NIRYO

HUMAN - MOTION - ROBOT

Ned

The
collaborative & **open-source**
robot designed for
Education & **Research**

MADE IN FRANCE

6 axes

Ned reproduces all the movements required in the most complex processes of industry 4.0.

Aluminum structure

Robust, Ned offers a precision and a repeatability of 0.5mm.

ROS ARDUINO Raspberry Pi

AN ECOSYSTEM BUILT FOR INDUSTRY 4.0

To make **robotics accessible**, we created **Ned**, your **new partner for Education and Research**. Its **Ecosystem** allows you to reproduce and test many uses oriented towards **industry 4.0**.

VISION SET

Use **image recognition** to interact with objects according to their **shape** and **color**.

Experience **Vision** with **Blockly**, or use **Python** and **OpenCV** to create your own **image processing** and **artificial intelligence** pipelines.

NED

Reproduce **advanced industrial processes** using its 6 axes.

Based on **open-source technologies**, Ned integrates a **Raspberry Pi 4** making it reactive and versatile.

Its **aluminum structure** gives it high **robustness** and **repeatability**, ideal for all your robotics projects.

CONVEYOR BELT

Easily prototype **production lines**. Two versions of the Conveyor Belt are available to fit your projects:

- The **Standard Set** consists of the Conveyor Belt, an **infrared sensor** and the **control box** for an autonomous use.
- The **Education Set** includes these same elements as well as a **slope**, an **end-stopper**, **Vision landmarks** and **6 manipulable objects** of different shapes and colors.

PROGRAMMING & PROTOCOLS

Ned was designed to **democratize robotics.** In this context, it allows to **learn**:

BLOCKLY

Similar to **Scratch**, it is a library that allows you to **program visually by interacting with blocks**. It allows to control Ned intuitively **without any programming knowledge**.

ROS

Ned is based on **ROS (Robot Operating System)**. It is an operating system designed for robotics offering **standardized functions** to use with different languages such as **Python** and **C++**.

PYTHON

Python is a **powerful** and **versatile multi-platform** programming language. It can be used in robotics, image processing, cloud computing, Big Data...

MODBUS

A **Modbus/TCP server** is integrated into Ned. This **communication protocol**, which is essential in many **industrial** settings, can be studied to connect different devices in a master-slave relationship.

MATLAB

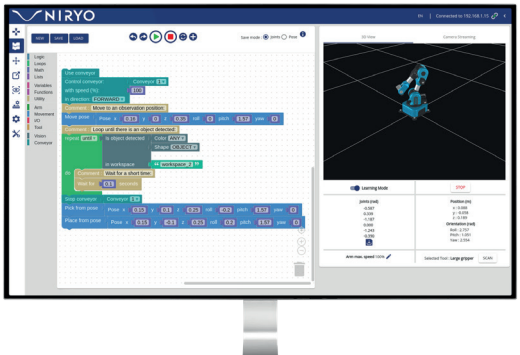
With Ned - MATLAB integration, it is possible to analyze the difference between theoretical and actual **trajectory curves**. Matlab thus provides a better understanding of **system control** concepts.

NIRYO STUDIO

Discover **Niryo Studio**,
our **free desktop application**.

Create your programs easily by assembling **blocks**. **Easy** and **intuitive**.

Available on:



INDUSTRIAL USES REPRODUCTION

EDUCATION

Ned aims to **support the teaching of collaborative robotics** and allows to **learn** different programming languages by reproducing many robotic uses in a concrete way.

RESEARCH & DEVELOPMENT

Ned can be integrated in a **research & development** logic to carry out the different activities that can be related to it such as **monitoring** and **prototyping**.

PICK & PACK

PICK & PLACE

PRODUCTION

ACCESSORIES

Ned comes with the **Custom Gripper** which allows you to manipulate many objects.

Need to manipulate other objects?

Its jaws are **interchangeable** and can be **3D printed**. Also, other **accessories** are available to give life to all your robotic projects.

Jaws pack

Large Gripper

Adaptive Gripper

Vacuum Pump

Electromagnet

TECHNICAL SPECIFICATIONS

NED

Degrees Of Freedom (DOF)	6
Weight	6.5 kg
Maximum payload	300 gr
Reach	440 mm
Repeatability	0.5 mm
Power supply	DC 11.1 Volts / 6A
Communication	Ethernet 1 Gb/s WIFI 2.4 GHz & 5 GHz - Range 802.11n (~31 dBm, <80dBm) Bluetooth 5.0 BLE USB
Interface / Programming	Windows / MacOS / Linux (desktop application) & APIs
Power consumption	~ 60 W
Materials	Aluminum, PLA (3D printing)
Ports	1 Ethernet + 2 USB 3.0 + 2 USB 2.0
Hardware	Raspberry Pi 4 3 x NiryoSteppers 2 x Dynamixel XL – 430 1 x Dynamixel XL – 320
Collision detection sensor	Magnetic sensor (on motor)

VISION SET

Model	ELP-USBFHD06H-L21
Sensor	Sony IMX322
Lens size	2.1 mm
Pixel size	12.8×11.6 mm
Image area	2000(H)x1121(V) approx. 2.24 M pixels
Formats	YUV, H264 & MJPEG
Control methods	Niryo Studio / API Python / TCP IP
SN ratio	42 dB
Dynamic range	86 dB
Sensitivity	5.0 V / lux-sec@550nm
Mini illumination	0. 01 lux
Ajustable parameters	Brightness, contrast, saturation, hue, sharpness, gamma, gain, white balance, backlight contrast, exposure

CONVEYOR BELT

Effective Delivering Distance	700 mm
Dimensions	712 mm × 225 mm × 60 mm
Direction of movement	Bidirectional
Maximum speed	38 mm/s (reduced in autonomous mode)
Maximum payload	2 kg
Drive mode	NiryoStepper
Control methods	Niryo One Studio / Niryo Studio / Python API / Niryo Modbus / Arduino

EDUCATIONAL RESOURCES

To guide you in **learning robotics**, we provide a set of resources available online, free of charge:

- Detailed documentations,
- Tutorials,
- Applications examples...

These educational resources allow you to learn or practice **programming** (Blockly, Python, ROS), **simulation**, **image processing**, and many other uses.

CONTACT

HEADQUARTERS & PRODUCTION SITE

165 avenue de Bretagne
59000 Lille
France

+33 (0)3 59 08 32 30

contact@niryo.com

www.niryo.com

NIRYO SAS - SIREN 824 143 515 - RCS 824 143515 NANTERRE