# NAO

MECHATRONICS ANKLE

EDUCATIONAL KIT

The Mechatronics ankle kit is a part of NAO's body that teachers and students can use in order to perform in-depth studies on the command of a two axis system extracted from a humanoid robot.

The ankle is composed of the same electronics and mechanics components as NAO. Through a serial communication protocol (RS485) on USB, you can operate specific PWM (Pulse Wide Modulation) to both motors and recover measures on the actuators positions and currents.
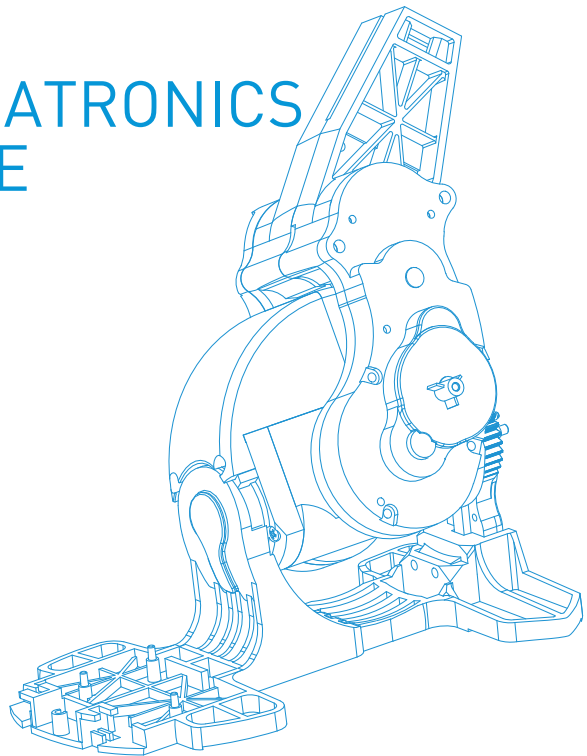
EXAMPLES
OF APPLICATIONS

EDUCATION

» Control law definition of a two degrees of freedom system

» Study of control

» Application of specifics PWM (Pulse Wide Modulation) on each motor

ELECTRICAL

INPUT	12-24Vdc / 1-2A

LIMITS

CURRENT LIMIT	600MA MAX
PWM	Turns off the motor if the difference between PWMwn and PWMn+1 > 20

AVAILABLE DATA

Time
MRE Motors 1&2
MRE Reduction 1&2
Motors current
PWM

CONSTRUCTION

DIMENSION (H×D×W)	157×140×77mm / 6.18×5.51×3.03 inches
WEIGHT	130.85g / 0.28lb

CONNECTION

USB	Adaptator RS485 to USB

POSITION SENSORS

MRE (MAGNETIC ROTARY ENCODER)	×4
	Using hall effect sensor technology
	Precision: 12bits / 0.1°

DESCRIPTION OF THE MOTORS

MOTOR TYPE	Brush DC Coreless
Model	22NT82213P
Number	×2
No load speed	8300 rpm ±10%
Stall torque	68 mNm ±8%
Continuous torque	16.1mNm max

SPEED REDUCTION RATIO
ANKLEPITCH

Reduction ratio	130.85

SPEED REDUCTION RATIO
ANKLEROLL

Reduction ratio	201.3

WWW.ALDEBARAN-ROBOTICS.COM