

## What is the difference between the top-hat (DIN) rail and switch cabinet version?

The top-hat (DIN) rail version is a control system for integration into your own switch cabinet.

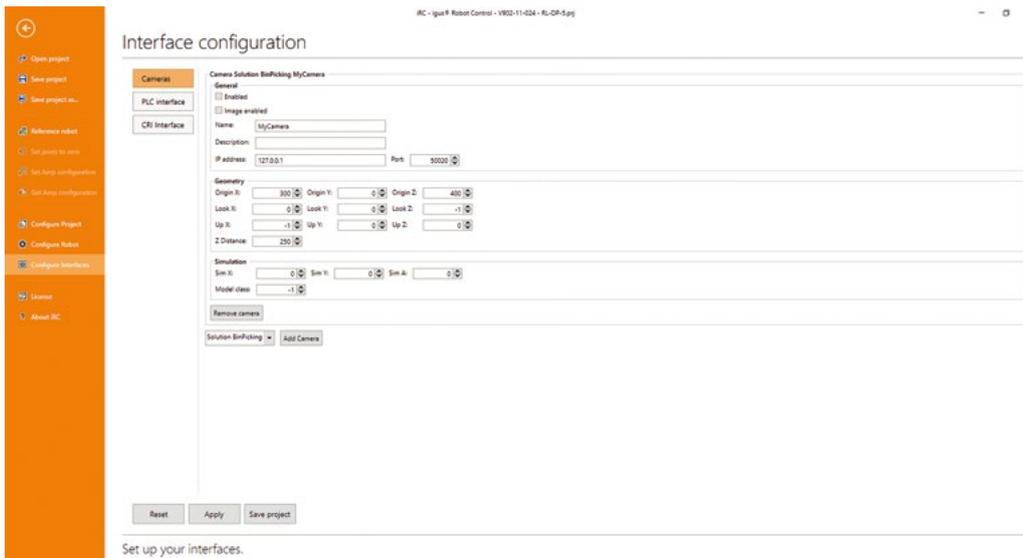
Accordingly, no emergency stop or power supply unit is included in the scope of delivery.

The switch cabinet version is a complete switch cabinet with emergency stop, power supply unit and all other joining links to immediately operate the robot.

## Can I connect a camera to the control system?

The iRC software has built-in support for receiving target positions from cameras. Currently, the camera is supported by IFM with the O2D product range.

The workpiece position reported by the camera can be accessed with the command "Camera" in the robot programme.



## How do I establish a connection between the control system and the computer?

Use an Ethernet cable to connect the PC to the robot control system. Use the Ethernet terminal that is located directly next to the USB socket of the integrated computer belonging to the robot control system.

Set the IP address of the PC to: static and 192.168.3.1, subnet mask 255.255.255.0

## What is the virtual box?

The virtual box settings limit the range of movement of the robot arm. These constraints are monitored for both linear and axis movement.

This functionality helps to avoid mechanical damage. However, the virtual box is purely a programming aid. It is not a functionality suitable for personal safety! Furthermore, it is important to know that the range only refers to TCP.

In manual jogging mode, an error message appears on the left side of the iRC window. If a programme is executed that breaches the virtual box, the programme is stopped with an error message.

## What does axis movement actually mean?

The command Joint moves the robot to an (absolute) target position that is specified in axis co-ordinates. The resulting movement of the TCP is usually a curve and not a straight line.

The speed of movement is indicated by "Speed". It is measured as a percentage of the maximum permitted movement speed for the respective robot axes. The max. movement speed varies between the different robots.

- ▶ Articulated arm robot: 100mm/s
- ▶ Linear robot: 500mm/s
- ▶ Delta robot: 700mm/s

The Joint command can be called up in the iRC programme editor under the menu items "Action" -> "Axis Movement" and "Action" -> "Variable Movement" -> "Axis Movement".

## What does linear motion actually mean?

The Linear command moves the robot to an (absolute) target position specified in Cartesian co-ordinates. The resulting movement of the TCP follows a straight line.

The speed of movement is indicated by "Speed" in mm/s. If it exceeds the maximum permitted movement speed of the robot, this will cause a kinematic error during execution. The max. movement speed varies between the different robots.

- ▶ Articulated arm robot: 100mm/s
- ▶ Linear robot: 500mm/s
- ▶ Delta robot: 700mm/s

The Linear command can be called up in the iRC programme editor under "Action" -> "Linear Movement" and "Action" -> "Variable Movement" -> "Linear Movement".

## How do I get support if I have a problem?

In case of problems we would be happy to help!

- ▶ Phone: +49 2203 9649-8255

### ▶ Support:

E-mail (national): [de-robot-control@igus.net](mailto:de-robot-control@igus.net)

E-mail (international): [ww-robot-control@igus.net](mailto:ww-robot-control@igus.net)

Please describe the problem briefly and send us the file "logMessages.log" from the folder C:\iRC-igusRobotControl\.

- ▶ Youtube Channel: [https://www.youtube.com/channel/UCWA1VujEQ\\_E3LF14I5rMfyA/playlists](https://www.youtube.com/channel/UCWA1VujEQ_E3LF14I5rMfyA/playlists)
- ▶ Troubleshooting: [https://wiki.cpr-robots.com/index.php/Troubleshooting\\_Identification](https://wiki.cpr-robots.com/index.php/Troubleshooting_Identification)

## What do I do if the error "Bus dead" is displayed?

Meaning: The CAN-Bus is not available. Reasons are missing power supply or missing plug connections.

Measures: Check the plug connections of the power supply and the CAN line. Restart the control computer.

## What do I do if the error "Temp" is displayed?

Meaning: The motor module temperature is too high.

Measures: Check that the ventilation is installed and is working. Possibly the motor current must be reduced.

## What do I do if the error "E-Stop/Supply" is displayed?

Meaning: Emergency stop switch pressed or voltage too low.

Measures: Check whether the emergency stop switch is enabled.

## What do I do if the error "MNE motor not enabled" is displayed?

Meaning: No error. The motors are not released yet.

Measures: Press the "Activate" button.

## What do I do if the error "COM Comm Watch Dog" is displayed?

Meaning: The time span without a CAN command from the controller was too long.

Measures: The position commands via the CAN bus must be sent at short intervals. Close other programmes and update/virus scan processes.

## What do I do if the error "LAG Position Lag" is displayed?

Meaning: Position drag error. The robot cannot keep the target position.

Measures: Reduce the speed of the movement.

## What do I do if the error "ENC Encoder Error" is displayed?

Meaning: Error in the motor encoder or absolute encoder.

Measures: Check the encoder cables.

## What do I do if the error "OC Overcurrent" is displayed?

Meaning: Overcurrent in the motors.

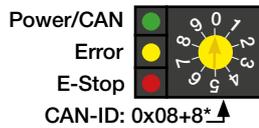
Measures: Reduce the motor current.

## What do I do if the error "DRV" is displayed?

Meaning: Error in the motor driver or the motor algorithm.

Measures: Driver specific.

## What do the different LEDs of the electrical modules mean?



### Support module:

Green LED on: Logic power supply on  
 Green LED flashes: CAN communication with the support module  
 Orange LED on: Error  
 Red LED on: Emergency stop button pressed



### Stepper module:

Green LED on: Logic power supply on  
 Green LED flashes: CAN communication with the stepper module  
 Orange LED on: Reference switch is active  
 Red LED on: Stepper module is in error state or the motor is not activated



### Digital input/output module:

Green LED on: Logic power supply on  
 Green LED flashes: CAN communication with the DIO module  
 Orange LED on: The state of an input or output changes.  
 Red LED on: Error

## How do I add additional axes or is this even possible?

The robot control system can process up to 3 external axes.  
 (from version V902-11-023, the earlier versions only support one external axis).

**Caution! This should only be done by experts with experience in handling the robot control system.**

1. **Install the hardware**
2. **Configure the external joint in the software**
  - 2.1 The update must be requested first from igus® Support so that it can be downloaded. It contains the software for the embedded control system, as well as an appropriate iRC version.
  - 2.2 You can find operating instructions for your robot on the corresponding robot pages.
  - 2.3 Configure the external joint on the Data tab ► of the programming environment.
3. **Adjust the firmware parameters**
  - 3.1 Download the firmware parameters
  - 3.2 Adapt currents, referencing speed and direction and INI sensor type
  - 3.3 Uploading the firmware parameters
  - 3.4 Cold start of the robot control system
  - 3.5 Test the external joints

The CRI Ethernet interface allows remote applications to be connected to a robot control system: iRC, CPRog or the embedded control system.

## How can I connect a programmable logic controller (PLC) with the igus® Robot Control? – CRI interface

The CRI interface is used for connection and for the resulting communication between a PLC and the igus® Robot Control. The remote application can apply the following operations

- Moving the robot arm in joint space or in Cartesian space (base or tool co-ordinate system x, y, z, a, b, c)
- Send commands: joint movement, linear movement, digital outputs, ...
- Change variables
- Start and stop programmes. These can be saved programmes or the commands that have just been sent.

The use of this interface requires programming experience in the client-server area. iRC/CPRog version V902-11-011 or higher Embedded Control with TinyCtrl from version V980-11-087 onwards

Video with short explanation: igus® learning – Youtube Channel: [https://www.youtube.com/watch?v=HLIzhV1xSww&list=PLkROPBZ4Nkc\\_krCqoa8lcrBk-FN8Sz5pf&index=12](https://www.youtube.com/watch?v=HLIzhV1xSww&list=PLkROPBZ4Nkc_krCqoa8lcrBk-FN8Sz5pf&index=12)

### iRC specific settings

With the new version of iRC and TinyCtrl (from V902-11-007), the CRI interface can be configured in the backstage menu. Press File/Interface Configuration/CRI Interface.

## Is there a possibility of ROS?

Information about OSRF's Robot Operating System can be found at [www.ros.org](http://www.ros.org). ROS is a framework with many low, medium and high level functionalities that are relevant in robot environments.

An interface to ROS can be configured with the new version of iRC and TinyCtrl.