

Background

All security cameras that dominate the market have wires. Due to the need for cable routing, installation costs make security systems too expensive for most consumers. However, current cableless options, such as the EyeTrax Ranger system, cost upwards of \$2,000, not including monthly cellular data connection fees. The FLIR Helios is a cableless low-cost alternative to these security cameras which integrates solar power and WiFi capabilities to remove nearly all cabling.

Overview

The low power infrared (IR) Lepton and the FUJI visual cameras allow the Helios to provide 24/7 security, while being powered solely by the sun. When not streaming video, the Helios enters a low-power sleep cycle to conserve energy. A website and Android application give the customer the opportunity to view a live stream or 80 hours recorded video. The Helios will sell for about \$500 and due to its simple installation the secondary costs are negligible.

Design Specifications

Engineering Characteristic	Target Spec (Minimum requirement)	Target Spec (Ideal)	Design Spec
Submerged in 1m Water	30 min	30 min	30+ min
Minimum Solar levels	2.9 hours/day	2 hour/day	<ul style="list-style-type: none"> Failed with 2W solar panel To be tested with new solar panel
Temperature Range	-20 to +50 °C	-30 to +60 °C	Max +53°C
Weight	15 pounds	10 pounds	3.6 pounds
Connectivity	WiFi	Extended WiFi	WiFi (25m)
Battery Life	2.5 hours	10 hours	3.7
Price (in bulk)	\$700	\$200	\$500

The FLIR Helios



Figure 1

Solidworks Render of the FLIR Helios

Hardware / Key Components



Camera Enclosure

The enclosure is designed to be injection moldable, and IP67 water and dust proof.



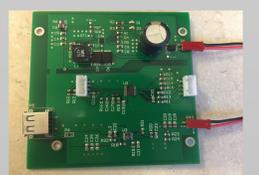
Faceplate

This plate will be made from acrylic to allow the PIR sensor to detect outside the camera domes. Ribbing increases the surface area to allow for a watertight seal with 3M's VHB adhesive tape.



Custom Flex Cable

Two 30-pin adapter boards allow for camera module mobility. Traces contain both differential pairs and I²C signals.



Power Board

This board includes the solar charge controller, DC-DC converter, and outputs to the battery.

System/Assembly Overview

The enclosure is designed for easy assembly in production though it contains many parts. An overview of major components and how they fit together is shown in the diagram below, *figure 2*.

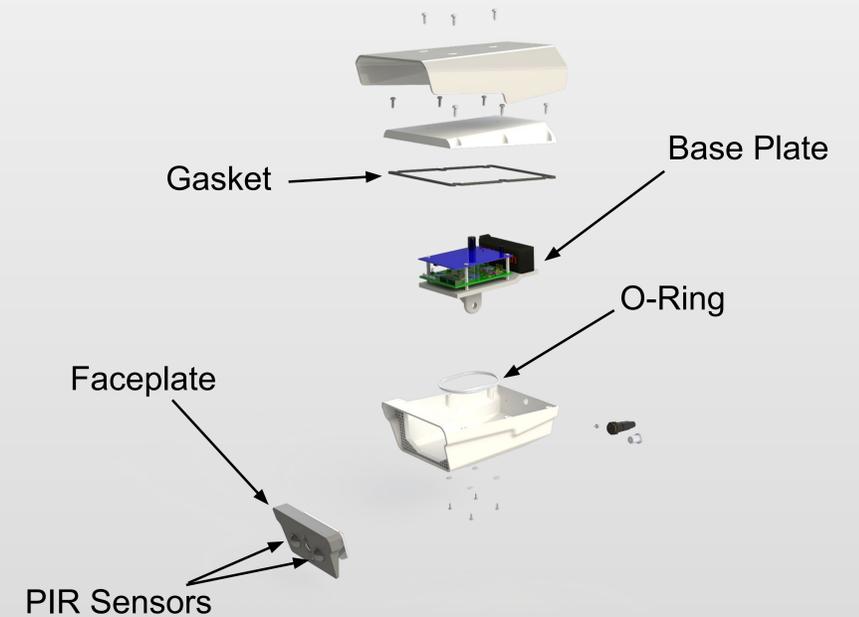


Figure 2 : Camera Assembly

Connectivity



The Helios seamlessly connects to a Wi-Fi network, allowing for the user to view live video from the web or an Android phone.

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