

# Remotely Operated Video Enhanced Receiver

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**Abstract:** The "Remotely Operated Video Enhanced Receiver (ROVER) is a versatile system designed for remote environmental monitoring and data acquisition, tailored for challenging terrains, including extraterrestrial surfaces such as the Moon. The project integrates multiple sensors and a real-time video system to provide precise and actionable insights. A soil moisture sensor detects the presence of water or moisture in the substrate, triggering an LED to blink as an indicator. Additionally, a smoke and gas detector identifies harmful gases or smoke in the air, with an LED notification to alert the user to environmental hazards. These features make the system highly effective for monitoring and exploration in remote or hazardous environments. The system also employs an LDR (Light Dependent Resistor) to automatically activate the solar panel, optimizing energy usage by harnessing sunlight when available. A camera module provides real-time video streaming and recording capabilities, enabling visual observation of the surroundings. Designed for remote operation, ROVER offers a practical solution for applications such as planetary exploration, environmental hazard monitoring, and autonomous research operations. The integration of sensors with automated alerts and video recording enhances its usability and reliability for various scientific and industrial purposes.

**Keywords:** Motor Driver L298, Soil moisture sensor, Gas detector sensor, LED indicators, PCB Tx and Rx, Solar panel automation, Camera, DC Motors