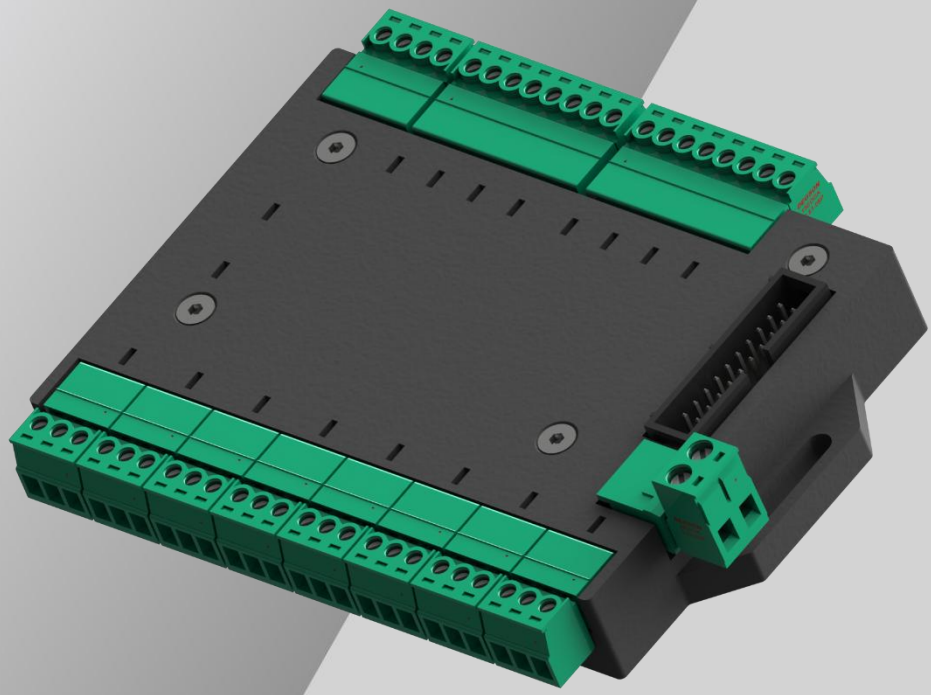
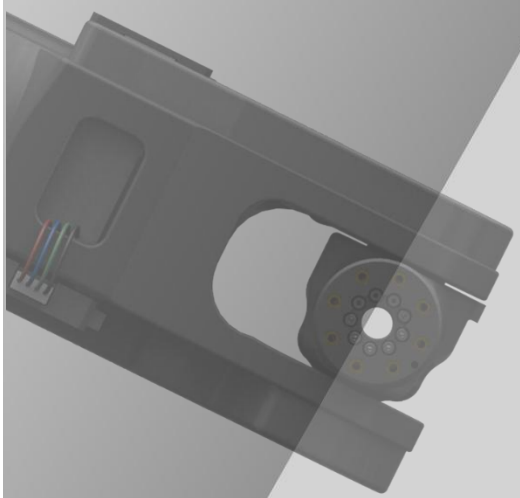
Kawasaki Robotics

Astorino

24V IO Module Operation Manual





Preface

This manual describes the handling of the 6-axis robot “astorino" 24V IO Module 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.

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.

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 ☑.

List of contents

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:

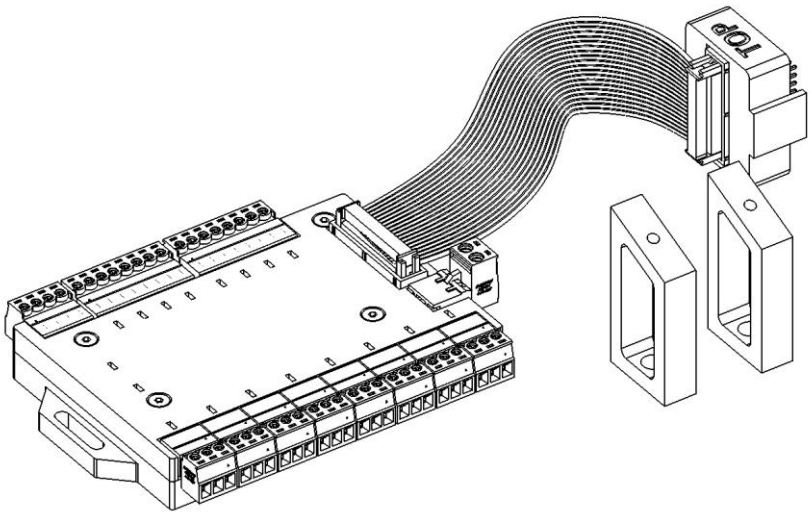
https://ftp.kawasakirobot.de/Software/Astorino/

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 24V IO Module
Working environment	Temperature	15–35°C
	Humidity	35–60%
Galvanic isolation		Yes
Operating Voltage		24 V
Max. current consumption		2400 mA
Connection ribbon cable length		30 cm
Size		123x91.5x26mm
Number of inputs		8
Number of outputs		8
Input type		PNP
Output type		PNP
Weight		150 g
Material		PET-G, PCB
Colour		Black/Green
Connector types	Inputs	15EDGK-3.81-03P
	Outputs	15EDGK-3.81-08P
	Power inlet	2EDGK-5.08-02P
	Power outlet	15EDGK-3.81-04P

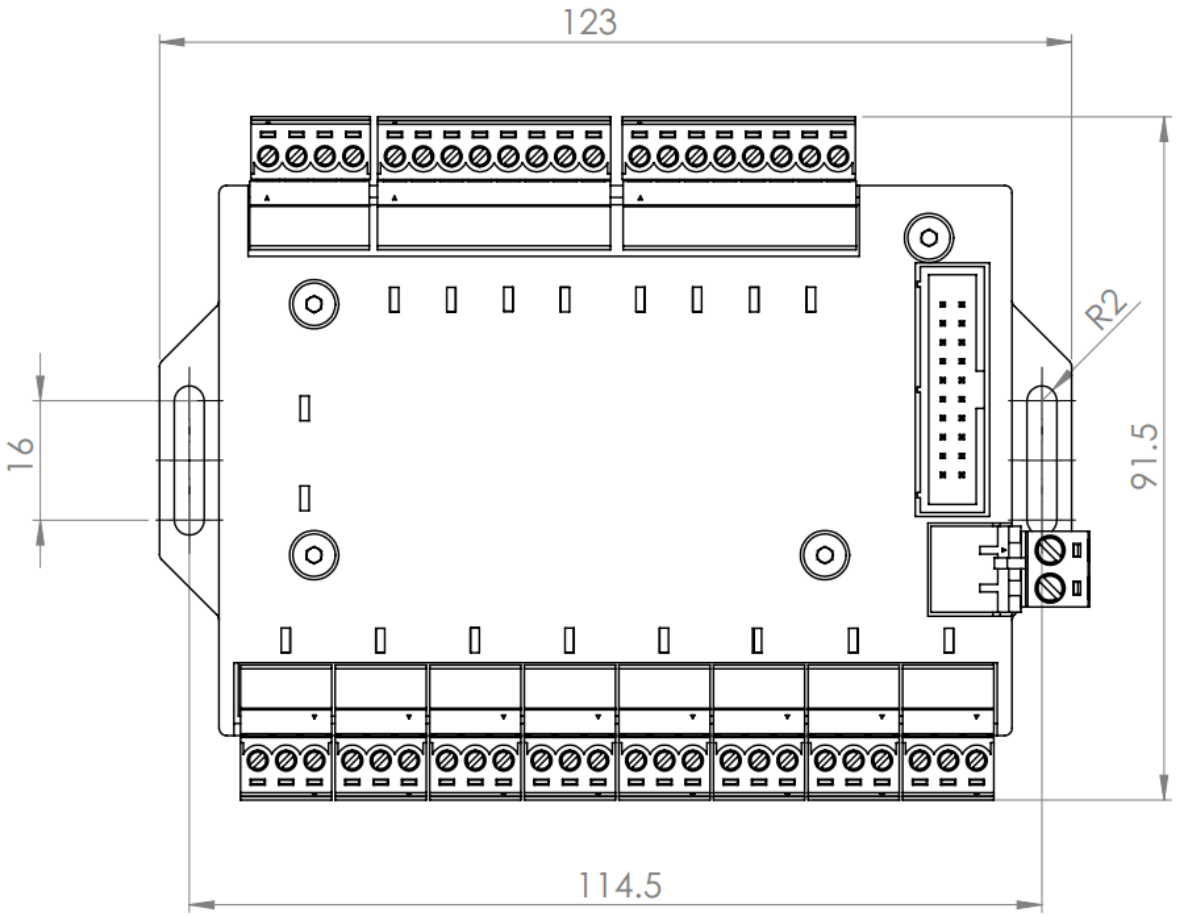
4 24V IO Module package contents

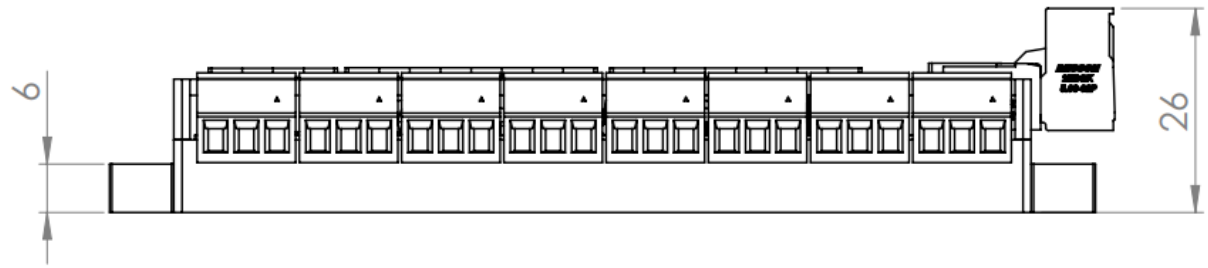


IO Module,
ribbon cable,
IO adapter,
stand

24V
power supply

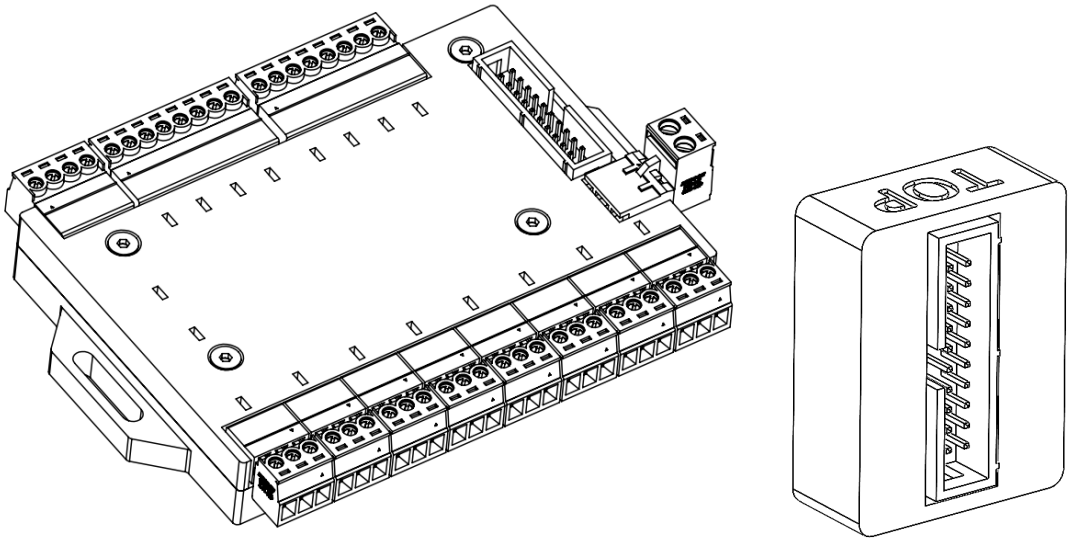
5 Dimensions

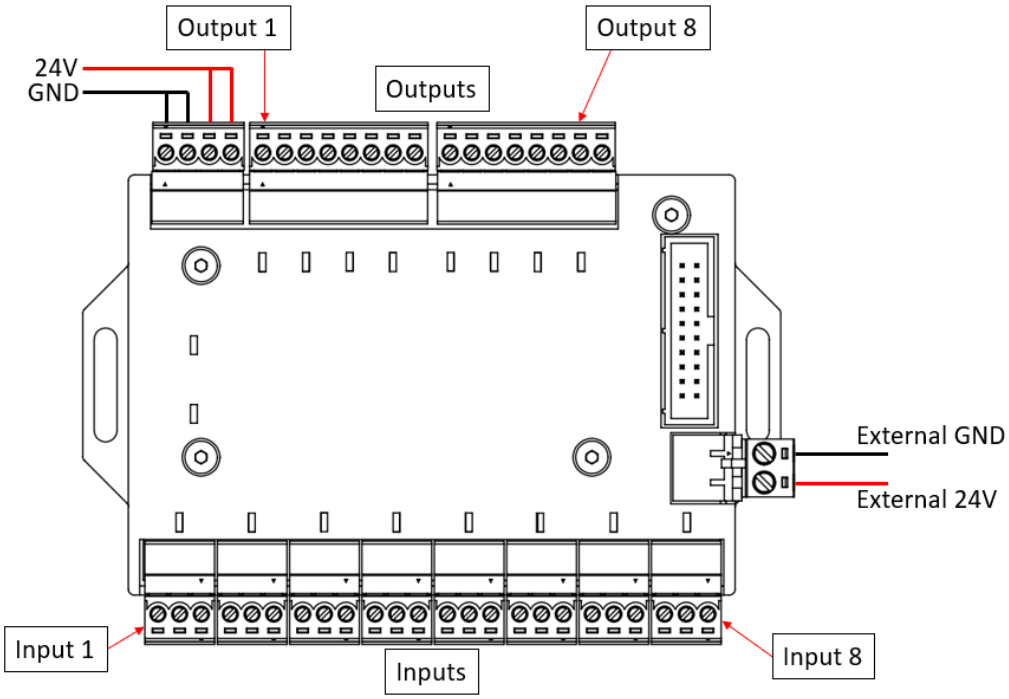




6 General information

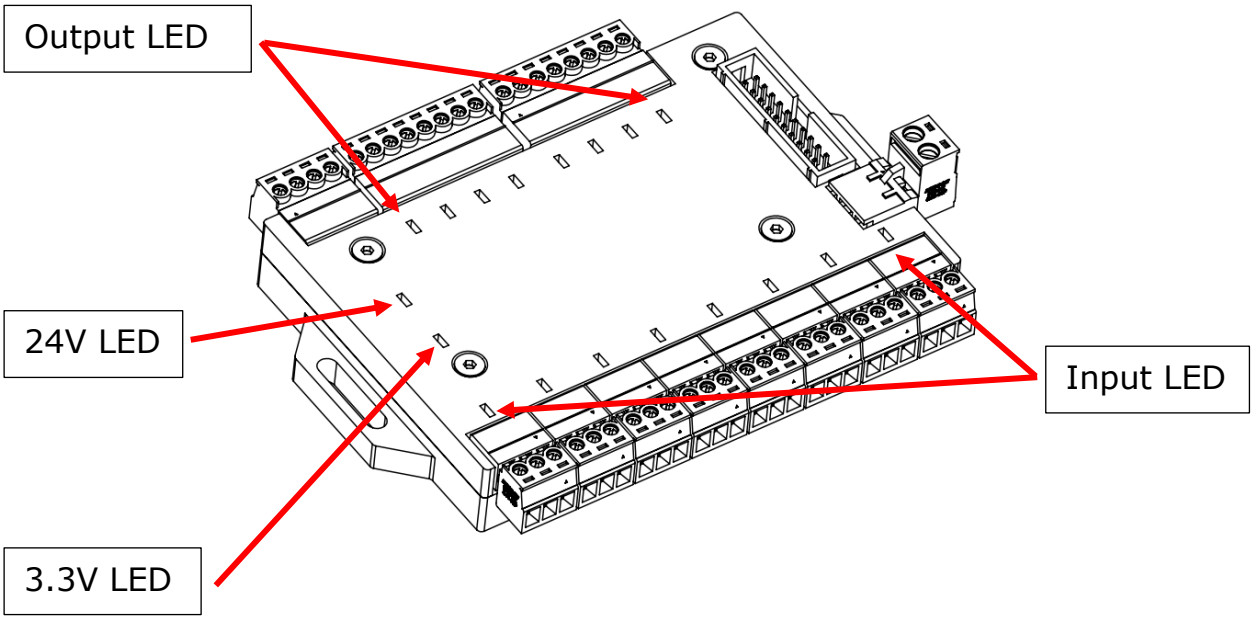
The 24V I/O module is available as an option and is sold independently of the astorino robot or the astorino robot Kit. Both inputs and outputs work in PNP mode.





A total of 8 24V inputs and 8 24V outputs can be connected.
Each output provides 300mA current (approx. 7.2W output power).

7 LED indicators



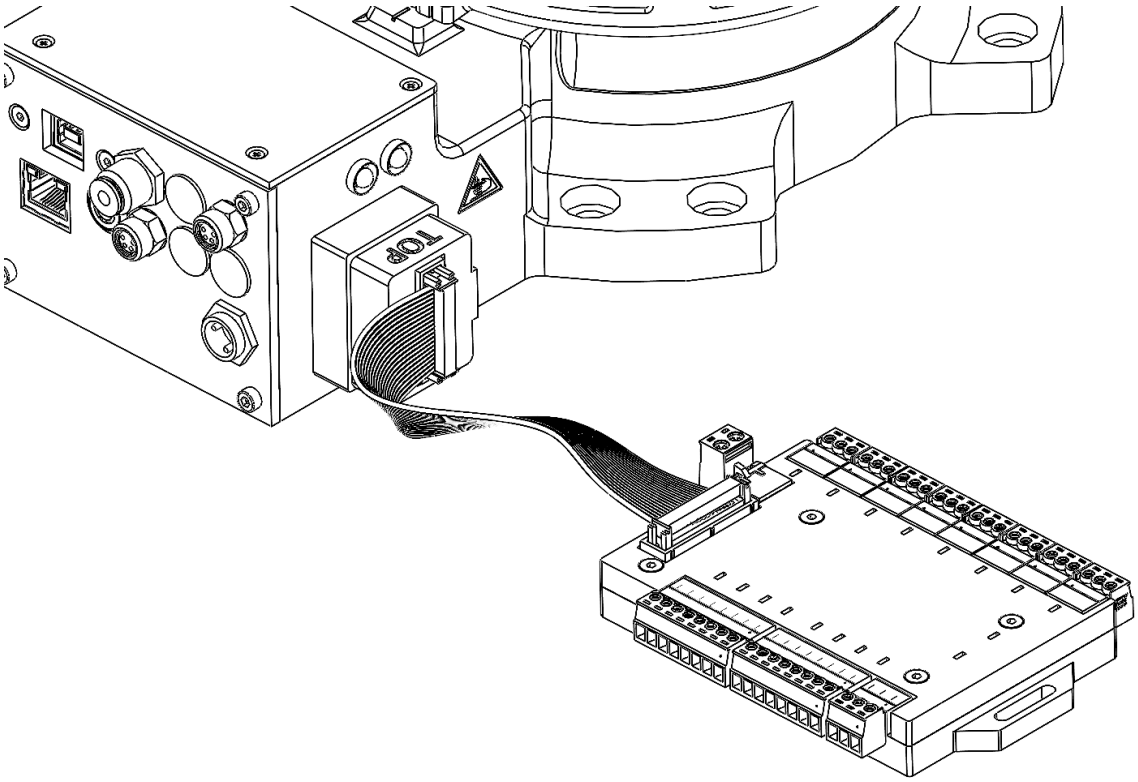
- 24V LED is on when 24V is delivered to the module,
- 3.3V LED is on when robot is connected to the module and is turned on,
- Output LED is on when output signal is HIGH,
- Input LED is on when input signal is HIGH.

8 Connection to the robot

WARNING

Before installation make sure that the robot is TURNED OFF and is installed on the firm surface to avoid any injury!

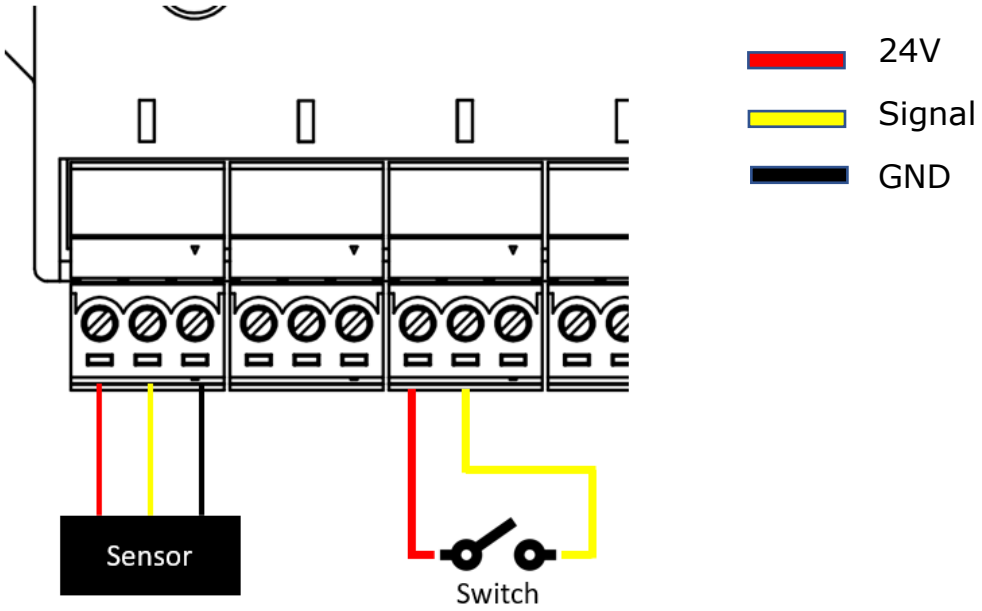
The module is connected via the supplied 30cm ribbon cable.



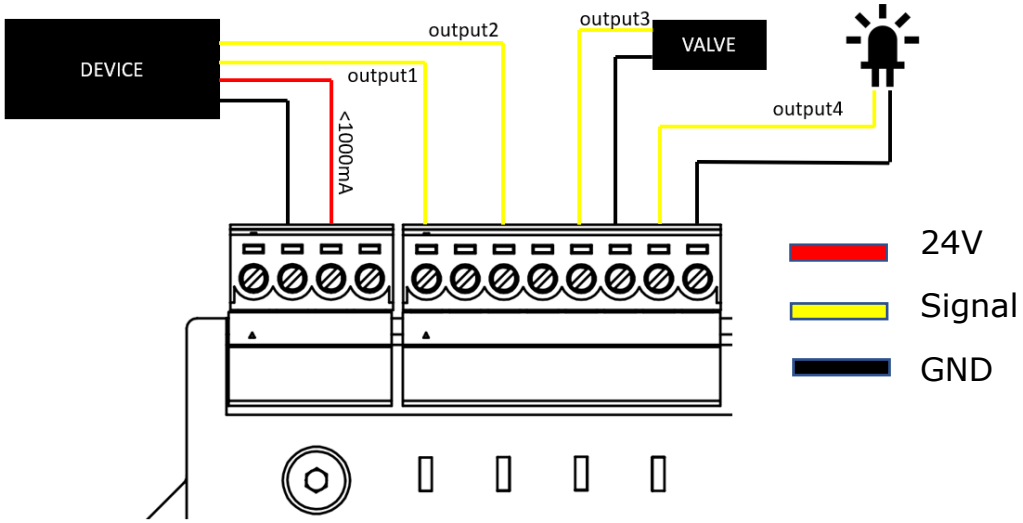
WARNING

Only authorized and trained personnel can connect and disconnect the electrical equipment to 24 IO module!

8.1 Connecting inputs

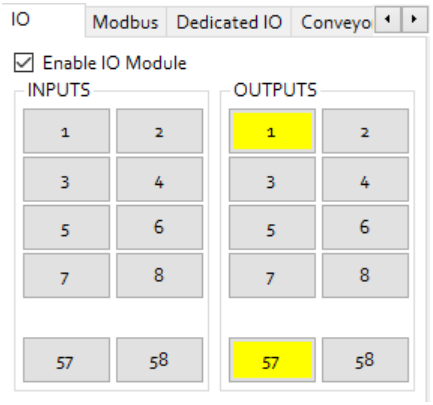


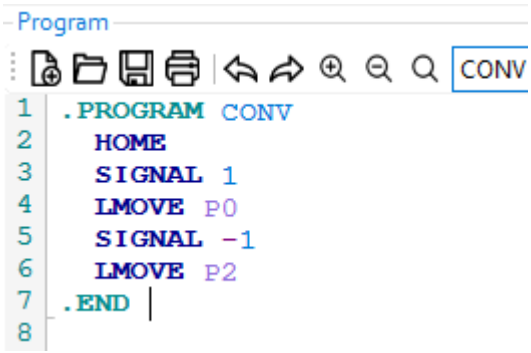
8.2 Connecting outputs



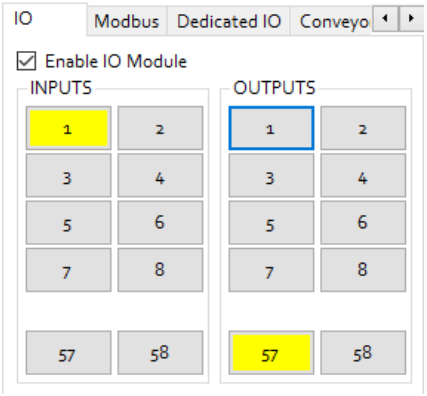
9 Controlling IO module

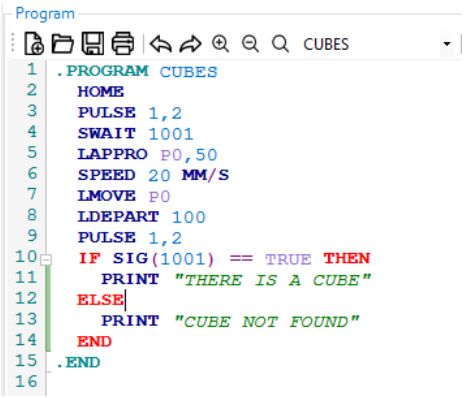
To control the IO module use astorino software or Teach Pendant to turn ON or OFF OUTPUTS, or use SIGNAL command in your program.





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





10 Manufacturer information

For further questions, contact Kawasaki Robotics support.

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