MODULAR ARM

Product

The modular robotic arm of Robotnik is based on the Schunk PoweCube modules. These rotary modules include gear-motor, power stage and controller, so the resulting arm does not need an external control cabinet. Instead, the external connection of the arm is reduced to just 24 VDC power and comunication via CAN bus.

The modules work as distributed controllers. The master controller (control PC) is responsible for generating the sequence of the program and sending references to each of the axes of the joints.

Current control, speed and position control is self-made by each module as well as temperature and stop control supervision operations. The control loops (current, velocity and position) can be closed in the external controller.

It is posssible to choose a conventional arm or to redesign the joining elements to fulfil the requeriments of a specific application.
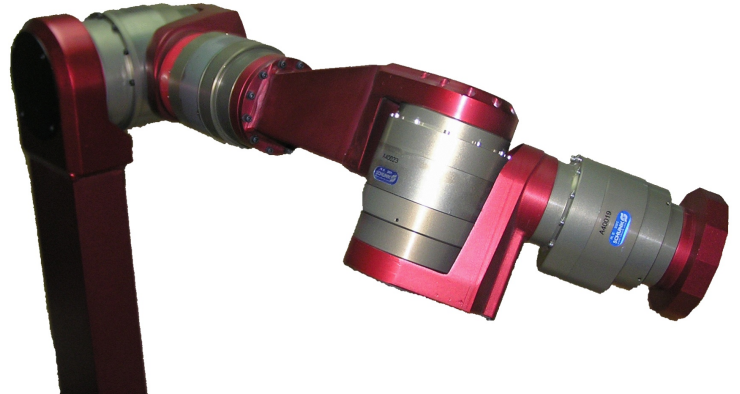
This type of arm, which integrates the power stage and control, is the most appropiate for installation on mobile platforms or androids. Some advanteges this arm offers are:

-Power to 24 VDC. No need to carry a heavy inverter.
-Control via CAN bus.Unlike an industrial robot arm, this arm only requires a PC with a CAN communication card, instead of a control cabinet.
-The dimensions of the links, and the number of degrees of freedom, become according to client specifications.

The modular robot arm kit includes the following items:

-PowerCubes and the elements connecting them.
-Assembly element with the chassis or base where the arm will be installed.
-Final effector assembly element.
-Cabling and connectors.
-CAN communication card.
-Control software for Windows and Linux platforms. It includes collision control algorithms, trajectory control, direct and inverse kinematics.

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MODULAR ARM

Applications

- Mobile manipulation.
- Humanoid robotics.
- Medical robotics.
- Service robotics.
- Force control (sensor 6 d.o.f.).

Technical specificactions

Mechanical y Electronics

Dimensions	400 to 1300 mm reach (7 d.o.f.)
Weight	19 Kg for a 6 d.o.f. configuration
Payload	9 Kg on the base of the final effector with 6 d.o.f.
Degrees of freedom	From 4 to 7 d.o.f. + final effector
Material	Aluminium
Traction Motors	Servodrivers *PowerCube* Gearbox, control and power stages integrated Magnetics brake integrated for each axis
Power supply	20 A @ 24 VDC Maximum power with 6 d.o.f. 1 A @ 24 VDC Control 6 d.o.f.
Movement range	Depends on the configuration and d.o.f. 6 d.o.f. : (+-) 190º, 105º, 180º, 195º, 107º, 360º
Movement speed	57 degrees / s on the base 300 degrees / s wrist rotation Others axes depends on the configuration and d.o.f.
Accuracy	Positional repeatability of 0.5 mm
Modularity	Widely scalable system: - Allows to mount combinations from 4 to 6 d.o.f. - Allows the connection of any type of sensing - Allows to mount one or more arms on a single platform

Control

Comunication	CAN
Controller	Current control, speed and position in each module Possibility of closing the control loops from an external controller
Software	Control libraries for Windows and Linux Collision control, control of paths and direct and inverse kinematics implemented.

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