the following properties:
 - i. Jumbo frames: maximum value allowed (9014bytes usually).
 - ii. Interrupt moderation: “Extreme” (if it is available, otherwise set it “On”).
 - iii. Receive buffers/Descriptors: maximum value allowed (usually 2048bytes).
3. Connect an Ethernet cable (cat. 5e or higher) on the camera side.




4. Then you can connect the other side of the Ethernet cable on a network board in your computer.

 *It is not recommended to use Ethernet switches as the bandwidth will be shared with the other connected devices, which can cause issues.*

5. Now you need to plug the power cable. Take the power/trigger cable provided and connect the Hirose connector on the camera. Then connect the jack connector on the power cable to the cable of the power supply provided.



6. Finally plug the power supply in a power outlet.

 *You don't need to plug a power supply if you have taken the Power over Ethernet option in your order.*

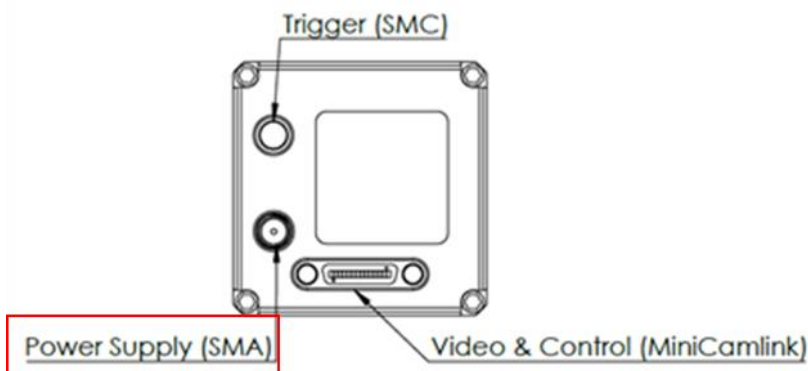
5.2.3. Camera Link (all models)

This paragraph presents the steps to connect your Camera Link camera on your computer.

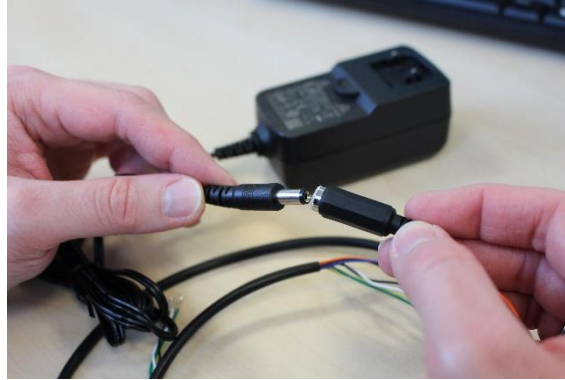
1. Take the provided USB key and plug it to the computer. If you plan to use the Graphical User Interface (GUI), here are your software options:
 - M-SE & M-STE series cameras: NITLink.
 - M-S & M-ST series cameras (SenS 1280 excluded): WiDyCAM.
 - SenS 1280 M-ST cameras: NITVision.
2. To use the GUI, copy the corresponding folders at any location which doesn't require special privileges to create or modify files (Xs represent the software versions, not needed for NITVision with installer):
 - "9S19002W_XXXXXX" for NITLink,.
 - "9S16007CAMXXXXXX" for WiDyCAM.
 - "9S21002W_XXXXXX" for NITVision (only if you don't have an installer version of NITVision).
3. Plug the camera link cable on the camera side. Make sure the screws are tightened. Then connect it on your frame grabber.




4. Next, you need to connect the power cable on the SMA or Hirose connector on the camera.



5. Once it is done, you can connect the jack side of the power cable to the power supply (for Hirose connectors). Then connect the power supply to a power outlet.



 *You don't need to plug a power supply if you have taken the Power over Camera Link option in your order.*

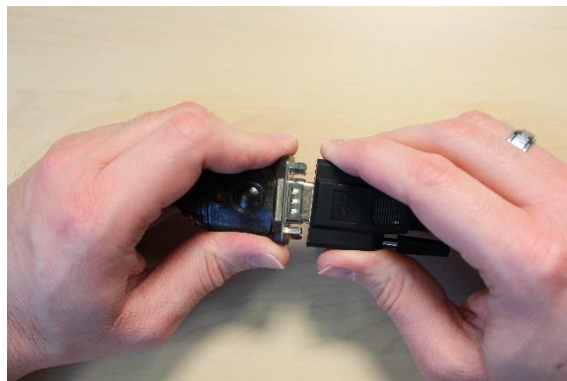
5.2.4. SDI/Analog

This paragraph presents the steps to connect your SDI or Analog camera on your computer.

1. Take the provided USB key and plug it to the computer. If you plan to use the Graphical User Interface (GUI) NITLink, then copy the folder “9S19002W_XXXXXX” (Xs represent the software version) at any location which doesn't require special privileges to create or modify files.
2. Plug the Harwin connector on the camera. Please note that you need to screw the connector to have it plugged. To do it easily, screw each screw in alternance and not one after the other.



3. Plug the DB9 to your RS232 interface.



4. Now, you can connect your display device to the SDI or coax connector on the camera.



5.3. Software set up

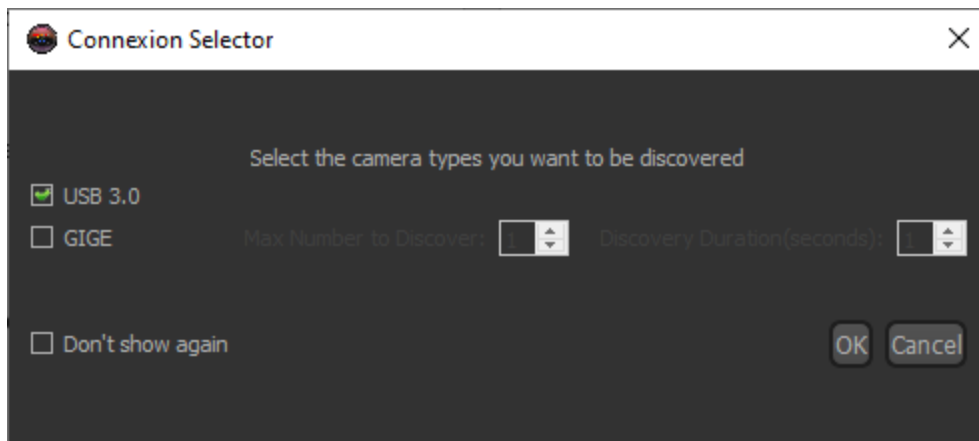
5.3.1. USB 3.0

5.3.1.1. Graphical user interface (NITVision)

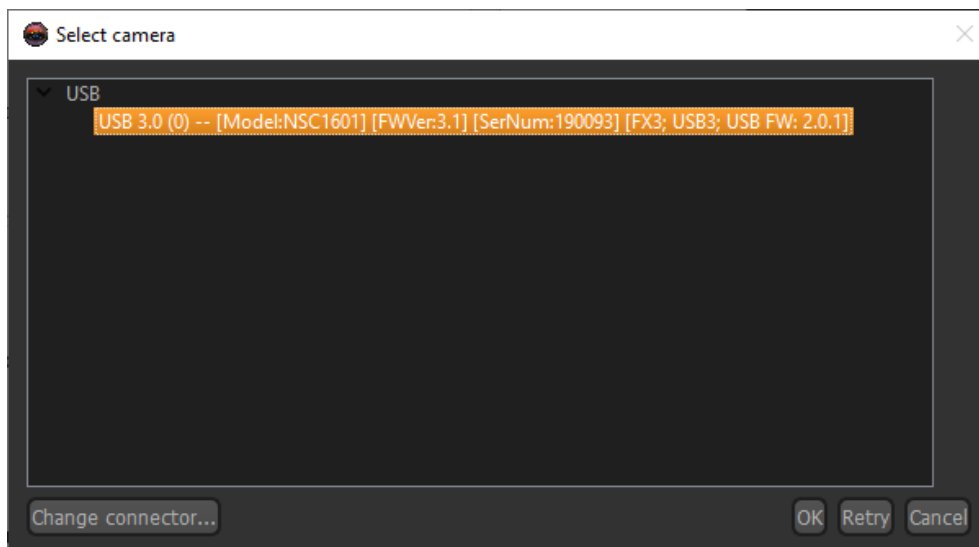
Your camera is delivered with the GUI NITVision. It is a software that will allow you to control your camera and acquire images. It also has some more advanced functions, but this guide will only cover the basic operations in order for you to acquire the first images. To go further, please read the reference manual “NITVision-X.X-Y.pdf” provided with NITVision in the folder: 9S21002W_XXXXXX\Windows\NITVision\REFERENCE GUIDE.

⚠ *If you do not have Microsoft Visual C++ Redistributable 2013 and 2015 installed, you will have an error message when starting NITVision saying that “MSVCP120.dll” and “MSVCR120.dll” are missing (the message can also ask for “MSVCP140.dll” and “MSVCR140.dll”). Please install the 2013 and 2015 Redistributable (we advise to install both the x86 and x64 versions).*

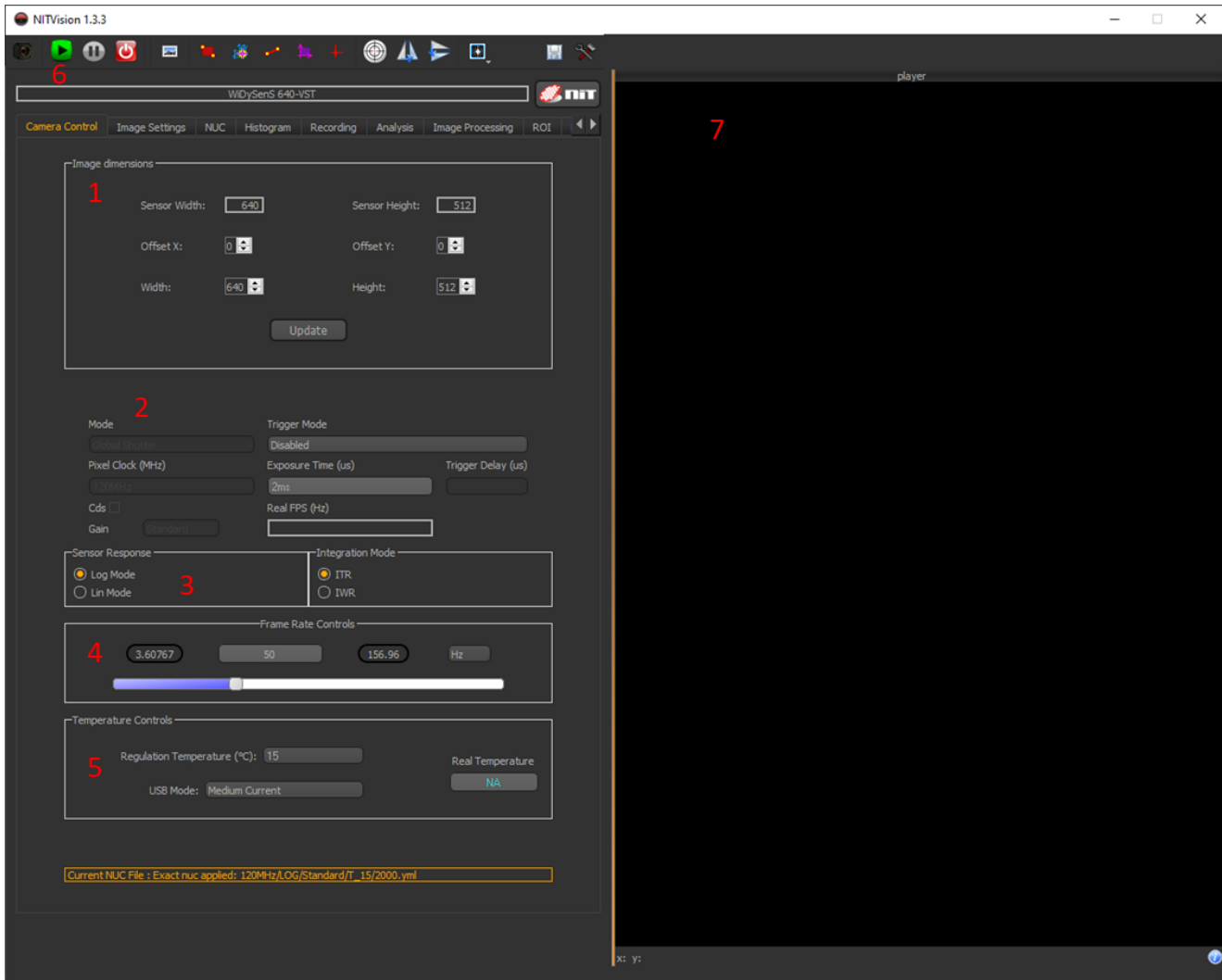
When you start NITVision, a first pop-up appears that asks what kind of connection the camera is using. Select USB 3.0:



Then, a second pop-up appears that shows all the cameras detected in USB 3. Select the one you want to use, then click “OK”.



Then the main window of NITVision appears. All the most important controls to start an acquisition are on the tab opened “Camera Control”.



1. Images dimensions: this area allows to control the size of the image acquired.
2. Acquisition mode, trigger and exposure time: this area allows to set the acquisition mode (global shutter, rolling, etc.), the trigger options, the exposure time, the pixel clock (if the model allows it) and read the real frame rate of the camera.
3. Sensor response & integration mode: this area allows to switch between logarithmic and linear sensor modes, and to select between ITR and IWR acquisition techniques.
4. Frame rate controls: allows to set the frame rate.
5. Temperature controls: allows to select the temperature at which the sensor is regulated, to change the current limit (more current allows a bigger delta between ambient temperature and sensor temperature but consumes more power) and displays the sensor temperature.
6. Function ribbon: here you will find multiple functions, but the most important are the play and pause buttons that starts and pauses the acquisition. The on/off button stops the acquisition and exits the software.
7. Player: the images acquired are displayed here.



Now that the software is up and running, you can check the image acquisition is working by pressing play in the function ribbon (6). You can also tune the camera settings according to your application.

5.3.1.2. Software integration (SDK)

If you wish to develop your own application, we provide an SDK called NITLibrary. The following languages are supported:

- Python scripts (compatible versions: 3.5, 3.6, 3.8 and 3.9).
- C++.
- C#.

You can find all the SDKs and samples in the Support/Download section of the New Imaging Technologies website: <https://new-imaging-technologies.com/software-log-in/>.

5.3.2. GigE

5.3.2.1. Graphical user interface (NITVision)

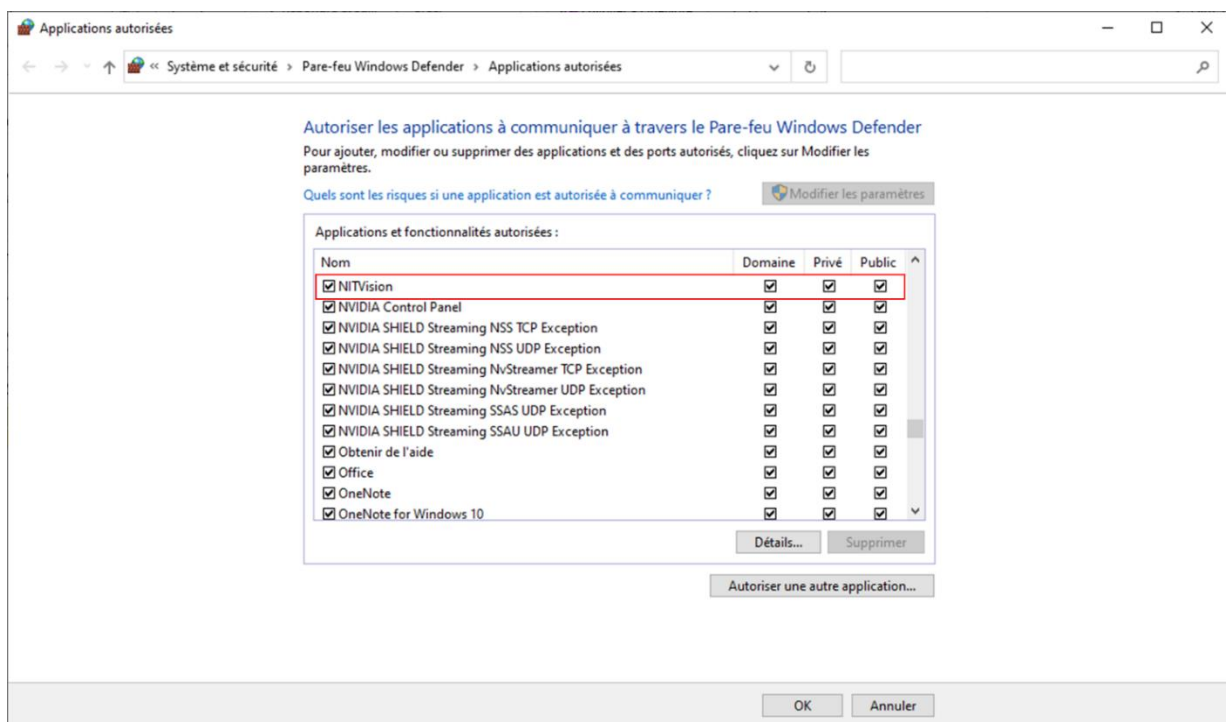
Your camera is delivered with the GUI NITVision. It is a software that will allow you to control your camera and acquire images. It also has some more advanced functions, but this guide will only cover the basic operations in order for you to acquire the first images. To go further, please read the reference manual “NITVision-XX.X-Y.pdf” provided with NITVision in the folder: 9S21002W_XXXXXX\Windows\NITVision\REFERENCE GUIDE.

⚠ *If you do not have Microsoft Visual C++ Redistributable 2013 and 2015 installed, you will have an error message when starting NITVision saying that “MSVCP120.dll” and “MSVCR120.dll” are missing (the message can also ask for “MSVCP140.dll” and “MSVCR140.dll”). Please install the 2013 and 2015 Redistributable (we advise to install both the x86 and x64 versions).*

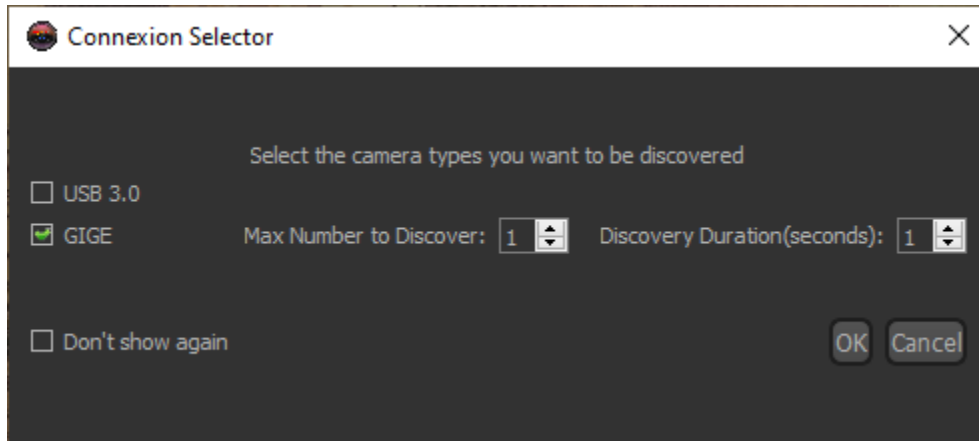
As GigE cameras use network boards, you need to add an exception in the firewall for NITVision before starting the software, or else communication with the camera will not be possible. If you have an installer version of NITVision and you chose to let it add the exception, this is not necessary.

⚠ *When using a direct connection between the camera and the computer, this connection can be labelled as “public” by default. Thus you need to either change manually this connection to private, or allow the software to communicate through the firewall on public networks.*

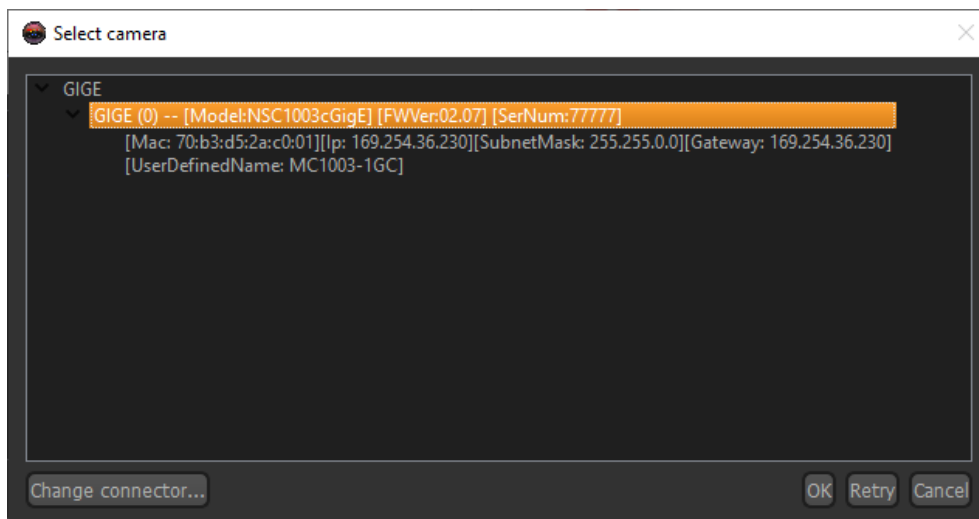
⚠ *If your computer has multiple firewalls, then you need to add the exception for the software on every firewall. If you have issues communicating with the camera, you might need to contact your network administrator.*




When you start NITVision, a first pop-up appears that asks what kind of connection the camera is using. Select GigE:

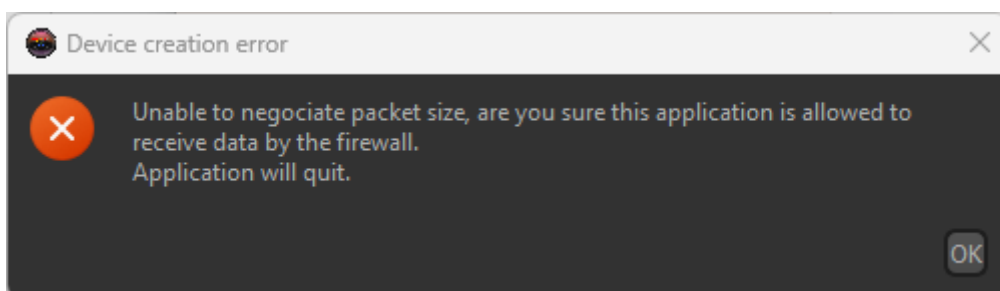


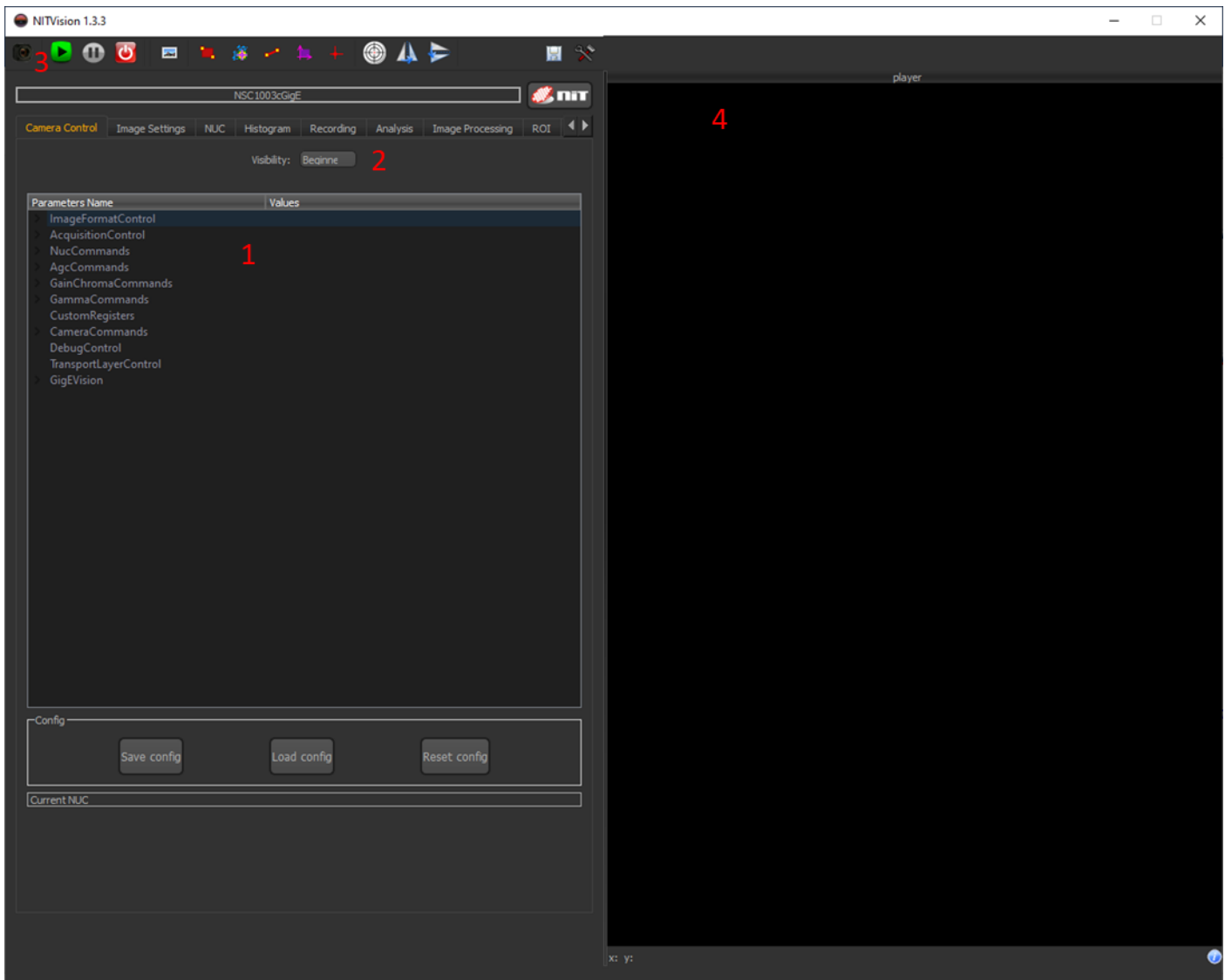
Then, a second pop-up appears that shows all the cameras detected in GigE. Select the one you want to use (serial number is indicated), then click “OK”.



Then the main window of NITVision appears. All the most important controls to start an acquisition are on the tab opened “Camera Control”).

 *If this pop-up appears, please check your firewall settings (see §5.2.2.1).*





1. Parameters: this area allows to control all the parameters of the camera, from exposure time to frame rate, ROI, sensor mode...
2. Visibility: if you don't find the parameter you want to change in 1., you can select the other levels of visibility to have access to more parameters. There are three levels: beginner, expert and guru.
3. Function ribbon: here you will find multiple functions, but the most important are the play and pause buttons that starts and pauses the acquisition. The on/off button stops the acquisition and exits the software.
4. Player: the images acquired are displayed here.

Now that the software is up and running, you can check the image acquisition is working by pressing play in the function ribbon (3). You can also tune the camera settings according to your application.



5.3.2.2. Software integration (SDK)

If you wish to develop your own application, we provide an SDK called NITLibrary. The following languages are supported (our GigE cameras are GigE Vision compliant):

- Python scripts (compatible versions: 3.5, 3.6, 3.8 and 3.9).
- C++.
- C#.

You can find all the SDKs and samples in the Support/Download section of the New Imaging Technologies website: <https://new-imaging-technologies.com/software-log-in/>.

All our GigE cameras are GigE Vision compliant thus can be used with any GigE Vision compliant third-party software.

5.3.3. Camera Link (M-SE and M-STE series)

5.3.3.1. Graphical user interface (NITLink & frame grabber software)

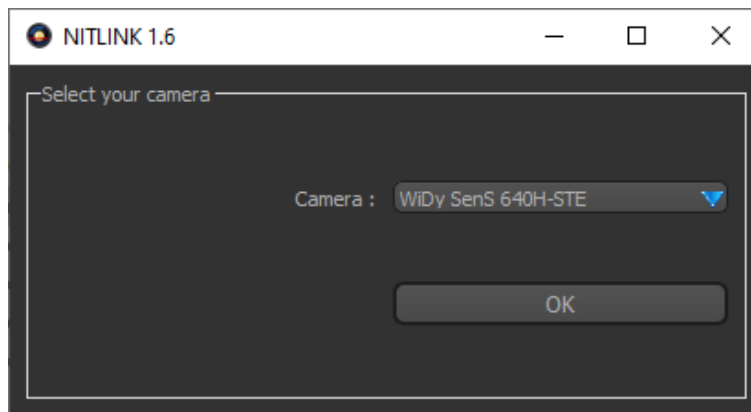
⚠ NITLink uses a Windows COM port to communicate with the camera. Your frame grabber needs to be configured to expose its serial port as a Windows COM port, check your frame grabber documentation to set it up.

⚠ NITLink allows you to set and control your camera parameters. Image acquisition is handled by the frame grabber's software, check your frame grabber documentation to set up image acquisition. Please note you need to set the resolution and bit per pixel corresponding to your current camera parameters.

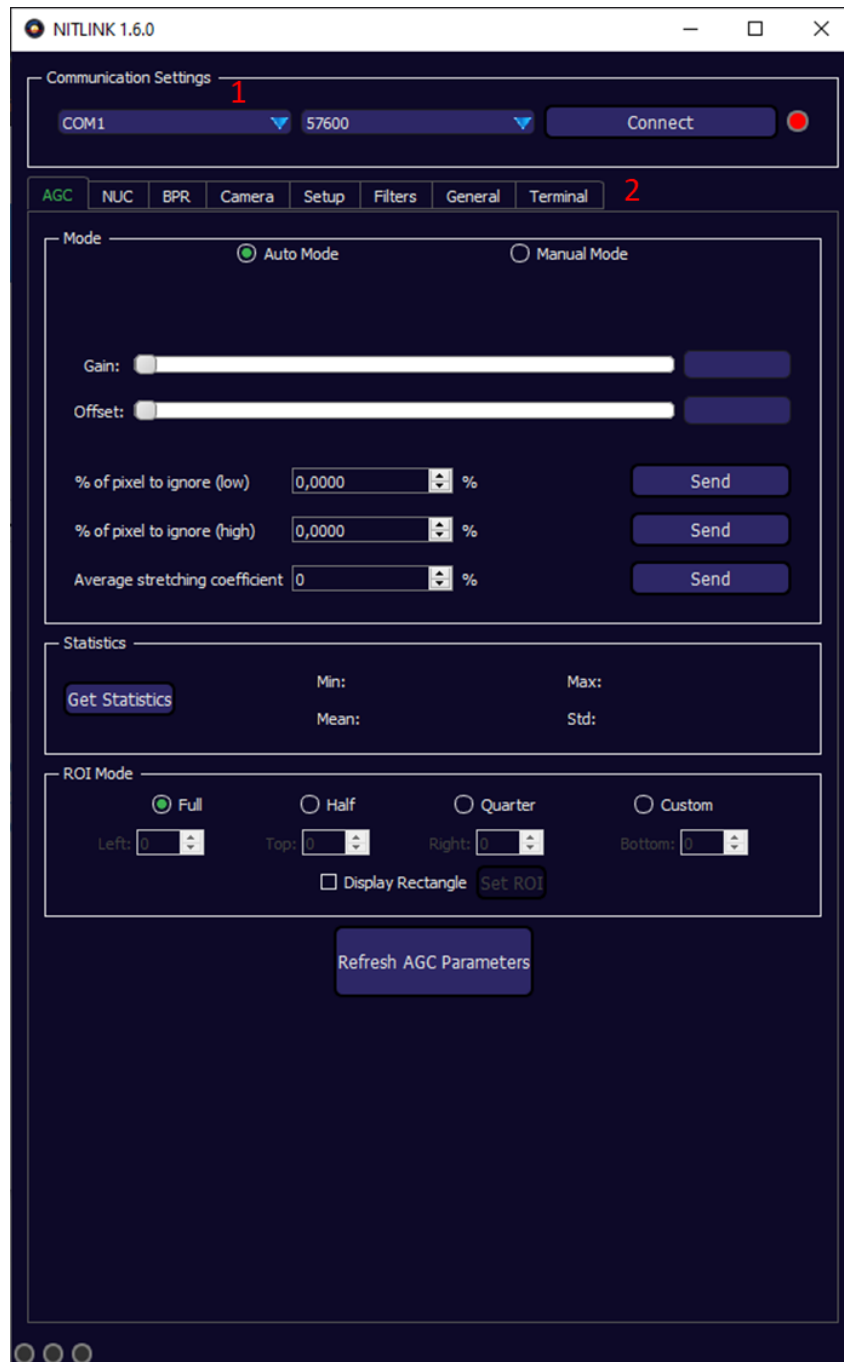
Your camera is delivered with the GUI NITLink. It is a software that allows you to control your camera and change its parameters. It also has some other functions, but this guide will only cover the basic operations in order for you to acquire the first images. To go further, please read the reference manual "NITLINK X.X.X - RG.pdf" provided with NITLink in the folder "9S19002W_XXXXXX\Windows\REFERENCE GUIDE".

⚠ If you do not have Microsoft Visual C++ Redistributable 2013 and 2015 installed, you will have an error message when starting NITVision saying that "MSVCP120.dll" and "MSVCR120.dll" are missing. Please install the 2013 and 2015 Redistributable (we advise to install both the x86 and x64 versions).

When started, the software displays a pop-up that asks what kind of camera you have plugged. You need to select the model in the drop-down menu and click on "OK".



Now NITLink's main window appears. Its layout is as follow:

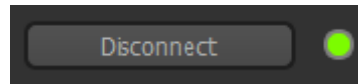


The layout of the main windows is the following:

1. Communication settings: here you can set the COM port on which the camera is connected, the baud rate and connect to the camera.
2. Tabs: you have multiple tabs that allows to set a number of parameters of the camera, by default you start on the AGC (Automatic Gain Control)



Now that the main window is displayed, you need to set the COM port number on which the camera is connected. You can find it in Windows Device Manager. Then click on “Connect” to initiate the control of the camera. The small light on the right of “Connect” will turn from red to green and “Connect” will be replaced by “Disconnect”:



If you wish to go further, you can check the NITLink manual that is provided (in the USB key in \9S19002W_XXXXXX\Windows\REFERENCE GUIDE\NITLINK X.X.X - RG.pdf).

5.3.3.2. Software integration (NITLink Protocol)

If you wish to develop your own application, you can use the NITLink protocol in order to control the camera and its settings. You can find the documentation on this protocol and a code sample in the “NITLink integration guide” that you can download in the Application notes section of the New Imaging Technologies website: <https://new-imaging-technologies.com/wp-login.phphttps://new-imaging-technologies.com/software-log-in/>.

5.3.4. Camera Link (M-S and M-ST series)

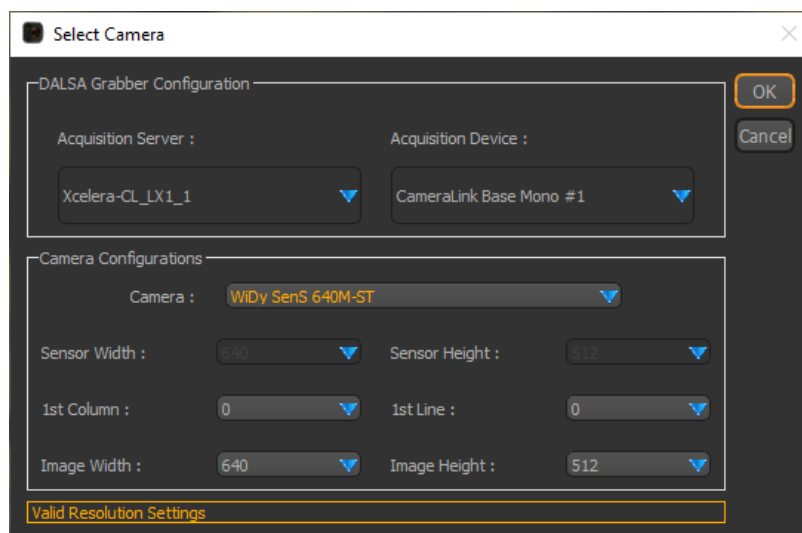
5.3.4.1. Graphical user interface (WiDyCAM)

⚠ WidyCam is only compatible with Teledyne Dalsa and ImperX frame grabbers. Make sure your frame grabber is properly setup and that you are able to acquire images with your frame grabber’s image acquisition software before proceeding.

Your camera is delivered with the GUI WiDyCAM. It is a software that will allow you to control your camera and acquire images. It also has some more advanced functions, but this guide will only cover the basic operations in order for you to acquire the first images. To go further, please read the reference manual “WiDyCAM X.X - RG.pdf” provided with WiDyCAM in the folder: 9S16007CAMXXXXXX\.

⚠ If you do not have Microsoft Visual C++ Redistributable 2013 and 2015 installed, you will have an error message when starting NITVision saying that “MSVCP120.dll” and “MSVCR120.dll” are missing. Please install the 2013 and 2015 Redistributable (we advise to install both the x86 and x64 versions).

Then start the software a first pop-up will appear, showing the camera (or cameras) found:

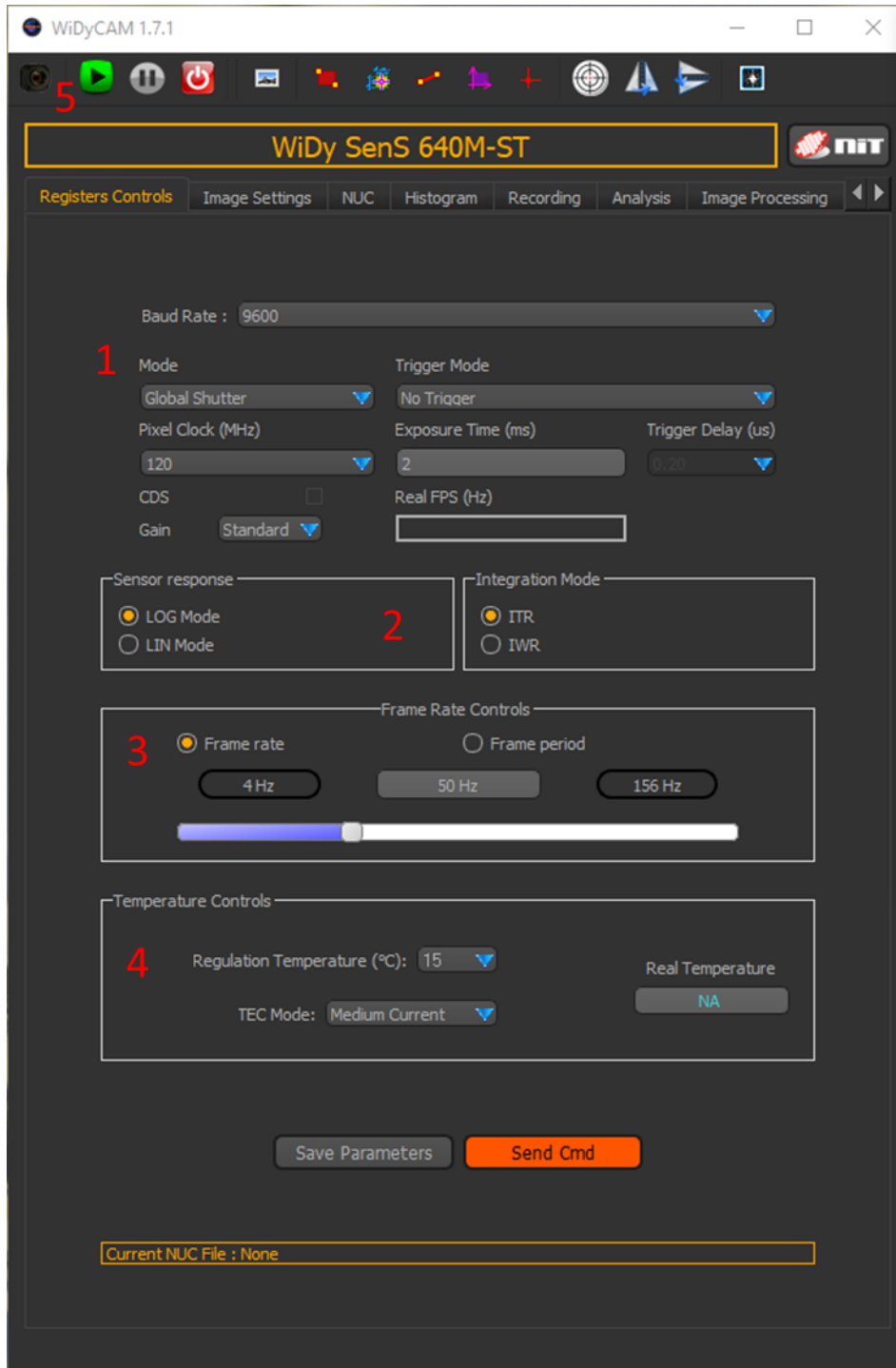


Once you have made sure that the frame grabber and camera selected are the one you wish to use, click on “OK”. The main window of WiDyCAM appears, along with another window with the player displaying the images from the camera.

Here are the settings you can find on the main window:

1. Acquisition mode, trigger and exposure time: this area allows to set the acquisition mode (global shutter, rolling, etc.), the trigger options, the exposure time, the pixel clock (if the model allows it) and read the real frame rate of the camera.
2. Sensor response & integration mode: this area allows to switch between logarithmic and linear sensor modes, and to select between ITR and IWR acquisition techniques.
3. Frame rate controls: allows to set the frame rate.
4. Temperature controls: allows to select the temperature at which the sensor is regulated, to change the current limit (more current allows a bigger delta between ambient temperature and sensor temperature but consumes more power) and displays the sensor temperature.

5. Function ribbon: here you will find multiple functions, but the most important are the play and pause buttons that starts and pauses the acquisition. The on/off button stops the acquisition and exits the software.



Now that the software is up and running, you can check the image acquisition is working by pressing play in the function ribbon (5). You can also tune the camera settings according to your application.

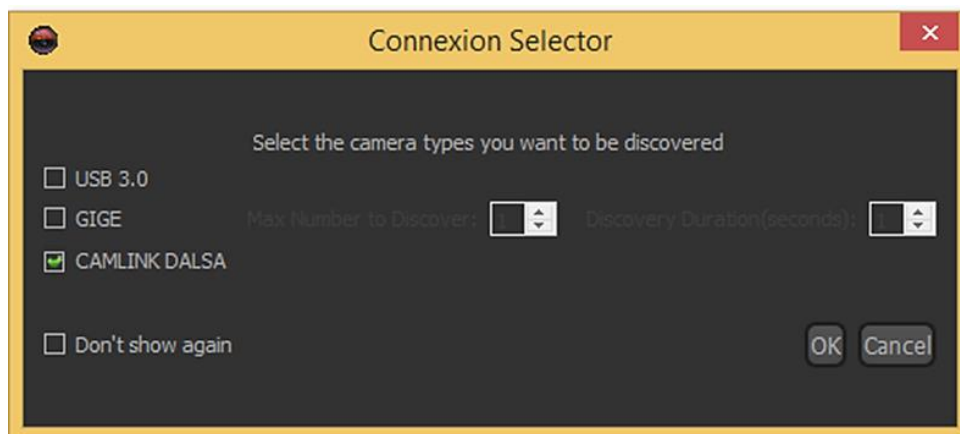
5.3.4.2. Graphical user interface for SenS 1280 only (NITVision)

⚠ NITVision is only compatible with Teledyne Dalsa frame grabbers. Make sure your frame grabber is properly setup and that you are able to acquire images with your frame grabber's image acquisition software before proceeding.

Your camera is delivered with the GUI NITVision. It is a software that will allow you to control your camera and acquire images. It also has some more advanced functions, but this guide will only cover the basic operations in order for you to acquire the first images. To go further, please read the reference manual “NITVision-X.X-Y.pdf” provided with NITVision in the folder: 9S21002W_XXXXXX\Windows\NITVision\REFERENCE GUIDE.

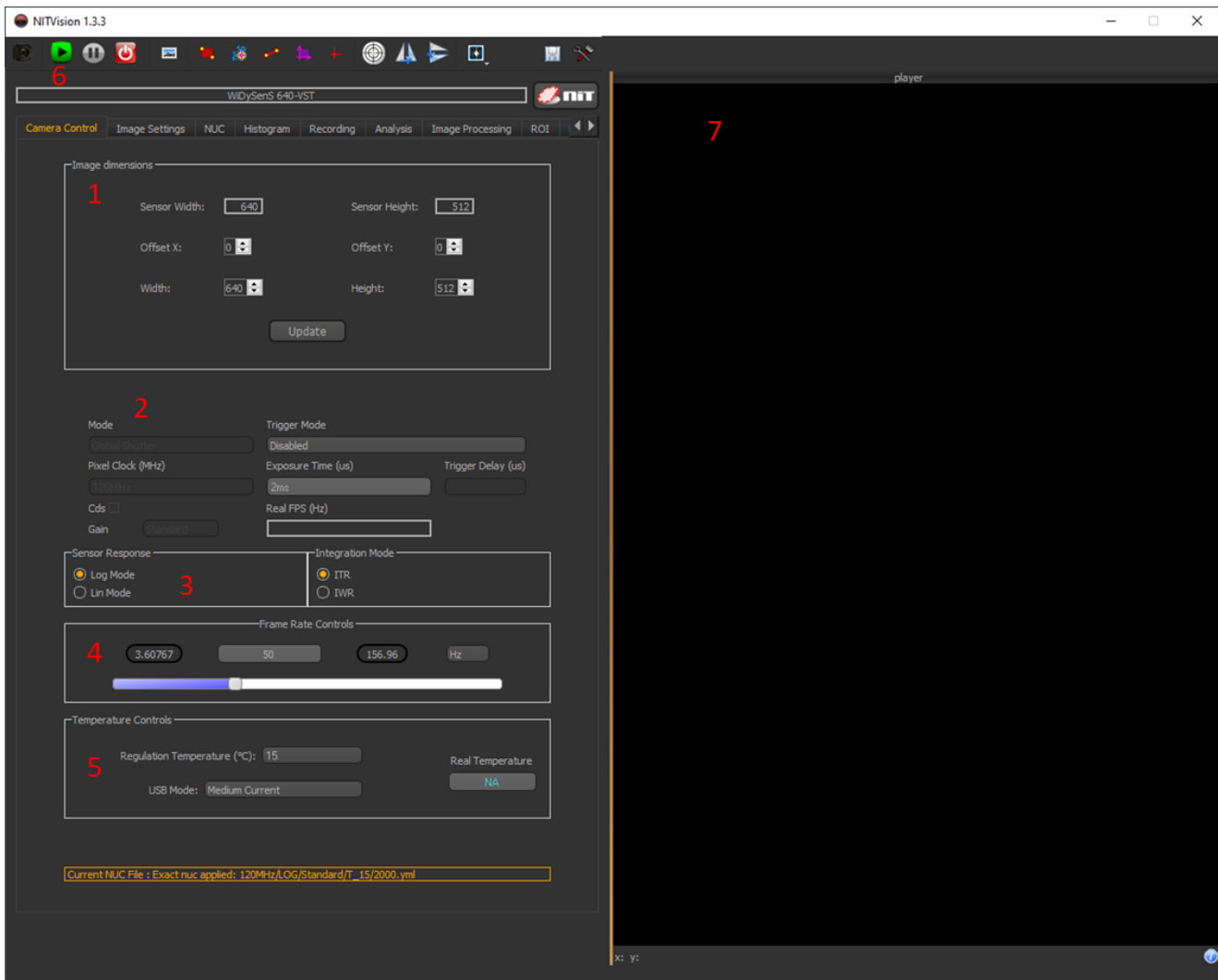
⚠ If you do not have Microsoft Visual C++ Redistributable 2013 and 2015 installed, you will have an error message when starting NITVision saying that “MSVCP120.dll” and “MSVCR120.dll” are missing (the message can also ask for “MSVCP140.dll” and “MSVCR140.dll”). Please install the 2013 and 2015 Redistributable (we advise to install both the x86 and x64 versions).

When you start NITVision, a first pop-up appears that asks what kind of connection the camera is using. Select “CAMLINK DALSA”:



Then, a second pop-up appears that shows all the cameras detected. Select the one you want to use (serial number is indicated), then click “OK”.

The main window of NITVision appears. All the most important controls to start an acquisition are on the tab opened “Camera Control”.



1. Images dimensions: this area allows to control the size of the image acquired.
2. Acquisition mode, trigger and exposure time: this area allows to set the acquisition mode (global shutter, rolling, etc.), the trigger options, the exposure time, the pixel clock (if the model allows it) and read the real frame rate of the camera.
3. Sensor response & integration mode: this area allows to switch between logarithmic and linear sensor modes, and to select between ITR and IWR acquisition techniques.
4. Frame rate controls: allows to set the frame rate.
5. Temperature controls: allows to select the temperature at which the sensor is regulated, to change the current sent (more current allows a bigger delta between ambient temperature and sensor temperature but consumes more power) and displays the sensor temperature.
6. Function ribbon: here you will find multiple functions, but the most important are the play and pause buttons that starts and pauses the acquisition. The on/off button stops the acquisition and exits the software.
7. Player: the images acquired are displayed here.

Now that the software is up and running, you can check the image acquisition is working by pressing play in the function ribbon (6). You can also tune the camera settings according to your application.



5.3.4.3. Software integration (SDK)

Depending on your camera model, you have multiple options. Please contact our support to explore them.

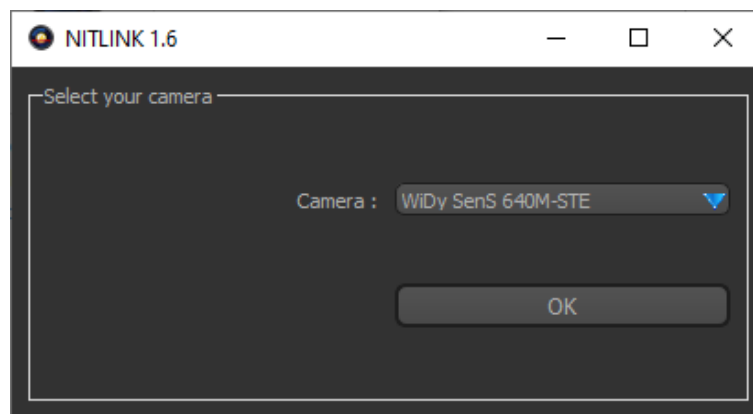
5.3.5. SDI/Analog

5.3.5.1. Graphical user interface (NITLink & third-party player)

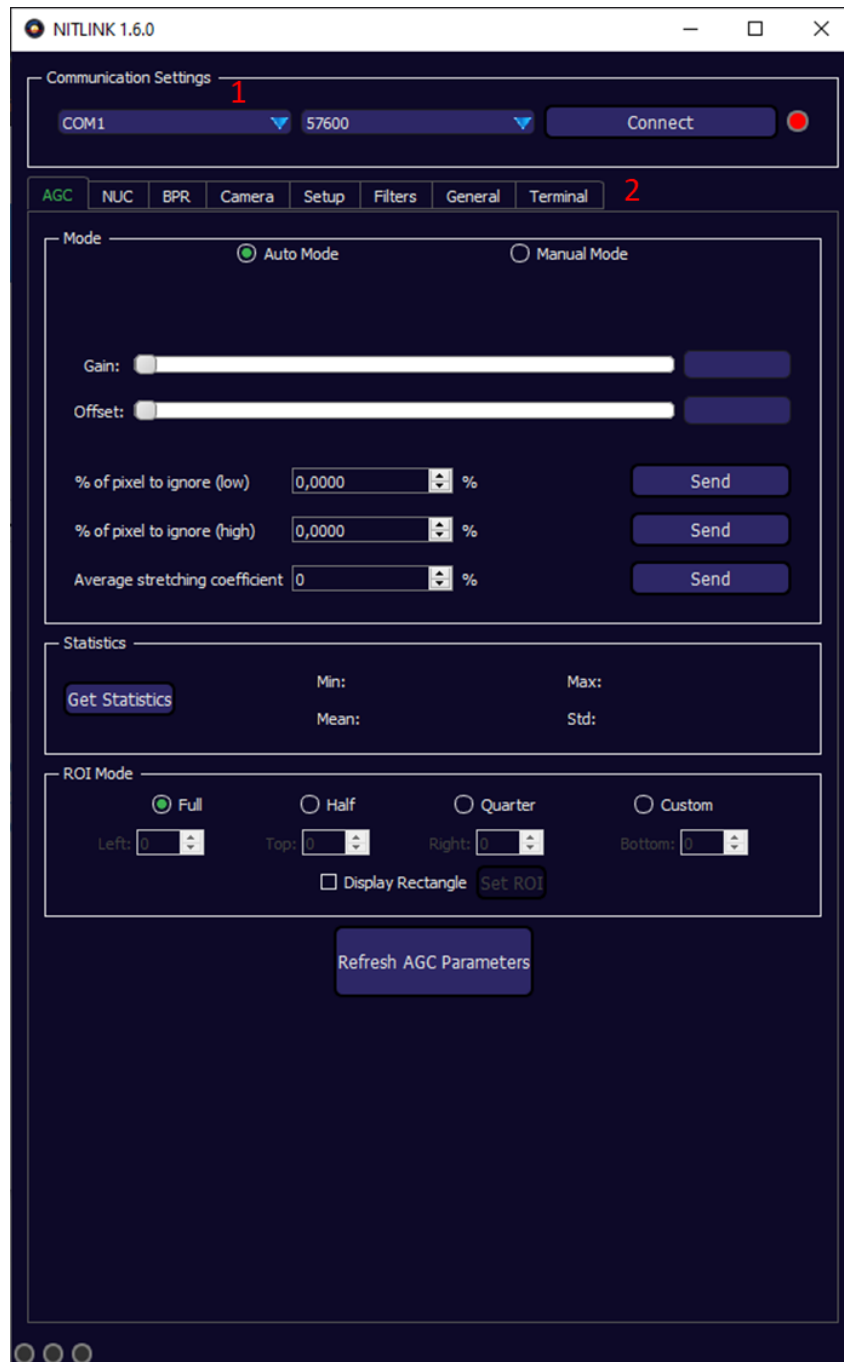
Your camera is delivered with the GUI NITLink. It is a software that allows you to control your camera and change its parameters. It also has some more advanced functions, but this guide will only cover the basic operations in order for you to acquire the first images. To go further, please read the reference manual “NITLINK X.X.X - RG.pdf” provided with NITLink in the folder “9S19002W_XXXXXX\Windows\REFERENCE GUIDE”.

⚠ *If you do not have Microsoft Visual C++ Redistributable 2013 and 2015 installed, you will have an error message when starting NITVision saying that “MSVCP120.dll” and “MSVCR120.dll” are missing. Please install the 2013 and 2015 Redistributable (we advise to install both the x86 and x64 versions).*

When started, the software displays a pop-up that asks what kind of camera you have plugged. You need to select the model in the drop-down menu and click on “OK”.



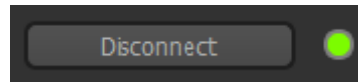
Now NITLink's main window appears. Its layout is as follow:



The layout of the main windows is the following:

1. Communication settings: here you can set the COM port on which the camera is connected, the baud rate and connect to the camera.
2. Tabs: you have multiple tabs that allows to set a number of parameters of the camera, by default you start on the AGC (Automatic Gain Control).

Now that the main window is displayed, you need to set the COM port number on which the camera is connected. You can find it in Windows Device Manager. Then click on “Connect” to initiate the control of the camera. The small light on the right of “Connect” will turn from red to green and “Connect” will be replaced by “Disconnect”:



If you wish to go further, you can check the NITLink manual that is provided (in the USB key in \9S19002W_XXXXXX\Windows\REFERENCE GUIDE\NITLINK X.X.X - RG.pdf).

5.3.5.2. Software integration (NITLink Protocol)

If you wish to develop your own application, you can use the NITLink protocol in order to control the camera and its settings. You can find the documentation on this protocol and a code sample in the “NITLink integration guide” that you can download in the Application notes section of the New Imaging Technologies website: <https://new-imaging-technologies.com/wp-login.phphttps://new-imaging-technologies.com/software-log-in/>.

6. Troubleshoot

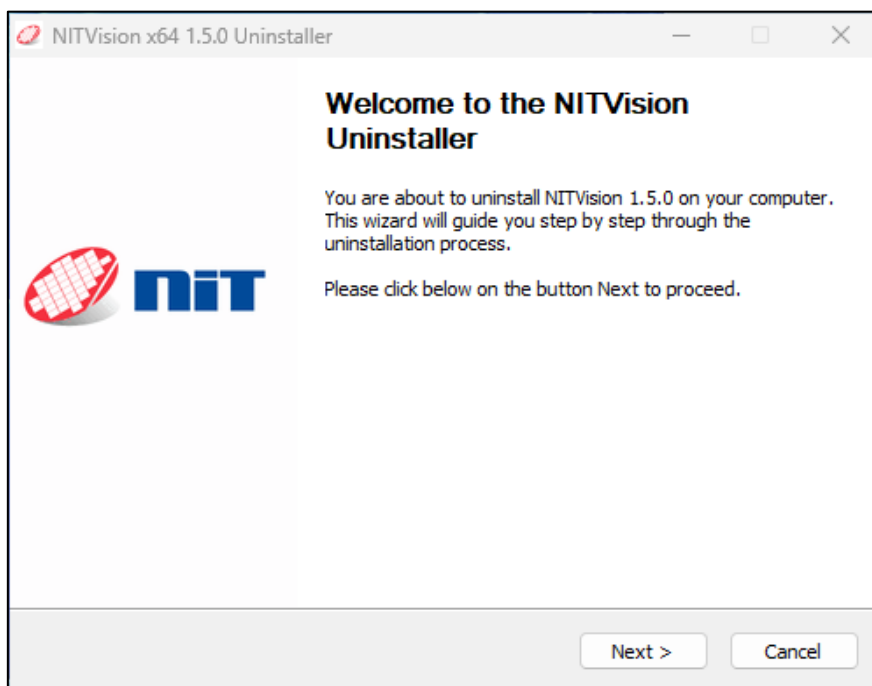
Here are a few common issues that you could be running into while beginning to use our cameras. If your issue is not listed here, or if none of the proposed solutions work, please contact our support team: support@new-imaging-technologies.com. Please mention in your mail:

- Your camera serial number.
- An as precise as possible explication of the issue you are facing.
- What you tried to solve it (coming from this document or not).

6.1.I wish to remove my NIT software

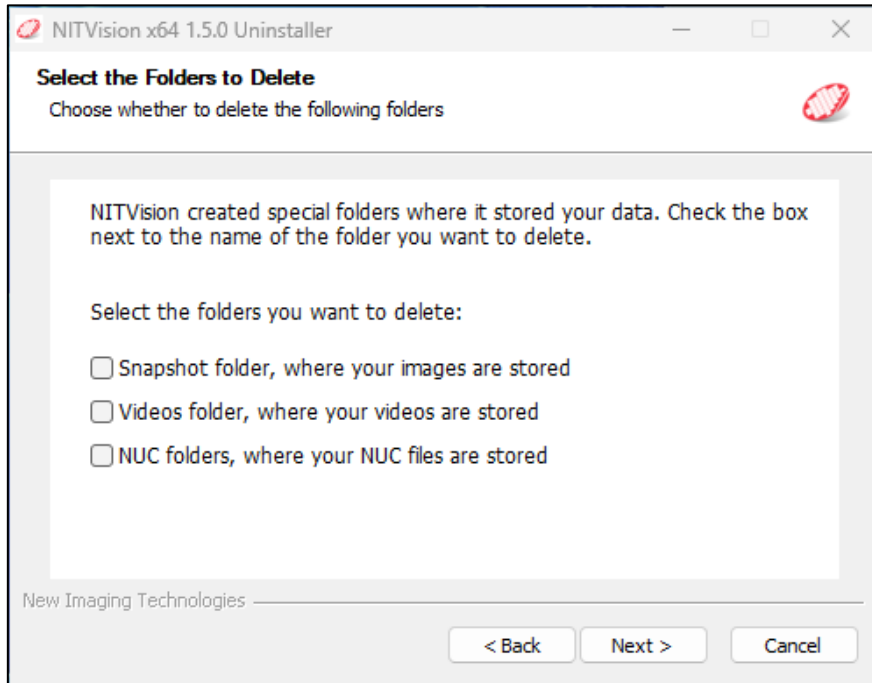
In the case of NITVision with installer:

NITVision with installer comes with an uninstaller which removes automatically the files added to your computer. To call the uninstaller, you simply need to go in the search area of the task bar and type “Apps & features”. Then find “NITVision uninstaller”, and chose to uninstall the program. This window opens:

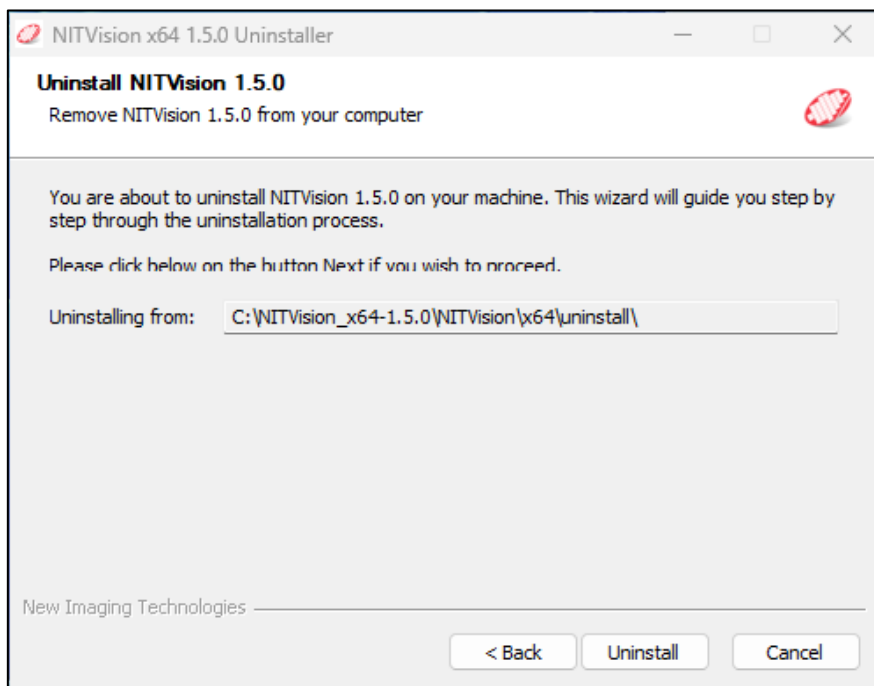


Click next to proceed.

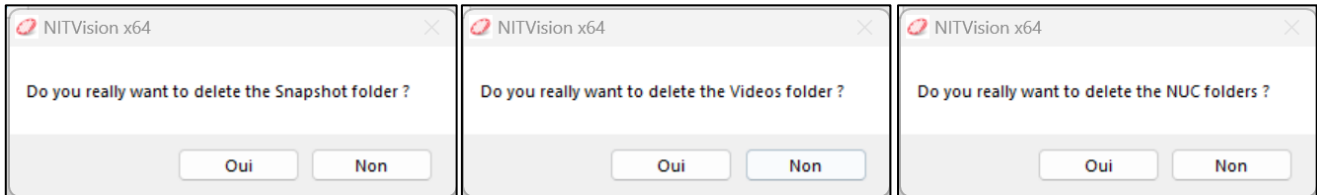
A new window opens, that asks you if you wish to also remove the folders “Snapshot” and “Videos” that by default stores the snapshots and videos taken with NITVision. It is also asks if you wish to remove the NUC files that you may have copied in NITVision’s folder. You can choose to remove or keep every one of them, or just a selection.



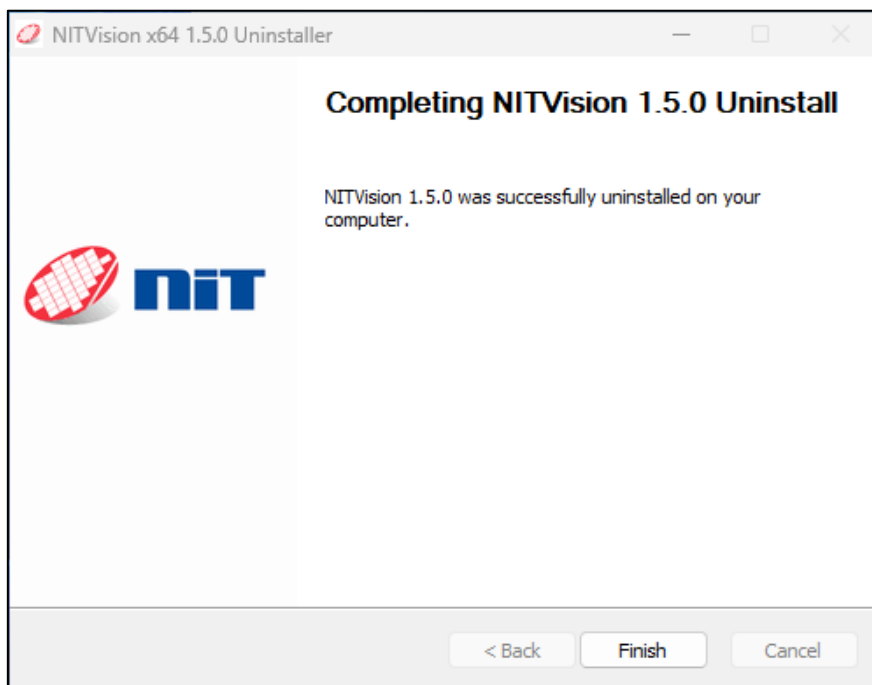
Once you have selected the folders to delete, a window warning you that the uninstallation will be carried out appears. Once you click on “Uninstall”, the uninstallation begins.



If you have chosen to delete any or all of the folders, a pop-up will appear before removing each one of them. It provides you with the opportunity to either reiterate your will to delete each folder or, if you changed your mind, refuse the deletion.



Once the uninstallation is over, a last window appears to inform you of the success of the operation:



In the case of any other software:

The software provided with your USB key is portable and ready to use. To remove it, you simply need to delete all the files you have copied on your computer.

6.2.All cameras with TEC

If you happen to have an image with stripes overlaid and white dots such as this:



Then you should verify if your TEC is correctly stabilizing the sensor. You can find the temperature target value and real time measurement here:

- NITVision (USB 3.0 & SenS 1280 M-ST): in “Camera Control tab” in the “Temperature controls” area.
- NITVision (GiGe): look for the parameters “TECTemperature” (target) and “CamBoardTemperature” (measure).
- WiDyCAM: in “Registers controls” tab in the “Temperature controls” area.
- NITLink: in the “Camera” tab in the area “TEC”.

If the measured temperature varies importantly from the target, or is not stable at all, then you might need to try one of our solutions for a better thermal dissipation. You can find them in the document “Heatsinking” in the folder “\Application note\Heatsinking” in the USB key provided.

6.3.USB 3.0

The driver of the camera is blocked by Windows

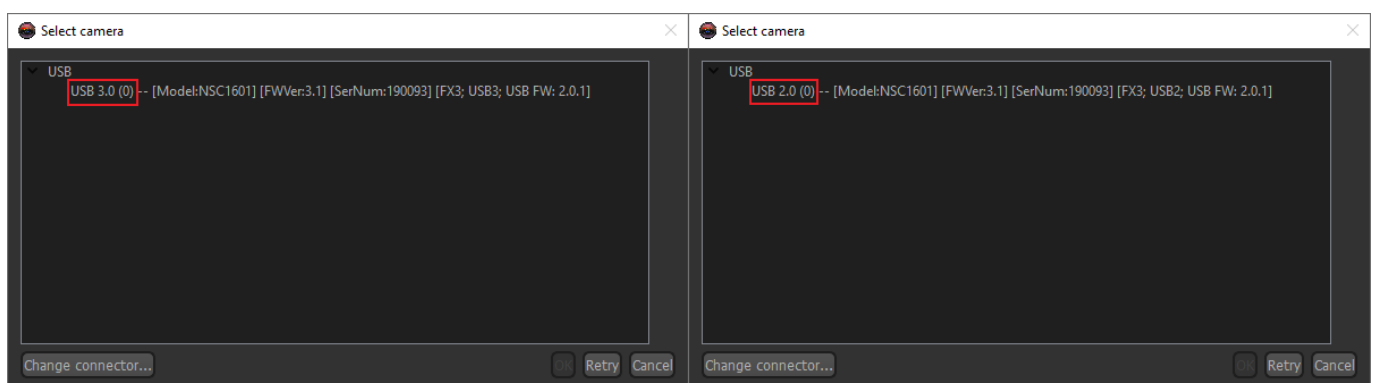
Sometimes Windows displays an error message after installing the driver for camera saying “The driver for this device has been blocked from starting because it is known to have problems with Windows. Contact the hardware vendor for a new driver”. This happens when a 32bit driver is installed on a 64bit computer. It is easily solved by following this procedure:

1. In the Windows search bar type “Device Manager”.
2. In the “USB controllers” section, find the "Cypress FX3 USB StreamerExample Device" and right click on it and select “Properties”.
3. In the “Driver” tab, click on “Uninstall”. The driver will be deleted.
4. Unplug the camera, then plug it again.
5. In the “USB controllers” section should now appear an unknown device. Right click on it and select “Properties”.
6. In the “Driver” tab, click on “Update driver software”.
7. Select “Browse my computer for driver software”.
8. Browse to the folder “9S21002W_131000\Windows\DRIVERS\ Win10\x64” in the USB key provided.
9. Verify in Windows Device Manager that you now have a “Cypress FX3 USB StreamerExample Device” in the “Universal Serial Bus controllers” list:



I start NITVision and select the camera but the main window doesn't appear

The first thing to check is that the USB connection is recognized as USB 3.0 and not USB 2.0. This is very easy to see on the second pop-up for camera selection. The connection must be US 3.0 as on the left image and not USB 2.0 as on the right.



If you have a USB 2.0 connection, then first you need to make sure that you connected the camera on a USB 3 port. An easy tell is that there is an “SS” mark over the USB trident (for Super Speed) and the plastic stripe in the port is blue (but it may not always be the case).

If the port is USB 3.0, then unplug the connector on the computer side and replug it firmly and quickly. If the connector is inserted slowly, Windows will consider the connection USB 2.0 and it will cause issues with NITVision.



NITVision is started, the main window is displayed but I can't get any image

Apart from the lack of image (or a distorted image), you can also see the error message: "Camera seems disconnected" written in red on the bottom of NITVision main window. Or you might have issues while saving pictures or clips taken with the camera and end up having distorted files, or with noise-looking stripes in them. Here are a few things you can check in order to solve the issue.

1. Is the trigger option internal or external?

Sometimes NITVision can start with a previously saved setting for trigger (for example, someone saved the parameters of the application). If this setting is for an external trigger and you don't send triggers to the camera, the image feed will not start. You can verify the trigger setting the zone 2 (see §5.3.1.1). It must be set to "Disabled" in order to use the camera's internal trigger.

2. Are you using the USB cable provided?

If not, please make sure that the one used is well shielded and not too long (>3m is not recommended).

3. Check the system resources available.

Open Windows Task Manager to see if any resource usage is high (CPU, RAM, etc.). If it is so, then NITVision might suffer from a lack of needed resources to run correctly. Please close any application that isn't necessary.

4. Is the camera connected to the computer directly, or is it going through a hub?

It is preferable to avoid going through hubs as the bandwidth will be shared with the other connected devices, which can cause trouble.

5. Are you saving on a slow repository?

If you save your images and clips to a slow repository such as network repositories with a slow connection, slow hard drives or USB keys you can have issues with the files saved. Because the writing speed is low, the computer buffers are erased with the next images and you end up with unexploitable images. Please consider switching to a fast-accessed repository.

6. Is the computer used a laptop or a desktop?

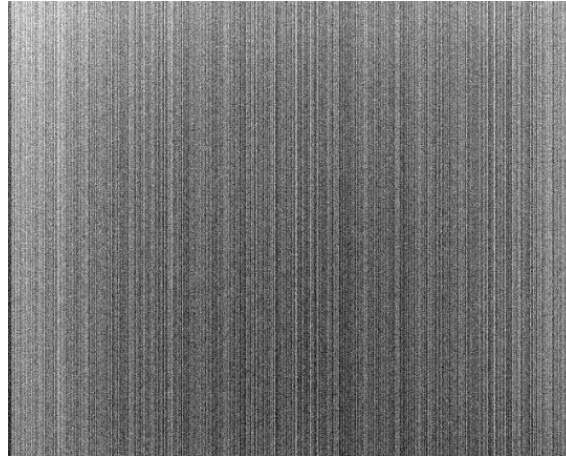
If it is a desktop, then it is also preferable to connect the cable on the back panel USB 3 ports, as they are plugged directly to the mother board. Laptops don't have this issue since all ports are plugged directly to the motherboard.

7. Verify Windows power plan.

Open Power Options and change Windows power plan to "High performance". This is especially important if the camera is connected to a laptop. Windows often activates power saving options, and that can severely affect the CPU power available. Then, click on "Change settings for the plan", then "Change advanced power settings" and go in USB settings->USB selective suspend setting and deactivate everything (whether on battery or plugged in).

Vertical stripes are visible on the images

If you happen to have an image similar to this:



Then you need to check if the NUC files are applied. These files contain the data used by the software to correct the non-uniformity of the sensor. NITVision displays on the bottom of Camera Control which NUC file is used, if any. If you see a yellow or orange message such as these ones, then contact the support:

```
Current NUC File : Exact nuc applied: 120MHz/LOG/Standard/T_15/2000.yml
```

```
Current NUC File : 120MHz/LOG/Standard/T_15/: interpolated 2000.00us - 3000.00us
```

If you see a gray text such as below, then the NUC are not applied:

```
Current NUC
```

To solve this, you need to get the NUC files for your camera. They are stored in a folder named after the serial number of your camera: "SNYYYYYY", with the Ys being the serial number.

These files are stored in the USB key in "\9S21002W_XXXXXX\Windows\NITVision\x64\" for the 64bit application, or "\Windows\NITVision\x86\" for the 32bit application. You need to copy the folder, and paste it in the NITVision folder on your computer.

Image degraded with stripes and white dots

If your camera is equipped with a TEC (Thermo-Electric Cooler) and you happen to have an image with stripes overlaid and white dots such as this:



Then you should verify if your TEC is correctly stabilizing the sensor. Please refer to the §6.1 to do so.



6.4.GigE

NITVision is started, the main window is displayed but I can't get any image

Apart from the lack of image, you might have issues while saving pictures or clips taken with the camera and end up having distorted files, or with noise-looking stripes in them. Here are a few things you can check in order to solve the issue.

1. Is the trigger option internal or external?

Sometimes NITVision can start with a previously saved setting for trigger (for example, someone saved the parameters of the application). If this setting is for an external trigger and you don't send triggers to the camera, the image feed will not start. You can verify the trigger setting the zone 1 of the main window (see §5.3.2.1). It must be set to "Internal" in order to use the camera's internal trigger.

2. Check the system resources available.

Open Windows Task Manager to see if any resource usage is high (CPU, RAM, etc.). If it is so, then NITVision might suffer from a lack of needed resources to run correctly. Please close any application that isn't necessary.

3. Is the camera connected to the computer directly, or is it going through a switch?

It is preferable to avoid going through switches as the bandwidth will be shared with the other connected devices, which can cause trouble.

4. Are you saving on a slow repository?

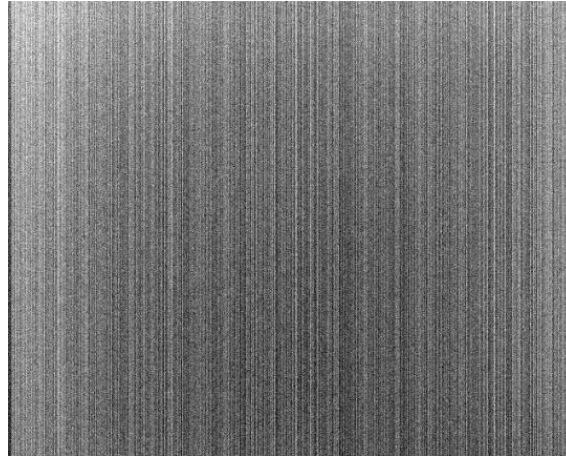
If you save your images and clips to a slow repository such as network repositories with a slow connection, slow hard drives or USB keys you can have issues with the files saved. Because the writing speed is slow, the computer buffers are erased with the next images and you end up with unexploitable images. Please consider switching to a fast-accessed repository.

5. Verify Windows power plan.

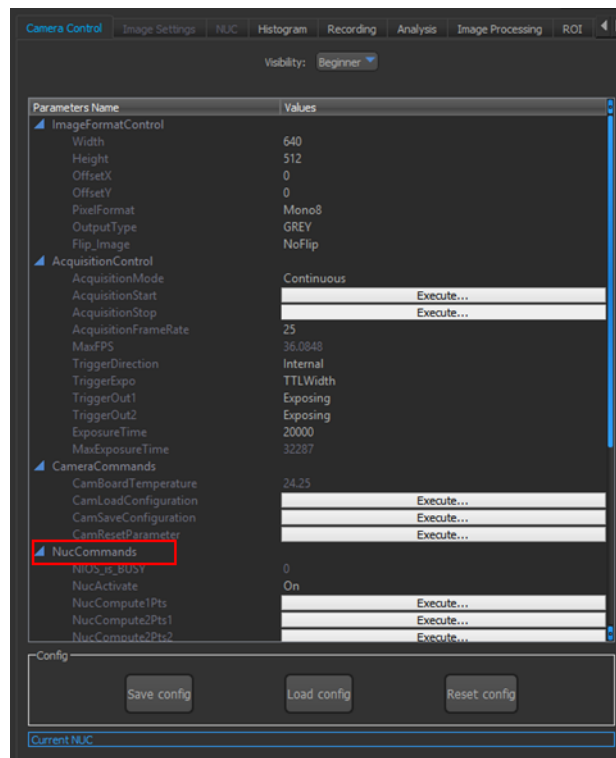
Open Power Options and change Windows power plan to "High performance". This is especially important if the camera is connected to a laptop. Windows often activates power saving options, and that can severely affect the CPU power available.

Vertical stripes are visible on the images

If you happen to have an image similar to this:



Then you need to check if the NUC are correctly applied. To do this, go in “Camera Control” tab and search for “NUC commands”:



Two parameters need to be checked:

- NUCActivate: must be “ON”
- NUCMode: must be set to “Automatic” (if the parameter is available)

If they are not set as above, we advise you to change them to match it. If they are set as above, then we would advise that you contact our support.

I cannot find my camera, it doesn't appear in the selection pop-up

Your camera might be set up with a fixed IP that you might not know that is not accessible through your subnetwork. In order to set back the camera with a temporary IP you need to download this tool:

<https://www.dropbox.com/s/mfa9tzt4cg3t10/ForceIPTool.rar?dl=0>

Then right click while holding shift key in the folder where you have set up the tool, and click on "Open powershell window here". Then type ".\ForceIpTool.exe ". It should now display the procedure to follow:

```
PS D:\Users\Demo-CUDA\Desktop\SoftCameras\ForceIPTool> .\ForceIpTool.exe
Usage: ForceIpTool <Mac Address> <IpAddress> <SubnetMask> <DefaultGateway>
Exemple: ForceIpTool 70:b3:d5:2a:c0:00 192.168.100.11 255.255.255.0 192.168.100.1
The Mac address can be found at the rear of the camera
Set an Ip address who is accessible from your host( same subnetwork )
If you have no gateway on your network, set the Ip address of your host
Once set, this Ip address is valid until you shutdown the device
PS D:\Users\Demo-CUDA\Desktop\SoftCameras\ForceIPTool>
```

You can then start again the software, and provide it with the required arguments as described:

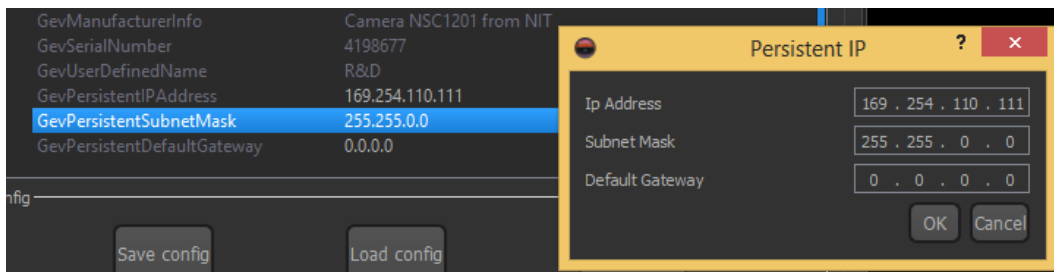
- MAC address of the camera (it is written on its label close to its serial number).
- An IP address you can access in your sub network.
- The SubnetMask.
- The Default Gateway.

Here is an example of the parameters you need to send:

`.\ForceIpTool 70:b3:d5:2a:c0:00 192.168.100.11 255.255.255.0 192.168.100.1`

Now that your camera's IP is changed, you should be able to access it in NITVision. But please note that this change is temporary, you now need to change some parameters in NITVision to make it permanent. To do so:

1. Go in Cameral Control tab
2. Search the parameter GevNetworkConfiguration
3. Set the parameter to your choosing (LLA, LLA_Persistent_IP, LLA_DHCP or all).
4. Depending on your choice, you might need to enter information. For a persistent IP for example, click on GevPersistentIPAddress and a pop-up such as below will let you set the parameters:



5. Power cycle the camera to apply your modified Network settings.

Image degraded with stripes and white dots

If your camera is equipped with a TEC (Thermo-Electric Cooler) and you happen to have an image with stripes overlaid and white dots such as this:



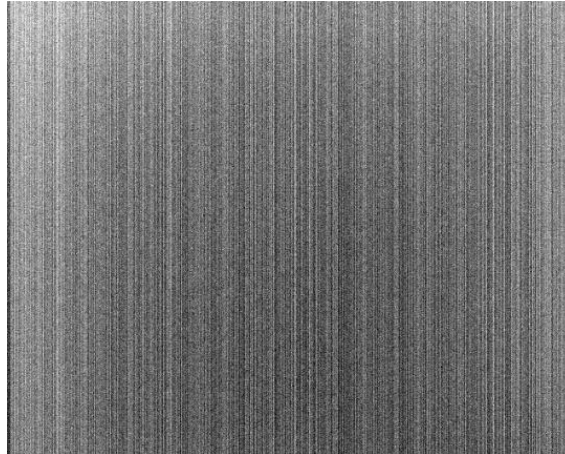
Then you should verify if your TEC is correctly stabilizing the sensor. Please refer to the §6.1 to do so.

6.5.Camera Link (M-SE and M-STE series)

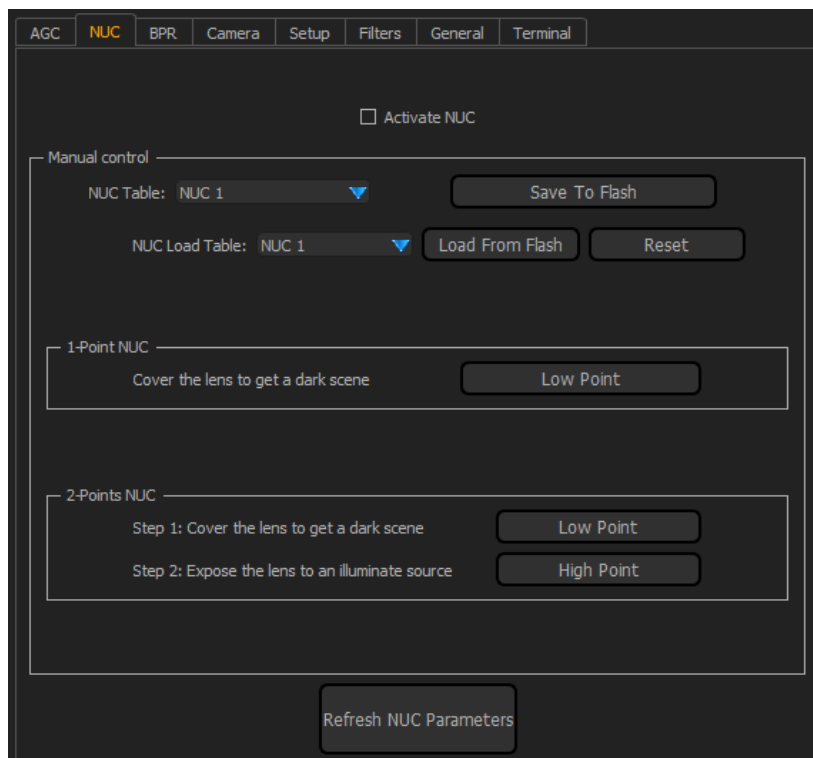
Vertical stripes are visible on the images

⚠ *This solution is only applicable for M-SE & M-STE series cameras. If your camera is M-S or M-ST series, please refer to §6.6.*

If you happen to have an image similar to this:



Then you need to check if the NUC are correctly applied. To do this, launch NITLink and go in the “NUC” tab. Click “Refresh NUC Parameters”:

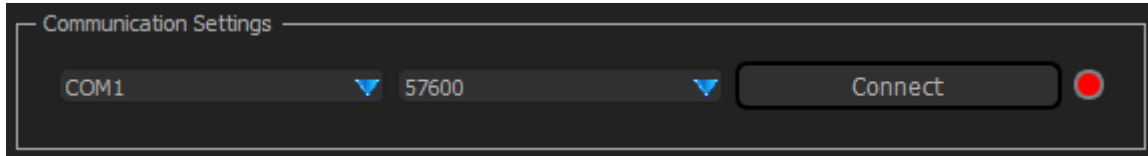


Then you need to check if the “Activate NUC” tick box is ticked. If not, tick it to active the NUC.

If it's already ticked, then please contact our support.

NITLink doesn't connect

If when you click on “Connect” in “Communication Settings” in NITLink nothing happens, then there are a few things you can try.



First, please check that the COM port selected is the right one.

If it is correct, then maybe the baud rate setting of the camera is different from the default one (57600). To solve this, you might try the other baud rates allowed in the drop-down list. Once the camera connects, you can change it back to the default (or any other value that suits your needs) by doing the following:

1. Go in the Setup tab
2. Choose the baud rate that suits you in “Set Baud Rate for next setup”.
3. Click on “Save Parameters”

Next time you start NITLink, the camera will have the baud rate you chose.

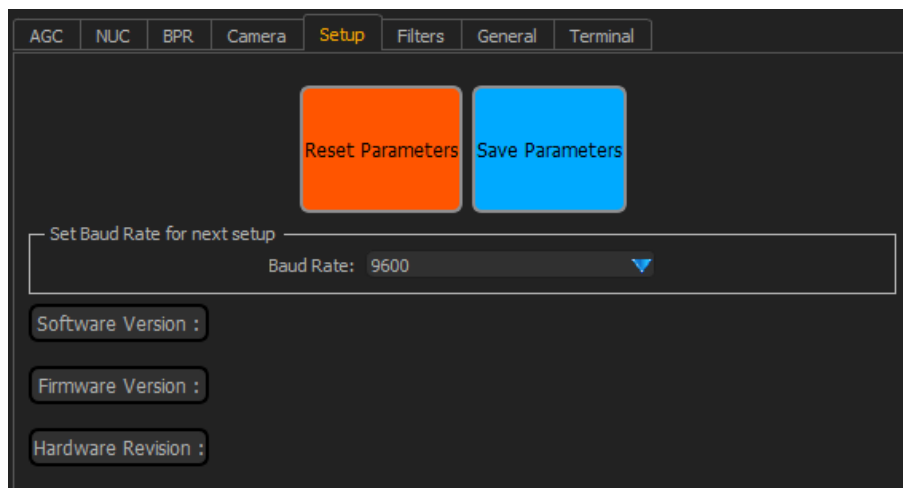


Image degraded with stripes and white dots

If your camera is equipped with a TEC (Thermo-Electric Cooler) and you happen to have an image with stripes overlaid and white dots such as this:



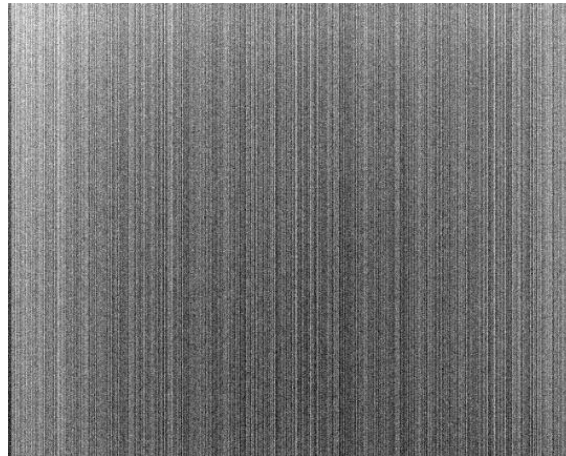
Then you should verify if your TEC is correctly stabilizing the sensor. Please refer to the §6.1 to do so.

6.6.Camera Link (M-S and M-ST series)

Vertical stripes are visible on the images

⚠ *This solution is only applicable for M-S & M-ST series cameras. If your camera is M-SE or M-STE series, please refer to §6.5.*

If you happen to have an image similar to this:



Then you need to check if the NUC files are applied. These files contain the data used by the software to correct the non-uniformity of the sensor.

WiDyCAM (all M-S & M-ST series cameras excluding SenS 1280):

The software displays on the bottom of Camera Control which NUC file is used, if any. If you see a yellow or orange message such as these ones, then contact the support:

Current NUC File : SN190057/NUC/120MHz/LOG/Standard/T_15/NUCFactory_2000us.yml

Current NUC File : SN190057/NUC/120MHz/LIN/High/T_15: interpolated 100.00us - 1000.00us

If you see an orange text “Current NUC File : None” such as below, then the NUC are not applied:

Current NUC File : None

To solve this, you need to get the NUC files for your camera. They are stored in a folder named after the serial number of your camera: “SNYYYYYY”, with the Ys being the serial number.

The files are stored in these two places in the USB key provided with your camera:

- “\9S16007CAMXXXXXX\WiDyCAM 1.7.1\Dalsa\Dalsa_x64\Sap83\SNYYYYYY” for Dalsa v8.3 frame grabbers
- “\9S16007CAMXXXXXX\WiDyCAM 1.7.1\ImperX\ImperX_x64\SNYYYYYY” for ImperX frame grabbers.

You need to copy one of these folders into the WiDyCAM folder on your computer, in the same place where you found it on the USB key.



NITVision (for SenS 1280 M-ST cameras):

The software displays on the bottom of Camera Control which NUC file is used, if any. If you see a yellow or orange message such as these ones, then contact the support:

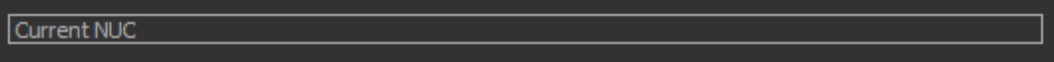
A screenshot of a software message box with a black background and a yellow border. The text inside is yellow and reads: "Current NUC File : Exact nuc applied: 120MHz/LOG/Standard/T_15/2000.yml".

Current NUC File : Exact nuc applied: 120MHz/LOG/Standard/T_15/2000.yml

A screenshot of a software message box with a black background and a yellow border. The text inside is yellow and reads: "Current NUC File : 120MHz/LOG/Standard/T_15/: interpolated 2000.00us - 3000.00us".

Current NUC File : 120MHz/LOG/Standard/T_15/: interpolated 2000.00us - 3000.00us

If you see a gray text such as below, then the NUC are not applied:

A screenshot of a software message box with a black background and a gray border. The text inside is gray and reads: "Current NUC".

Current NUC

To solve this, you need to get the NUC files for your camera. They are stored in a folder named after the serial number of your camera: "SNYYYYYY", with the Ys being the serial number.

These files are stored in the USB key in "\9S21002W_XXXXXX\Windows\NITVision\x64\" for the 64bit application, or "\Windows\NITVision\x86\" for the 32bit application. You need to copy the folder, and paste it in the NITVision folder on your computer.

Image degraded with stripes and white dots

If your camera is equipped with a TEC (Thermo-Electric Cooler) and you happen to have an image with stripes overlaid and white dots such as this:

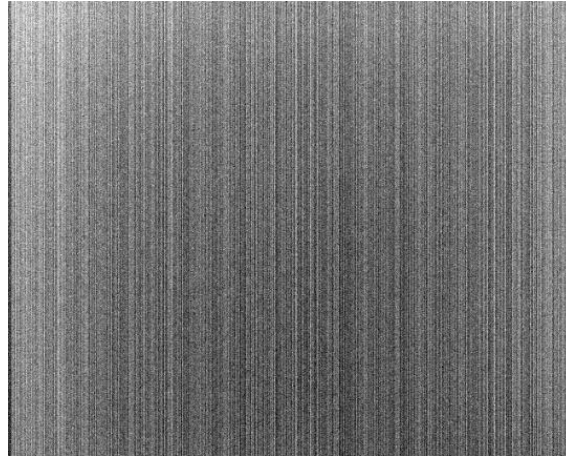


Then you should verify if your TEC is correctly stabilizing the sensor. Please refer to the §6.1 to do so.

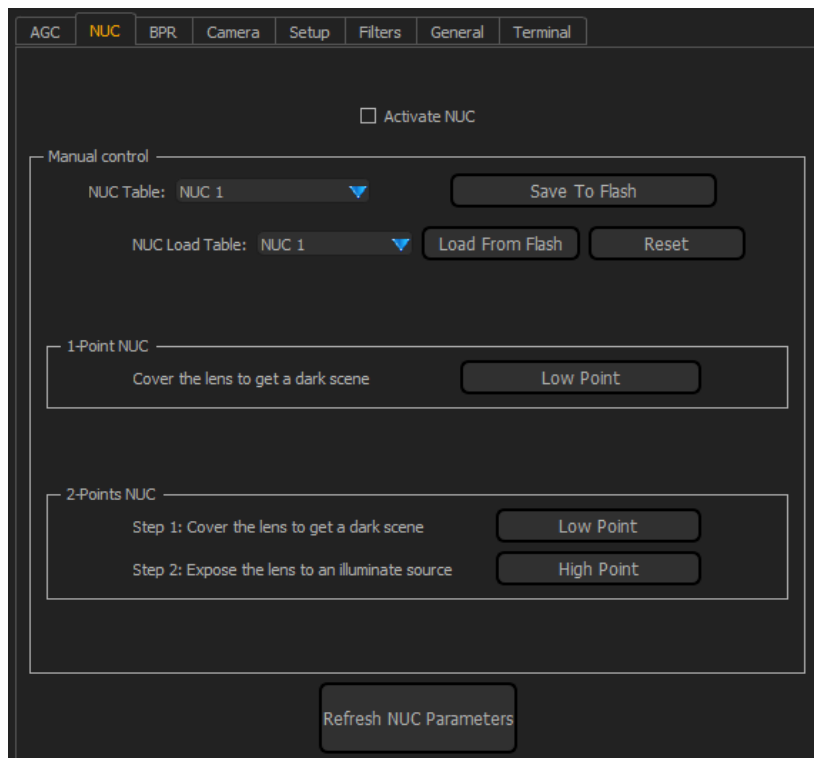
6.7.SDI/Analog

Vertical stripes are visible on the images

If you happen to have an image similar to this:



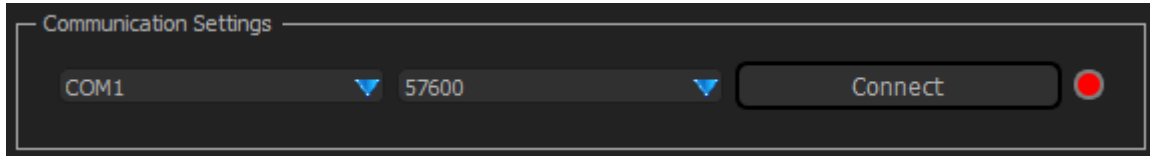
Then you need to check if the NUC are correctly applied. To do this, launch NITLink and go in the “NUC” tab. Click “Refresh NUC Parameters”:



Then you need to check if the “Activate NUC” tick box is ticked. If not, tick it to active the NUC. If it’s already ticked, then we would advise that you contact our support.

NITLink doesn't connect

If when you click on “Connect” in “Communication Settings” in NITLink nothing happens, then there are a few things you can try.



First, please check that the COM port indicated is the right one. The drop-down list can be closed without taking your choice into account if you click a bit too close to the edge.

If it is correct, then maybe the baud rate registered by the camera is different from the default one (57600). To solve this, you might try the other baud rates allowed in the drop-down list. Once the camera connects, you can change it back to the default (or any other value that suits your needs) by doing the following:

4. Go in the Setup tab
5. Choose the baud rate that suits you in “Set Baud Rate for next setup”.
6. Click on “Save Parameters”

Next time you start NITLink, the camera will have the baud rate you chose.

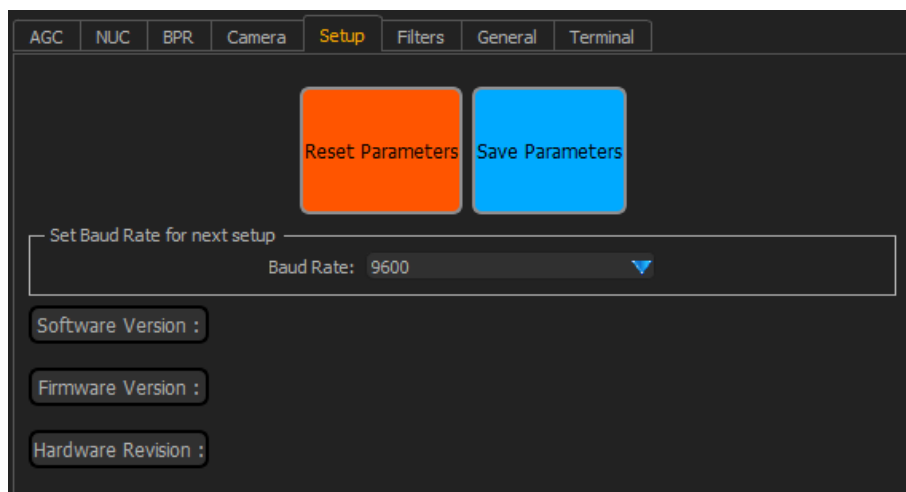


Image degraded with stripes and white dots

If your camera is equipped with a TEC (Thermo-Electric Cooler) and you happen to have an image with stripes overlaid and white dots such as this:



Then you should verify if your TEC is correctly stabilizing the sensor. Please refer to the §6.1 to do so.

Contact & Support

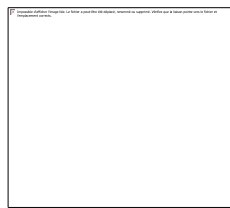
You can contact support@new-imaging-technologies.com for additional information. Please remember to mention your camera's serial number along with your questions.



Annex: Sensor without cover glass option

Sensor packages are closed by a 0.7 mm thick protective glass window with anti-reflection coating on both sides. We provide an option to remove the window as it can be a hindrance for some applications. Cameras without sensor packaging window are delivered with a protective window threaded into the camera C-Mount interface. This window is also AR-Coated (see data: <https://midopt.com/filters/lp190/>).

This option has a main drawback that is if you use a lens, its model would need to be selected carefully to avoid any interference with the window. This window being much further away from the sensor than the packaging window in most cases it shouldn't cause interference but if it is the case the distance between the sensor and this window can be tuned by unthreading it or completely removing it. To do so, a specific tool is provided:



It is recommended to unscrew this temporary window with the sensor facing down to avoid having dust particles falling onto the sensor during this process.



NIT Cameras software guide

NIT Quick start guide
User note
Rev 1.1



A World Class Supplier of CMOS Sensors™

NIT

1 Impasse de la noisette, Bat D- 1^{er} étage, BP426

91370 Verrières Le Buisson Cedex, France

Tel +33(0) 1 64 47 88 58

www.new-imaging-technologies.com

info@new-imaging-technologies.com

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