www.codlai.com/en

CODLAI
TECHNOLOGIES

MODULES
USER GUIDE

"ROBOTIC CODING FOR EVERYONE"

Modules User Guide

2025 (v2.0)

Contents

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Who Are We?

CODLAI TECHNOLOGIES INC.

CODLAI Technology Inc. was founded during the pandemic, when the challenges and shortcomings of distance learning became apparent. During this period, it was observed that the existing infrastructure, particularly in robotics coding and similar practical courses, was inadequate, leading to significant decreases in productivity. To address these issues, in 2021, one of our founders and a graduate student, Samed Kaya, completed his thesis titled "Internet-Oriented Sensor Board Design and Production for Intermediate and Advanced Robotics Coding Education." This work laid the foundation for the CODROB brand and our first products, the IoTBot and sensor modules.

The resulting products have attracted attention with their innovative features as well as eliminating the deficiencies in the market. In 2022, with the partnership of Kule Mold Machinery and Industry INC. located in Gebze/Kocaeli, CODROB has gained wider opportunities and developed new generation programmable robots, advanced program called "CODROB Editor" and web platform.

The CODROB Project, awarded the "Seal of Excellence" in the first call of the 2025 TÜBİTAK 1812 (BIGG) Program, began its R&D and commercial activities under the name **"CODLAI TECHNOLOGY INC."** The company operates in the Teknopark Istanbul area.

CODLAI currently offers a wide range of products, including three different programmable IoT-based motherboards, more than 20 sensor modules, programmable cars, robotic arms, and drones. Furthermore, it aims to meet all needs in the field with its next-generation AI-powered products, coding editor, and training curriculum. Curricula and sample projects appropriate to the learning level have been created for all devices produced.

Our Future Vision

As CODLAI, we aim to focus on innovative topics such as new programmable motherboards, developable robots for robotics competitions, and robotic coding via virtual reality in the future. Our aim is to provide pioneering and innovative solutions in educational technologies and to ensure that students and educators have the best experience.

Our Mission

As CODLAI Technologies Inc., our mission is to provide innovative, accessible and effective solutions to students and educators by using technology in education in the most effective way. We aim to raise the technology leaders of the future by increasing the quality in robotic coding and applied courses. In this direction, with our constantly developing product range and educational materials, we aim to provide practical and advanced technology-based educational tools that are suitable for the needs of learners at all levels. Increasing efficiency in education, integrating technological innovations into the world of education and developing products that can compete on a global scale are among our basic principles.

www.codlai.com/en

What Do We Offer?

STEM TRAINING KITS

You can learn robotics and electronics from scratch to advanced level with training sets consisting of CODLAI Products!

PROGRAMMABLE ROBOTIC KITS

You can reinforce the foundations established with training kits with robotic kits, and learn what, when, where and how you can use it in daily life!

CODLAI EDITOR

You can perform either block-based or text-based programming and simulation with the dual-language supported 'CODLAI Editor' program that you can use on all platforms. Moreover, a web editor that does not require installation is waiting for you! For more: www.editor.codlai.com

CURRENT CURRICULUM

CODLAI products are supported by course programs and sample applications prepared by leading instructors in the sector. Get a 1-0 head start on your training with its current and even future-visioned curriculum.

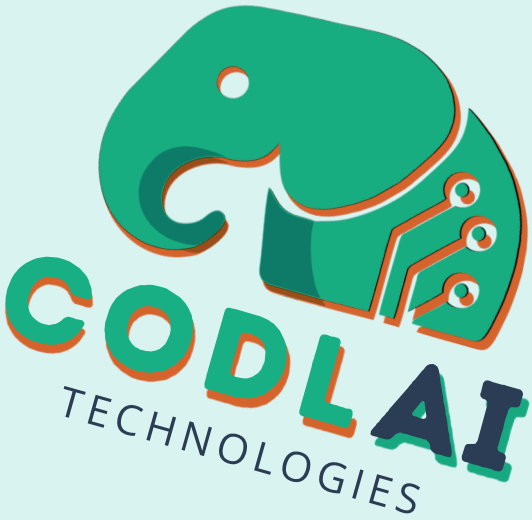
RELIABLE CONTENT

Our sample applications and programs on our CODLAI site have been prepared by expert trainers and checked by our engineer team. We take a firm stance against misinformation and misinformation!

ALWAYS FULL SUPPORT

CODLAI products are always with you, not just until the first sale. We are waiting for you at www.codlai.com, where you can find all kinds of support and updated content about the products! You can also always get a response as quickly as possible with our Whatsapp live support line.

Modules User Guide



Modules User Guide

Entrance

WARNING

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1. Entrance

1.1 Introduction to the Regulation

- ***CE Compliance***

This appliance is suitable for home and office use. The CE Mark confirms compliance with European Union regulations:

- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Low Voltage Directive 014/35/EU (equal to A2:2013)
- Radio & Telecommunications Terminal Equipment (R&TTE) Directive 1999/5/EC

This device can be operated at a maximum ambient temperature of 35 *C. Do not expose to temperatures below 5 *C or above 40 *C. THERE IS A RISK OF EXPLOSION IN CASE OF INCORRECT APPLICATION OF BATTERIES AND POWER ADAPTER. PLEASE USE THE BATTERIES AND ADAPTER SPECIFIED FOR THE PRODUCT IN ACCORDANCE WITH THE INSTRUCTIONS.

1.2 Safety Instructions

Do not use this device near magnetic fields as this may adversely affect the performance of the device.

If you think there is a problem with the device or any of its components, consult the technical service team. In case of malfunction, the device must be repaired by the technical service. Please do not repair it yourself.

Do not apply excessive pressure to the device by hitting, hitting, dropping or pushing it. This may damage or destroy the device and/or its components.

Do not expose the device to direct sunlight. Keep it away from high temperature ambient conditions and avoid contact with high temperature surfaces.

Do not expose your device directly to liquid. Do not leave it in rain or humid environments and prevent exposure to these. Do not leave the product's power adapter plugged in during conditions such as thunderstorms.

Use and keep the device, its accessories, components and packaging out of reach of babies and children to prevent the risk of suffocation and injury.

1.3 Guide Information

ATTENTION: This sign and warning message indicates special rules that must be observed for user safety.

Before using your device for the first time, read and follow this original user manual and the safety warnings provided with it. Keep this manual for later use or for future users.

2. Modules

2.1 DC Motor Module

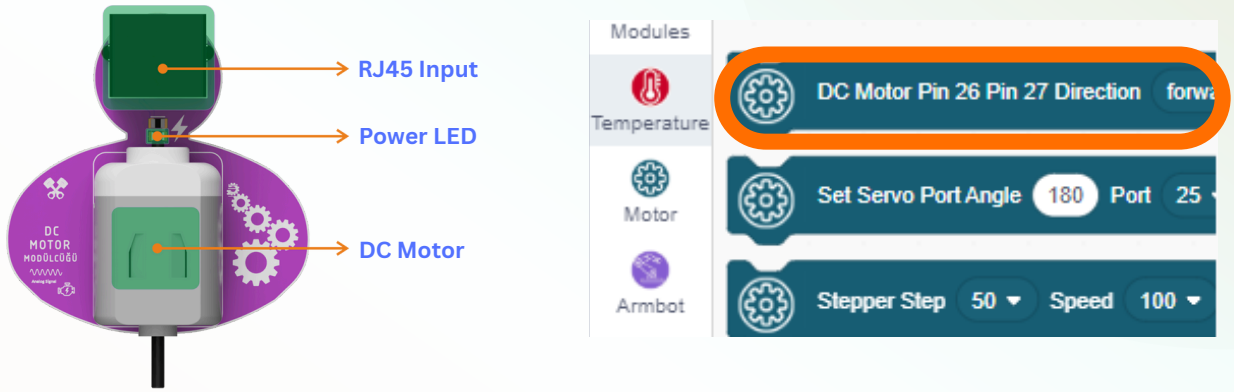


Figure 1 - DC Motor Module Top View and Codlai Editor DC Motor Module Blocks

DC Motor (Direct Current Motor) is an electric motor that works with direct current power. The main working principle of the motor is to provide mechanical movement by creating a rotating force. The DC motor in the module has a value of 3-6V. You can use the DC Motor module on Pins 26 and 27 in IotBot. We cannot use the DC Motor in RelayBot and MiniBot because they do not have a motor driver. You can use the DC Motor in your mini wind turbine, fan and vending machine projects. You can see the relevant blocks for the DC Motor Module in the Codlai editor in the picture. (Picture 1)

2.2 Smart LED Module

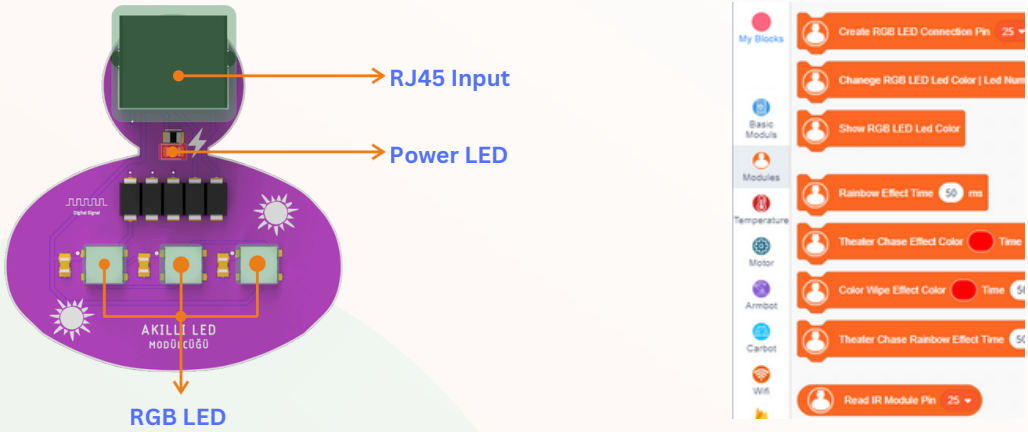


Figure 2 - Smart LED Module Top View and Codlai Editor Smart LED Module Blocks

RGB LED (Red, Green, Blue Light Emitting Diode) is a diode that uses the three primary colors of red, green and blue in different combinations to produce a light emitting color. 3 programmable RGB LEDs are used in the Smart LED Module. You can use the Smart LED Module on pins 25-26-27-32-33 in IotBot and pins 4-5-12-13-14 in MiniBot. You can use RGB LEDs in your colorful night lamp, dancing musical light, and color-controlled aquarium projects. You can see the relevant blocks for the Smart LED Module in the Codlai editor in the picture. (Picture 2)

2.3 Gas and Smoke Module

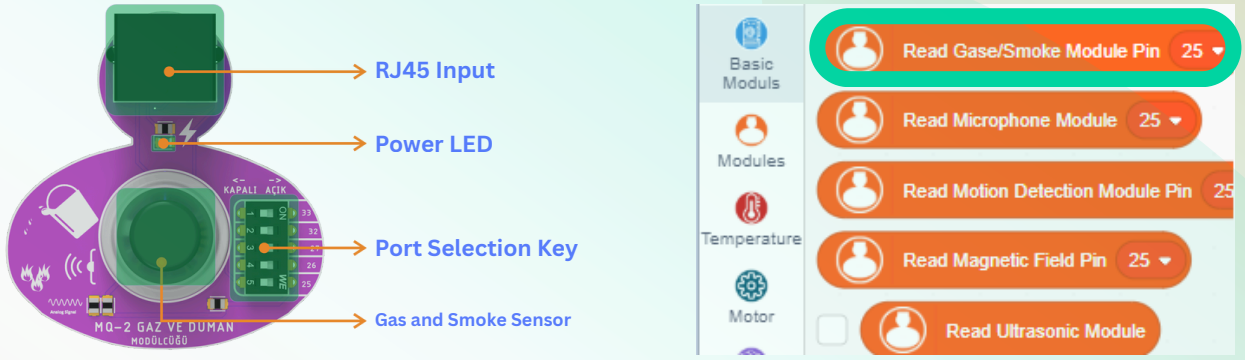


Figure 3 - Gas and Smoke Module Top View and Codlai Editor Gas and Smoke Module Blocks

Gas and Smoke Modules are devices that detect certain gases or smoke in the atmosphere. The module uses the “MQ-2” model gas and smoke sensor. You can use the Gas and Smoke Module on pins 25-26-27-32-33 in IotBot. We can’t use it on MiniBot because it doesn’t have the appropriate analog pins. You can use the Gas and Smoke Module in your gas leak detector, fire alarm system and greenhouse control system projects. You can see the relevant blocks for the Gas and Smoke Module in the Codlai editor in the picture. (Picture 3)

2.4 Expansion Module

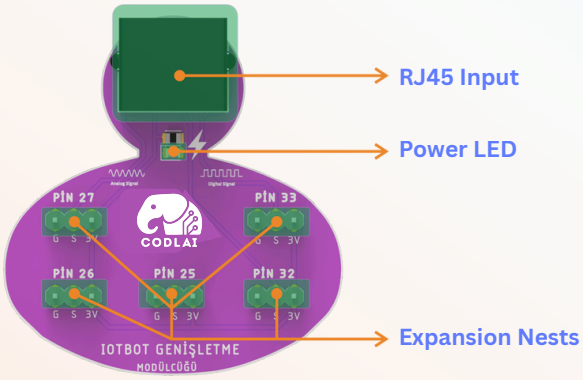


Figure 4 - Expansion Module Top View

The Expansion Module is designed for sensors or components that we can connect externally to IotBot. It has separate signal lines, voltage lines and ground lines to connect with 5 different pins. Only sensors that work with logic 3V can be connected with this module. A logic converter module must be used for sensors that work with 5V. You can use the expansion module on pins 25-26-27-32-33 on IotBot and pins 4-5-12-13-14 on MiniBot. With the expansion module, you can connect more sensors or motors to IotBot and develop your projects. (Picture 4)

2.5 Logic Conversion Module

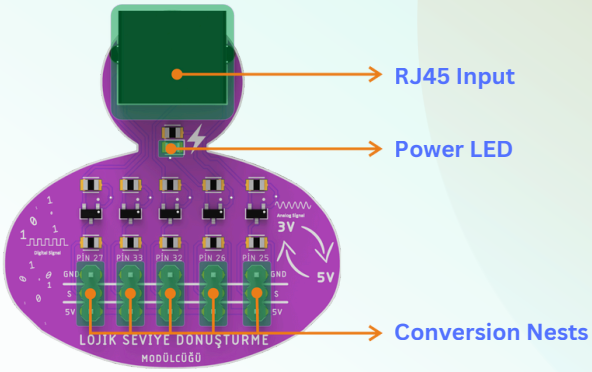


Figure 5 - Logic Conversion Module Top View

The Logic Conversion Module is designed for components that we can connect externally to IotBot. It has separate signal lines, voltage lines and ground lines to connect with 5 different pins. You can use the Logic Conversion Module on pins 25-26-27-32-33 on IotBot and pins 4-5-12-13-14 on MiniBot. With the Logic Conversion Module, you can connect more sensors or motors to IotBot and develop your projects. (Picture 5)

2.6 IR Sensor Module

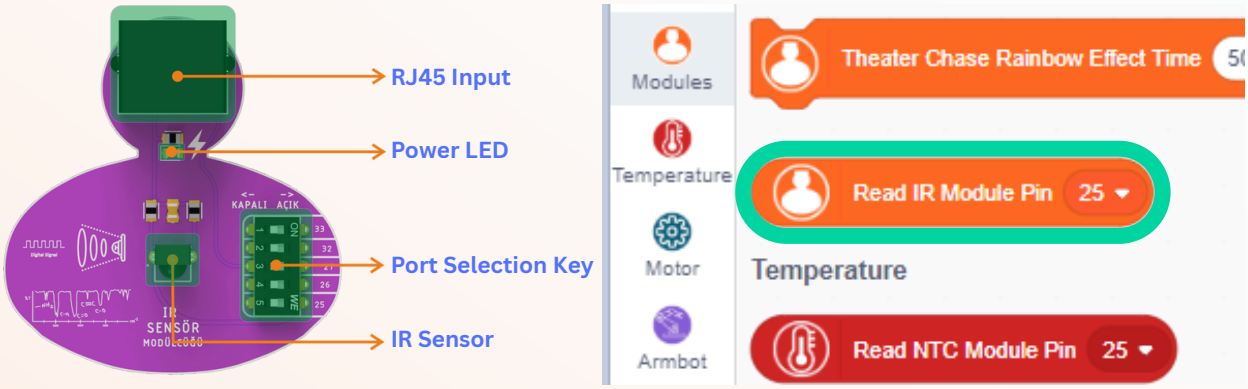


Figure 6 - IR Sensor Module Top View and Codlai Editor IR Sensor Module Blocks

The IR (Infrared) Sensor Module is a device that detects infrared light. Infrared light is a part of the electromagnetic spectrum that cannot be seen by the human eye. IR sensors detect presence or movement by detecting light from reflected and emitted infrared objects in the environment. You can use the IR Sensor Module on pins 25-26-27-32-33 in the IotBot and pins 4-5-12-13-14 in the MiniBot. You can use the IR sensor in your remote control, distance sensor, and reflex sensor projects. You can see the relevant blocks for the IR Sensor Module in the Codlai editor in the picture. (Picture 6)

2.7 Magnetic Field Module

Figure 7 - Magnetic Field Module Top View and Codlai Editor Magnetic Field Module Blocks

A magnetic field sensor is a device that detects and measures magnetic fields around it. Magnetic fields can be caused by electric current. The Magnetic Field Module is used to detect the strength, direction or change of the magnetic field. You can use the Magnetic Field Module on pins 25-26-27-32-33 on the IotBot and pins 4-5-12-13-14 on the MiniBot. You can use the Magnetic Field Module in your compass and detector projects. You can see the relevant blocks for the Magnetic Field Module in the Codlai editor in the picture. (Picture 7)

2.8 Matrix Button Module

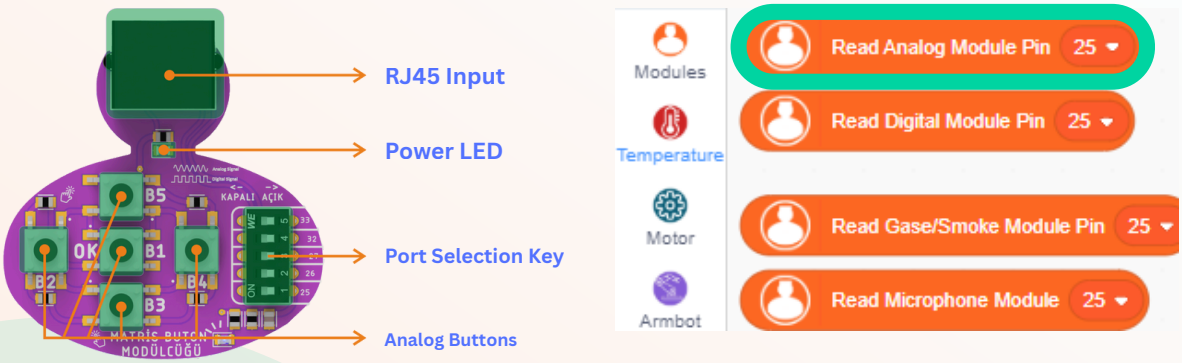
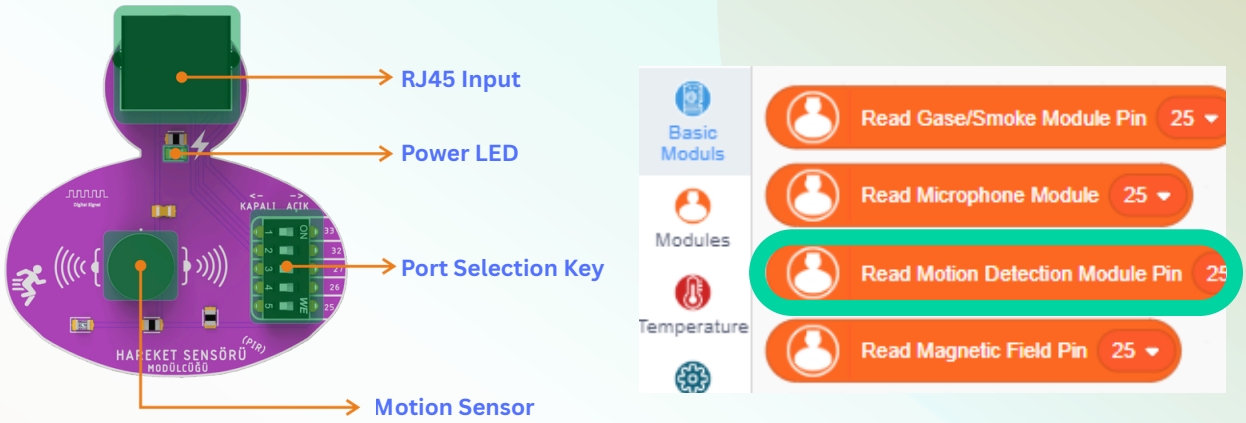


Figure 8 - Matrix Button Top View and Codlai Editor Matrix Blocks

The matrix button is a series of buttons arranged in rows and columns. There is a button at each row and column intersection. The Matrix Button Module is fixed to 1 intersection point. You can use the Matrix Button Module on pins 25-26-27-32-33 in IotBot and pins 4-5-12-13-14 in MiniBot. You can use the Matrix Button Module in your LED control, counter systems, and control device projects. You can see the relevant blocks for the Matrix Button Module in the Codlai editor in the picture. (Picture 8)

2.9 Motion (PIR) Sensor Module



2.9 Motion (PIR) Sensor Module

A PIR (Passive Infrared) sensor is a sensor used to detect motion by sensing changes in thermal energy around it. These sensors are called "passive" because they do not emit active light or radio waves themselves to detect motion. Instead, they detect infrared (IR) light reflected or emitted from surrounding objects. You can use the PIR module on pins 25-26-27-32-33 on the IotBot and pins 4-5-12-13-14 on the MiniBot. You can use the PIR module in your automatic lighting and security system projects. You can see the relevant blocks for the PIR Sensor in the Codlai editor in the picture. (Picture 9)

2.10 Relay Module

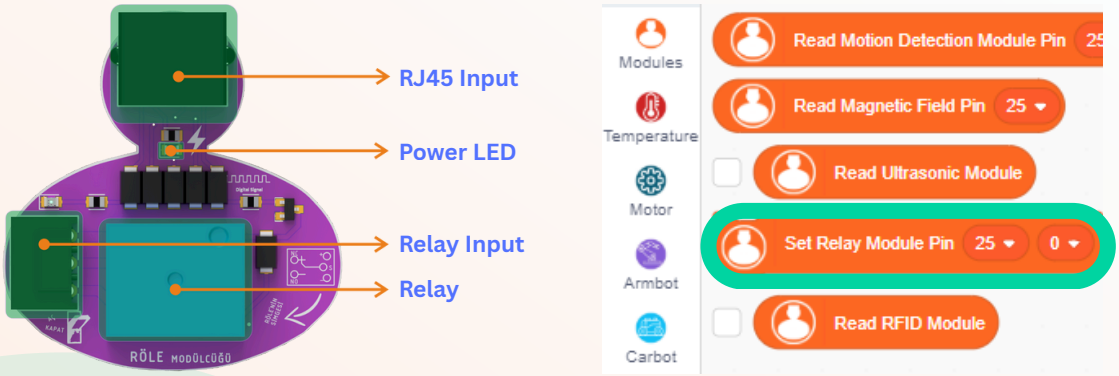


Figure 10 - Relay Module Top View and Codlai Editor Relay Module Blocks

A relay is a mechanical switch that works with an electrical signal or control signal. It is used to open and close a circuit by providing control over the electric current. Relays are used to control a higher power current with a small control signal and thanks to these features, they are used in many different applications. You can use the relay module on pins 25-26-27-32-33 in IotBot and pins 4-5-12-13-14 in MiniBot. You can use the relay in lighting, socket, motor, door sensor projects. You can see the relevant blocks for the Relay Module in the Codlai editor in the picture. (Picture 10)

2.11 Servo Motor Module

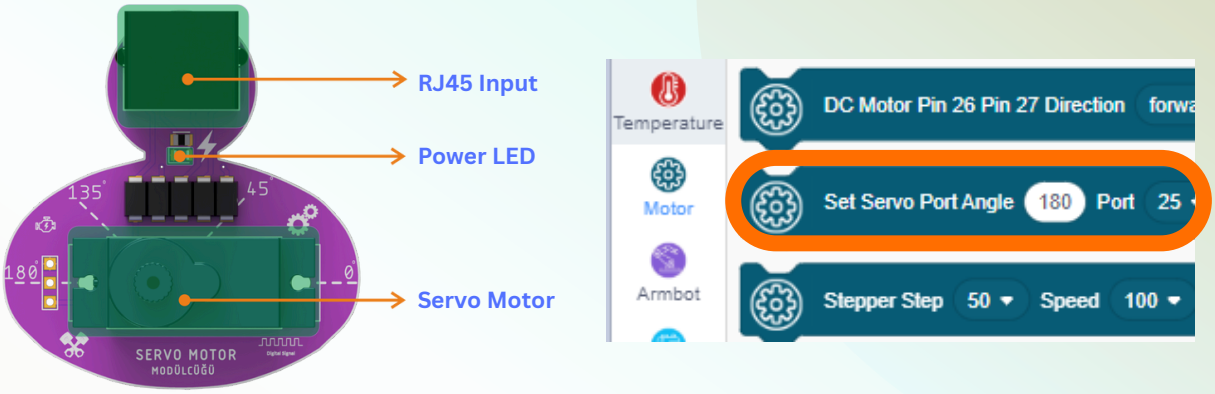


Figure 11 - Servo Motor Module Top View and Codlai Editor Servo Motor Module Blocks

Servo motors are precise and accurate motors designed to provide rotation or position control at a specific angle. These motors, which usually have a feedback system, can remain fixed in the desired position according to the given control signals. You can use the servo motor module on pins 25-26-27-32-33 in IotBot and pins 4-5-12-13-14 in MiniBot. You can use the Servo Motor Module in your autonomous vehicle, robot arm and moving platform projects. You can see the relevant blocks for the Servo Motor Module in the Codlai editor in the picture. (Picture 11)

2.12 NTC Temperature Module

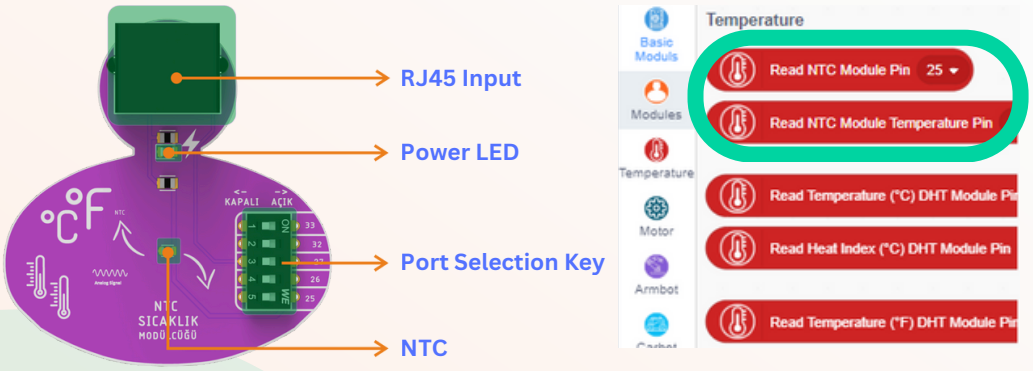


Figure 12 - NTC Temperature Module Top View and Codlai Editor NTC Temperature Module Blocks

NTC sensors are used to measure temperature by converting temperature changes into electrical signals. You can use the NTC Temperature Module on pins 25-26-27-32-33 on the IotBot. We cannot use it on the MiniBot because it does not have suitable analog pins. You can use the NTC temperature module in your heating, ventilation, and air conditioning system projects. You can see the relevant blocks for the NTC Temperature Module in the Codlai editor in the picture. (Picture 12)

2.13 Temperature and Humidity Module

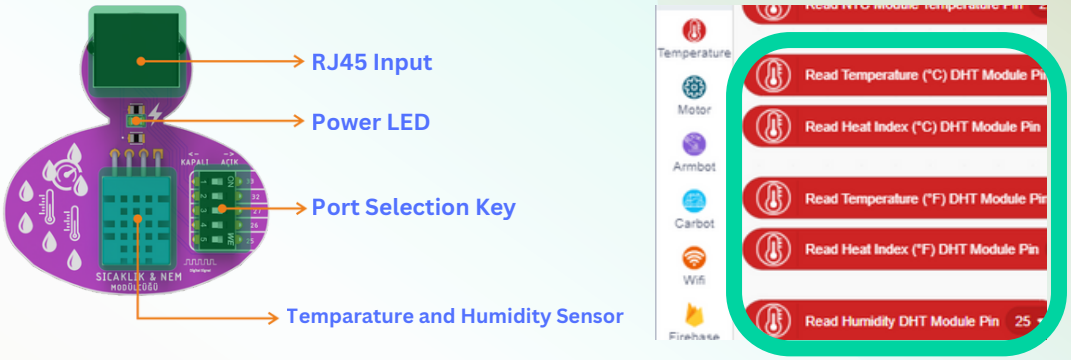


Figure 13 - Temperature and Humidity Module Top View and Codlai Editor Temperature and Humidity Module Blocks

Temperature and humidity sensors are devices that measure the temperature and humidity levels in the environment. These sensors provide measurement and monitoring by converting temperature and humidity values into electrical signals. You can use the temperature and humidity module on pins 25-26-27-32-33 in IotBot and pins 4-5-12-13-14 in MiniBot. You can use the temperature and humidity module in your plant care, ventilation systems, and irrigation systems projects. You can see the relevant blocks for the Temperature and Humidity Module in the Codlai editor in the picture. (Picture 13)

2.14 Stepper Motor Module

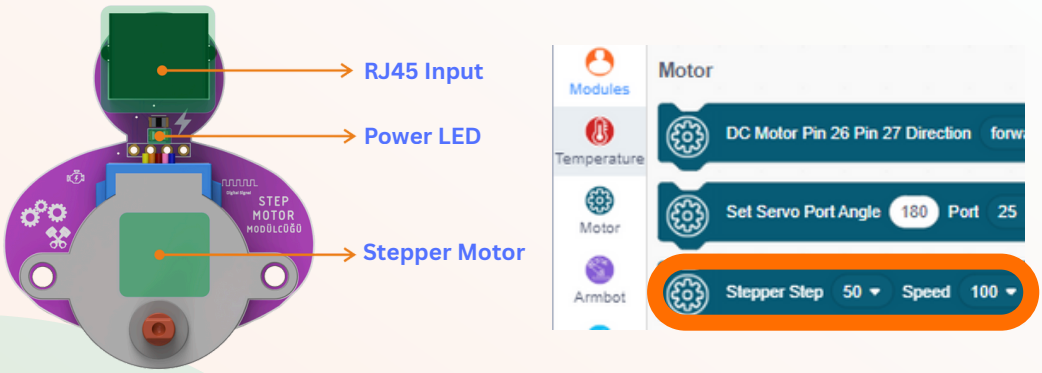


Figure 14 - Stepper Motor Module Top View and Codlai Editor Stepper Motor Module Blocks

A stepper motor is an electric motor that rotates in certain steps with digital signals and moves a certain angle with each step. These motors rotate step by step and advance one step angle with each step. We can use the stepper motor on pins 26-33-32-27 in IotBot. We cannot use it in MiniBot because it does not have a motor driver. You can use the Stepper Motor Module in your projects such as automatic curtain system, sun tracking system, automatic mixing system. You can see the relevant blocks for the Stepper Motor Module in the Codlai editor in the picture. (Picture 14)

2.15 Vibration Module

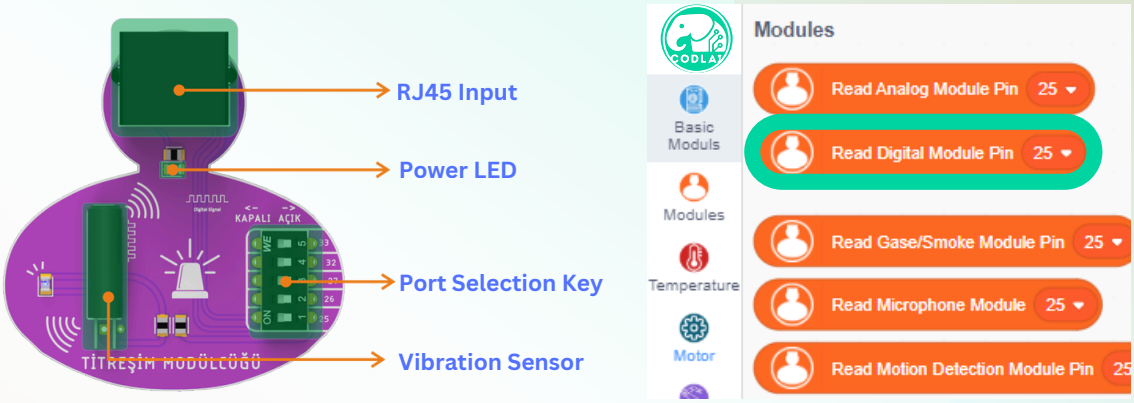


Figure 15 - Vibration Module Top View and Codlai Editor Vibration Module Blocks

The Vibration Module generates mechanical vibrations and converts these vibrations into electrical signals. It can detect or apply vibrations by converting mechanical energy into electrical energy. You can use the Vibration Module on pins 25-26-27-32-33 in IotBot and pins 4-5-12-13-14 in MiniBot. You can use the Vibration Module in your massage and alarm projects to get vibration feedback. You can see the relevant blocks for the Vibration Module in the Codlai editor in the picture. (Picture 15)

2.16 Soil and Moisture Sensor Module

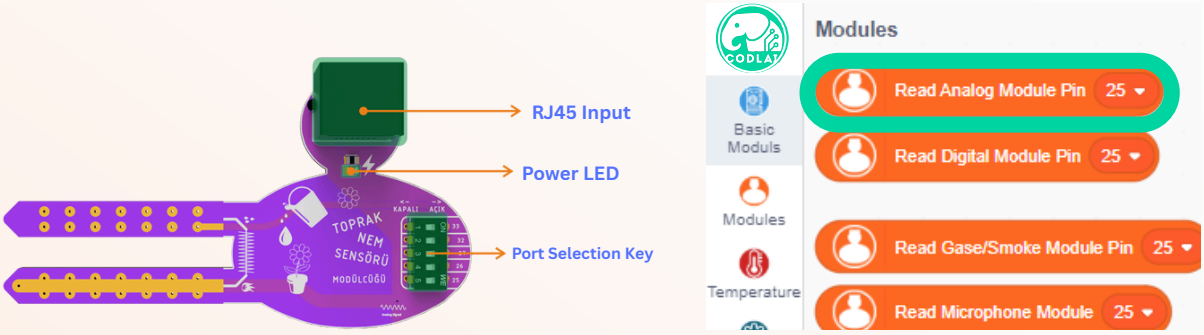


Figure 16 - Soil Moisture Sensor Module Top View and Codlai Editor Soil Moisture Sensor Module Blocks

The Soil and Moisture Module is used for plant growth, agriculture, gardening and monitoring soil moisture. This module helps determine the watering needs of plants by measuring the moisture content of the soil and ensures healthy plant growth. You can use it on pins 25-26-27-32-33 on IotBot and pins 4-5-12-13-14 on MiniBot. You can use the Soil and Moisture Module in your projects such as smart plant irrigation system, weather sensitive irrigation system, remote agricultural monitoring system. You can see the relevant blocks for the Soil and Moisture Module in the Codlai editor in the picture. (Picture 16)

2.17 Traffic Light Module

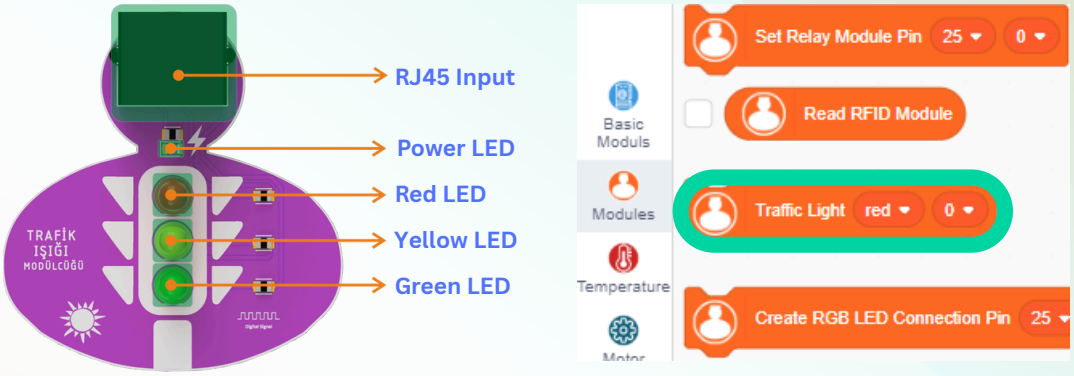
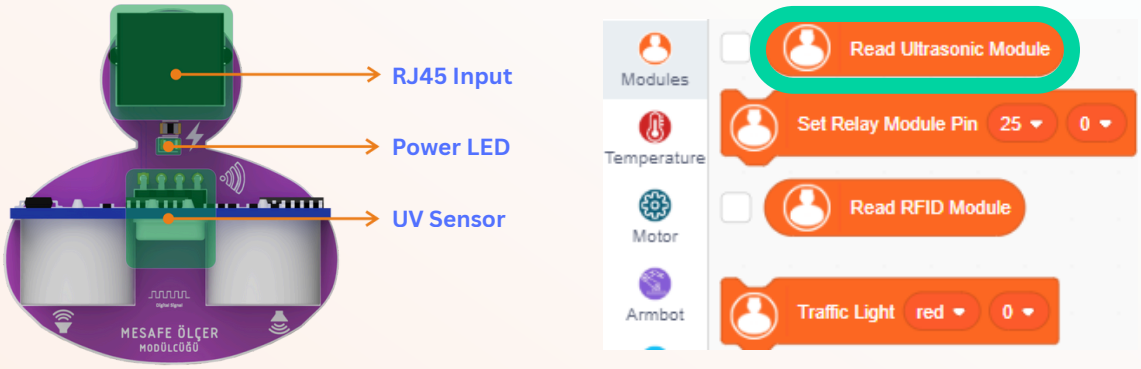


Figure 17 - Traffic Light Module Top View and Codlai Editor Traffic Light Module Blocks

The Traffic Light Module has 3 (Red-Yellow-Green) 5mm LEDs and allows us to create various traffic simulations. You can use the traffic light module on pins 25-26-27-32-33 in IotBot and pins 4-5-12-13-14 in MiniBot. We can use the Traffic Light Module in our projects such as pedestrian crossing simulation, traffic flow simulation, etc. You can see the relevant blocks for the Traffic Light Module in the Codlai editor in the picture. (Picture 17)

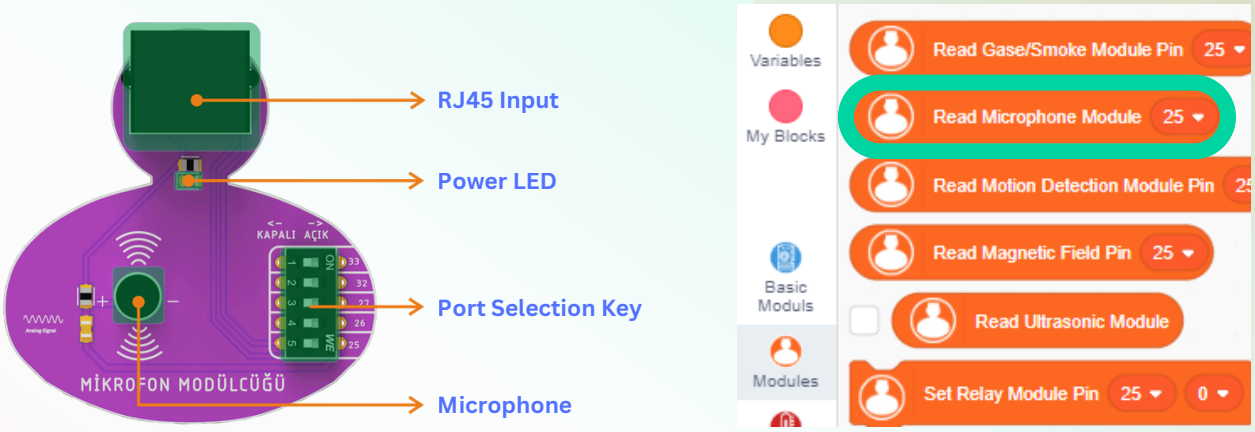
2.18 Distance Meter Module



Picture 18 - Distance Meter Module Top View and Codlai Editor Distance Meter Module Blocks

Ultrasonic Distance Sensor is designed to measure the distance to surrounding objects using sound waves. This module works via trig and echo pins and determines the distance from the measured object to the sensor. ECHO Pin of UV Sensor is at pin 27 on IotBot and pin 12 on MiniBot. TRIG pin is at pin 32 on IotBot and pin 12 on MiniBot. Trig (Trigger) Signal: The sensor starts ultrasonic sound waves when a high level (1) signal is applied to the trig pin. Sound waves are sent towards the surroundings. Echo Signal: The reflected sound waves are detected by the sensor and a high level signal is sent to the echo pin. Duration Measurement: The time difference between the trig and echo pins represents the time it takes for the reflected sound waves to return to the sensor. Ultrasonic distance sensors are used in robots, obstacle avoidance systems, autonomous vehicles, automatic door opening systems, water level control systems, etc. You can use it in your projects. You can see the relevant blocks for the Distance Meter Module in the Codlai editor in the picture. (Picture 18)

2.19 Microphone Module



Picture 19 - Microphone Module Top View and Codlai Editor Microphone Module Blocks

The Microphone Module has a microphone with a sound sensor on it. This sensor detects the sound intensity in the environment and provides an analog output accordingly, allowing us to learn the intensity of the sound it detects. You can use the Microphone Module on pins 25-26-27-32-33 in IotBot. We cannot use it in MiniBot because it does not have the appropriate analog pins. You can make sound-triggered applications using the Micron Module. You can see the relevant blocks for the Microphone Module in the Codlai editor in the picture. (Picture 19)

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"ROBOTIC CODING FOR EVERYONE"

CODLAI TECHNOLOGIES INC.

In this period when technology is advancing Decently, robotics and coding skills are among the most valuable competencies of the future. CODLAI Technologies A.S. as such, we invite you to step into this exciting world.

Encode the Future with CODLAI
Our mission is to provide innovative, accessible and effective solutions to students and educators by using technology in education in the most effective way.

Be the Technology Leaders of the Future
We aim to educate the technology leaders of the future by increasing the quality in robotic coding and applied courses. With our constantly developing product range and educational materials, we offer practical and advanced technology-based educational tools that are suitable for the needs of students at all levels.

CODLAI Technologies INC.
"Innovative Solutions in Education, Strong Steps to the Future"

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