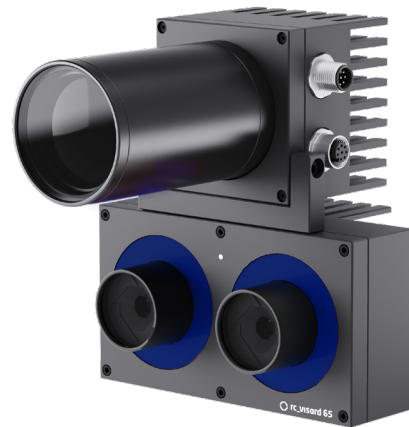


Quickstart Guide



English

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Warnings

This guide shows how to initially connect and configure the [rc_randomdot](#) projector. It is not meant to provide instructions for permanent installation or operation in an industrial environment.

Before operating the [rc_randomdot](#), please read the full [rc_randomdot](#) and [rc_visard](#) documentation.

Please refer to the full manual for connection requirements.

Do not look directly into the projected beam. Do not look at the beam with an optical instrument.

Looking at the sun through the lens might cause damage to the eyes. Directing the lens at the sun might start a fire.

The [rc_randomdot](#) is protected according to IP54. High humidity or temperature can damage the device. Do not operate in an environment where combustible or explosive fumes may occur.

All cables must be secured.

Make sure to use the correct power supply, which conforms to the EN 62368-1 standard, and check polarity and connections.

1. Introduction

MATRIX VISION offers the [rc_randomdot](#) projector as a specifically tailored projector that can be used as an enhancement to the [rc_visard](#) when the perception of particularly difficult scenes with little or no natural texture is required. It can be mounted over a scene or directly on any [rc_visard](#). It increases the scene density and hence improves the quality of stereo matching when the natural scene texture is low. This guide will help you get the projector connected and set up.

2. Prerequisites

This guide assumes that you have purchased the following components:

- [rc_visard 160](#) or [rc_visard 65](#)
- [rc_randomdot](#) projector with 30 cm connection cable
- 24V power supply, power adapter cable, and network cable

This guide also assumes that you have read and understood the [rc_randomdot](#) documentation, the [rc_visard](#) quickstart guide and complete documentation, and that the [rc_visard](#) is successfully connected and configured.

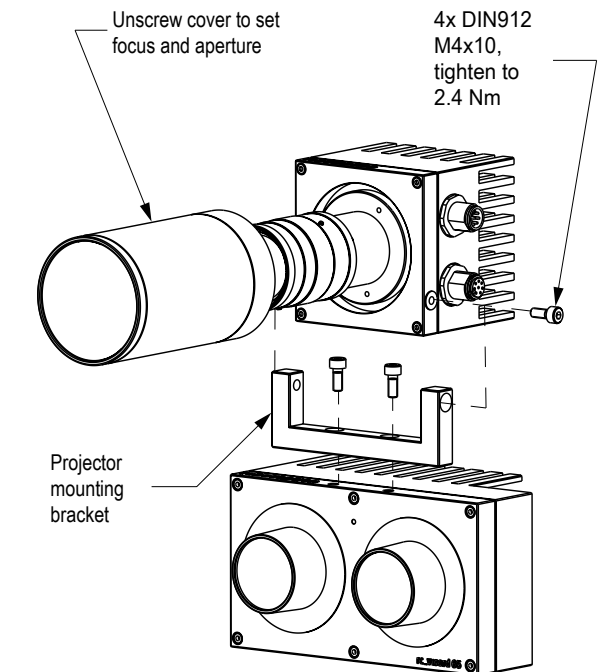
3. Additional Information

A tutorial on optimizing settings with the [rc_randomdot](#) projector to obtain dense depth images can be found at <https://tutorials.roboception.de/>

The documentation of the IOControl Module can be found at: <https://doc.rc-visard.com/latest/en/iocontrol.html> under Optional Software Components.

4. Mounting the Projector

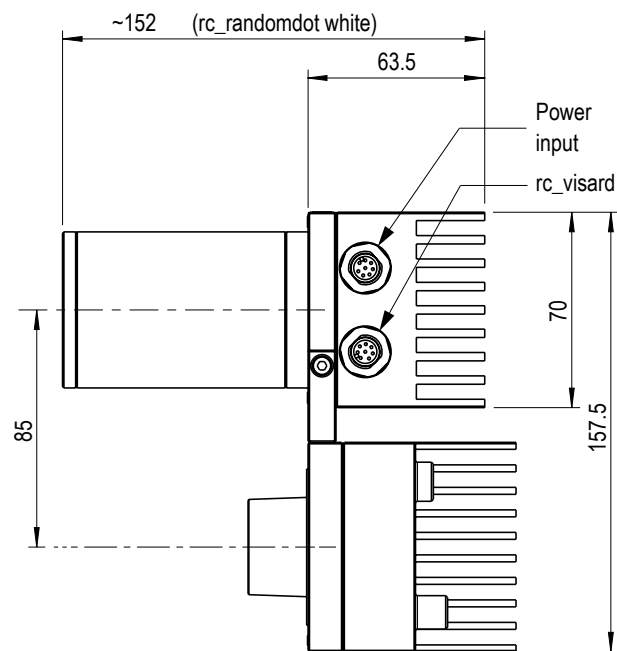
The [rc_randomdot](#) projector should be mounted as close as possible to the [rc_visard](#) in order to reduce occlusions. If possible, we recommend to attach the projector directly onto the [rc_visard](#) using the mounting bracket and included M4x10 Tuflok® coated screws. A medium strength thread-locker or Tuflok® screws must be used to protect against vibrations. Screws must be tightened to 2.4 Nm.



5. Connecting the Cables

Please note that a 24V power supply is required to power the [rc_visard](#) and the [rc_randomdot](#) together.

The power supply must be connected to the top (plug) M12 connector of the [rc_randomdot](#). The bottom (socket) M12 connector is connected to the bottom M12 connector of the [rc_visard](#) with the supplied 30 cm M12 shielded cable. Make sure to check the polarity of your power supply as reverse polarity will damage the [rc_randomdot](#). Now you are ready to power up the [rc_visard](#) and the [rc_randomdot](#).



6. Projector Pin Assignments

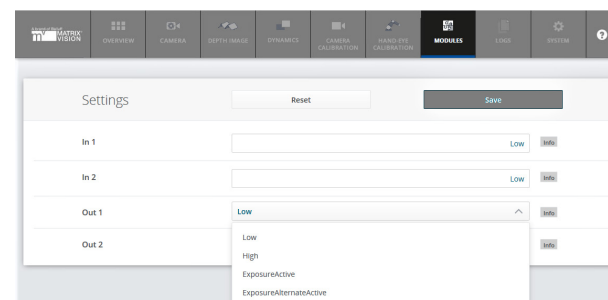
Pin number	Cable Color	Designation	Details
1	White	nc.	
2	Brown	+24V	2.75 A @ 24 V
3	Green	GPIO in 2	passed to rc_visard
4	Yellow	GPIO GND	
5	Grey	GPIO Vcc	
6	Pink	GPIO out 1	rc_visard exposure signal
7	Blue	GND	
8	Red	GPIO out 2	from rc_visard

For rc_visard pin assignments and rc_randomdot GPIO operation, please consult the respective documentations of rc_visard and rc_randomdot.

7. Projector Specifications

	White
Illumination Mode	Strobe
Wavelength	5500 K
Power Supply	24 V
Connectors	M12, 8 Pin, A-coded
Weight	660 g
Dimensions	70 mm x 152 mm
Temperature Range	0 °C - 45 °C (passive cooling)
Protection Class	IP 54
Lens (C-mount)	12 mm, f min 1:1.4
Projection Angle	62° x 48°

8. Operating the Projector



The rc_randomdot projector is controlled via the GPIO Out1 of the rc_visard. State and behaviour of the rc_visard's GPIOs can then be controlled via the rc_visard's WebGUI IOControl panel from the Modules tab. Starting with rc_visard firmware 20.10, Out1 is set to *Low* by default, turning the projector off.

ExposureActive turns on the rc_randomdot for exactly the exposure time of every image.

High will turn the projector on continuously, but reduce power to 18% to protect the light source.

Typically, the user will select *ExposureAlternateActive* mode in which the rc_randomdot is on only for the exposure time of every second image. Images with projected pattern are used for computing depth images. Images without pattern can be used for texture or other image processing modules. Note: In *ExposureAlternateActive* mode, the rc_visard's auto exposure algorithm ensures that images with pattern are correctly exposed in order to produce dense disparity images. As identical exposure settings are used for the images without pattern, which are displayed in the WebGUI, those might be underexposed depending on overall illumination conditions. This effect can be minimized by properly adjusting environmental light conditions, projector aperture, and exposure time.

9. Adjusting Focus and Aperture Settings

Remove the protective lens cap by unscrewing it. To change focus and aperture settings, loosen the three small Phillips screws on the respective lens ring, turn the ring to the desired setting and lightly tighten the screws again. For focus adjustments, the projector should be turned on permanently by setting the Out1 mode to *High* in the WebGUI. For aperture adjustments, Out1 should be set to *ExposureAlternateActive* and exposure mode should be set to 'Auto' in the WebGUI Camera tab.

Starting from the largest aperture (smallest f-stop number on projector lens), reduce light output by decreasing the aperture until the white (high confidence) areas in the confidence image start to get smaller or darker. At the same time, the camera image should become less underexposed. At this point, slightly open the aperture again to find a suitable compromise.

Replace the protective lens cap to restore the IP54 rating of the projector. Make sure the seal at the bottom of the protective cap is in place and undamaged.

10. Support

Please refer to rc_visard WebGUI and documentation at: <https://roboception.com/en/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

11. Conformity

Projector

The approvals and certificates have been issued to Roboception GmbH.



Lens

No electronic components.

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

Manufacturer:

Roboception GmbH
Kafelerstrasse 2
81241 Munich
Germany

Distributor:

MATRIX VISION GmbH
Talstrasse 16
71570 Oppenweiler
Germany

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