

**Hikvision**  
Solar Camera  
Low Power  
Surveillance  
Technology

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## BACKGROUND

Many regions across the U.S. and the world are home to vast and sparsely populated areas. The outdoor environment in these regions needs to be monitored via network security cameras. However, it is hard to achieve due to the expensive cost of wiring cables. In many urban areas, the construction and labor cost of wiring are very expensive due to the large number of historical buildings and streets. At the same time, stakeholders still want to monitor the area and provide surveillance coverage for roads, garbage stations, and perimeters with wireless products. As a result, network cameras that can transmit data wirelessly without a power supply after installation help to support these applications.

The Hikvision Solar-Powered Security System provides a standalone wireless surveillance system that uses low power technology. In this white paper, we will delve deeper into how this low power technology works to provide remote area surveillance without straining the system's battery power.

## LOW POWER TECHNOLOGY INTRODUCTION

Low power technology means the power consumption of the camera is much lower than a traditional security camera. Low power surveillance technology in the Hikvision Solar-Powered Security System is mainly achieved with lower power consumption by the chip, the reduced frame rates of the video, and switchable work mode of the module, while keeping the camera responsive to events. The following are some of the schemes applied to achieve this:

### 1. Lower System On Chip (SOC) GHz

SOC refers to the G5 platform chip built into the Hikvision Solar-Powered Security System, also referred to as the "chip" in this white paper. When the camera's chip is powered on and working, the frequency of the chip is lowered, which reduces the power consumption of the camera. At the same time, the chip responds to the user's request to operate the device in real time. After reducing the power consumption, the operating power consumption of the chip can be reduced by about 20%. When in standby mode, the power consumption of the SOC can be omitted.

### 2. Low Power Hardware Design

- » A major SOC with high performance and low power consumption is applied, delivering high computing capacity with low power consumption.
- » The network module with high performance and low power consumption is applied, together with the ability to maintain a "heartbeat" in the standby mode, and switches between the working modes to efficiently save power consumption.
- » A high-performance microcontroller unit (MCU) is applied to support multiple power consumption modes, and work with an ultra-low static operating current. The power supply strategy is also of high efficiency, improved by more than 15% compared with that of traditional security cameras, as the power supply of each module is controlled by the MCU intelligent management, preventing unnecessary power usage.

## LOW POWER TECHNOLOGY INTRODUCTION (CONTINUED)

### 3. Standby Mode

Hikvision's Solar-Powered Security Camera has three power modes: performance mode, proactive mode, and standby mode. In standby mode, the camera maintains its network module and keeps a heartbeat only, it does not transmit data unless it is woken manually or by event detection. When in standby mode, the overall power consumption of the camera remains between 0.01-0.1 watts.

After the user configures and sets the event detection, the camera will be able to capture event pictures in standby mode, which then wakes up the network module to send this captured image to the connected server. Likewise, when the user initiates a request to operate the device on the Hik-Connect client or other client server, the network module will be awakened to respond to the user's request. After the user stops accessing the device, the network module goes back to standby mode.

### 4. Configurable Threshold of Standby Mode

The configuration parameters for standby mode ranges from 15 to 50% of battery, and the default value is 20%. The user can configure this parameter. When the actual power is lower than the parameter set by the user, the camera will enter extremely low power mode (the standby mode), which can effectively reduce the operating power consumption by dynamically adjusting it within the camera.

### 5. Configuring Scheduled Standby Mode

Scheduling standby mode can be configured to capture pictures at certain intervals, thereby improving efficiency. Up to eight periods of standby mode can be configured per day, and the default configuration is none. During standby mode, the wake-up interval can be configured, and the default interval is 30 minutes. After entering the standby period configured by the user, the camera enters a sleeping state, and the MCU establishes a connection with the Hik-Connect server or other server through the heartbeat of the network module to keep the camera responsive upon request.

## LOW POWER TECHNOLOGY INTRODUCTION (CONTINUED)

### 6. Supports Storing Local Video and Pictures on eMMC/SD

The locally recorded pictures and timed snapshots are supported for storage in either an eMMC (embedded multi-media) or an SD card.

### 7. Quick Imaging for Live View

By introducing ECM dialing – a popular network connection dialing method that is more efficient than traditional PPP – the dialing function is optimized. With the speed accelerated, dialing can be completed within 6 to 7 seconds. When powering on, the microcontroller unit (MCU) controls the hardware pins and powers on the camera. The system establishes a connection with the server in a short time to respond to the user's requests for a preview, parameter configurations, and more. This way, the system running time is reduced and the user experience is improved. When processing user requests, the system will prioritize core functions such as imaging and alarming, optimizing the startup process, and reducing the time to begin the imaging process (shortening the overall time duration for waking up the network module to provide a live image in a short time period).

### 8. Battery Power Reporting Platform

The battery power reporting platform can perform power calculations, analyze power consumption trends, and then adjust the orientation of solar panels or the overall working mode strategy to increase running time. Running time is the actual working time of the camera's battery life. For example, you may change the work mode or the direction of the solar panel so that the camera can last longer in bad weather.

**To learn more about Hikvision's Solar-Powered Security System, contact your local representation or visit this link: <https://us.hikvision.com/en/catalogs-brochures/flyers>.**



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