

IDS NXT

Setup IDS NXT rio



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1 Preface

Introduction

IDS Imaging Development Systems GmbH has taken every possible care in preparing this manual. We however assume no liability for the content, completeness or quality of the information contained therein. The content of this manual is regularly updated and adapted to reflect the current status of the software. We furthermore do not guarantee that this product will function without errors, even if the stated specifications are adhered to.

Under no circumstances can we guarantee that a particular objective can be achieved with the purchase of this product.

Insofar as permitted under statutory regulations, we assume no liability for direct damage, indirect damage or damages suffered by third parties resulting from the purchase of this product. In no event shall any liability exceed the purchase price of the product.

Please note that the content of this manual is neither part of any previous or existing agreement, promise, representation or legal relationship, nor an alteration or amendment thereof. All obligations of IDS Imaging Development Systems GmbH result from the respective contract of sale, which also includes the complete and exclusively applicable warranty regulations. These contractual warranty regulations are neither extended nor limited by the information contained in this manual. Should you require further information on this product, or encounter specific problems that are not discussed in sufficient detail in the manual, please contact your local dealer or system installer.

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Status: November 2021

Contact

Visit our web site <http://www.ids-nxt.com> where you will find all the latest information about our software and hardware products. Please contact your local IDS distributors for first level support in your language. For a list of IDS distributors worldwide please go to our website <http://www.ids-nxt.com>.

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2 Symbols and hints



This symbol indicates hints with useful information for better understanding and using features and functions.



This symbol indicates important warnings for product safety to prevent damage.



This symbol indicates important warnings for personal safety to prevent injury.

3 Safety instructions

Read carefully these safety instructions before installing and using the product. The producer is not responsible for damages and injury, which can occur due to false handling of the product and ignoring the safety instructions. All warranty will be spoiled in this case.

Intended use

IDS industrial cameras are to be used to capture images for visualization and image processing tasks. They are designed for use in industrial environments. Observe the requirements for the proper use of this product. Failure to do so will render the warranty void.

- The product is not authorized for use in security relevant applications. If it is used in security relevant applications, the customer is responsible for the necessary approvals.
- If the product is modified or changed, all approval becomes invalid. In this case, the customer is responsible for ensuring product conformity.
- The warranty expires if the product is improperly disassembled, reworked or repaired by the customer or a third party and IDS Imaging Development Systems GmbH assumes no liability for defects. If you need service, please contact the support team.
- The product is not a toy. Operate and store out of the reach of children.

Protection against electrostatic discharge (ESD)

Board-level cameras are especially sensitive to electrostatic discharge. Make sure to avoid mechanical or electrical damage of the printed circuit board or its connections. Wear ESD-protective clothing and observe the rules for handling ESD-sensitive components.

- Do not touch the printed circuit board while it is powered.
- Always hold the board by the edges to avoid the risk of electrostatic discharge damage.
- For optimum ESD behavior, a clearance of 4 mm from non-shielded housings must be maintained all the way around. For shielded housings, a smaller clearance is possible.
- Attach the board to a conductive surface using the fixing screws. If this is not possible, ensure an insulating connection.
- Use connecting cable with a low-resistance shield on both sides.

Installation, operation and maintenance

The product must be connected, taken into operation and maintained only by appropriately qualified personnel. The error-free and safe operation of this product can only be ensured if it is properly transported, stored, set up and assembled, and operated and maintained with due care. The installation, inspection, maintenance, extension, and repair may only be done by authorized personnel.

- Observe the specifications in the documentation when installing the product.
- Do not subject the product to direct sunlight, moisture or shock. Ensure that the IP code of the product meets the requirements for the ambient conditions.

- Only operate the product under ambient conditions for which the respective product is approved. The use under other ambient conditions may result in damage.
- To avoid any damage to the connectors, only mount or remove the product with the cables disconnected.
- Lay cables in such a way that no one is endangered.
- Before starting up, check if the electrical wiring corresponds to the specifications in the documentation. Faulty wiring (overvoltage, undervoltage) can result in a damage in the electronics.

Transport

- Only use ESD packaging for storage and transport of ESD-sensitive components.
- Keep packing materials like films away from children. Abuse may result in suffocation.

Operation and power supply

The camera power supply must meet the requirements for SELV (safety extra low voltage)/LPS (limited power source) or ES1/PS2.

WARNING! Non-approved power supplies for camera operation may cause painful or dangerous electric shock. Serious injury or death may occur. Use a power supply that meet the requirements for SELV (safety extra low voltage)/LPS (limited power source) or ES1/PS2.

- In order to ensure electrical safety, we recommend using a shielded connection cable or grounding the camera housing so that the camera housing is connected to ground via the appropriate installation.

Avis pour le Canada

Fonctionnement et alimentation électrique

L'alimentation électrique de la caméra doit être conforme aux exigences de sécurité SELV (très basse tension de sécurité)/LPS (source à puissance limitée) ou ES1/PS2.

AVERTISSEMENT ! Avec un bloc d'alimentation non prévu pour les caméras, il existe des risques de décharges électriques douloureuses ou dangereuses. Celles-ci peuvent provoquer des blessures graves, voire mortelles. Utilisez un bloc d'alimentation conforme aux exigences de sécurité SELV (très basse tension de sécurité)/LPS (source à puissance limitée) ou ES1/PS2.

- *Pour garantir la sécurité électrique, nous recommandons l'utilisation d'un câble de connexion blindé ou la mise à la terre du boîtier de la caméra, afin que ce dernier soit relié correctement à la masse.*

CAUTION! As the camera housing may get hot depending on the operating conditions there may be risk of burns. Provide sufficient heat dissipation so that the housing temperature does not exceed 55 °C (131 °F).

NOTICE! Cameras with Power-over-Ethernet (PoE) can be powered from an external source or via PoE. The camera should not be supplied with both power sources at the same time, as this may cause irreparable damage to the camera.

Correct disposal

Dispose the camera and accessories properly and separately from other types of waste to encourage recycling of reusable materials and to protect the environment.

According to the EC Directive 2012/19/EU (WEEE) we are obliged to take back this product, distributed by us after August 13, 2005, free of charge at the end of its useful life and to ensure its correct disposal. As this product is exclusively for commercial use (B2B), it must not be handed over to a public disposal facility. The product can be disposed of by specifying the date of purchase and the serial number at the following address:

IDS Imaging Development Systems GmbH
Dimbacher Str. 10
D-74182 Obersulm, Germany

4 Standards and directives

(only valid for devices with housing)

IDS Imaging Development Systems GmbH hereby confirms that this product has been developed, designed and manufactured in compliance with the following European directives

- 2014/30/EU: EMC - Electromagnetic compatibility
- 2011/65/EU: RoHS - Restriction of the use of certain hazardous substances in electrical and electronic equipment
- Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
- The CE declaration of conformity is available on the [IDS website](#).

If the product is modified or changed all approval becomes invalid. In this case the customer is responsible for ensuring product conformity.

Product type	IDS NXT rio
Information for CE EMC specifications	EN 61000-6-2 EN 55035 EN 61000-6-4* EN 55032 (Class A)
Information for USA This equipment has been tested and found to comply with part 15 of the FCC Rules	Class A
Information for Canada Renseignements pour le Canada	CAN ICES-3 (A)/NMB-3(A)
Information for UL	UL 62368-1 CAN/CSA C22.2 No. 62368-1-14
Information for UK EMC specifications	UKCA EN 61000-6-2 EN 55035 EN 61000-6-4* EN 55032 (Class A)
Further information	RCM KC (R-R-img-NXTrío)

* Cameras are intended exclusively for use in industrial environments.

This product may cause interference when used in residential areas. Such use is to be avoided unless the user takes measures to prevent interference emissions.

사 용 자 안 내 문
<p>이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.</p>

For customers in the USA

For a class A digital device:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Name of Responsible Party

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5 IDS NXT rio

Housing/board-level	+/-
Dimensions height x width x length	34 x 44 x 73 mm
Mechanical specifications	Mechanical specifications
IP code	IP 30 <ul style="list-style-type: none"> • Protection against the ingress of small particles (diameter = 2.5 mm) • No protection against water
Ambient conditions	Ambient conditions
Lens mount	C-mount, see Optical specifications
Mounting holes bottom/top/side/front	4/0/0/0
Thread diameter	M3
Status LED	Status LED
Interface connector	GigE RJ45, screwable
Power supply	Input I/O connector (M12): 12-24 V DC +20 %, max. 1 A Input GigE connector (RJ45): PoE 41-57 V DC, max. 350 mA
I/O connector	12-pin M12 connector , screwable
Electrical specifications	Electrical specifications

5.1 Ambient conditions

The temperature values given below refer to the outer device temperature of the camera housing. The temperature inside of the camera housing is generally higher than the outer temperature and may be up to 70 °C (158 °F).

Device temperature during operation	0 °C ... 55 °C 32 °F ... 131 °F
Device temperature during storage	-20 °C ... 60 °C -4 °F ... 140 °F
Humidity	20 % ... 80 %, relative, non-condensing

Non-condensing means that the relative air humidity must be below 100 %. Otherwise, moisture will form on the camera surface. If, for example, air has a relative humidity of 40 % at 35 °C (95 °F), the relative humidity will increase to over 100 % if the air cools down to 19.5 °C (67 °F); condensation begins to form.



CAUTION! As the camera housing may get hot depending on the operating conditions there may be risk of burns. Provide sufficient heat dissipation so that the housing temperature does not exceed 55 °C (131 °F).

Notes on ambient conditions

- Avoid high air humidity levels and rapid temperature changes when using IDS cameras.
- Temperatures below +4 °C (39 °F) combined with excessive relative air humidity levels can cause icing.

Provide sufficient heat dissipation so that the specified device temperature is not exceeded during operation. In general, the following recommendations apply:

- For a passive heat dissipation, mount the camera on a thermally-conductive surface like a metal plate or a heat sink.
- If necessary, provide an active cooling for example by means of a fan.

With increasing device temperatures, the image quality could be reduced due to thermal noise. It is recommended to mount the camera to a heat-dissipating unit even if the camera is operated below the maximum specified temperature.

Vibration and shock resistance

Vibration and shock resistance of the cameras corresponds to EN 60068-2-6 and EN 60068-2-27.

5.2 Connecting a IDS NXT rio

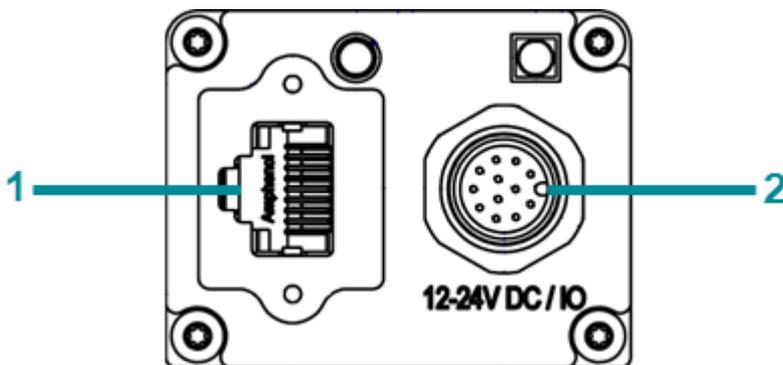


Fig. 1: IDS NXT rio

- [1: Pin assignment GigE connector \(RJ45, 8-pin\)](#)
- [2: Pin assignment I/O connector \(M12, 12-pin\)](#)



NOTICE! The camera can be supplied with voltage both from an external source and via Power-over-Ethernet (PoE). The camera should not be supplied through both voltage sources at once as this can irreparably damage the camera.

1. Install the [IDS NXT cockpit](#).
2. Make sure that your camera is powered (LEDs are flashing), either with the I/O connector or with PoE (Power-over-Ethernet).
3. Connect the camera to to a Gigabit Ethernet port on the PC either directly or using switches.

Cables

- Use Cat5e type cables or better for the complete connection between your camera and the host PC.
- The cable length of each segment must not exceed 100 m. A segment is a continuous cable connection between two network devices (e.g. PC, camera, switch).

Network devices involved

All devices that contribute to the network connection between camera and host PC (e.g. switches) should support at least 1000 Mbit/s to ensure a consistent connection.

It is recommended that each device uses Jumbo Frames, if possible. Otherwise the maximum possible packet size will be used. Refer to your device's manual how to configure Jumbo Frames.

Network adapter settings

Your camera should be connected to a separate network card or port. Do not use the same as for your internet connection (or other communication network) because this reduces the bandwidth for image data transfer and can lead to incomplete or lost images.

To ensure optimum performance of the network connection, you need to install the latest drivers for your network card.

The transfer rate of GigE network adapters for PCI slots is limited to approximately 110-120 MByte/s. USB Ethernet adapter can have different restrictions, depending on the model.

For operating IDS NXT cameras, it is recommended:

- Maximize the receive buffer size or stack buffer size.
- Enable Jumbo Frames.

6 Electrical specifications

[Pin assignment GigE connector \(RJ45\)](#)

[Pin assignment I/O connector](#)

6.1 Pin assignment GigE connector (RJ45)

8-pin RJ45 socket

Pin	Designation 100BASE-TX	Designation 1000BASE-T
1	Tx+	BI_DA+
2	Tx-	BI_DA-
3	Rx+	BI_DB+
4		BI_DC+
5		BI_DC-
6	Rx-	BI_DB-
7		BI_DD+
8		BI_DD-

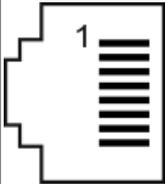


Fig. 2: RJ45 socket, camera rear view



The RJ45 socket of the IDS NXT rio complies with the IEC 60603-7 standard.

6.2 Pin assignment I/O connector

12-pin M12 connector (Attend 216A-12MSR)

Pin	Signal	Description
1	VBUS	Power supply: 12-24 V DC +20 %
2	VBUS GND	Reference level (ground) for power supply and RS-232
3	Opto IN (0)	Trigger input with optocoupler
4	Opto IN (1)	Input 1 with optocoupler
5	Opto IN (COM)	Reference level for all Opto IN
6	Opto OUT (COM)	Reference level for all Opto OUT
7	Opto OUT (1)	Output 1 with optocoupler
8	Opto OUT (2)	Output 2 with optocoupler
9	RS232 (RxD)	Serial interface
10	RS232 (TxD)	Serial interface
11	Opto IN (2)	Input 2 with optocoupler
12	Opto OUT (0)	Flash output with optocoupler
Shield	Shield	Shield

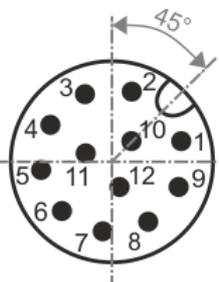


Fig. 3: I/O connector, camera rear view

You can check the color assignment of the cable on the [Website](#) directly at the specific accessory item.



The maximum length of the I/O cable is 30 m. The cable must be shielded.

Power supply



NOTICE! The camera can be supplied with voltage both from an external source and via Power-over-Ethernet (PoE). The camera should not be supplied through both voltage sources at once as this can irreparably damage the camera.

Voltage	Input I/O connector (M12): 12-24 V DC +20 % Input GigE connector (RJ45): PoE 41-57 V DC
Current	Input I/O connector (M12): min. 1 A Input GigE connector (RJ45): min. 350 mA
Residual ripple	120 mVpp

IDS Imaging Development Systems GmbH recommends to adjust the power supply to the power requirement of the camera to limit overheating in case of short circuit.

To ensure the electrical safety, the camera power supply must meet the requirements for SELV (safety extra low voltage) / LPS (limited power source) or ES1 / PS2. The camera power supply must be rated by the values given in the table above. It also must ensure that the voltage values given in the table above are available at the input of the camera.

Avis pour le Canada:

IDS Imaging Development Systems GmbH recommande d'adapter l'alimentation électrique aux besoins de la caméra afin de limiter la surchauffe en cas de court-circuit.

Pour garantir la sécurité électrique, l'alimentation de la caméra doit être conforme aux exigences de sécurité SELV (très basse tension de sécurité)/LPS (source à puissance limitée) ou ES1/PS2. L'alimentation de la caméra doit respecter les valeurs indiquées dans le tableau ci-dessus. Elle doit également répondre au fait que les tensions indiquées dans le tableau ci-dessus sont présentes à l'entrée de la caméra.

Information on the power consumption of individual camera models can be found in the model data sheet.



Keep in mind that a voltage drop will occur when you use long cables for power supply to the camera. Choose the size of the cable in such a way that the supply voltage available at the input of the camera is at least 12 V.



To supply the IDS NXT rio camera with power using PoE or PoE+, you can use PoE injectors or switches that are compatible with IEEE standard 802.3af or IEEE standard 802.at.

7 Status LED

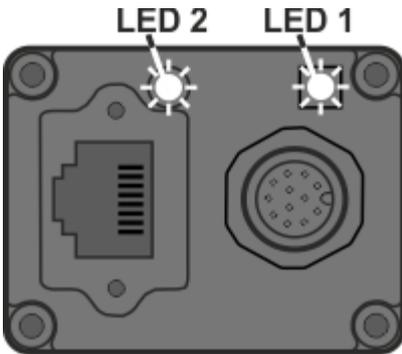


Fig. 4: Status LEDs

The camera has two LEDs that indicate information of the current status.

- LED 1: camera status (two-color)
- LED 2: Network status (two-color)

LED 1

Camera is off/no power	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Camera is booting	Green	Grey	Green	Grey	Green	Grey	Green	Grey
Camera is ready	Green	Green	Grey	Grey	Green	Green	Grey	Grey
Camera is open	Green	Green	Green	Green	Green	Green	Green	Green
Camera is ready - no valid IP address	Green	Green	Red	Grey	Green	Green	Red	Grey
No firmware loaded	Red	Red	Red	Red	Red	Red	Red	Red
Service firmware active	Orange	Orange	Grey	Grey	Orange	Orange	Grey	Grey

LED 2

No network connection	Grey							
Network connection OK	Green							
Network connection OK + data transfer	Green	Orange	Orange	Orange	Green	Orange	Orange	Orange
Continuous data transfer	Orange							
Network error	Red	Red	Grey	Grey	Red	Red	Grey	Grey

8 Setup in network

The following steps must be executed to setup IDS NXT rio camera:

1. Install the [IDS NXT cockpit](#).
2. Connect the camera to the network and power supply.



NOTICE! The camera can be supplied with voltage both from an external source and via Power-over-Ethernet (PoE). The camera should not be supplied through both voltage sources at once as this can irreparably damage the camera.

8.1 Installing IDS NXT cockpit

The installation package of the IDS NXT cockpit is available for download from <https://en.ids-imaging.com/downloads.html>.

- Follow the setup wizard for the installation under Windows.



IDS NXT cockpit is currently available for Windows 64-bit. You should have an up-to-date graphics card driver installed for an optimal display.

8.2 Getting an IP address

During the initial network setup, the following situations can occur:

1. Valid IP address via DHCP
2. Valid IP address via Zeroconf
3. No connection/link (Check the [status LED](#) of the camera!)

As supplied, the camera attempts to get an IP address from a DHCP server in the network.

DHCP

The camera is assigned a valid IP address by the DHCP server. You can log on to the camera using the [IDS NXT cockpit](#) and set the [network parameters](#).



The PC network card must be in the same subnet as the camera to find the camera via the IDS NXT cockpit.

Zeroconf

In an IPv4 network with no DHCP server, the camera in DHCP mode uses the Zeroconf method to independently acquire a valid IP address from the reserved link-local address range. You can use the [IDS NXT cockpit](#) to assign a different IP address to the camera. You can then to log on to the camera and set the [network parameters](#).

Static IP address

After logging on to the camera, you can assign a static IP address in IDS NXT cockpit, see [Network configuration in IDS NXT cockpit](#).

8.3 Starting IDS NXT cockpit

Start the IDS NXT cockpit.

- Windows: either via the icon on the desktop or under "Start > All Programs > IDS > IDS NXT cockpit".



The first time the program is started, a firewall security prompt is displayed. Allow firewall access to all networks (domain network, private networks and public networks).

In Windows Defender Firewall, IDS NXT cockpit must have the following permissions (Control Panel\All Control Panel Items\Windows Defender Firewall\Allowed Apps):

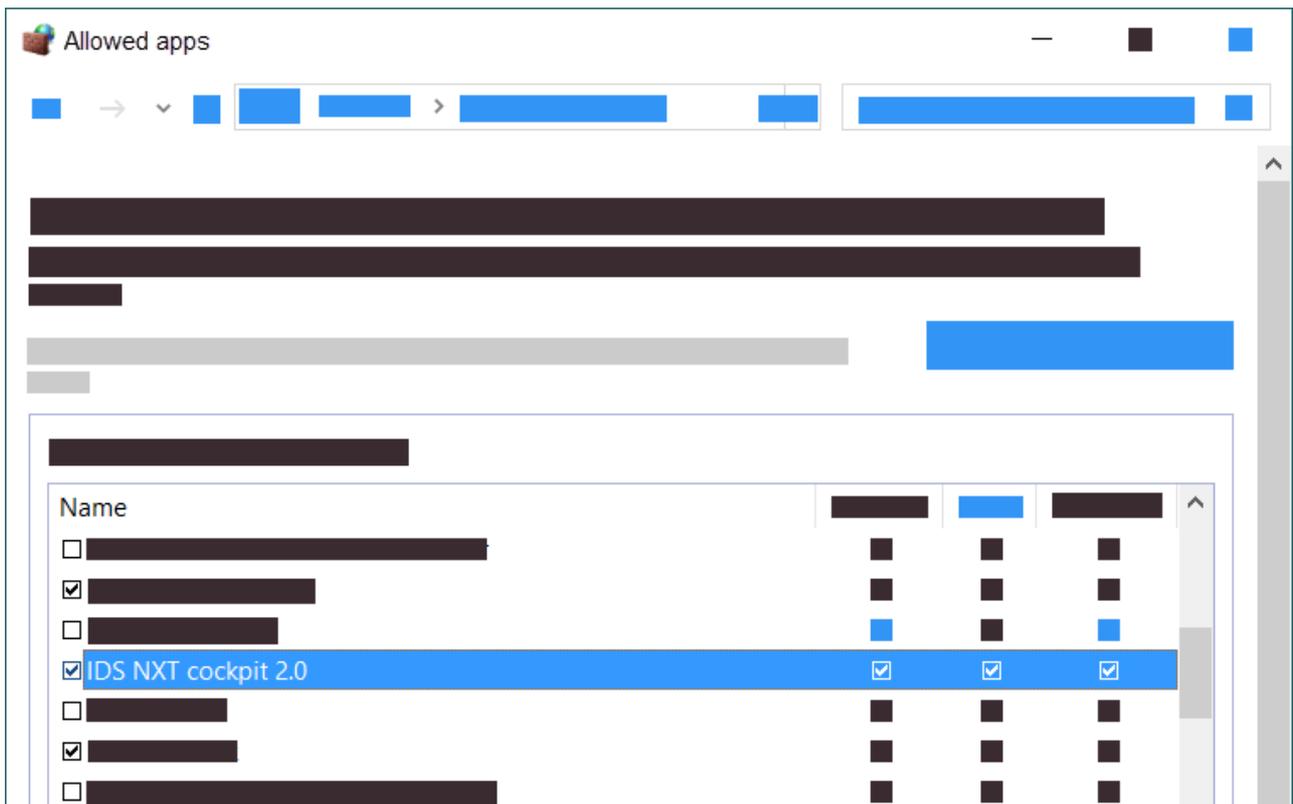


Fig. 5: Firewall settings

After launching, you will be in the Finder ("device overview"). IDS NXT cockpit scans the network for IDS NXT cameras and lists them in this overview. A login to IDS NXT cameras is possible by direct entry of an IP address.



Automatic finding of IDS NXT cameras only works if the following parameters are possible in the network:

- UDP broadcasts via port 5055 ("Finder" queries from IDS NXT cockpit)

- TCP response from devices via port 5055
- UDP broadcasts via port 3956 (GVCP - GigE Vision Control Protocol)

You can see more detailed information about the found devices when you select a device.

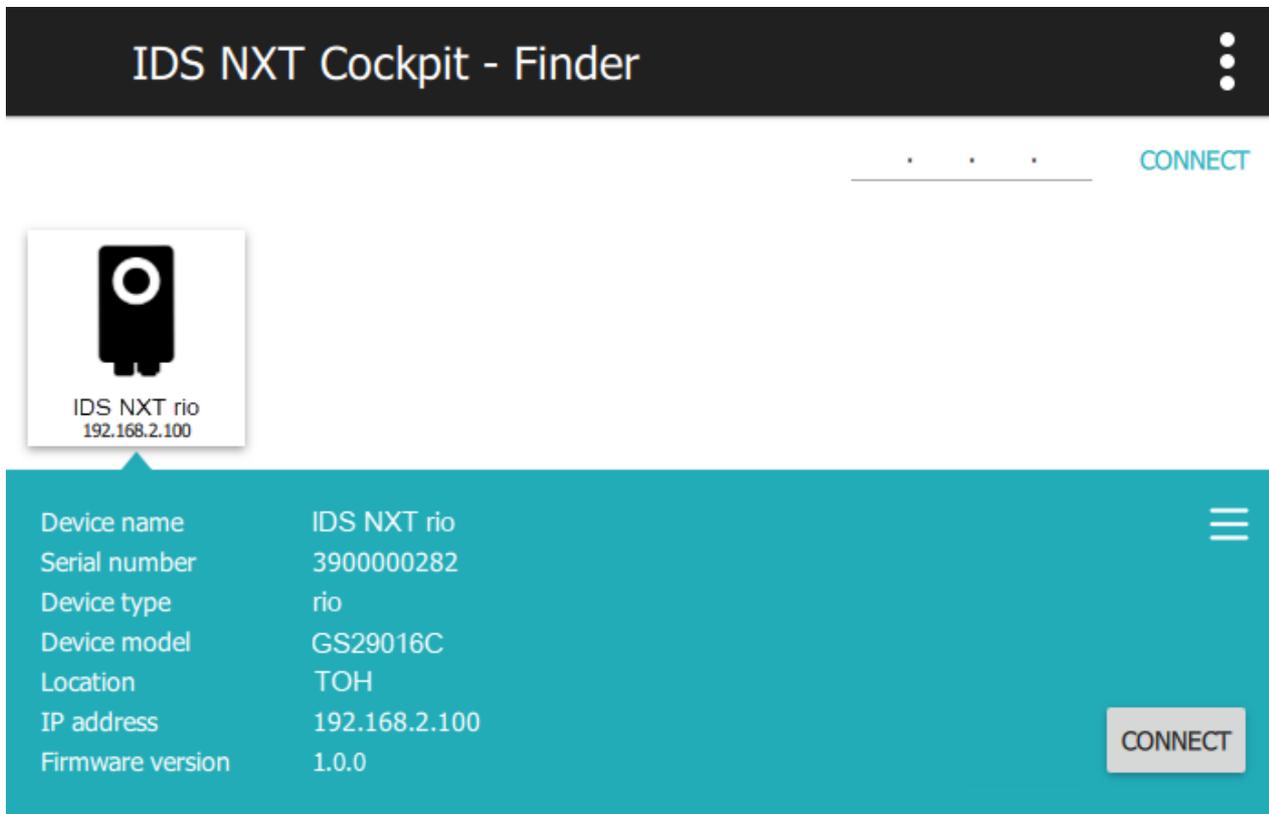


Fig. 6: IDS NXT cockpit shows a camera with its device information

Via "Connect" you get to the respective [device logon](#).

8.4 Logging on to the device

Via the selection, select the user class that you want to use to log on to the device. There are three basic user classes that are used.

- **Administrator**

The administrator profile allows full access to the IDS NXT camera's configuration. You can do everything from firmware updates to installing and setting up IDS NXT vision apps.

- **Service**

This user profile can be used to perform service activities. Specified settings can be changed, for example to respond to changed production specifications. These include camera settings (brightness, gain, ...) and settings for the IDS NXT vision apps.

- **User**

This user profile provides shop floor employees, for example, with status information for an IDS NXT camera so that they can directly find information about fault conditions.



By default, the password for each user class is "ids". At the first login, you have to change the password to be able to log on. When you log on with the administrator profile, you can change the passwords for the user classes "Service" and "User". The procedure for this is described in the IDS NXT cockpit manual.

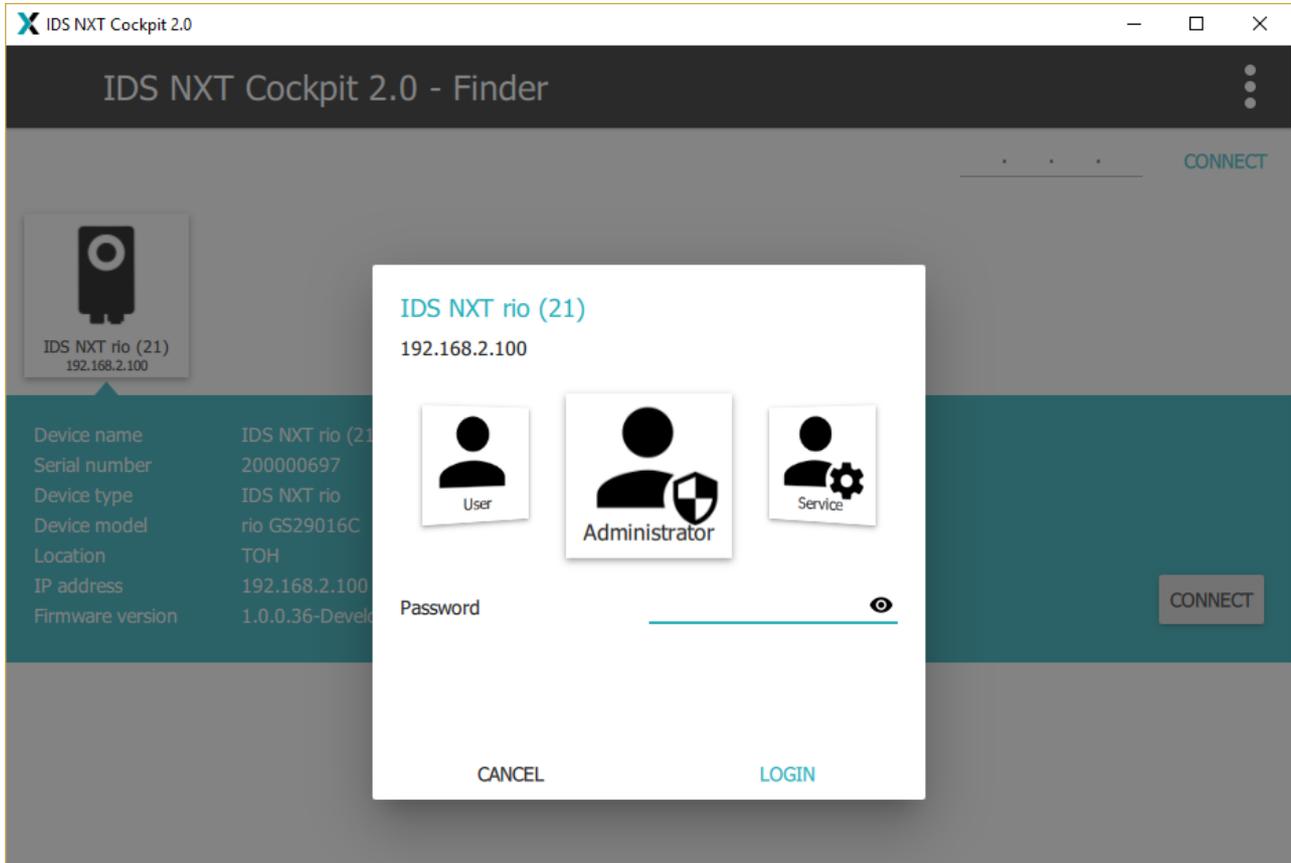


Fig. 7: Log on

Initial login

1. Select the "Administrator" user class for login.
2. Enter the initial password. A dialog opens and you have to enter a new password for the user class.
Note: This dialog is only displayed if you use IDS NXT cockpit version 2.2 or higher!
3. Enter a new password. The password can have a maximum length of 255 characters. The following special characters are not allowed: "?", "=", ":", and "&".
A lock is displayed behind the password field. Depending on the security of the password, the lock is red (low security), yellow or green (high security).
4. Confirm the password. If the two entries are identical, a green check mark is displayed behind the confirmation field.
You can view the entered passwords by pressing the eye symbol behind the input field with the mouse. As long as you keep the mouse button pressed, the password is displayed.
5. Click on "Apply" to save the changes. Afterwards, you will be automatically logged on to the device.

It is recommended that you change the initial passwords for the other user classes as well.

8.5 Changing the IP address

If the IP address of the camera is not set correctly, the camera is displayed in the Finder with an exclamation mark. With IDS NXT cockpit version 2.2 or higher, you can change the IP address of the camera in IDS NXT cockpit.

IDS NXT cockpit 2.0 - Finder

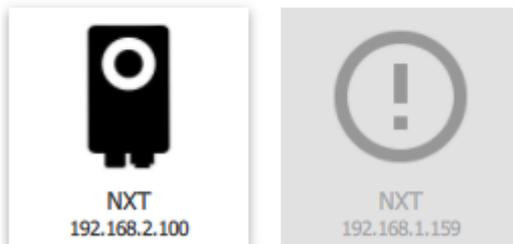


Fig. 8: Incorrect IP address

1. Select the camera to change the IP address.
2. Click on "Change IP address".
⇒ The dialog for changing the IP address opens.
3. Enter a new IP address for the camera. A suggestion based on your network settings will be displayed.
4. Click on "Apply" to change the IP address temporarily.

You can now log on to the camera and change the IP address permanently under "Configuration > Network".

8.6 Network configuration in IDS NXT cockpit

After [logging onto](#) a IDS NXT camera, you will see the "Dashboard" which displays various device information.

To set the network parameters select "Configuration > Network".

- The "Obtain IP address automatically (DHCP)" option is activated by default. It is recommended to keep this setting.
- You can use the device without DHCP and assign a static IP address to the device (not recommended).

IDS NXT Cockpit 2.0 - IDS NXT rio (21) 192.168.2.100

DASHBOARD CONFIGURATION LOGBOOK

Camera settings

General settings

Network

Users

Network configuration

Obtain IP address automatically (DHCP)

IPv4 address

Address	192 . 168 . 2 . 100
Subnet mask	255 . 255 . 255 . 0
Standard gateway	192 . 168 . 2 . 11

DISCARD APPLY

Fig. 9: IDS NXT cockpit network configuration

9 Opening device website

Besides the IDS NXT cockpit, you can open a website that displays status information about the IDS NXT camera. To do this, enter the IP address of the respective camera in your browser and [log on](#). On the website, you see the following information:

- Live image
Note: If you still use the default password for login, you will not see a live image (applies to cameras with IDS NXT OS 1.2 and higher). You must first change the password in IDS NXT cockpit (see manual IDS NXT cockpit).
- System monitor with status information
- Information about the device like IP address or location etc.
- Link to IDS NXT website and license information



It is recommended to reload the device website after a firmware update, as websites are automatically cached depending on the browser settings.

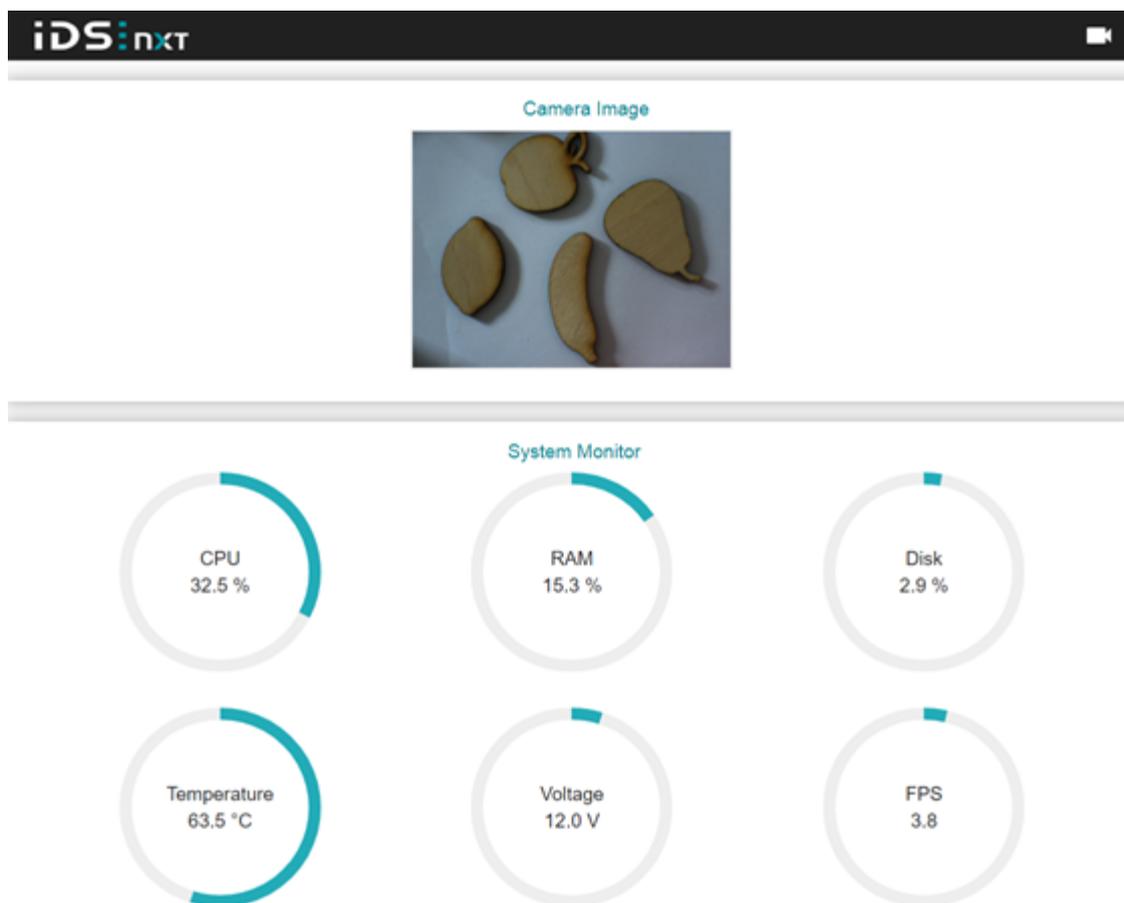


Fig. 10: Website with system status

10 HTTPS communication with SSL certificate

You have the possibility that you upload a SSL certificate to the camera and establish a secure connection between the host PC and the camera. The following certificate types can be used:

- **Self-signed certificate**
This consists of a private key and a certificate file with a public key and details of the certificate. The server must know the private key and the certificate file. On the client side, each self-signed certificate must be trusted separately.
- **CA-signed certificate (CA = certificate authority)**
For this certificate type, first a certificate is created for the certification authority. The CA certificate itself is a self-signed certificate consisting of a private key and the certificate file. The CA's private key is required to sign the server certificate. Multiple server certificates can be created for different devices. These server certificates also consist of a new private key and the original server certificate, which is signed by the CA.

For uploading to an IDS NXT camera, you need an encrypted SSL package (*.NXT_SSL). You create this via IDS NXT Vision App Creator using a script. Alternatively, you can upload a ZIP archive via the IDS NXT cockpit.

- [Creating SSL package with existing certificates](#)
- [Uploading a certificate](#)
- [Optional: disable HTTP](#)

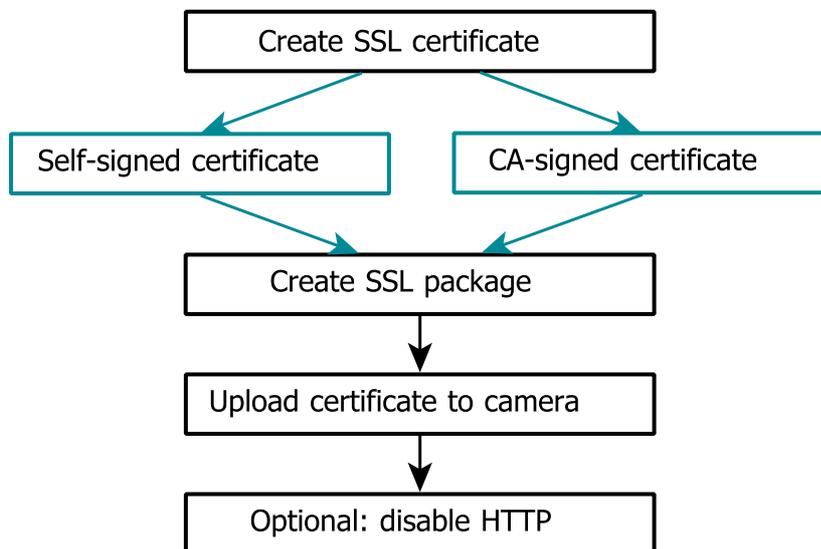


Fig. 11: Configure HTTPS communication



If you use an SSL certificate, it is not necessary to make any further settings for IDS NXT cockpit, as IDS NXT cockpit uses a secure connection.

10.1 Creating SSL package with existing certificates

Prerequisites

- IDS NXT camera with IDS NXT OS version 1.2.0 or higher
- IDS NXT Vision App Creator version 1.0 or higher
- SSL certificates in pem format

Preparing

1. Download the archive "ids-nxt-pack-certificate.zip" (see <https://en.ids-imaging.com/downloads.html>).
2. Unpack the archive into the shared folder under "C:/Users/<user name>/Documents/NXT/customsslcerts". The archive contains the following file: generate_nxt_package.py

Creating SSL package

1. Create a folder named "myCertificates" under "C:/Users/<username>/Documents/NXT/customsslcerts" where you place your SSL certificate files.
2. Create the file "ssl.json" in the "myCertificates" folder.
3. Open the "ssl.json" file in a text editor.

```
{
  "issuer": "YourOrganisation",

  "key-file": "server.key",
  "cert-file": "server.cert",
  "chain-files":
  [
    "server.cert"
  ]
}
```



Under "chain-files", you must enter all certificates of the chain, i.e. also the certificate of the server itself.

Make sure to write the file names correctly, as no further verification takes place.

4. Open Oracle virtual box.
5. Select "Show" in the context menu of the virtual machine.

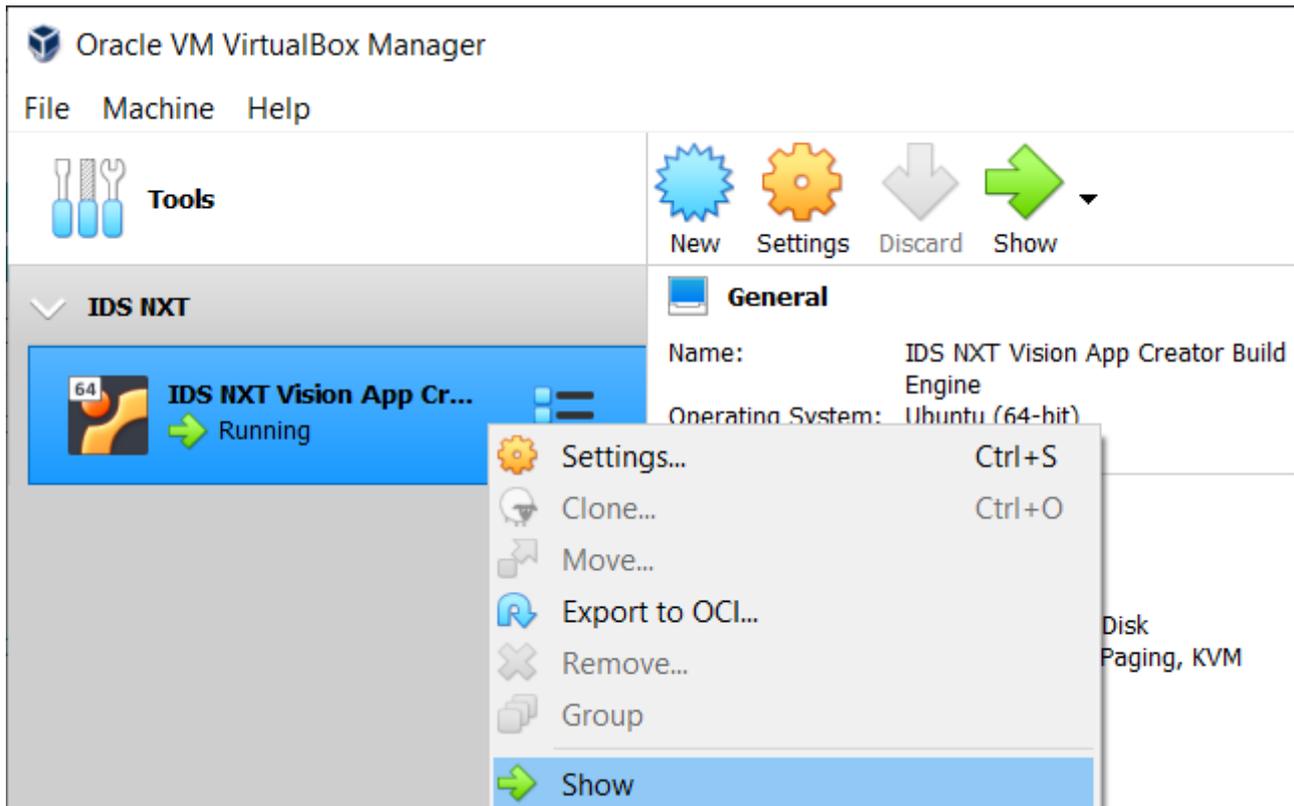


Fig. 12: Open a virtual machine

6. The virtual machine runs with an English keyboard by default. You can activate the German keyboard with:
`sudo loadkeys de`
7. Go to the directory containing the scripts in the virtual machine:
`cd ~/share/customsslcerts`
8. Run the script to build the SSL package:
`python3 generate_nxt_package.py -b ./myCertificates`

[The SSL package "package.NXT_SSL" has been created and can be uploaded to the camera via IDS NXT REST interface.](#)

10.2 Uploading a certificate

[Via the IDS NXT cockpit](#)

[Via the REST interface](#)

10.2.1 Via the IDS NXT cockpit

1. Open the IDS NXT cockpit.
2. Log in as "Admin" user.
3. Open the "Network" section in the navigation on the left.

SSL Certificate

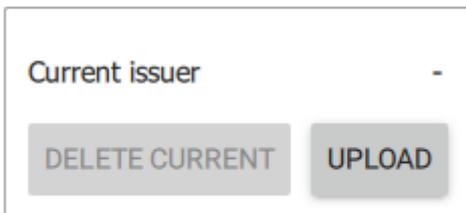


Fig. 13: Hochladen des SSL-Pakets im IDS NXT cockpit

- Click the "Upload" button to upload an SSL package (*.NXT_SSL or ZIP archive).
- Under "Current issuer", you will see the issuer of the SSL certificate.
- Click the "Delete Current" button to delete the SSL certificate.

10.2.2 Via the REST interface

To upload the SSL package to the camera, use the IDS NXT REST interface.

```
curl -X PUT http://<ip>/network/ssl -u admin:<password> -T "package.NXT_SSL" -H "content-type: application/NXT_SSL"
```

If you want to transfer the SSL package to the camera via HTTPS, you must also pass the `--insecure` parameter.

```
curl -X PUT https://<ip>/network/ssl -u admin:<password> -T "package.NXT_SSL" -H "content-type: application/NXT_SSL" --insecure
```

Querying the active SSL package on the camera

```
curl -X GET http://<ip>/network/ssl -u admin:<password>
```

Showing the current certificate information

```
curl https://<ip> --insecure -vvvv
```

Deleting the SSL package on the camera

```
curl -X DELETE http://<ip>/network/ssl -u admin:<password>
```

10.3 Optional: disable HTTP

If you want to disable non-encrypted communication of the camera via HTTP, use the "RestrictHTTP" option of the IDS NXT REST interface:

```
curl -X PATCH http://<ip>/network -u admin:<password> --data "restricthttp=true" --noproxy "*"
```

11 Updating IDS NXT OS

The IDS NXT rio cameras are based on the Vision standard and are updated using a GUF file, just like a Vision camera.

Use the IDS NXT cockpit 2.0 version 2.2 (or higher) to update IDS NXT OS:

- [Updating per IDS NXT cockpit](#)

Use the "ids_deviceupdate" tool to update IDS NXT OS. The "ids_deviceupdate" tool can be found in the installation directory of the IDS NXT cockpit, e.g. under "C:/Program Files/IDS/ids_nxt_cockpit/visiontools". The procedure varies depending on how the camera obtains its IP address:

- [IP address with DHCP](#)
- [IP address without DHCP](#)



Updating cameras with IDS NXT OS 1.0

If a camera is to be updated that is still running IDS NXT OS 1.0, it is recommended that the camera gets its IP address via DHCP, since the camera uses DHCP in service mode by default (see [Network configuration in IDS NXT cockpit](#)).

11.1 Updating per IDS NXT cockpit



Updating cameras with IDS NXT OS 1.0

If a camera is to be updated that is still running IDS NXT OS 1.0, it is recommended that the camera gets its IP address via DHCP, since the camera uses DHCP in service mode by default (see [Network configuration in IDS NXT cockpit](#)).

You can use the IDS NXT cockpit version 2.2 or higher to upload the update to the camera using the GUF file.

1. Open the IDS NXT cockpit.
2. Select the camera to be updated in the Finder.
3. Click on  on the right and select "IDS NXT OS update" in the menu.
4. Select the GUF file.
5. Click on "Install".
The IDS NXT OS update can take several minutes. Wait until it is finished.

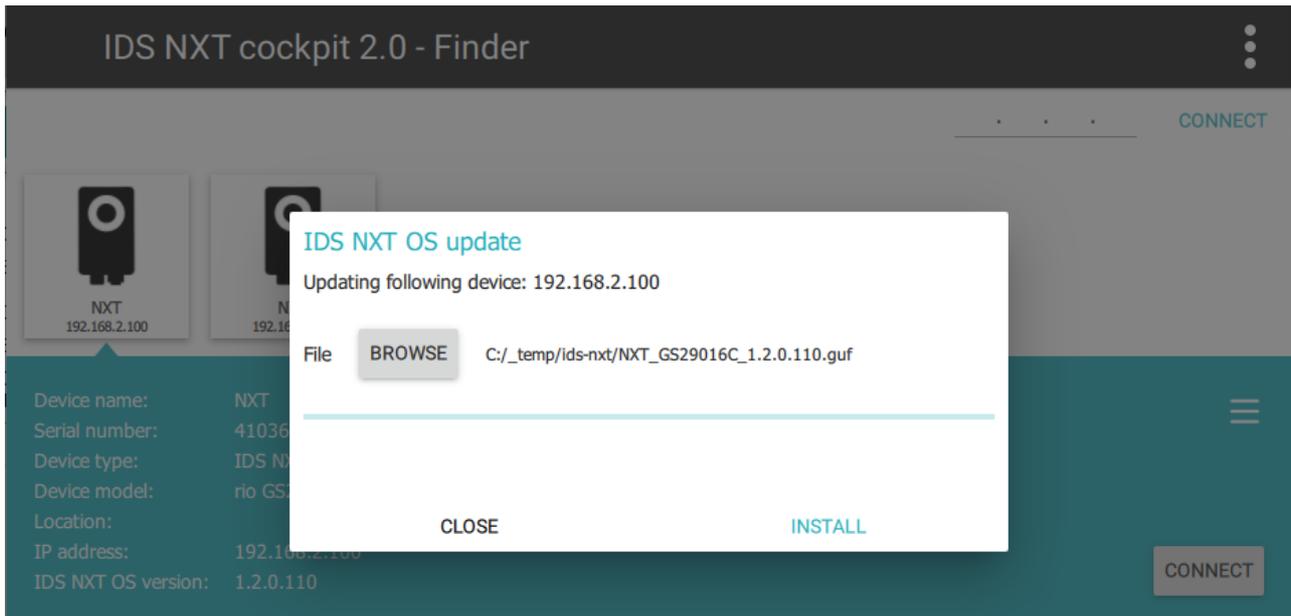


Fig. 14: Update IDS NXT OS

11.2 IP address with DHCP



Updating cameras with IDS NXT OS 1.0

If a camera is to be updated that is still running IDS NXT OS 1.0, it is recommended that the camera gets its IP address via DHCP, since the camera uses DHCP in service mode by default (see [Network configuration in IDS NXT cockpit](#)).



If you start the IDS NXT OS update by double-clicking on the GUF file, all corresponding models in the network are updated automatically. If you want to update only a specific camera, follow the instructions below.

Use the "ids_deviceupdate" tool to transfer the update to the camera via the GUF file. The "ids_deviceupdate" tool can be found in the installation directory of the IDS NXT cockpit, e.g. under "C:/Program Files/IDS/ids_nxt_cockpit/visiontools". The command line tool allows you to choose the camera explicitly for the update.

1. Open the "ids_deviceupdate" command line tool.
2. List all available cameras with:


```
ids_deviceupdate.exe --list-all
```
3. Select a camera e.g. based on the last digits of its serial number and start the update, e.g.


```
ids_deviceupdate -s *6675 --guf "C:\GUF\NXT_GS29016C_1.1.0.100.guf" -U
```
4. Confirm the update with "y".
The IDS NXT OS update can take several minutes. Wait until it is finished.



IDS NXT rio is a complete system consisting of different components, therefore 2 version numbers are distinguished during the update: **DeviceRuntimeSystemVersion** and **DeviceSensorFirmwareVersion**.

However, when querying `ids_deviceupdate --list-device-versions`, the camera will not display a valid version number because this command queries the version number in **DeviceFirmwareVersion**.

11.3 IP address without DHCP



Updating cameras with IDS NXT OS 1.0

If a camera is to be updated that is still running IDS NXT OS 1.0, it is recommended that the camera gets its IP address via DHCP, since the camera uses DHCP in service mode by default (see [Network configuration in IDS NXT cockpit](#)).

If the camera cannot obtain the IP address via DHCP, the camera uses the Zeroconf method.

1. Boot the camera manually into service mode, see [Booting the camera in service mode](#). The IP address of the camera may change due to Zeroconf.
2. Make sure that the camera and host are in the same subnet.
3. The following steps are identical to the description under [IP address with DHCP](#).

After the IDS NXT OS update, the camera is automatically started in runtime mode.

12 Troubleshooting/FAQ

IP configuration

Can the camera's IP configuration be changed in service mode if the camera is in the wrong subnet?

- If the camera is running in [service mode](#), the IP address can be changed via IDS NXT cockpit or Vision-compliant tools, e.g. with "ids_ipconfig". The change of the IP address is only effective as long as the camera is running in service mode.
- The "ids_ipconfig" tool can be found in the installation directory of the IDS NXT cockpit, e.g. under "C:/Program Files/IDS/ids_next_cockpit/visiontools".

Example

The following example uses "force IP" to change the IP address of a camera:

```
ids_ipconfig.exe -s *6675 --force-addr --ip "192.168.178.24" --netmask  
"255.255.255.0"
```

- -s: Serial number of the camera
- -force-addr: Force IP command
- -ip: New IP address
- -netmask: New subnet mask

Passwords

How can the administrator password be reset?

- If you have changed the camera's administrator password and you do not remember it, you must reset the camera to the factory settings in order to assign a new password. To do this, [boot the camera in the service mode](#), [reset the camera to factory settings](#) and [reboot it in the runtime mode](#).

Firmware

How to update the camera?

- When logging on to IDS NXT cockpit, it is checked if the firmware on the camera is up-to-date. If this is not the case, a message is displayed. How to update IDS NXT OS on the camera is described in [Updating IDS NXT OS](#).

What to do if the camera runs unintentionally in service mode?

- If a critical error occurs during operation, the camera is restarted in service mode. The camera remains in the service mode until it is rebooted - either by using the [IDS Vision Cockpit](#) or by disconnecting the camera from power supply. [You can also boot the camera in runtime mode.](#)

What to do if the network connection was interrupted during the IDS NXT OS update?

- If the camera's network connection is interrupted while an update is in progress, the update cannot be restarted. In this case, briefly disconnect the camera from power and then restart update.

What to do if the update terminates while the camera is booting into service mode?

- Manually boot the camera into service mode and then restart the IDS NXT OS update.

Vision apps

Are there new versions of the vision apps for my camera?

- New vision app versions can be downloaded from the download area of the IDS website: <https://en.ids-imaging.com/downloads.html>. Use the IDS NXT cockpit to update the vision apps on the camera.

After a factory reset, no vision apps are available on the camera?

- Resetting the camera to factory settings deletes the camera settings and vision apps. You have to reinstall the vision apps you want to use. You can download the vision apps in the download area of the IDS website: <https://en.ids-imaging.com/downloads.html>

12.1 Booting the camera in service mode

With IDS NXT cockpit version 2.2 or higher

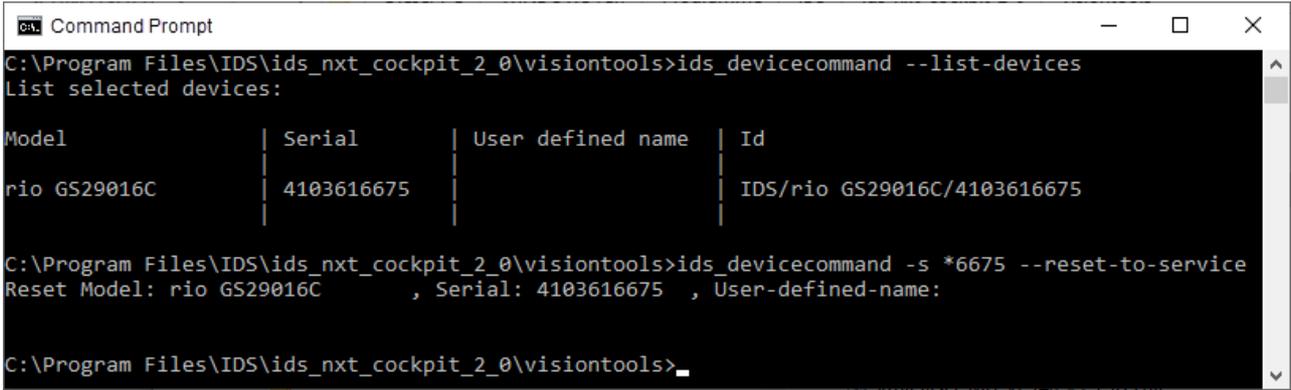
Use the IDS NXT cockpit to boot the camera in service mode.

1. Open the IDS NXT cockpit.
2. In the Finder, select the camera with the mouse.
3. Press and hold the left mouse button until the button displays "Boot into service" (instead of "Connect").
4. Click on "Boot into service".

The camera powers off briefly and is booted in service mode.

Using command line

Use the "ids_devicecommand" tool to boot the camera in service mode. The "ids_devicecommand" tool can be found in the installation directory of the IDS NXT cockpit, e.g. under "C:/Program Files/IDS/ids_nxt_cockpit/visiontools".



```

C:\Program Files\IDS\ids_nxt_cockpit_2_0\visiontools>ids_devicecommand --list-devices
List selected devices:

Model          | Serial      | User defined name | Id
-----|-----|-----|-----
rio GS29016C   | 4103616675 |                   | IDS/rio GS29016C/4103616675

C:\Program Files\IDS\ids_nxt_cockpit_2_0\visiontools>ids_devicecommand -s *6675 --reset-to-service
Reset Model: rio GS29016C , Serial: 4103616675 , User-defined-name:

C:\Program Files\IDS\ids_nxt_cockpit_2_0\visiontools>_

```

Fig. 15: Boot in service mode

1. Open the "ids_devicecommand" tool at the command prompt.
2. You can first display all available cameras to identify the serial number:
ids_devicecommand --list-devices
3. You use the serial number to define which camera should boot in service mode:
ids_devicecommand -s 4103616675 --reset-to-service

The camera powers off briefly and is booted in service mode.

12.2 Resetting the camera to factory settings

When the camera is booted in [service mode](#), you can reset the camera to factory settings.



After the camera is booted in service mode, you have to call the command to reset the camera within 120 seconds.

With IDS NXT cockpit version 2.2 or higher

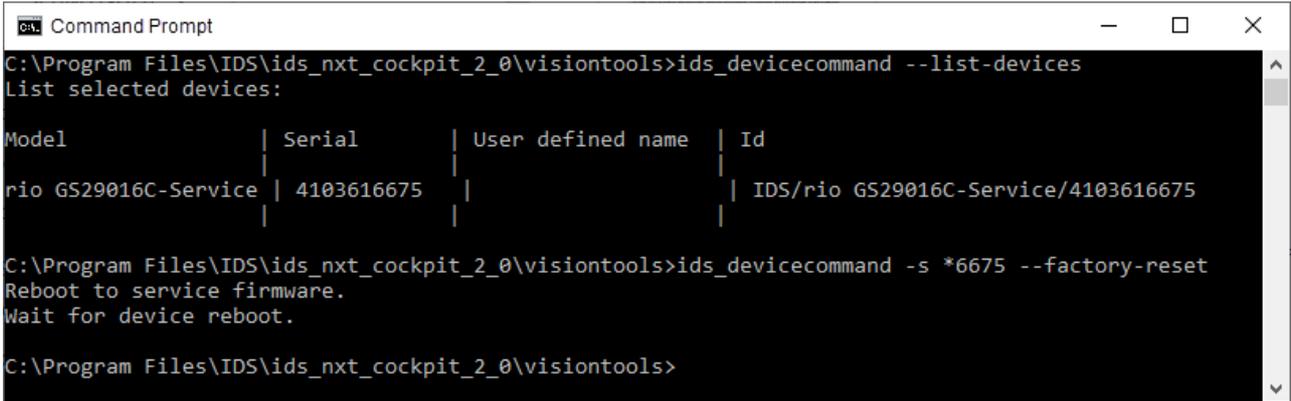
The IDS NXT cockpit is open.

1. In the Finder, select the camera.
2. Click on  in the Finder.
3. Click on "Reset to factory settings".

Resetting the camera to factory settings deletes the camera settings and vision apps. You have to reinstall the vision apps you want to use. After rebooting, the camera is in runtime mode. Note that by default, the camera attempts to obtain an IP address from a DHCP server on the network (see [Getting an IP address](#)).

Using command line

Use the "ids_devicecommand" tool to reset the camera to the factory settings. The "ids_devicecommand" tool can be found in the installation directory of the IDS NXT cockpit, e.g. under "C:/Program Files/IDS/ids_nxt_cockpit/visiontools".



```
C:\Program Files\IDS\ids_nxt_cockpit_2_0\visiontools>ids_devicecommand --list-devices
List selected devices:

Model          | Serial          | User defined name | Id
-----|-----|-----|-----
rio GS29016C-Service | 4103616675    |                   | IDS/rio GS29016C-Service/4103616675

C:\Program Files\IDS\ids_nxt_cockpit_2_0\visiontools>ids_devicecommand -s *6675 --factory-reset
Reboot to service firmware.
Wait for device reboot.

C:\Program Files\IDS\ids_nxt_cockpit_2_0\visiontools>
```

Fig. 16: Resetting to factory settings

1. Open the "ids_devicecommand" tool at the command prompt.
2. You can first display all available cameras to identify the serial number:
`ids_devicecommand --list-devices`
3. Use the serial number to define which camera is to be reset to factory settings:
`ids_devicecommand -s 4103616675 --node DeviceResetToFactoryDefaults --execute`

Resetting the camera to factory settings deletes the camera settings and vision apps. You have to reinstall the vision apps you want to use. After rebooting, the camera is in runtime mode. Note that by default, the camera attempts to obtain an IP address from a DHCP server on the network (see [Getting an IP address](#)).

12.3 Booting the camera in runtime mode

With IDS NXT cockpit version 2.2 or higher

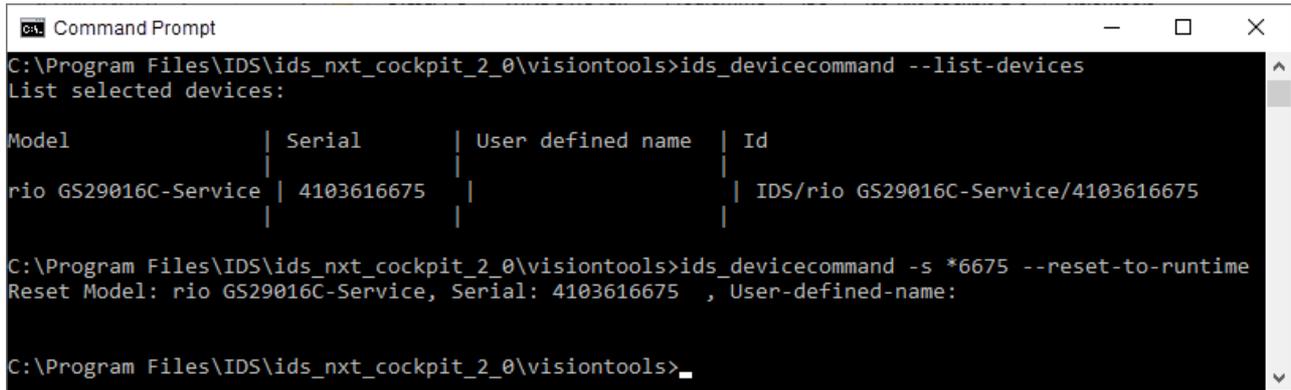
Use the IDS NXT cockpit to boot the camera in runtime mode.

1. Open the IDS NXT cockpit.
2. In the Finder, select the camera with the mouse. The camera is displayed with a wrench icon because it is in service mode.
3. Click on "Boot in runtime".

The camera powers off briefly and is booted in runtime mode.

Using command line

Use the "ids_devicecommand" tool to boot the camera in runtime mode. The "ids_devicecommand" tool can be found in the installation directory of the IDS NXT cockpit, e.g. under "C:/Program Files/IDS/ids_nxt_cockpit/visiontools".



```
Command Prompt
C:\Program Files\IDS\ids_nxt_cockpit_2_0\visiontools>ids_devicecommand --list-devices
List selected devices:

Model          | Serial      | User defined name | Id
-----|-----|-----|-----
rio GS29016C-Service | 4103616675 |                   | IDS/rio GS29016C-Service/4103616675

C:\Program Files\IDS\ids_nxt_cockpit_2_0\visiontools>ids_devicecommand -s *6675 --reset-to-runtime
Reset Model: rio GS29016C-Service, Serial: 4103616675 , User-defined-name:

C:\Program Files\IDS\ids_nxt_cockpit_2_0\visiontools>
```

Fig. 17: Boot in runtime mode

1. Open the "ids_devicecommand" tool at the command prompt.
2. You can first display all available cameras to identify the serial number:
`ids_devicecommand --list-devices`
3. You use the serial number to define which camera should boot into runtime firmware:
`ids_devicecommand -s 4103616675 --reset-to-runtime`

The camera powers off briefly and is booted in runtime mode.

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