



Getting Started

VisionCam XM / LM / EB

Version 2.2 – October 2022

Welcome

Congrats on your new VisionCam! In this “Getting Started” guide, we will show you all necessary steps to get the VisionCam ready for first operation.

What you need

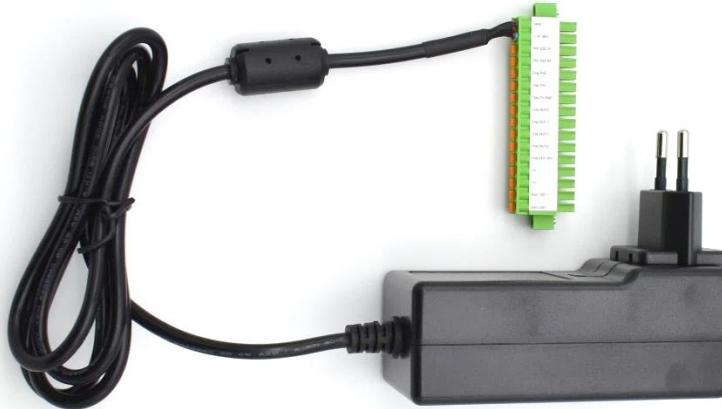
- A PC with the following requirements:
 - OS: Windows 10 or Debian GNU/Linux
 - Internet connection for downloading the required tools
 - Ethernet port
- Requirements for the VisionCam:
 - 17-pin power and I/O cable with green terminal connector (included in the Vision-Cam starter kit)



- Ethernet cable with M12 Connector for VisionCam XM / EB (included in the starter kit) or Standard Ethernet Cable for VisionCam LM

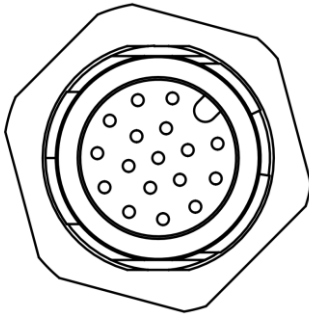


- Power supply 24V, minimum 1A with green terminal connector (included in the VisionCam starter kit)



Attach the 17-pin power and I/O cable

Attach the 17-pin power and I/O cable to the corresponding 17-pin connector of the camera. A schematic of the camera's 17-pin connector is shown below:



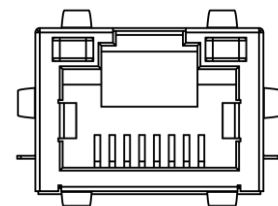
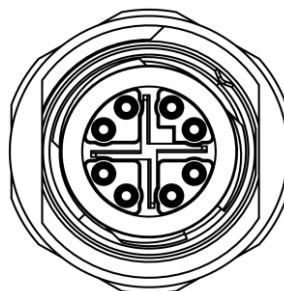
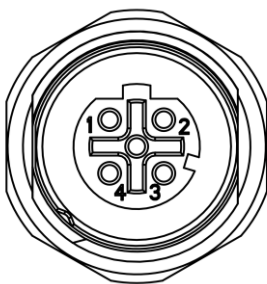
Note: Disconnect the device and cable from power supply for all installation work! Before you start, make sure that your environment is protected against ESD!



For pin assignment and cable colour coding please have a look at Appendix 1.

Attach the Ethernet cable

Attach the Ethernet cable to the Ethernet connector of the camera. Depending on the version of the camera, the Ethernet connector can look like this:



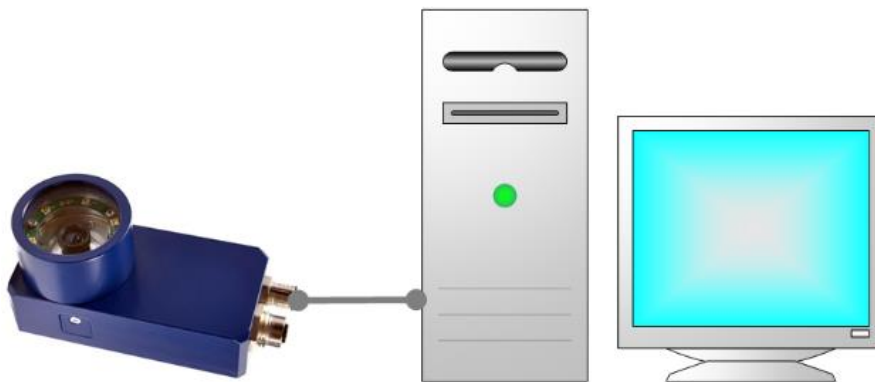
Prepare the Ethernet connection

The network interface of the VisionCam is set to DHCP. If you want to connect the camera to your local network infrastructure, a running DHCP server is required. Usually, every modern router has a built-in DHCP server.

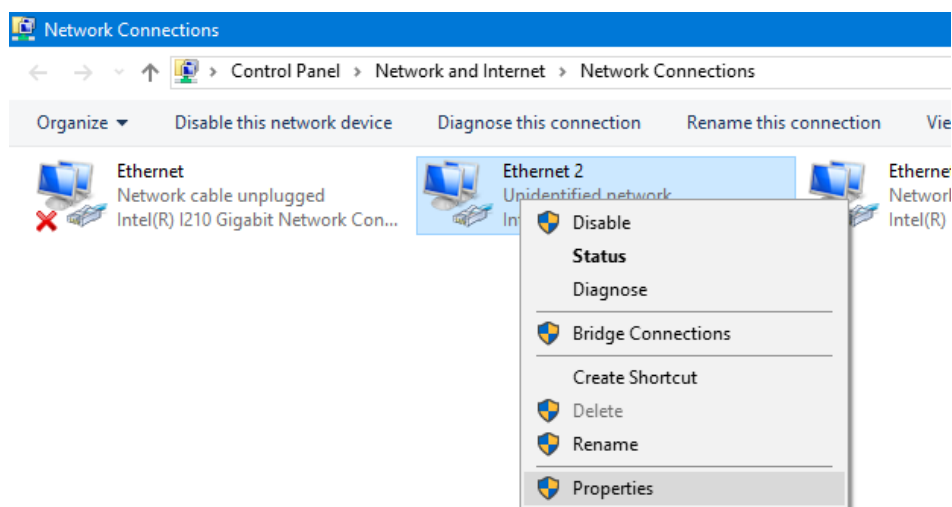
You also have the possibility to attach the VisionCam directly to your PC. Due to the missing DHCP server, the camera and the PC will use Automatic Private IP Addressing (APIPA) or Zeroconf.

Direct attach (APIPA / Zeroconf):

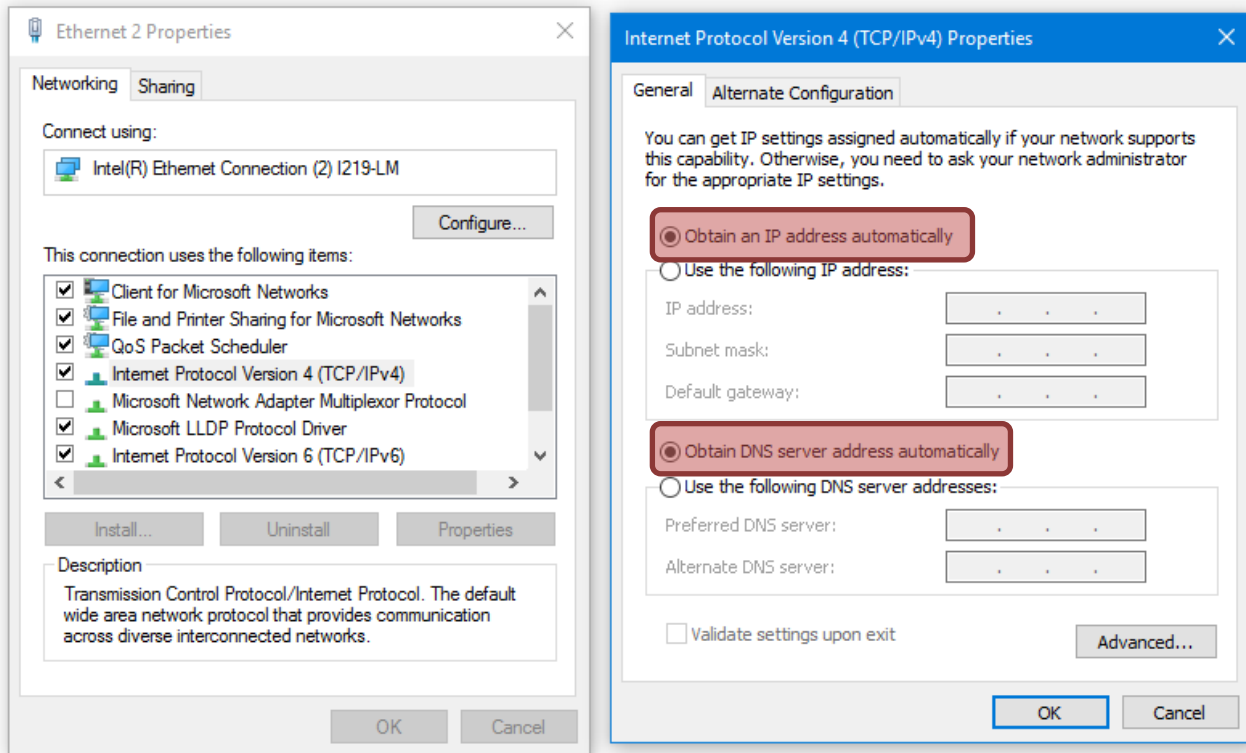
You can connect the VisionCam directly to your PC. Simply plug in the Ethernet cable of the VisionCam into the Ethernet port of your PC.



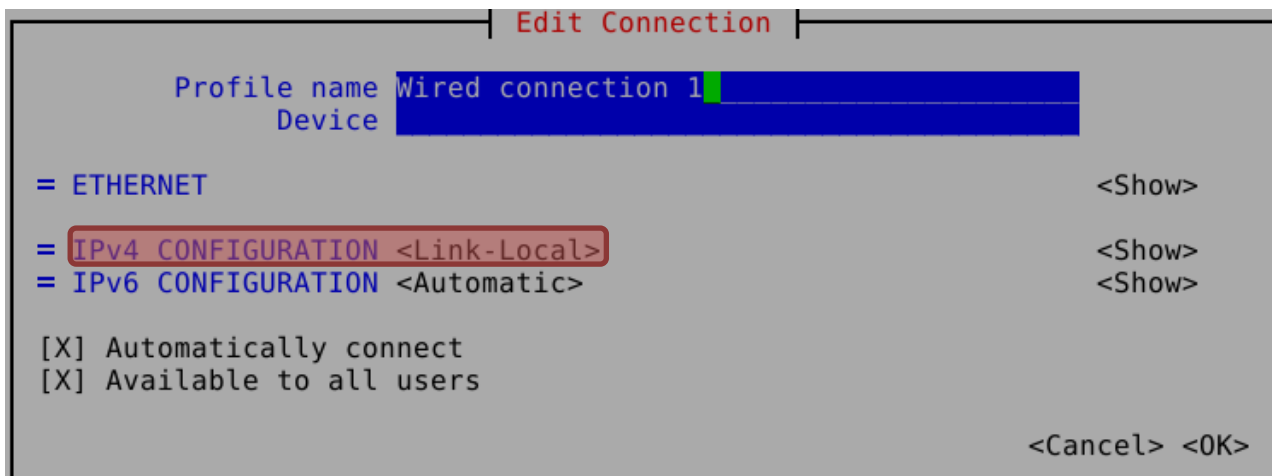
For direct attach, the PC and the camera must support Automatic Private IP Addressing (APIPA) or Zeroconf. If you have a Windows 10 PC, APIPA is enabled by default. Go to the Ethernet adapter settings. Select the Ethernet adapter (right click), which is connected to the VisionCam, then click on “Properties”:



Select “Internet Protocol Version 4”. Then click on “Properties”. Make sure that both options “Obtain an IP address automatically” and “Obtain DNS server address automatically” are enabled.

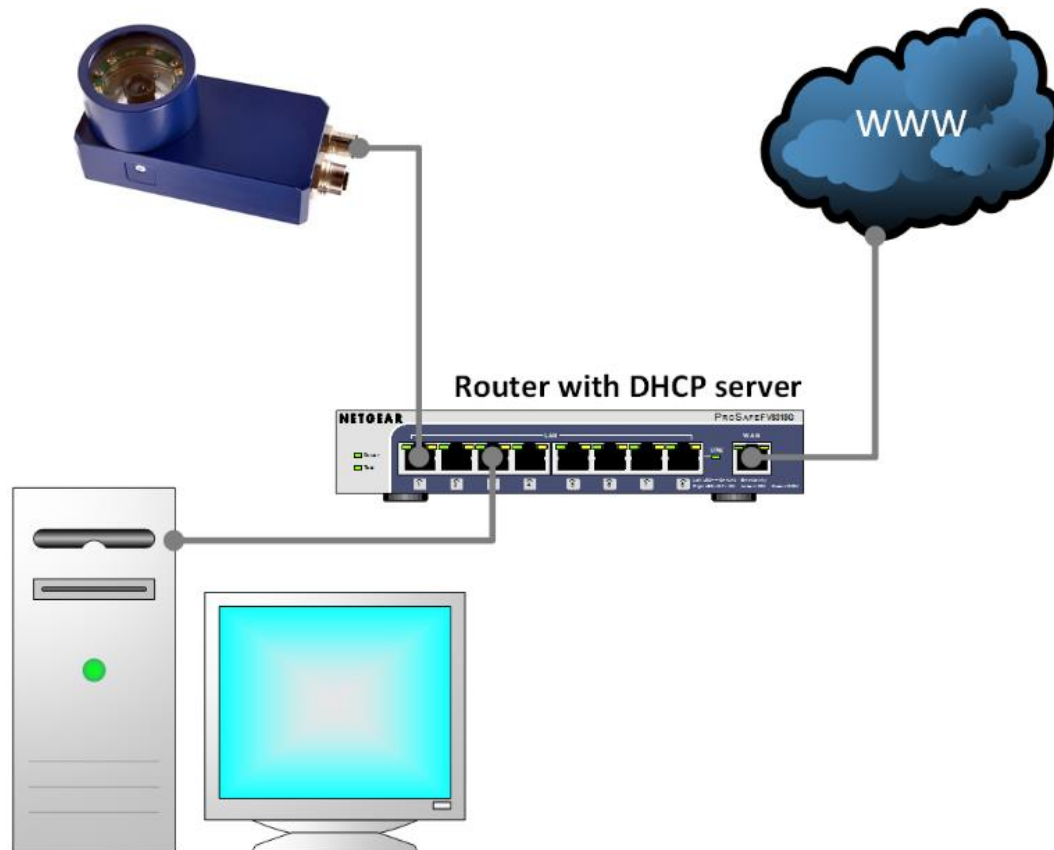


If you are using Debian GNU-/Linux on your PC, you can use for example nmtui to configure the Ethernet adapter. Start nmtui and select the Ethernet adapter which is connected to the camera. Then select “Link-Local” as IPv4 address method:



Local network infrastructure (DHCP Server):

You also have the possibility to connect the camera to your local network infrastructure. In this case, please make sure that a DHCP server is available and running in your network. Usually, every modern router has a built-in DHCP server.



Now you can continue with the next step “Establish power supply”.

Establish power supply

Connect the green terminal connector of the 17-pin power and I/O cable with the green terminal connector of the power supply. Now you can power on the VisionCam. You can continue with the next step “First login via SSH”.

First login via SSH

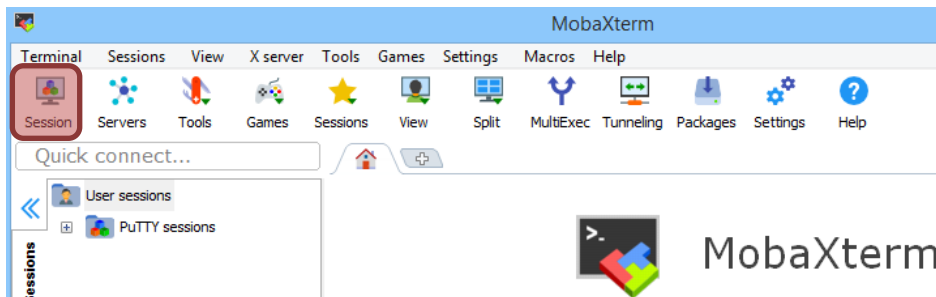
Now we will login via SSH.

For the login, you need to know the username and password. This device is preconfigured with two user accounts, namely “root” and “visioncam”. The password for both is “vision”.

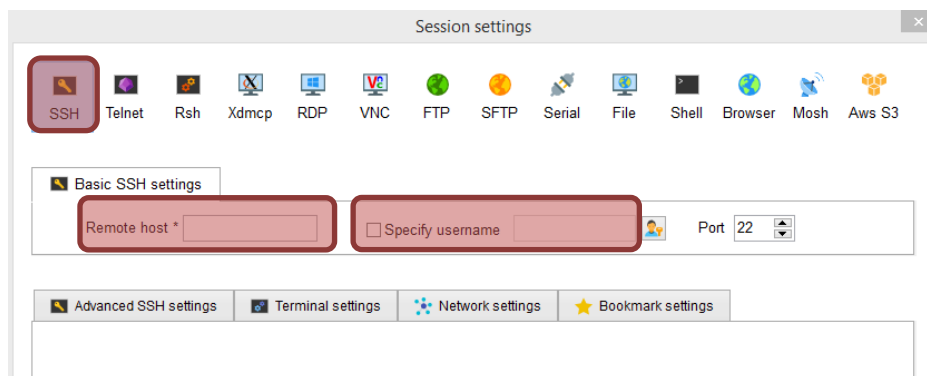
User	Password
root	vision
visioncam	vision

Windows host:

For your Windows PC you must install a SSH client program. We recommend using MobaXterm <https://mobaxterm.mobatek.net/>, which is an enhanced terminal for Windows with included X11 server, SSH and serial session management. After the installation is completed, set up the SSH connection. Run MobaXterm and click on the “Session” button:



Next, select “SSH” as session type:

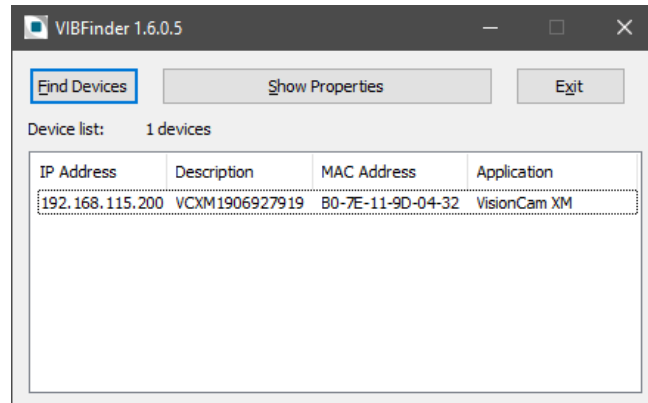


In the text field “Remote host”, enter the serial number of the camera without the hyphen and add the domain “.local”. You can find the serial number on the camera.

Example: If the serial number of the camera is “VCXM-1904-000315” you must enter “VCXM1904000315.local” into the text field “Remote host”.

Instead of using the serial number, you can also enter the IP address of the camera in the text field “Remote host”.

To find out the IP address of the camera you can use the IMAGO VIBFinder program (only available for Windows PC, see chapter “What’s next?” for download details). This program sends a broadcast via SNMP and shows all IMAGO devices and their corresponding IP addresses.



In this example, the camera has the IP address 192.168.115.200.

You can connect either as user “visioncam” or as “root”. In this example, we log in as user “root”.

In MobaXterm, enable the checkbox “Specify username”. Enter the username “root” in the corresponding text field. Confirm all settings with “OK”. Now the SSH connection should be established and you will be asked for the password. After successful login, you can continue with the next step “Set up your system”.

Linux host:

If you have a Debian GNU-/Linux PC, you first have to install following package:

```
apt-get install libnss-mdns
```

Now you can use the “ssh” program to establish the SSH connection. As already mentioned, you can connect either as user “visionsensor” or as “root”. The password for both accounts is “vision” (see table above). Enter the serial number of the camera without the hyphen and add the domain “.local” as SSH destination. You can find the serial number on the camera.

Example: If the serial number of the camera is “VCXM-1904-000315” you must enter “VCXM1904000315.local” as SSH destination.

```
ssh root@VCXM1904000315.local
```

Now, the SSH connection should be established and you will be asked for the password. After successful login, you can continue with the next step “Set up your system”.

Set up your system

After the first login, you should proceed with the following steps to set up your system:

Update the package list

If the VisionCam is connected to the internet, you can update the package list with the following command:

```
apt-get update
```

Change your password

We recommend changing the password of both accounts. You can do this with “passwd”:

```
passwd
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
```

Set up your network configuration

The network interface of the VisionCam is set to DHCP. You can change this by editing the file “/etc/network/interfaces”. For example, if you want to set the VisionCam to the static IP address 192.168.0.2 and your gateway is 192.168.0.1, you can do this with the following lines:

```
#auto eth0
#iface eth0 inet dhcp

auto eth0
iface eth inet static
address 192.168.0.2
netmask 255.255.255.0
gateway 192.168.0.1
```

Remove SNMPD if not needed

An SNMPD (Simple Network Management Protocol) daemon/service runs on this system. This service provides some information about the VisionCam in the network, for example hostname or uptime. It is required to get the IP address of the VisionCam for the first login via SSH. If you don't need it anymore, you can remove this service with the following commands:

```
apt-get purge snmpd
```

Login via serial port (RS232)

It is also possible to login via serial port (RS232). Usernames and passwords are the same as described above. In the table below, you can find the correct serial port settings.

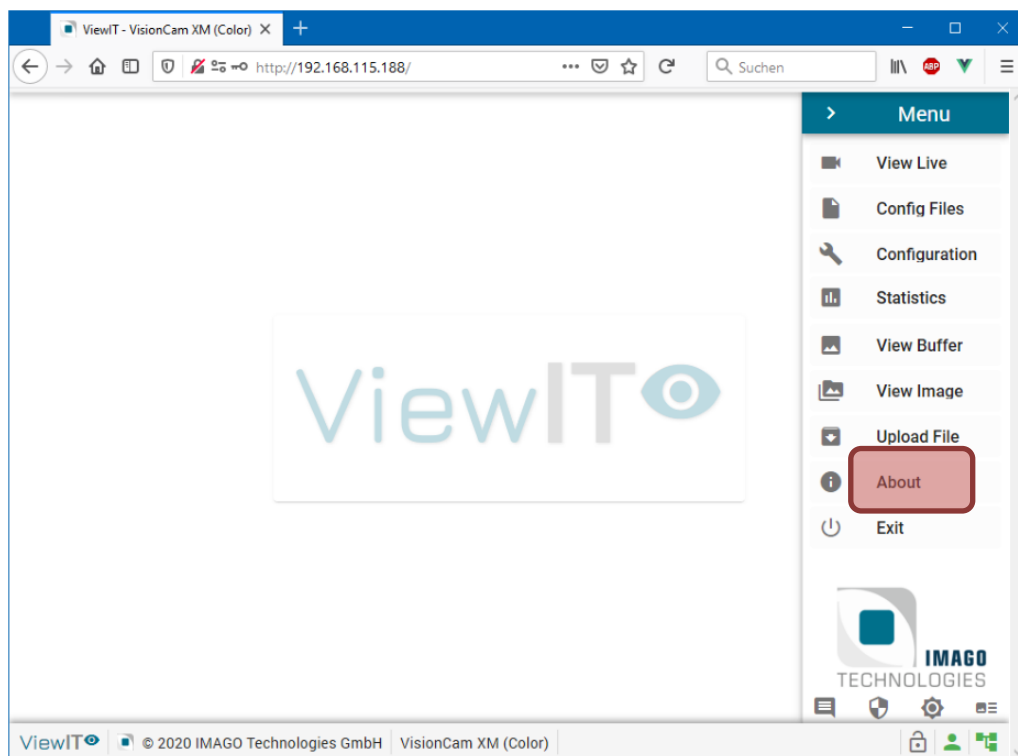
Serial port settings VisionCam	
Baud rate	115200
Parity	None
Bits	8
Stopbits	1
Flow control	none

For RS232 pin assignment and cable colour coding please have a look at Appendix 1.

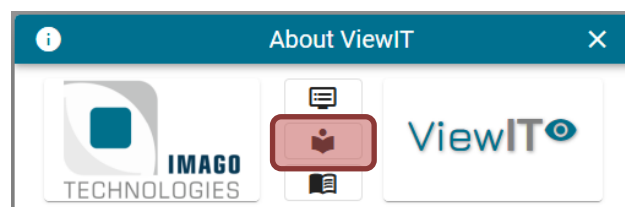
ViewIT-Light (Web GUI)

For new customers, the device comes with the pre-installed ViewIT software. ViewIT is a framework for easily handling image processing functions on IMAGO Technologies devices like VisionCam or VisionSensor PV. The framework gives access to the live view from the camera, acquisition parameters, general purpose digital inputs and outputs and allows using self-designed image processing algorithms.

After entering the IP address or serial number like described the section “First login via SSH” into the address field of a web browser, the main screen appears:



The software documentation can be downloaded from the device by selecting “About” and then clicking the following symbol:



Good to know...

The operating system (OS) of the VisionCam is based on Debian GNU/Linux. The OS has its own VisionCam -specific

- Linux kernel
- U-Boot
- Configuration files
- Firmware

IMAGO releases the OS of the VisionCam as a complete preconfigured image. Each image has a unique version number. The version number can be found in the file name of the image and in the OS hostname. Here is a little example. The file name of the image is `deb10_vcxm_v1.0_a.tar.gz`:

```
Deb10 -> Debian GNU/Linux 10 "Buster"  
vcxm  -> IMAGO VisionCam XM  
v1.0  -> Image version  
a     -> Image variant
```

The corresponding OS hostname for this example is `Deb19VCXMv1-0a`.

For further information about the operating system's version history, please have a look at the corresponding release notes.

What's next?

Register at our IMAGO Download Portal:

- <https://www.imago-technologies.com/support>

Read the VisionCam Hardware Manual:

- <https://imago-technologies.sharefile.com/d-s2b7b86e22a7748f>
- Get more technical data about your new VisionCam

Read the SDK Documentation:

- <https://api.imago.tech/>

Learn how to use the I/Os and strobe unit of your new camera using the *VIB Interface Library*:

- Online API documentation: https://api.imago.tech/VIB_Interface/
- Build and run the FirstSteps example:
https://api.imago.tech/VIB_Interface/first_steps.html#FIRST_STEPS_LINUX

If you have a VisionCam with Prophesee Event Based Sensor (also called VisionCam EB) please use following documentation:

- Read the METAVISION API documentation in /usr/share/metavision/doc
- Code samples are installed in /usr/share/metavision/samples/
- Visit www.prophesee.ai

Learn how to grab images with your new camera. The FG Camera Library provides a C API for generic image acquisition supporting the VisionCam and the VisionSensor PV:

- Online API documentation: <https://api.imago.tech/FGCamera/>
- Build and run the FirstSteps example:
https://api.imago.tech/FGCamera/fg_first_steps.html

Access further files and tools (Documentation, Linux Images, Linux Sources, IMAGO VIBFinder) for the VisionCam on the IMAGO Download Portal:

- <https://imago-technologies.sharefile.com/f/fo6f1bfa-5c9a-4dba-a5f8-83a42bd2d463>

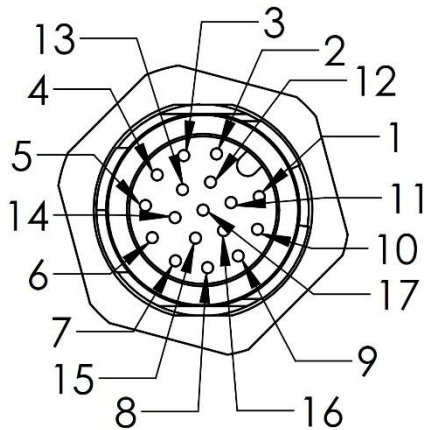
Finally, if you have any open questions, the IMAGO support team is happy to assist you in any cases. For direct contact to the support, please use our ticket system:

- <https://imago.freshdesk.com>

Document History

Revision	Date	Changes	Initials
1.0	Aug-2018	First version, valid for all images >= deb9_vcxm_v1.0_a	av
1.1	Aug-2018	Text revision	vm
1.2	Oct-2018	Added chapter "Prepare the Ethernet connection", valid for all images >= deb9_vcxm_v1.1_a	av
1.3	Oct-2018	Text revision	vm
1.4	Jun-2019	Text revision	av
1.5	Jul-2019	Updated chapters "Good to know..." "What's next?"	av
1.6	Oct-2019	Updated chapter "First login via SSH"	av
1.7	Nov-2019	Removed chapter "Prepare your PC for serial connection", general update of all chapters	av
1.8	Nov-2019	Text revision	vm
1.9	Dec-2019	Updated chapter "What's next?"	av
2.0	Mar-2020	Updated chapter "What's next?", Added Appendix 1	av
2.1	Nov-2020	Update for new OS image deb10_vcxm_v1.2_a	rg
2.2	Oct-2022	Add Devices, Update Text	dm

Appendix 1 Power and I/O cable



Color	Position	Function
Brown	1	Power -
Blue	2	Power + (11V ...26.4V)
White	3	RS232 TX
Green	4	RS232 RX
Pink	5	Opto In 0 +
Yellow	6	Opto In 1 +
Black	7	Opto In Common -
Gray	8	Opto Out 0 -
Red	9	Opto Out 1 -
Purple	10	Opto Out 2 -
Gray/pink	11	Opto Out 3 -
Red/blue	12	Opto Out Common +
White/green	13	RS485 -
Brown/green	14	RS485 +
White/yellow	15	External LED current +
Yellow/brown	16	External LED current -
White/gray	17	n.c.