



Science

Technology

Engineering

Mathematics

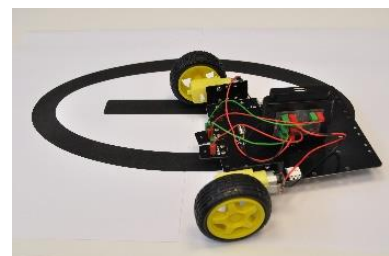
Robots

Coding

Makers

Sensors

Robotics Training Lab



NeuLog

About SES

SES Scientific Educational Systems develops, manufactures and markets worldwide educational training systems since 1982.

SES is a quality assured firm with of ISO-9001:2008 certification.

SES products cover study programs for:

Universities, colleges, vocational schools, high schools, secondary schools and primary schools.

SES products are off-the-shelf products and are course modular systems. They can be adapted to various types of study programs and laboratories.

SES has 4 product lines:

DEGEM Systems Professional training for universities, colleges and vocational schools.

NeuLog Logger sensors for science experiments and robotics systems for all schools.

MagiClass Response system with intuitive clickers for all schools.

MultiCenter Science, robotics, technology, art, music and language training systems for ages 5+.



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Sense Robotics in 3 stages

The Sense robotics builds innovation, creativity and coding skills in three stages.

Enjoy Coding with Sense

Sense is **Plug and code** robot with **RobocklySense** on PC or MAC.

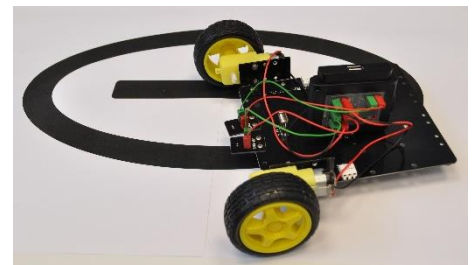
Provided in the **Sense** robot package are over 100 step by step lessons designed to bring coding to life with **RobocklySense** (visual block coding program).



No prior knowledge required. Complex subjects such as following walls, tracking other robots and autonomic car operation are made simple.

Practice Inventing with Sense-Make

Provided in the Sense-Make package Robot is the **Inventing Kit** – where students can start to plan and build their own robotics systems with control unit, sensors, brain units and other robotics components.



Acquire 21st Century Skills with Coding Units

Adding **Coding Units** to **Sense** and to **Sense-Make** with **high-level languages**:

Blockly Visual block coding program of Google.

Python High level programming language that works on any computer platform.

C language Programming language that creates fast machine programs.



Sense Modular Robot (stage 1)

Sense is a standalone modular robot with 6 sensors expand with **NeuLog sensors, IR Tracking unit, Brain Gripper** and more

Plug and code with RobocklySense on PC or MAC.

Add extra coding unit for programming in **Robockly, Python, C language, C Arduino.**

Add backup battery (power bank) for cordless movement.



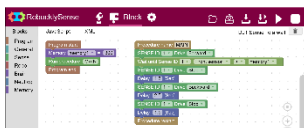
The SENSE includes:

- Base unit
- 3 connectors for NeuLog sensors or add-on units
- 5 IR range sensors
- A bottom line detector
- Shaft wheel
- 2 motors with wheels
- A controller and flash memory for the user programs
- USB communication cable

The **SENSE** robot is a tool to explore and solve coding challenges such as:

- Movement along black line or along walls.
- Movement along walls or in a labyrinth
- **Autonomic car** – movement in a labyrinth when other robots are also moving there
- Following a moving body holding IR transmitter using tracking module
- **Environment monitoring** and measurement robot with NeuLog sensors
- **Robot games** such as: football, catch me if you can, fighting robots

To a wall



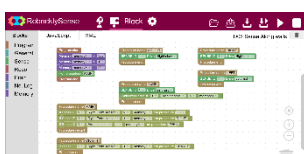
Along black line



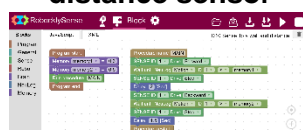
Along two lines



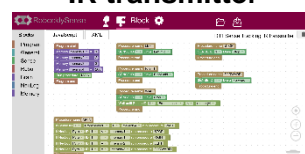
Along walls



To a wall with distance sensor



Tracking robot with IR transmitter



High Languages (Stage 3)

WiFi-203 – Wireless coding unit

WiFi-203 is an embedded Linux controller. It is a WiFi module housed in a rigid plastic packaging with colored label.

The module works wirelessly with any computer platform: computers, tablets, IPADs and smart phones.

The module has two connectors for communication with NeuLog sensors or with brain I/O units. The module includes flash memory used as hard disk for program files.

Programming languages: **Python** and full **Robockly**.



CARM-202 – C language coding unit

CARM-202 is a C language coding unit with 8 switches and 8 LEDs housed in a rigid plastic packaging and colored label.

CARM-202 can be also used as a stand-alone module for ARM microcontroller and for C language programming.

Programming languages: **C language**.



COM-202

COM-202 is an adapter card for the Arduino units plugged into one of the system's connectors (NeuLog sensor, SENSE robot or brain unit base) and through it to all the system's units.



The COM-202 card includes outlet wires for connecting to the communication and power terminals of the Arduino coding cards.

COM-202 comes with software functions that enable communicating with all the system units.

Programming languages: **C Arduino**.

Program in C language



Sense with WiFi and IPAD

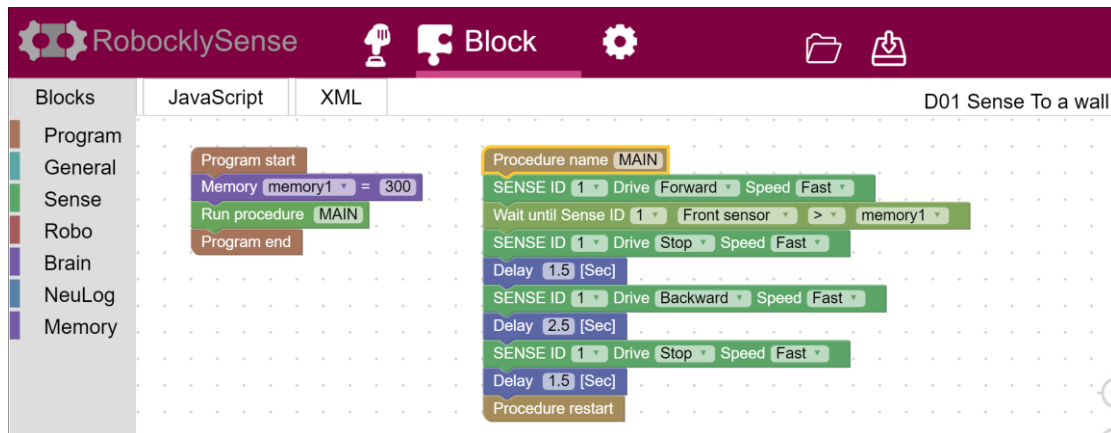


Robot with Arduino coding unit



Coding Languages

RobocklySense



The **RobocklySense** is a visual block programming editor. It uses blocks that link together to build a program instead of writing code texts.

The **RobocklySense** uses special blocks for NeuLog SENSE robots that read the inputs, operate its outputs and read any of the **NeuLog** sensors.

The **RobocklySense** is very friendly and it is easy to create and run robotics programs.

Robockly

Robockly has all **Blockly** (Google program) instructions, enhanced with SENSE instructions.

It has rich instruction sets such as loops, logic, mathematics, functions, arrays, text and variables.

Python

The **Python** is a very good high-level programming language that works on any computer platform.

It is excellent for programs with many functions and procedures that are limited in visual block programming languages.

C Language

C is a coding language for creating machine programs. These machine programs are fast and work directly with the system hardware components and not through interpreters as the programs above do.

Sense Add-on Units

SNS-101 – Brain Tracking Unit

SNS-101 Brain Tracking Unit is housed in a rigid plastic case, and is plugged into one of the SENSE sockets, with three IR (Infrared) sensors that enable tracking the IR transmitter.



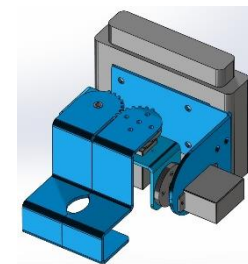
SNS-160 – IR Transmitter

SNS-160 IR Transmitter is an infrared transmitter that can be plugged into any of the SENSE sockets or in backup battery socket to be followed by the brain tracking unit.



SNS-167 – Brain Gripper Arm with servo motors unit

SNS-167 Brain Gripper Arm with 2 Servo Motors Unit is a brain unit housed in a rigid plastic case plugged into one of the SENSE robot sockets.



BAT-202 – Backup battery

BAT-202 Backup Battery is a rechargeable battery that can be plugged into any of the SENSE autonomous sockets or into any other NeuLog or SENSE unit for cordless operation.



NeuLog Series

The NeuLog Series includes over fifty different sensors designed for experimentation in chemistry, physics, biology and environment.

NeuLog Sensors may be linked to each other (as a chain) and create a network of sensors.

NeuLog sensors are designed as brain units and can be added to any Sense and Brain system.



ROBO-206 – Input output control unit

The ROBO-206 is an input and output control unit that connected by mini-USB cable to a computer and to receive power from the computer. No external power supply is required.



The module includes:

- 3 analog/digital inputs with LED indicators for passive sensors (switch, potentiometer, photo transistor, LDR, thermistor) reading.
- 3 bidirectional output ports with drivers and over current protection with LED indicators for driving motors and lamps.

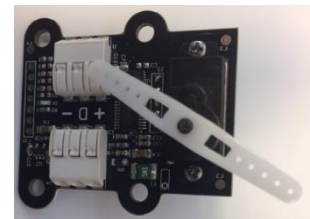
The module has two connectors for any NeuLog sensors and the smart I/O units.

The module includes flash memory for saving a program and can run independently when a standard backup battery is connected to it.

The ROBO-206 module also functions as USB module for NeuLog sensors.

SNS-161 – Brain Servo Motor Unit

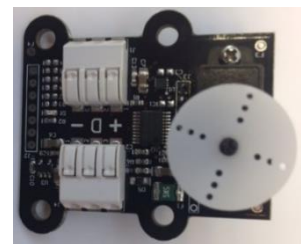
SNS-161 Brain Servo Motor Unit operates with the levers in a brain card and with two communication connectors; it can be connected in a chain to other brain units and to the ROBO-206.



The SNS-161 brain controls the lever angle according to the received message.

SNS-162 – Brain DC Motor with Gear and Wheel Unit

SNS-162 Brain DC Motor with Gear and Wheel Unit is a DC motor with a gear in a brain card and two communication connectors which can be connected in a chain to other brain units and to the ROBO-206.



The SNS-162 brain controls the motor speed and direction as programmed by the received message.

Recommended sets

Catalog No.	Description	Primary school (1-6)	Middle school (7-9)	High school (10-12)
SENSE	Sense mobile robot	10	10	10
SENSE-MAKE	Robot making kit		10	10
BAT-202	SENSE battery module	10	10	10
SNS-101	Brain tracking unit	10	10	10
SNS-160	IR transmitter	10	10	10
SNS-167	Brain gripper arm with servo motors		10	10
WIFI-203	Wireless Python and Robockly coding unit		10	10
CARM-202	C language coding unit			10

Sense Where to

Other Robots

- Walking robots
- Droid robots
- Flying robots (drones)
- Crawling robots

Add-On Brain Units

- Record and speaking
- Hearing and reacting to voice
- Arms and grippers
- Legs

Coding Units

- Bluetooth unit
- API for IOS applications
- API for Android applications
- API for PC and MAC applications

SES Training LABs

The training labs are based on learning-by-doing, which makes the students learn more quickly and remember what they have studied by performing practical experiments. They provide the students high profession skills and the knowledge on how to improve their chance of employment and earning capacity.

The manuals and courseware that accompany each course provide the theory background and experiments.

Electronics Training Lab

This modular laboratory is aimed for the **Electronics** profession, but also for technology disciplines that are also based in electronics, such as: **Electricity, Mechanics, Automotive, Robotics, Automation, Process control.**

Autotronics Training Lab

This modular laboratory is aimed for the five stages that comprise the automotive program: **Basic and automotive electronics, Car sub-systems simulators, Car sub-systems demonstrators, Car diagnostic and troubleshooting methods, Troubleshooting faults in a real car.**

Mechatronics Training Lab

This modular laboratory is aimed for the mechatronics program which includes the following disciplines: **Basic electronics, Pneumatics systems, Hydraulics systems, CNC machines.**

Refrigeration and Air-Conditioning Training Lab

The Refrigeration and Air-Conditioning training lab covers actual components and their interconnection, related functions, operation, diagnosis and repair methods through safe, hands-on practical activities.

Technology Preparation Training Lab

The Technology Preparation (Tech Prep) laboratory is a classroom-integrated laboratory consisting of educational modules covering a wide range of subjects such as: **Green energy, Computerized systems, Basic electronics, Basic communication, Mechanical systems.**

Science Training Labs

These laboratories (for primary, secondary and high schools) introduce the students to the computerized sensors world, **nature and industry processes** and **nature laws**. It will help them understand modern technologies such as: **home and medical appliances, wearing sensors, precise agriculture** and more.

Robotics Training Labs

The robotics programs (for primary, secondary and high schools) help students to build innovation and creativity skills. The idea is to make the students understand how systems work, to believe that they can improve them and be able to realize their ideas.

MultiCenter Training Lab

The MultiCenter offers a variety of selected interactive learning environments, with a large range of topics and activities such as: **Science, Technology, Graphic Design, Digital Music, Robotics, Computer Technologies** and much more for all sectors of society, cultures, different socio-economic groups and different age groups – from very young children to senior citizens.



Scientific Educational Systems



www.degem.com



www.NeuLog.com



www.magiclass.com



www.multicenter.co