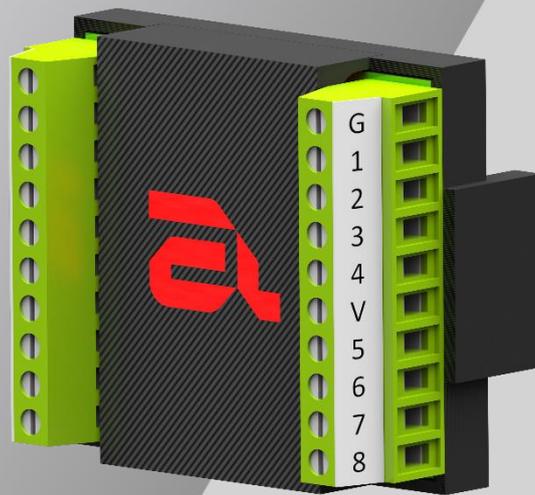


Astorino

IO Adapter Operation Manual



Preface

This manual describes the handling of the 6-axis robot "astorino" IO Adapter option.

The ASTORINO is a learning robot specially developed for educational institutions. Pupils and students can use the ASTORINO to learn robot-assisted automation of industrial processes in practice.

ASTORINO IO Adapter Manual

1. The "astorino" software included with the ASTORINO is licensed for use with this robot only and may not be used, copied or distributed in any other environment.
2. Kawasaki shall not be liable for any accidents, damages, and/or problems caused by improper use of the ASTORINO robot.
3. Kawasaki reserves the right to change, revise, or update this manual without prior notice.
4. This manual may not be reprinted or copied in whole or in part without prior written permission from Kawasaki.
5. Keep this manual in a safe place and within easy reach so that it can be used at any time. If the manual is lost or seriously damaged, contact Kawasaki.

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Symbols

Items that require special attention in this manual are marked with the following symbols.

Ensure proper operation of the robot and prevent injury or property damage by following the safety instructions in the boxes with these symbols.



WARNING

Failure to observe the specified contents could possibly result in injury or, in the worst case, death.

[ATTENTION]

Identifies precautions regarding robot specifications, handling, teaching, operation, and maintenance.



WARNING

- 1. The accuracy and effectiveness of the diagrams, procedures and explanations in this manual cannot be confirmed with absolute certainty. Should any unexplained problems occur, contact Kawasaki Robotics GmbH at the above address.**
- 2. To ensure that all work is performed safely, read and understand this manual. In addition, refer to all applicable laws, regulations, and related materials, as well as the safety statements described in each chapter. Prepare appropriate safety measures and procedures for actual work.**

Paraphrases

The following formatting rules are used in this manual:

- For a particular keystroke, the respective key is enclosed in angle brackets, e.g. <F1> or <Enter>.
- For the button of a dialog box or the toolbar, the button name is enclosed in square brackets, e.g. [Ok] or [Reset].
- Selectable fields are marked with a square box . If selected a check mark is shown inside the symbol .

ASTORINO IO Adapter Manual

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1 Nomenclature in this manual

The author of the manual tries to use generally valid terminology while achieving the greatest possible logical sense. Unfortunately, it must be noted that the terminology is reversed depending on the point of view when considering one and the same topic. Also it is to be stated that in the course of the computer and software history terminologies developed in different way. One will find therefore in a modern manual no terminologies, which always satisfy 100% each expert opinion.

2 Overview of ASTORINO

The ASTORINO is a 6-axis learning robot developed specifically for educational institutions such as schools and universities. The robot design is based to be 3D printed with PET-G filament. Damaged parts can be reproduced by the user using a compatible 3D printer.

Programming and control of the robot is done by the "astorino" software.

The latest software version and 3D files can be downloaded from the KAWASAKI ROBOTICS FTP server:

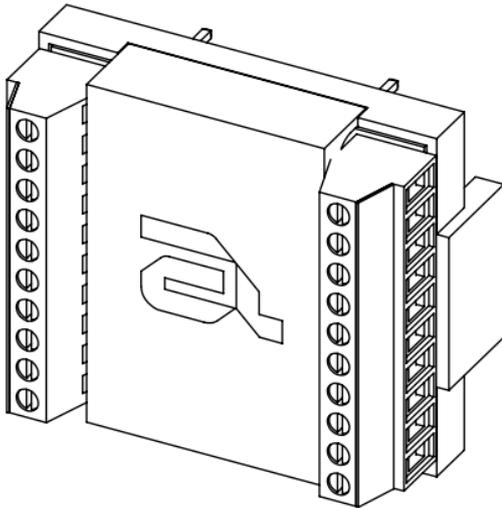
<https://ftp.kawasakirobot.de/Software/Astorino/>

Just like Kawasaki's industrial Robots the ASTORINO is programmed using AS language. Providing transferable programming skills from the classroom to real industrial applications.

3 Technical specifications

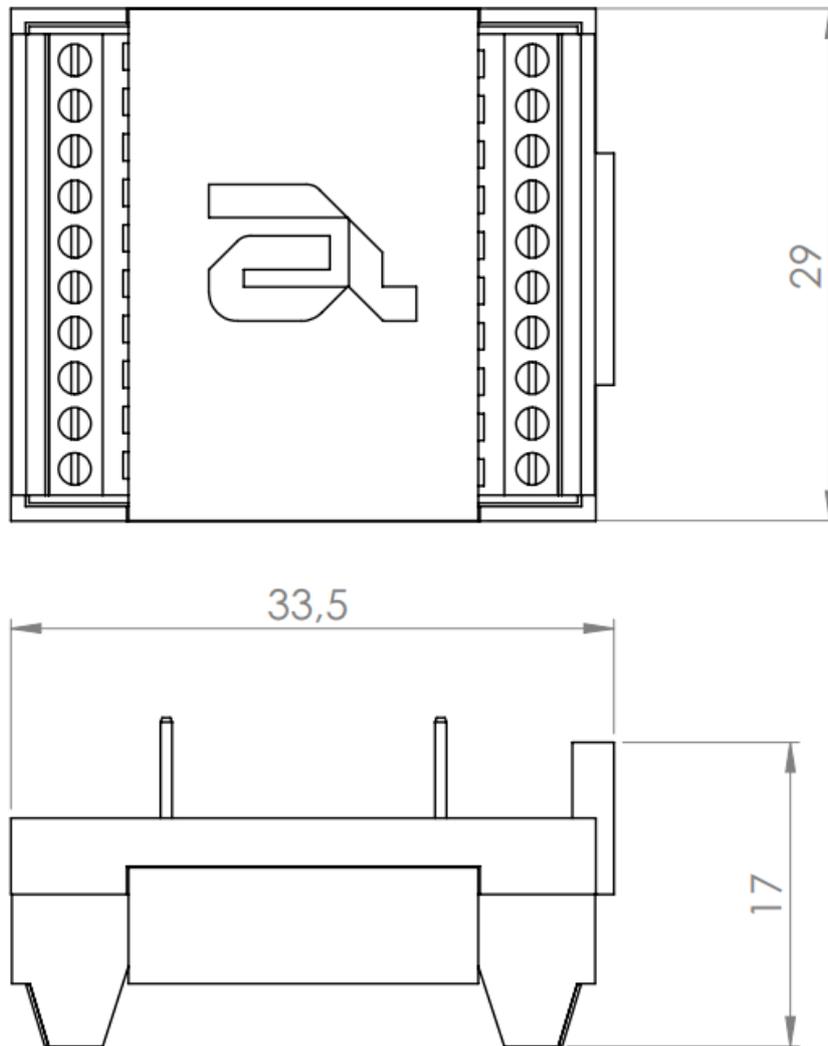
Characteristics		Astorino IO Adapter
Working environment	Temperature	0–40°C
	Humidity	35–80%
Galvanic isolation		No
Operating Voltage		3.3 V
Max. current consumption		200 mA
Size		29x33.5x17mm
Number of inputs		8
Number of outputs		8
Weight		30 g
Material		PET-G, PCB
Colour		Black/Green
Connector types	Inputs	KF128-2.54-10P
	Outputs	KF128-2.54-10P

4 IO Adapter package contents



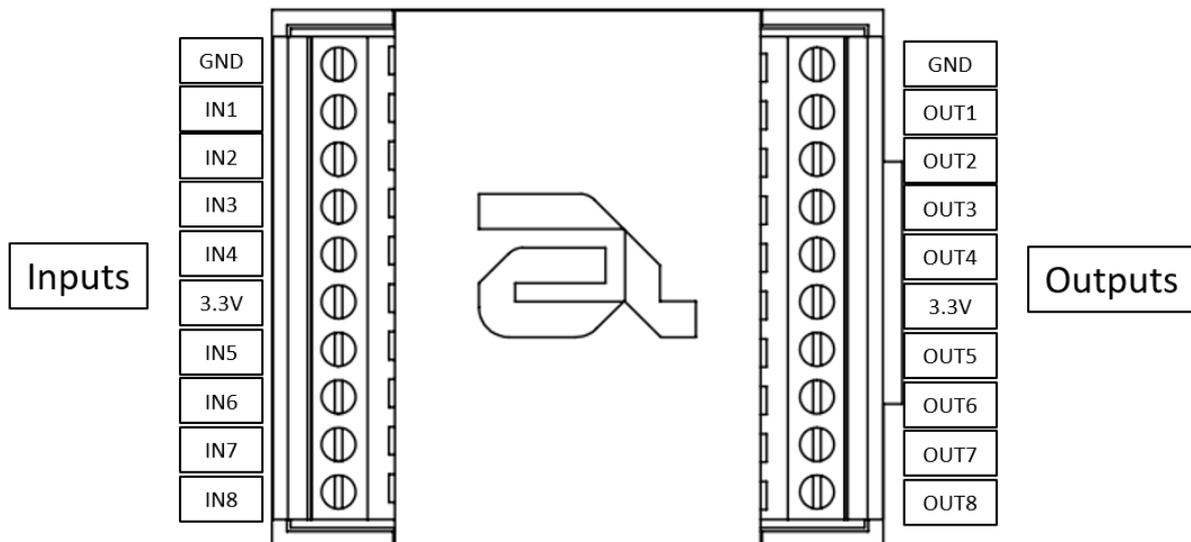
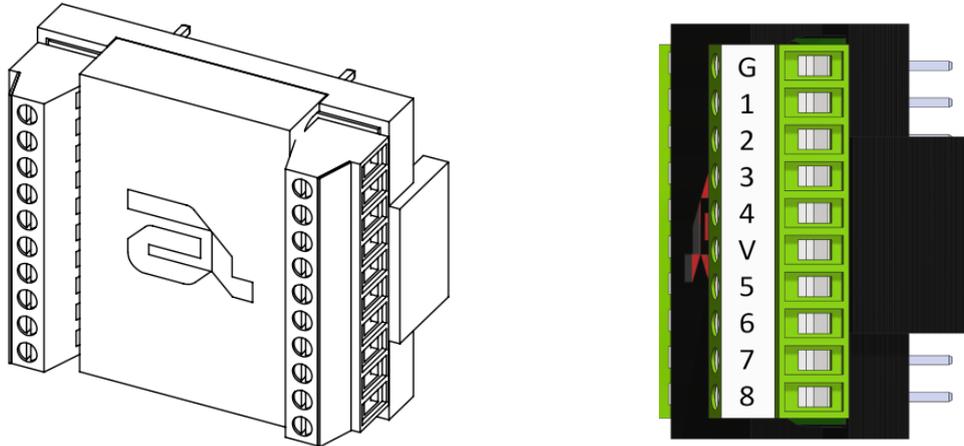
IO Adapter

5 Dimensions



6 General information

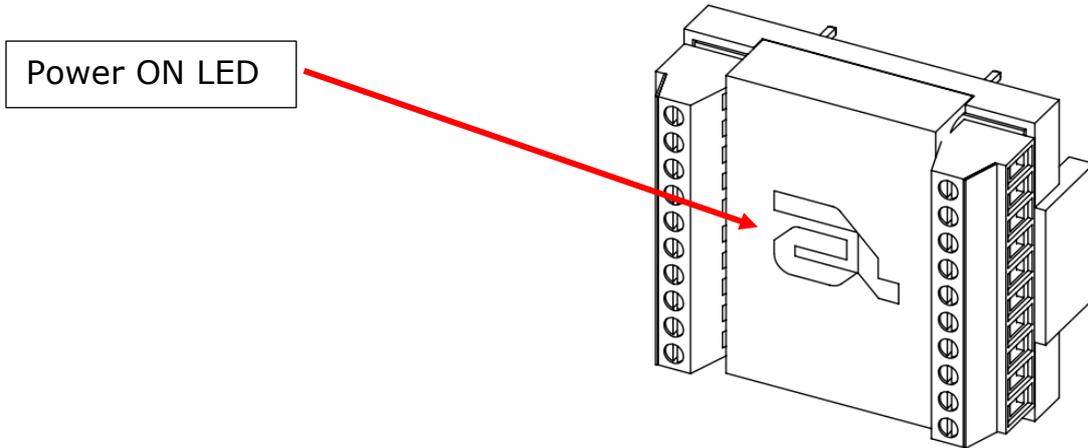
A 3.3V IO adapter is an option and is sold separately. The adapter allows you to easily connect external devices via screw connectors.



A total of 8 3.3V inputs (5V tolerant) and 8 3.3V outputs can be connected. Each output provides 8mA current.

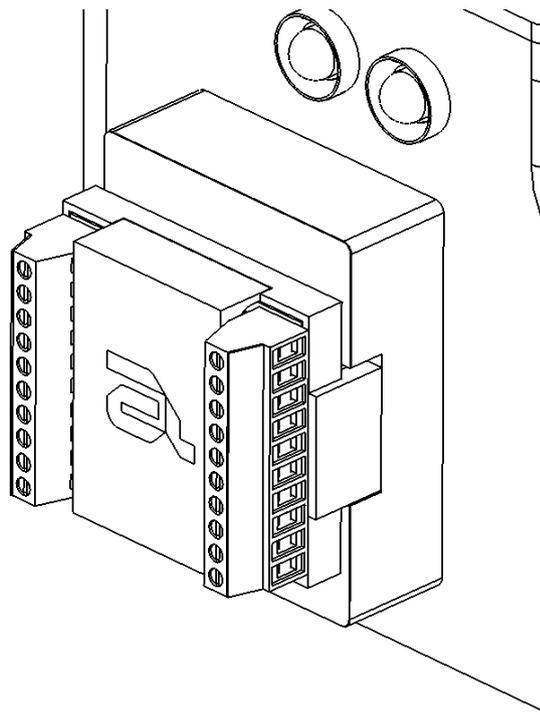
3.3V pin provides 200mA maximum.

7 LED indicators

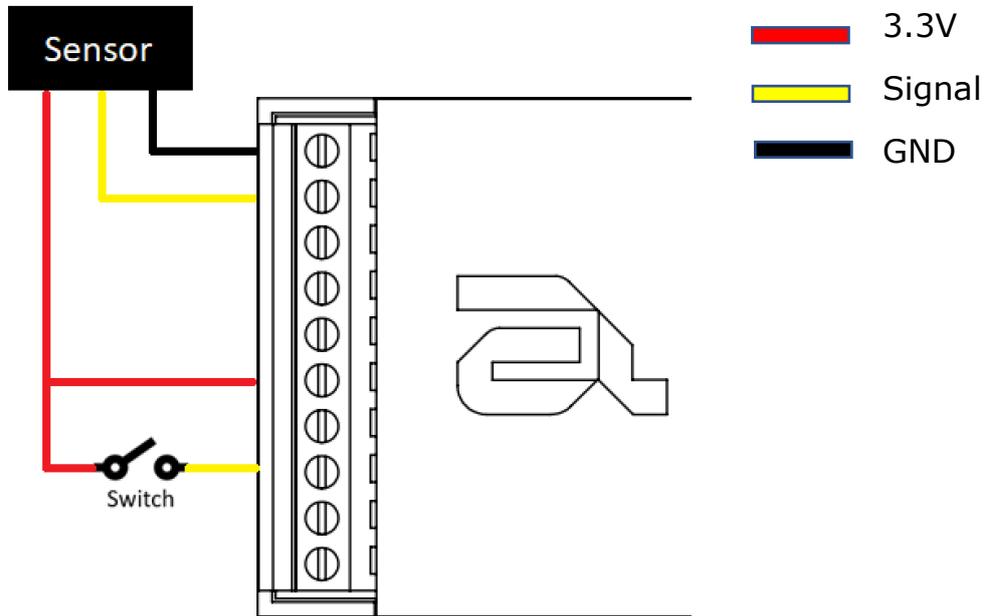


8 Connection to the robot

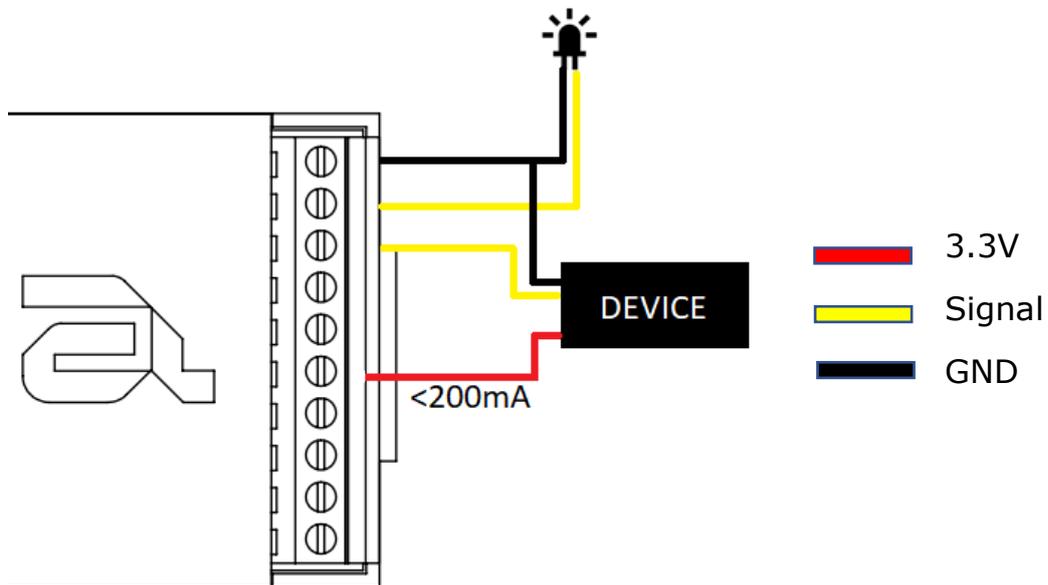
The module is connected directly to IO module of the robot.



8.1 Connecting inputs

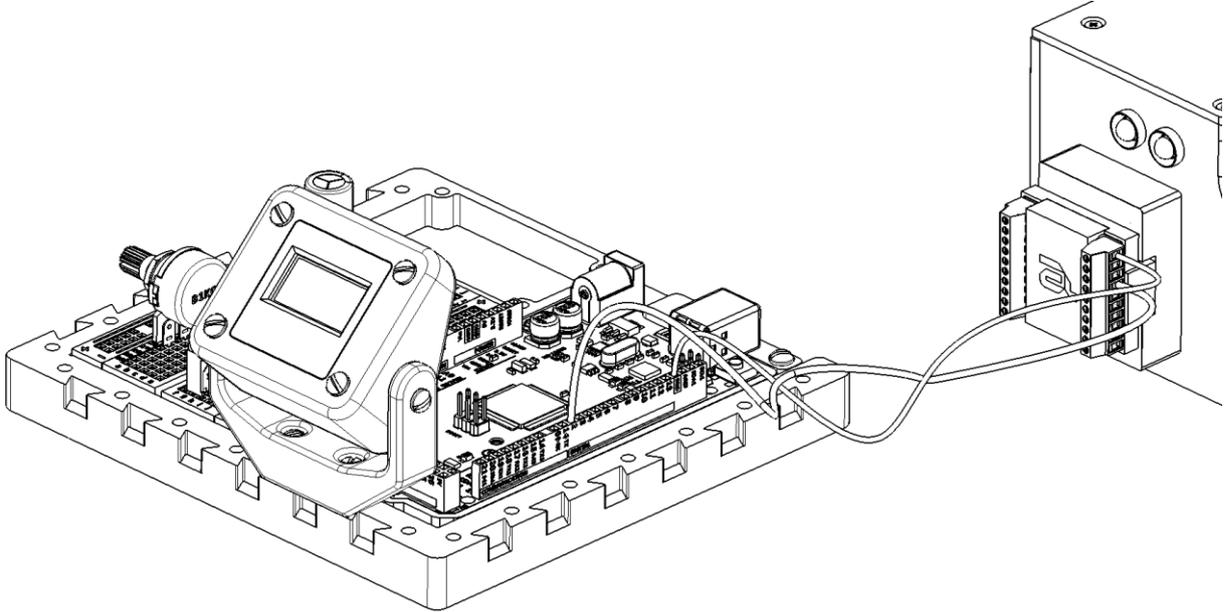


8.2 Connecting outputs



9 Example of usage

IO Adapter can be used to easily connect other devices to 3.3V IO module. In this example you can see Arduino station.



10 Controlling IO module

To control the IO module use astorino software or Teach Pendant to turn ON or OFF OUTPUTS, or use SIGNAL command in your program.

IO Modbus Dedicated IO Conveyo

Enable IO Module

INPUTS		OUTPUTS	
1	2	1	2
3	4	3	4
5	6	5	6
7	8	7	8
57	58	57	58

Program

```

1 .PROGRAM CONV
2 HOME
3 SIGNAL 1
4 LMOVE P0
5 SIGNAL -1
6 LMOVE P2
7 .END
8

```

To read inputs use astorino software or Teach Pendant to view INPUT or use SIG/SWAIT command in your program.

ASTORINO IO Adapter Manual

IO Modbus Dedicated IO Conveyo

Enable IO Module

INPUTS		OUTPUTS	
1	2	1	2
3	4	3	4
5	6	5	6
7	8	7	8
57	58	57	58

```
Program
1 .PROGRAM CUBES
2 HOME
3 PULSE 1,2
4 SWAIT 1001
5 LAPPRO P0,50
6 SPEED 20 MM/S
7 LMOVE P0
8 LDEPART 100
9 PULSE 1,2
10 IF SIG(1001) == TRUE THEN
11 PRINT "THERE IS A CUBE"
12 ELSE
13 PRINT "CUBE NOT FOUND"
14 END
15 .END
16
```

11 Manufacturer information

For further questions, contact Kawasaki Robotics support.

Contact:

Kawasaki Robotics GmbH

tech-support@kawasakirobot.de

+49 (0) 2131 – 3426 – 1310

Kawasaki Robot
IO Adapter Operation Manual

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