FC-51 Infrared IR Obstacle Avoidance Sensor Board 3 Pin

The **FC-51 Infrared (IR) Obstacle Avoidance Sensor Board 3-Pin** is a compact and reliable sensor module designed for robotics, automation, and electronic projects that require real-time obstacle detection. Utilizing infrared technology, this sensor detects objects in its path without physical contact, making it ideal for line-following robots, collision avoidance systems, automated vehicles, and smart home applications.

Advanced Infrared Obstacle Detection

The FC-51 sensor works by emitting **infrared light** from its IR LED transmitter and detecting the reflected light with its photodiode receiver. When an object comes within the sensor's detection range, the amount of reflected infrared light increases, triggering the sensor's output. This allows devices to detect obstacles quickly and respond in real-time, providing smooth operation for robotics and automation projects.

Simple 3-Pin Interface

The sensor board features a **3-pin interface** consisting of **VCC, GND, and OUT**:

- **VCC**: Connects to the power supply, typically 3.3V to 5V.
- **GND**: Ground connection for stable operation.
- **OUT**: Digital output that goes HIGH or LOW depending on whether an obstacle is detected.

This simple interface makes the FC-51 easy to integrate with popular microcontrollers such as **Arduino, Raspberry Pi, ESP32, and STM32**, allowing fast and efficient prototyping without complicated wiring.

Adjustable Sensitivity

One of the key features of the FC-51 sensor is the **potentiometer for sensitivity adjustment**. Users can fine-tune the detection range according to their project requirements, ensuring reliable performance whether detecting small obstacles or larger objects. This flexibility is particularly useful in robotics applications where different detection distances are required for navigation or collision avoidance.

Versatile Applications

The FC-51 Infrared Obstacle Avoidance Sensor is highly versatile and can be used in a wide range of projects, including:

- **Obstacle Avoidance Robots**: Enable robots to navigate around objects autonomously.
- **Line-Following and Path Detection**: Assist in following paths or detecting edges on a surface.
- **Automated Vehicles**: Integrate into small-scale automated cars or drones for real-time obstacle detection.
- **Smart Home Devices**: Detect motion or prevent objects from hitting sensitive areas in smart appliances.
- **Educational and DIY Projects**: Perfect for students and hobbyists learning about sensors and robotics.

Compact and Durable Design

The FC-51 module is small, lightweight, and easy to mount on robotic platforms, enclosures, or project boards. Despite its compact size, the sensor is durable and capable of withstanding repeated use in experimental, educational, or hobbyist environments. Its stable performance ensures reliable readings even in varying lighting conditions.

Easy to Use

Using the FC-51 sensor is straightforward. Simply connect the **VCC and GND pins** to the microcontroller's power and ground, and the **OUT pin** to a digital input pin. When an object enters the detection range, the output pin switches state, allowing the microcontroller to trigger events such as stopping a motor, changing direction, or activating an alarm.

Key Features

- Infrared emitter and receiver pair for precise obstacle detection.
- 3-pin interface: VCC, GND, and digital OUT pin.
- Adjustable detection sensitivity with onboard potentiometer.
- Detection range: typically 2cm to 30cm (adjustable).
- Compact and lightweight for easy integration into projects.
- Low power consumption and stable operation.

Package Contents

- 1x FC-51 Infrared IR Obstacle Avoidance Sensor Board 3-Pin
- 1x Instruction guide for basic integration and setup

Why Choose the FC-51 Sensor

The **FC-51 Infrared Obstacle Avoidance Sensor Board 3-Pin** is an essential component for robotics and automation projects. Its combination of precision, ease of use, and compact design makes it perfect for both beginners and advanced developers. Whether you are building autonomous robots, automated vehicles, or smart devices, the FC-51 provides reliable and accurate obstacle detection, helping your projects operate smoothly and efficiently.

Investing in this sensor allows makers and developers to implement real-time obstacle detection, improve navigation, and expand the functionality of their robots or automated systems. Its versatility and affordability make it one of the most popular IR obstacle sensors in the maker and robotics community.