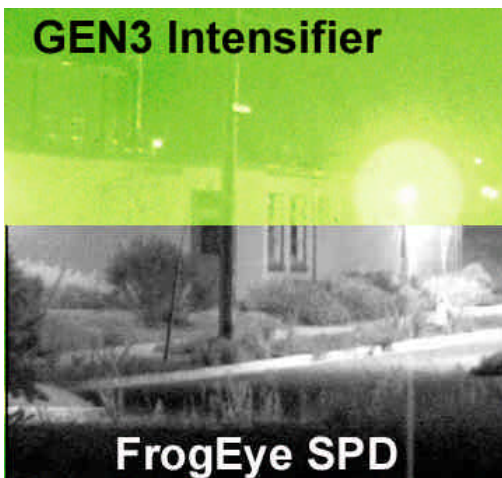




Operational Advantages for Field Reconnaissance, Surveillance, Science and Photojournalism

**Application Note
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FrogEye™ is task optimized for field work including military / law enforcement reconnaissance and surveillance requirements, scientific observations and demanding photojournalism. This application note takes a look at FrogEye™ technology from a users and mission planner's perspective, explaining how the system's features can enhance both the probability of success and the quality of data obtained during intelligence and scientific data gathering operations.



Improved Data Quality Day and Night

FrogEye™ is a dual-sensor camera including a so-called 'Single Photon Detector' (SPD) for night operations. The SPD offers a night vision capability comparable in use to common intensifier tube based devices such as NVG, but with significant performance advantages. Standard intensifier technology yields a limited resolution and contrast largely independent of light levels. FrogEye™ offers superior contrast and a resolution that improves when light levels increase. At illumination similar to what might be encountered when observing a fixed installation, detail recognition is improved by a factor of 3X-4X over intensifier technology. That means better data is available at a given stand-off distance, or alternatively the stand-off distance can be much larger. SPD technology also is day-use capable, thus providing a single solution for 24-hour observations. FrogEye™ further incorporates a number of technologies that strongly reduce haze, minimize motion blur and counteract camouflage, techniques that often reveal critical detail that may otherwise have been lost.

Ease of Operations in Difficult Environments

Standard cameras and optics capable of long-standoff work commonly require protection against impact, water and dust. That tends to preclude observations from more challenging but possibly advantageous locations. For example, it might not be practical to cross a river, climb up a steep rock wall or tree or conduct diver based long-standoff observations of a shoreline or other targets from sea. The inherently water/dust proof and impact resistant FrogEye™ camera however can be carried anywhere without further protection, placed on the ground and kept ready at all times. It is thus easily transported to any location. In particular significant for long-standoff work is its unique FL-400 lens. This light-weight and rugged telephoto lens collapses for transport and admits water when submerged. Upon surfacing, the water quickly drains and the camera is ready for use. This capability is of course useful for common requirements such as fording rivers. However, a diver can also operate the system to conduct observations from sea. During tests, divers were able to surface, aim, acquire a series of images and submerge again in the span of 15 seconds.



**House at 1km distance imaged
by diver using FL-400 lens.**

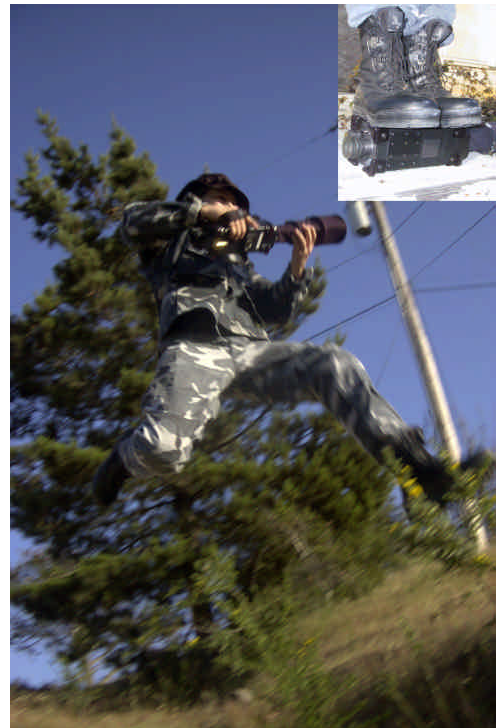


Manpower Savings Using Remote and Autonomous Modes

In addition to its hand-held mode, FrogEye™ can operate remotely or unattended. Currently available are wired remote operation from a PC over a thin twisted wire pair (up to 1.2 km) and unattended operation using a pre-programmed time schedule (a single image or a motion sequence is acquired in regular intervals). Upcoming are wireless remote operation via commercial long-distance RF modems and Harris Falcon military radios, as well as autonomous operation with automatic sensing of activity either by camera image evaluation or external sensors such as seismic, light barriers or sound. These capabilities support the monitoring of multiple sites from a safe or convenient location. While remote operation is a common video capability, FrogEye™ offers advantages of higher resolution, and day/night operating support. Installation and use is simplified due to more and less complex transmit options, lower power consumption and soon the camera's ability to detect and alert significant activity automatically.

Improved Data Survivability and Operational Risk Reduction

Ease of equipment use and equipment reliability obviously is a major factor contributing to the chances of success of field operations and the quality of data obtained. During demanding, exhausting or dangerous field operations in particular, any gear that requires a lot of operator 'brain cycles' for ensuring its protection and getting it ready for use is problematic. FrogEye™'s 'outdoor gear' design philosophy has proven to be of great advantage in the field. When compared to other cameras, FrogEye™ is quickly ready when needed, much easier to carry and much easier to maintain. The greater stand-off distance available on account of the FL-400 optics and high-resolution SPD night vision reduces risk to personnel in hazardous assignments. Desert Star employs a permanent field test program, verifying and optimizing use and survival capabilities of the camera system under a variety of conditions.



FrogEye™ Field Tests



FrogEye FC-2 Equipment Set