MIRKA

QUICK START GUIDE

Mirka UR Kit

Mirka UR Kit content

Mirka finishing tool for robots

Mirka motor drive cabinet Modbus:	MIA6514112
USB communication cable:	MIA6514122
UR adapter flange:	MIA6560111
10 meter robot cable:	MIA6512311

Mounting screws, Power cable and a USB stick

mirka.com

Minimum system requirements

Only for e-Series robots with a payload higher than 5 kg.
We recommend to use SW 5.8.0 or higher.
XML RPC port: 40464

Tools for installation

Hey key:	4 mm
Hex key:	6 mm

Flat screwdriver

1. Installing cables

Unpack the motor drive cabinet from its transport packaging. Open the cabinet with the supplied key and remove the packaging material inside.

The main components of the motor drive cabinet are the motor drive PCB and PSU. For installation purposes only the motor drive PCB will be relevant.

Locate connector J3 (robot cable). Pull the robot cable through the middle pass-through fitting and clamp the cable shield to X2. Locate connector J1 (USB communication cable) and pull the USB communication cable through the rightmost pass-through fitting, which is of a smaller size.

Insert a flat screwdriver in the rectangular hole and push down to open up the connector ports.

Connect the cables
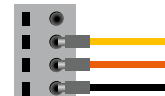in the following way:
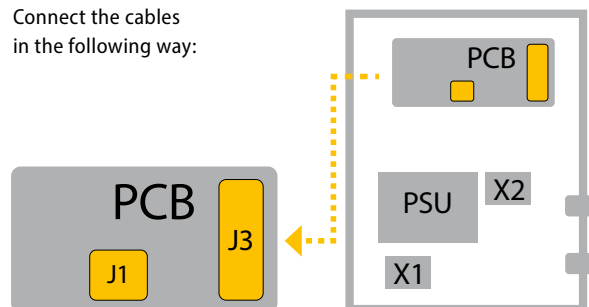
NOTE: The weight of the cable and vacuum hose may affect the force measurement of the sensor.

1.1. USB comm cable (J1)

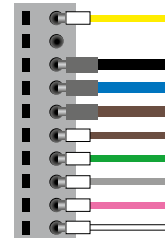Insert the USB communication wires in the following order (the heat shrinked cables are not to be used)

GND	○	(Not connected)
B	●	(Yellow)
A	●	(Orange)
GND	●	(Black)

1.2. Robot cable (J3)

Insert the robot cable wires in the following order:

NTC-	●	(Yellow)
GND	○	*Pre-connected*
Phase C	●	(Black)
Phase B	●	(Blue)
Phase A	●	(Brown, 1 mm^2)
NTC+	●	(Brown, 0,25 mm^2)
P-	●	(Green)
C-	●	(Grey)
C+	●	(Pink)
P+	○	(White)

WARNING!

Miswiring of the robot cable can cause permanent damage to the motor drive. Double check that all wires are in their correct position. If unsure have an electrician or a person skilled in the art do the installation.

1.3. Enable state cable

For the sander to be able to operate, terminal block 4 must be connected to a 24V output from the robot, while terminal block 6 should be connected to 0V on the robot. For enhanced safety, the enable state output could be set to low if the robot encounters an issue that causes it to stop. This will automatically halt the sanding/polishing head.

The 3 meter, 2-core cable provided with the cabinet should be used for connecting the enable state as per the instructions. The add-in is preconfigured to stop the tool when robot motors goes to off.

- ■ Robot digital output ➡ Mirka cabinet X1:4
- ■ Robot 0V ➡ Mirka cabinet X1:6

TB 4 to 24V robot output and TB 6 to robot 0V:
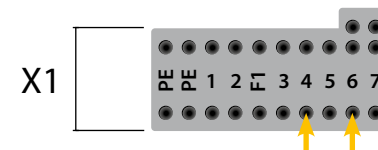
2. Installation

CABINET

1. Place the cabinet in the designated area
2. Route the USB comm cable in to the UR cabinet
3. Connect the USB comm cable to an available USB port on the UR control box
4. Connect the supplied power cord to the IEC socket

TOOL

1. Mount adapter flange on the UR robot using 4 x DIN 7991 M6 x 10 bolts and a 4 mm hex key (8 Nm).

NOTE: The rotation of the adapter flange and the flange of the robot should be aligned so that the dowel pin holes match.

2. Mount the finishing tool on the adapter flange using 6 x DIN 912 M8 x 16 bolts and a 6 mm hex key (18 Nm). Hold the tool in place while tightening the M8 screws, otherwise the tool join might move. NOTE: The dowel pin makes sure the tool is mounted in the correct alignment.

Rotation of the Adapter flange

Connecting the robot cable

3. Arrange the robot cable and eventual vacuum hose alongside the UR robot and make sure the cable and hose does not hinder the movement of the arm, E.g./I.e. by using clamps or by suspending the cables in air.
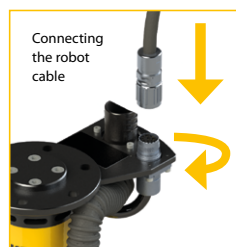
4. Connect robot cable to the finishing tool.

SOFTWARE CONFIGURATION

1. Connect USB stick with the latest version of the URcap, to the robot. (Visit www.mirka.com/airos to download latest version of the URcap)
2. Connect USB serial adapter to UR robot.
3. Tap the triple bar icon in the top right and select settings. Under the system section open the URCaps subsection and press the "+" icon bottom center. This will open a file explorer. Locate the USB stick and folder in which the Mirka URCap has been placed, press "mirkacontroller-x.x.x.urcap" and press "open".
4. Restart the UR robot.
5. Plug in the power cord of the cabinet and turn on the power.
6. Go to the installation tab. Locate the URCaps section and Mirka subsection.
7. Double check that the daemon tools is running, if not, start the process.
8. Click on refresh ports. Select correct serial port from the drop down list.
9. Click on Test connection to see if it is possible to read the serial number from the motor drive.
10. Under the installation tab on the teach pendant, tap the TCP section and add the TCP of the mounted finishing tool according to the table below.
11. Use the wizard tool to determine the payload and center of gravity of the mounted finishing tool.
12. Save the information before restart.

FINISHING TOOL TCP DATA	X, Y and Z Position [mm]			
	X	Y	Z¹	Z²
Mirka® AIROS 130S	0	0	139	196
Mirka® AIROS 150S	0	0	119	176
Mirka® AIROS 300P	0	0	134	191
Mirka® AIROS 312P	0	0	125	182
Mirka® AIROS 350S	0	0	125	182
Mirka® AIROS 353S	0	0	130	187
Mirka® AIROS 550S	0	0	125	182
Mirka® AIROS 650S	0	0	125	182

¹⁾ Z-value includes adapter flange. ²⁾ Z-value + adapter flange + ToolChanger

3. Using Mirka finishing tool

In the panel on the left, locate the URCaps section and the Mirka command. This will add a Mirka-node to the Robot Program. After a Mirka-node is placed in the program, there are several options to select from.

Firstly, a node operation is selected between the three following:

SET RPM
This gives the user the option to select a valid RPM from a list. This operation can be used either when the tool is stopped or when it is running. Set RPM also allows the user to manually test a selected RPM by using the "Test RPM" button. The tool is then stopped by using the "Stop" button under Tool Control in the bottom right.

RUN
This operation starts the tool. The tool will run at the last set RPM.

STOP
This operation stops the tool.

The selected node operation is visible in the program tree as
"**Mirka: Run**"
"**Mirka: Set RPM**" or
"**Mirka: Stop**"

The node options menu has manual controls for the user under Tool Control in the bottom right. Pressing the "Run" button will start the tool at the lastly set RPM and "Stop" will stop the tool.

The "Wait for tool to reach RPM" checkbox makes the robot program wait until the tool has reached the set RPM before continuing to the next program node. This is especially useful if a finishing tool has been pressed against a surface before starting it.

Start the robot program. The Mirka tool will automatically stop if the program is stopped.

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> **IMPORTANT:** When programming, make sure to avoid collisions between the cable & vacuum hose, and the UR robot itself. Failure to do so, may cause misreadings of the force sensor.

Uninstalling software

1. Tap the triple bar icon in the top right and select settings.
2. Under the system section, open the URCaps subsection and press the "-" icon bottom center.

4. Troubleshooting

► No serial ports found

1. Make sure that the motor drive cabinet power is turned on
2. Make sure the USB serial adapter is connected to the UR robot
3. Make sure the Mirka daemon process is running.
4. Try to reboot the robot

► Unable to detect sander/polisher

1. Make sure that the motor drive cabinet power is turned on
2. Check connection between the USB serial adapter and the motor drive cabinet. Make sure A/B/GND are correctly installed.
3. Make sure the correct serial port is selected. If multiple serial ports are available, try each port until the correct port is found.

► Troubleshooting finishing tool

Please refer to the tool manual, available at www.mirka.com/airos

Get the latest software

Visit www.mirka.com/airos/download for the latest software. Download the latest URcap on the supplied USB-stick