

Quickstart Guide



English

A brand of Balluff
MATRIX VISION

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Warnings

This guide shows how to initially connect and configure the **rc_visard**. It is not meant to provide instructions for permanent installation, on a robot, or in an industrial environment.

Before operating the **rc_visard**, please read the full manual.

This guide assumes you have purchased the optional connectivity kit. Otherwise, please refer to the full manual for connection requirements.

The **rc_visard** is NOT intended for safety-critical applications.

The **rc_visard** needs to be properly mounted before use.

All cables need to be secured to the robot mount.

Cables must be at most 30 m long.

Power to the **rc_visard** must be supplied through an appropriate, separate DC power source.

The housing of the **rc_visard** must be grounded.

The **rc_visard**'s and any related equipment safety guidelines must always be satisfied.

The **rc_visard**'s case temperature may exceed 60°C during operation. Please ensure that no heat-sensitive materials are near the **rc_visard**. Please use caution when touching or holding the **rc_visard** during operation.

Package Content

The **rc_visard** is a self-registering 3D camera based on passive stereo vision. It provides rectified camera images, disparity images, confidence images, and error images, which enable the viewed scene's depth values along with their uncertainties to be computed. Furthermore, the motion of visual features in the scene is combined with acceleration and turn-rate measurements at a high rate, which enables the sensor to provide estimates of its current pose, velocity, and acceleration.



Optional Connectivity Kit



Requirements

PC with Windows 7 or Windows 10, Microsoft Edge* or Mozilla Firefox® 54.0 or higher, and 100 Mbit or 1 Gbit LAN connection

Or

PC with Ubuntu® 14.04 or higher, Mozilla Firefox®, and 100 Mbit or 1 Gbit LAN connection

Or

Apple Mac** with macOS 10.10.5 or higher, Safari, and 100 Mbit or 1 Gbit LAN connection

And

- (included in connectivity kit)
- 24V power supply, minimum of 24W
- Adapter cable between power supply and **rc_visard**'s M12 power connector
- M12 to RJ45 network cable

Downloads

Visit <http://www.matrix-vision.com>

Get the latest instruction manual online as html or downloadable as pdf at <http://www.matrix-vision.com/manuals>

Download the Discovery Client for your OS from <http://www.matrix-vision.com>



* Windows 7, Windows 10, Microsoft Edge, and Internet Explorer are trademarks of Microsoft Inc., registered in the U.S. and other countries.

** Mac, macOS, and Safari are trademarks of Apple Inc., registered in the U.S. and other countries.

Installation

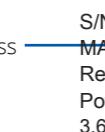
For configuration and troubleshooting, the **rc_visard** may be mounted using the standardized tripod thread (UNC 1/4"-20). For dynamic applications, please refer to the full manual.

Installation

Step 2 Network Configuration

robception

Type: rc_visard 65
 Host name: rc-visard-12345678
 S/N: 12345678
 MAC address: 00:14:2d:00:00:00
 Rev: 01
 Power: DC 18-30V 24W
 3.60.102.300/0000 00 J283



Step 2 continued

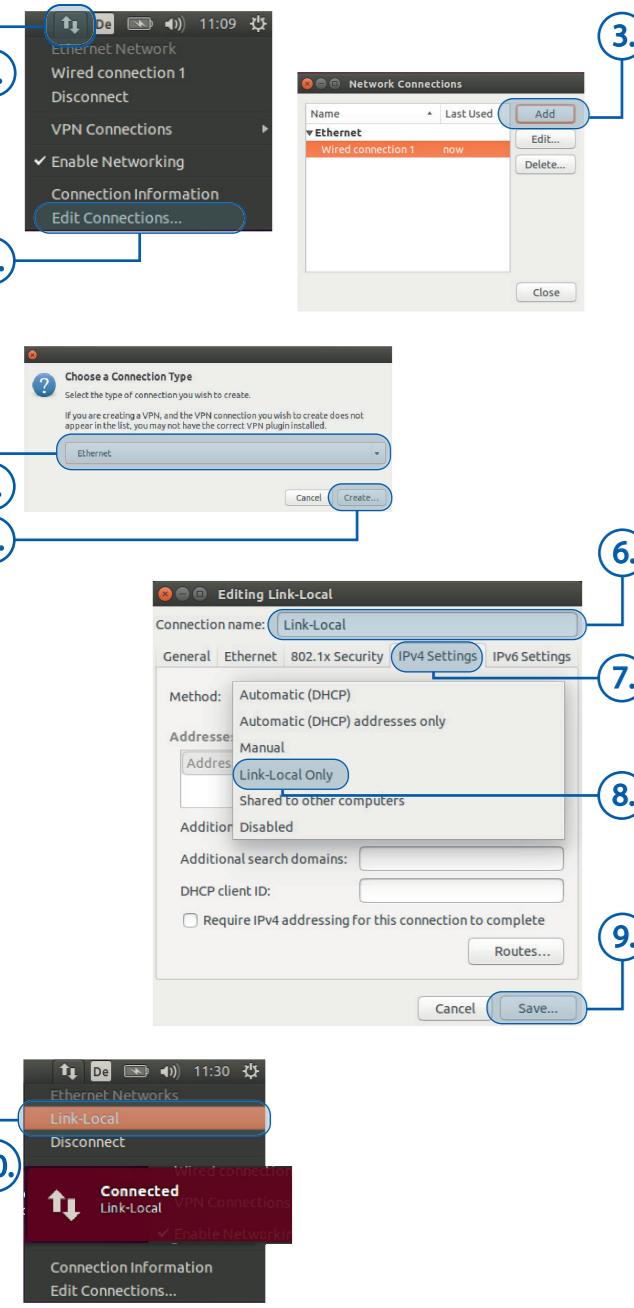
Automatic Configuration via Link-Local

If the **rc_visard** cannot contact a DHCP server for about 15 seconds after startup, or after plugging in the network cable, it will try to assign itself a unique IP address. This is called Link-Local. This option is especially useful for connecting the **rc_visard** directly to a computer. The computer must be configured to Link-Local as well. Link-Local might already be configured as a standard fallback option. If you are using Windows or macOS you can skip the following configuration and continue directly with 'Step 3: rcdiscover-gui Tool'.

Other operating systems, such as Linux, require Link-Local to be explicitly configured in their network manager (the configuration procedure in Ubuntu 16.04 is shown below).

1. Open Network Manager
2. 'Edit Connections'
3. 'Add' connection
4. Connection Type: 'Ethernet'
5. 'Create'
6. Give the new connection a name such as 'Link-Local'
7. Select the Tab 'IPv4 Settings'
8. Select 'Link-Local Only' under 'Method' dropdown
9. 'Save'
10. Select the new connection in the Network Manager

Net-

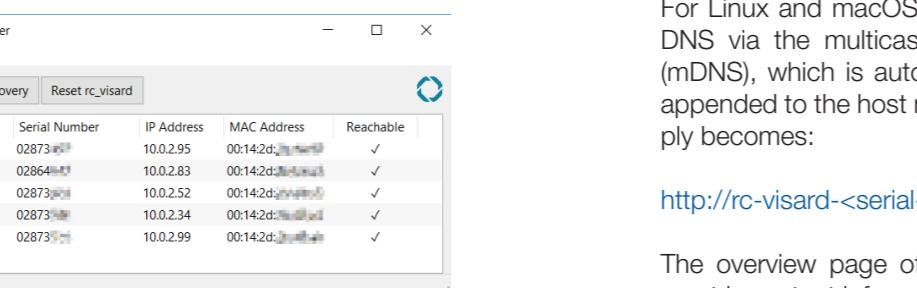


Installation Step 3 *rdiscover-gui* Tool

All *rc_visard* that are powered up and connected to the local network or directly to a computer can be found using the standard GigE Vision® discovery mechanism.

MATRIX VISION offers the tool *rdiscover-gui*, which can be downloaded free of charge from <http://www.matrix-vision.com/> for Windows as single executable* and for Ubuntu as Debian package**.

At startup, all available *rc_visard* devices are listed with their names, serial numbers, current IP addresses, and unique MAC addresses.



* In Windows 10, Smart Screen Defender will be triggered when starting the tool for the first time. Please allow execution by clicking on 'More Info', confirm that the issuer is Roboception GmbH, and then click 'Run Anyway'.

** In Ubuntu you will be prompted whether to disable Reverse Path Filtering. With filtering turned on, you will not be able to discover *rc_visard* in subnets other than the current one.

Congratulations
You have successfully connected to your *rc_visard*.

Installation Step 3 continued

After successful discovery, a double click on the device row opens the Web GUI of the *rc_visard* in the default web browser of the operating system. Please check the browser requirements.

Alternatively, some network environments automatically configure the unique host name of the *rc_visard* in their DNS (Domain Name Server). In this case, the Web GUI can also be accessed directly using the URL:

<http://rc-visard-<serial-number>>

by replacing <serial-number> with the serial number printed on the device.

For Linux and macOS, this even works without DNS via the multicast Domain Name System (mDNS), which is automatically used if .local is appended to the host name. Thus, the URL simply becomes:

<http://rc-visard-<serial-number>.local>

The overview page of the Web GUI gives the most important information of the on-board processing.

Installation Step 4 Web GUI

The Web GUI of the *rc_visard* is a web-based user interface for testing, calibration and configuration. Tabs in the top row of the page give access to individual modules. Further information on all parameters in the Web GUI can be obtained by pressing the Info button next to each parameter.

- **Dynamics** shows the location and movement of image features that are used to compute the egomotion of the *rc_visard*. Settings include the number of corners and features that should be used.

• **Camera Calibration** permits the camera to be checked for proper calibration. In rare cases when the camera is no longer sufficiently calibrated, calibration can also be performed using this module.

• **Hand-Eye-Calibration** allows the computation of the static transformation between the *rc_visard* and a coordinate system known in the robot system. This can be the flange coordinate system of a robotic arm if the *rc_visard* is attached to the flange. Alternatively, the *rc_visard* may be mounted statically in the robot environment and calibrated to any other static frame known in the robot system.

• **Depth Image** shows a live stream of the left rectified image, the depth image, and the confidence image. The page contains various settings for depth-image computation and filtering.

• **Logs** permits access to the log files on the *rc_visard*.

• **System** permits the firmware or the license file to be updated, and provides some general information about the device.

• **Full Documentation** can be accessed through the button in the top right corner of the Web GUI, or via download from the MATRIX VISION web page <http://www.matrix-vision.com/manuals>.



Installation Step 4 continued

During the boot process, the LED will change color several times to indicate stages in the startup process:

LED color	Boot stage
White	Power supply OK
Yellow → Purple → Blue	Normal boot process in progress
Green	Boot complete, the <i>rc_visard</i> is ready

The LED will also signal some warning or error states to support the user during troubleshooting. For detailed information, please consult the full manual.

LED color	Warning or error state
Off	No power to the sensor
Green with brief red flash every 5 seconds	No network connectivity
Green with longer red flash	A process terminated and fails to restart
Red while sensor appears to function normally	Temperature warning (case exceeds 60 °C)

Troubleshooting

LED Colors

Support

Please refer to Web GUI and documentation. For further support issues, please refer to <http://www.matrix-vision.com/> or email support@matrix-vision.de or phone +49-7191-9432-0.*

* phone support during CET business hours only

Conformity

The *rc_visard* has been designed and tested to be in compliance with the following standards:

AS/NZS CISPR32 : 2015, CISPR 32 : 2015, GB 9254 : 2008, CISPR 24 : 2015+A1 : 2015, EN 50581 : 2012, EN 55032 : 2015, EN 55024 : 2010+A1 : 2015, EN 61000-6-2 : 2005, EN 61000-6-3 : 2007+A1 : 2011



rc_visard is a registered brand of Roboception GmbH, Munich, Germany.

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