EDUCATIONAL ROBOT

CAN is used as embedded network

DJI (China), known as drone and aerial imaging provider, has launched the Robomaster S1 ground-based robot. It comes with an embedded CAN network.

The Robomaster S1 looks like a toy for war games, but is marketed as educational robot (Source: DJI)

The Chinese supplier has introduced the robot featuring brushless motors, a chassis that can move in all directions, a high-precision gimbal, and interactive modes for programming, play, and fight competition. Users can assemble their own hardware, can learn to maneuver the rover, and can program the robot using Python or Scratch. Frank Wang, DFI's founder said: "We developed the Robomaster S1 with the next generation of innovators in mind, making robotics, and programming not just more accessible but also an entertaining and academic experience."

The S1, short for "Step 1", provides a rover designed to give new users an introduction to artificial intelligence (AI), engineering, and robotics. With simple controls, a dedicated Robomaster app, navigable menus, and tutorials, the S1 is approachable to newcomers while offering features to users already experienced in AI, engineering, and robotics.

The robot is equipped with 31 sensors to help map the world around it, including six on its body armor, which are used to detect hits. Atop the durable robot frame is a first-person view (FPV) camera that sends a stabilized live feed from the robot to the provided app. The robot is modular with DJI parts and also includes six PWM (pulse width modulation) ports so advanced users can take advantage of third-party hardware.

Using the FPV camera and machine vision technology, the robot can identify different objects automatically, recognize and respond to sounds, and receive signals from other S1 units. The central processing unit and the CAN network enable it to process large amounts of data, maintaining a stable transmission signal even while performing multiple tasks. Along with its brushless motor, the robot has four wheels, each with 12 rollers that allow omnidirectional movement and precision control while operating.

The robot is equipped with machine vision technology, enabling users to get hands-on experience with real-world applications. It can perform six recognition functions:

- Line Follow: Create an interactive course and map out the path desired for the robot; program Line Follow through the app and the robot automatically follows the line.
- Vision Marker recognition: The robot can recognize up to 44 Vision Markers, including numbers, letters, and special characters, which opens more potential for coding, combat, and training.
- Follow Mode: Built into the app, the robot can identify and follow a person selected in the robot's field of vision.
- Clap recognition: A built-in clap recognition module on the robot can be programmed for responses based upon clap quantity.
- Gesture recognition: The robot can be programmed to recognize an array of physical hand gestures similar to some DJI drones.
- S1 recognition: The robot can recognize other S1 units and perform movements based on how it is programmed.

Users looking for more advanced functions can write Scratch 3.0 or Python code to program their own robot functions, from how it moves, to increasing efficiency and optimizing the torque of the four wheels. Built into the provided app, users will have access to "Road to Mastery," a project-based course series to educate S1 owners on programming languages.

DJI has invested in robotics education since 2013 with the introduction of the Robomaster competition. The launch of the robot marks DJI's first step into the robotics education field, supported with courses, educational materials, events, and hardware.

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