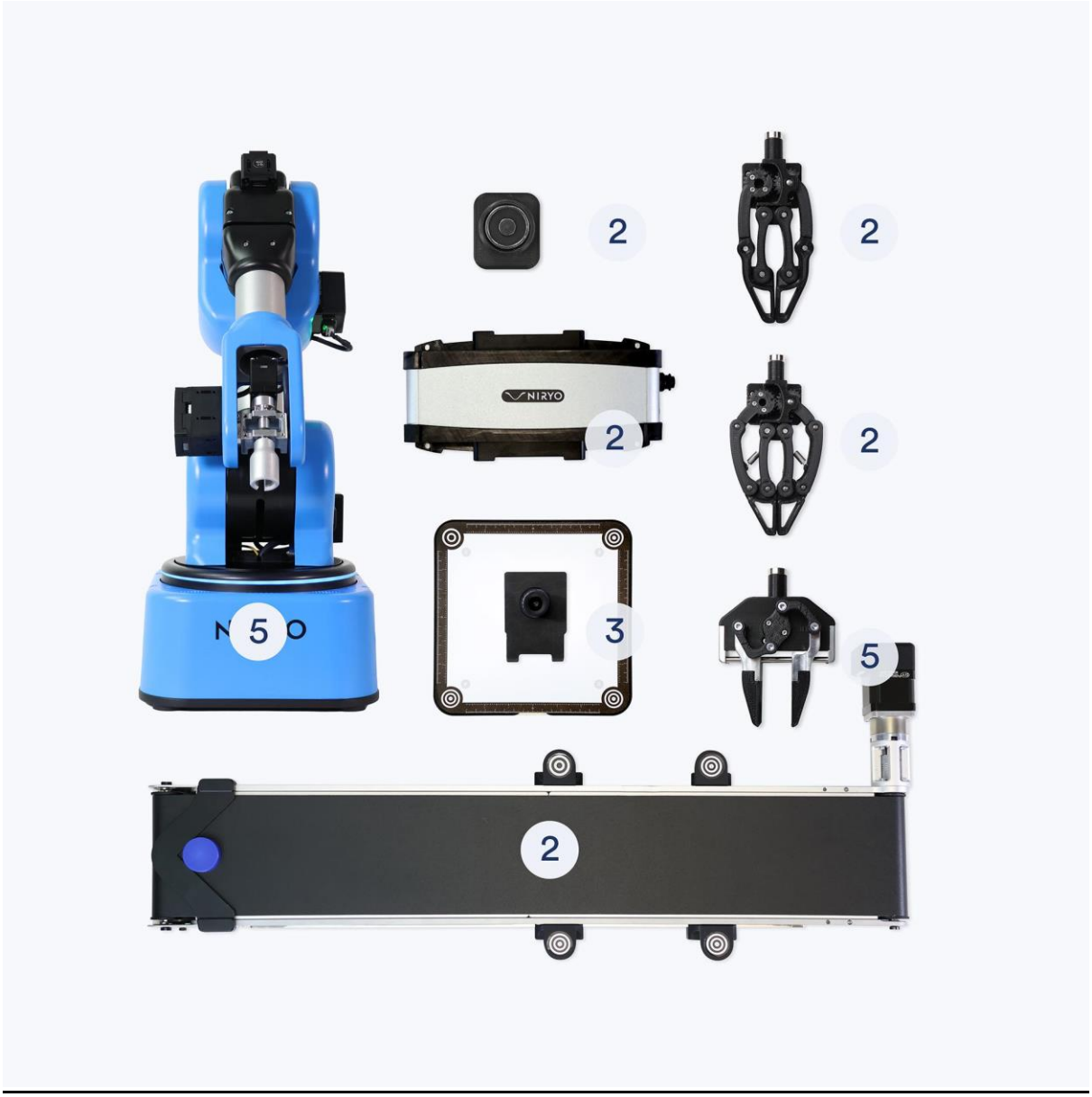
CLASSROOM PACK 5 PRODUCT SHEET



3-lines description

The **classroom pack 5** is perfect for getting started in a small classroom, if you don't have a lot of space and want to work with **5 to 10 students** in pairs per robot and build a mini-factory with multi-robot interaction.

Short description

The classroom pack 5 is perfect for getting started in a small classroom, if you don't have a lot of space and want to work with **5 to 10 students** in pairs per robot and build a mini-factory with multi-robot interaction.

This pack has been designed to equip you and adapt to your needs. At Niryo, we are committed to helping you with your installation thanks to the **3 hours of advanced support** offered with this pack. If you have any particular teaching needs, a Niryo expert will be able to help you.

Large description

CONTENT OF CLASSROOM PACK 5

- 5 Ned 2
- 5 Custom Gripper
- 2 Large Gripper
- 2 Adaptative Gripper
- 2 Conveyor + IR Sensor
- 5 Vacuum Pump
- 3 Vision Set
- 2 Electro Magnet
- 3 Hours advanced support

NED2 ROBOT AND CUSTOM GRIPPER

For several years now, Niryo's ambition has been to make robotics **obvious** and **accessible** to tomorrow's industrial players.

After supporting numerous students and researchers in learning collaborative robotics for Industry 4.0 with Niryo One, our first six-axis robot, and Ned, its successor, we now present our latest six-axis robot, Ned2, in 5 units, accompanied by its **5 custom grippers** in this **classroom pack 5**, designed for **Education**, **Research** and **Industry 4.0.**

The classroom pack 5 is perfect for starting out in a small classroom. If you don't have much space and want to work with **5 to 10 students** with a configuration of 2 students per robot to build a mini-factory featuring interactions between several robots.

This package has been designed to equip you and adapt to your needs. At Niryo, we're committed to helping you get set up, with **3 hours of customized support** included in the package.

CONCEPTION

Following in the footsteps of its predecessor, **Ned2** is the ideal cobot to meet your various needs in terms of prototyping **Industry 4.0** oriented applications. Its six axis give it a range of motion that meets the needs of the industry.

With the same aluminum structure as Ned, **Ned2** will continue to meet your requirements in terms of robustness, precision (0.5 mm) and repeatability (0.5 mm).
We have reworked the overall aesthetics of Ned to offer you a product with **plastic injection** molded covers, reducing its net weight and improving its robustness and finish.

Ned2 is based on **Ubuntu 18.04** and ROS Melodic and benefits from the capabilities of the **Raspberry PI 4,** a high performance **64-bit ARM V8 processor and 4Gb of RAM.**

Discover a robot with increased performances, thanks to new servo motors featuring **Silent Stepper Technology**, significantly reduces the noise level of the robot.

Improved Human-Machine Interaction

The novelty of **Ned2** lies in improving your experience of learning and handling the Robot.

Discover today a product redesigned according to your expectations, allowing you to better meet your needs while facilitating your apprehension of the robot, the messages emitted and its operation.

You can now appreciate the presence of a LED ring located at the base of your robot and quickly obtain important information from **Ned2**.
You will also find two speakers in the base of Ned2, making it easier for you to understand the messages thanks to a sound design adapted to the different states of the robot.

We have also equipped **Ned2** with a control panel located on its wrist, allowing you to manipulate the arm of your robot with a simple pressure. Activate the "Freemotion" mode with one touch, move your robot to the desired location, save its position in Niryo Studio and create your sequences in the easiest way possible. You can also program a dedicated button to suit your project's needs.

A Complete Ecosystem...

Discover a complete ecosystem reworked to fit your needs:

- A **Conveyor Belt**, allowing you to set up processes that reproduce industrial production lines.
- A **Vision Set** allowing the robot to perform tasks based on image processing and artificial intelligence, responding to the challenges raised by Industry 4.0.

The uses

Students, engineers or researchers, bring your various collaborative robotics projects to life with **Ned2.**

- With Niryo Studio, **learn robotics programming at your own pace** through a visual and intuitive interface based on **Blockly**. Set up a multitude of projects in the easiest way possible.
- **Perform advanced processes** based on artificial intelligence and image recognition with our Vision Set, which includes a camera and tools to create workspaces for your robot.
- With our Conveyor Belt and all the accessories offered by Niryo, **implement complete Industry 4.0 processes**, such as Pick & Place processes, in a concrete and realistic way.
- Open-source, **Ned2** allows you to develop without any limits and to implement use cases that meet your own needs.

Redesigned Tools

We have redesigned a large part of our ecosystem and the tools that make it,
in order to try to best meet your expectations, while making it easier for you to get started and use Ned2 :

- **The Easy Connect interface** is now based on a magnetic attachment system more robust and reliable. Changing tools has never been so easy and fast;
- Our different **grippers** have also been reworked to improve their robustness and ergonomics with new motors, making it easier to grip various objects;
- Our new **vacuum pump** now allows you to go even further and grasp objects more firmly thanks to the improvement of its suction system and its suction cup;
- Finally, our **Vision Set** has also been reworked to further simplify use cases that rely on the use of vision.

Control Ned2

There are different ways to control Ned2, from the most instinctive to the most complex:

- Using the control panel on the robot's wrist, move your robot's arm with your fingertips using the "**Freemotion**" mode.
- Use Niryo Studio, our visual and intuitive programming interface based on **Blockly**, and create your programs by selecting multiple blocks.
- With its digital inputs and outputs, control **Ned2** with an Arduino board or a Raspberry Pi.
- Control **Ned2** via our Python and Modbus APIs, or dive into the heart of the robot by developing your own ROS nodes in Python or C++. Develop new ways to control **Ned2** for your different projects.

Find all the information about **Ned2** here and about the **custom gripper** here.

LARGE GRIPPER

With this **2 large grippers** in your **classroom pack 5** and compatible only with the **Ned2** robot, you will be able to catch larger objects than with the custom gripper provided with the robot. The two fingers of the gripper remain parallel, so the grabbed object does not slide forward.

You can also precisely grab small objects from a greater distance.

The insertion of the gripper in the robot has been changed to a magnetic tip, it enables the grippers to be changed in a faster and efficient way.

The weight of the gripper has been reduced (79,2g) thanks to a lighter motor (Dynamixel XL330). This enables the robot to increase its payload capacity with the gripper connected without harming its reliability.

Find all the information about the **large gripper** here.

ADAPTATIVE GRIPPER

With this **2 adaptive grippers** in your **classroom pack 5** and compatible only with **Ned2** robot, you can grab non-standard objects that are difficult to handle with other grippers: round objects, pens, apples, eggs, etc.

You can be sure that the object will be correctly caught in the center of the gripper.

This gripper is perfect for fragile objects, or when the shape is not regular. You can also grab hollow objects from the inside (e.g. aluminum tube).

The insertion of the gripper in the robot has been changed to a magnetic tip, it enables the grippers to be changed in a faster and efficient way.

The weight of the gripper has been reduced (83g) thanks to a lighter motor (Dynamixel XL330). This enables the robot to increase its payload capacity with the gripper connected without harming its reliability.

Find all the information about the **adaptative gripper** here.

BUNDLE CONVEYOR BELT (v2)

In this **classroom pack 5**, you will find **2 autonomous conveyors** for prototyping an industrial production line. Each conveyor consists of an infra-red module, a slope, 6 manipulable objects, an end stopper and 4 markers, allowing you to recreate a workspace and interact with our Vision Set (product sold separately).

The **Bundle Conveyor Belt (v2)** enables you to learn how an industrial production line works by reproducing it on a small scale.

We have rethought the structure of the **Bundle Conveyor Belt (v2)** in order to offer a powerful and easy to set up magnetic holding system, allowing you to focus only on your **Industry 4.0** oriented projects.

The **Bundle Conveyor Belt (v2)** is accompanied by its Control Box for independent use.

Compatible with **Niryo One, Ned and Ned2**.

Main features

- Bidirectional
- Adjustable speed
- Autonomous
- Adapted to the **Ned2**'s ecosystem.

Control the Bundle Conveyor Belt (v2) in different ways:

- With your robot:
  - Connect the Conveyor to **Ned2**,

        - Choose your programming method (**Niryo Studio, Python API...**),
        - You are ready to control your production line.

    - With its control box:
        - Connect the control box to a power source,
        - Connect it to your Conveyor (v2),
        - Control your Conveyor (v2) in full autonomy, by adjusting its speed thanks to the potentiometer present on the box.

Find all the information about the **conveyor belt pack** here.

VACUUM PUMP

You will find **5 vacuum pumps** in your **classroom pack 5**. A vacuum pump is a very efficient system for "pick and place" (moving objects). With this tool only compatible with **Ned2** robot, you can remove plastic lids from cans, move coffee capsules, or large objects with a flat, non-porous surface.

Thanks to its 3 different models of suction, you will be able to grab a wide range of objects having a smooth surface in order to realize your use cases.

Most vacuum pumps make so much noise that it is impossible to work next to the robot. The pump developed by **Niryo** is different: it is quiet, but has the same efficiency as a normal vacuum pump, for the same price. A servomotor activates a syringe that will suck the air to catch the object.

The box of this vacuum pump is customized by Niryo!

Inserting the vacuum pump into the robot is easy thanks to the product's magnetic tip, which allows a quick and efficient tool change.

Find all the information about the **vacuum pump** here.

VISION SET

Give new perspectives to your projects and prototype advanced **industry 4.0** processes with the **3 Vision Set** included in your **classroom pack 5**.

The **Vision Set** gives **Ned2** the ability to detect objects and select the ones you want to interact with. It comes with a camera and objects of different shapes and colors to allow you to study topics such as **image recognition, machine learning and Artificial Intelligence** thanks to the contribution of **vision**.

The **Workspace**, also included in the **Vision Set**, is designed to work horizontally, vertically or even tilted. Its design, based on nano-suction technology, makes it sticky and repositionable.

Main features

- Object detection based on shape and color
- Easily perform advanced functions such as visual picking thanks to the new blocks in **Niryo Studio's Blockly** interface.
- An onboard camera on the wrist for a global field of view
- A modular workspace that can be used in the orientation and inclination of your choice.
- Adapted to the **Ned2**'s ecosystem.

Using the Vision Set

- Install the **Vision** module on the robot;

- Connect it to the robot through **Ned2** back panel thanks to USB 3.0 ports;
- Choose your programming approach:

- **With Niryo Studio**

1. Open the visual programming interface (**Blockly**).
2. Perform a workspace calibration.
3. Use the new blocks to perform advanced functions.

- **With a TCP script**

1. Use the TCP Client/Server environment of the robot.
2. Write a script in the desired programming language.
3. Use the new functions introduced by the **Vision Set**.

Content of the pack

- 1 x Camera
- 1x Calibration tip
- 2 x Screws to fix the camera on the support
- 1 x Workspace
- 6 x Objects to handle (3 squares & 3 rounds)
- 1 x USB cable
- 2 x Tape scratches to attach the cable

The Vision Set is sold with the content mentioned above.

To go even further in the implementation of Indutry4.0 oriented processes, couple Ned2 and your Vision Set with our Bundle Conveyor Belt (v2).

Find all the information about the **vision set** here.

ELECTROMAGNET

With the **2 electromagnets** in your pack, compatible only with **Ned2** robot, you can easily pick and place small metal parts (or several at a time), which may be impossible with other grippers, especially for very small parts (screws, washers, nuts, ...).

The insertion of the gripper in the robot has been changed to a magnetic tip, it enables the grippers to be changed in a faster and efficient way.

Find all the information about the **electromagnet** here.

HOURS OF PERSONALIZED SUPPORT

Benefit from **3 hours of personalized support** from our teams to install the robots in your classroom or to prepare your lessons. This customized support will enable you to adapt the classroom pack to your needs.

Find all the information about the **classroom pack 5** here.

CE

24 990,00 € Excl. VAT

26 990.00 $ Excl. VAT

YOUR PERSONALIZED ASSISTANCE PROGRAM:

We offer you an online educational resource platform called **Niryo Academy** which includes:

- Written assignments with answer keys
- Regular updates with new tutorials created by teachers
- Video tutorials to help you complete the assignments
- Assistance with product programming (Matlab, Blockly, Python)

We offer you the use of **Expert +** for **3 hours**.

CE

590,00 € Hors TVA

590.00 $ Hors TVA

YOUR ONLINE EDUCATIONAL RESOURCES PLATFORM:

We offer you an online educational resource platform called **Niryo Academy** which includes:

- Written assignments with answer keys
- Regular updates with new tutorials created by teachers
- Video tutorials to help you complete the assignments

We have a **Freemium offer** that gives you 6 months' use of Niryo Academy with every purchase until 31/12/2024.

CE

799,00 € Hors TVA

990.00 $ Hors TVA

WARRANTY:

For all NED 2 robots, Niryo includes a 1-year manufacturer's and publisher's warranty on :

- 6-axis arm
- Conveyor
- NiryoStudio application
- NiryoAcademy platform

The warranty covers :

- material damage upon receipt of equipment
- hardware or software malfunctions
- hardware or software performance that does not comply with technical specifications
- hardware or software deterioration unrelated to use
- inaccessibility of the software or platform