

Inexpensive Low Light Camera Prototype Efforts

Category: Optical Subsystems

Problem Statement: SOF desires optical subsystem designs for small modular camera(s), for use in extreme low light across a family of tactical ground Intelligence, Surveillance, and Reconnaissance (ISR) systems. The prototype cameras will be integrated onto reconnaissance and unattended ground sensor kits in time for a demonstration at a test event one year following.

Operational Use Scenario: The camera(s) will be used to detect and possibly classify activity (personnel, animal, vehicle, etc.) at range in a ground ISR mission during a moonless night. The camera will be used by human-in-the-loop and autonomous machine vision software.

General Conditions: Moonless nights

Unique Conditions: Systems will be subjected existing weather conditions such as solar load, rain, snow and wind.

Standards/Desirements:

1. The contractor shall propose and provide the sensors, lenses, enclosures, connectors, support electronics and software capabilities to support the easy integration of cameras via standard interfaces to kits.
2. Solutions will be assessed according to the following specifications. Submissions do not need to meet all of the desired technical parameters.
 - Use existing high resolution/high sensitivity sensors with capabilities that can approach or meet US Army Integrated Visual Augmentation System (IVAS)
 - Video output over SDI and TCP/IP (Ethernet)
 - Adjustable compressed video stream using standards such as RTSP, h.264 and h.265
 - Capable of being powered by Power over Ethernet
 - If the selected camera system itself is not already rated at IP68, it will be enclosed in a lightweight, waterproof enclosure
 - Camera control will be through commercially available standardized protocols such as VISCA, ONVIF, or others
 - Desired SWAP:
 - Size: 55 X 35 X 35 mm up to 115 X 75 X 75 mm (without lens)
 - Non PoE power input: Desired is 5 to 36 VDC, minimum acceptable is 10 to 16 VDC
 - Power consumption: Desired is 1W, minimum acceptable is 12W
 - Weight (camera core): Desired is 100g, minimum acceptable is 500g
 - Fast boot/Super low power sleep mode to enable rapid output from a zero or very low power state
 - Capable of using standard tripod mounts
3. Cost is an independent variable. Desired cost ranges from \$500 to \$5,000.

4. System Architecture Design

- Camera should either have user swappable lenses with an existing standard mount, or a family of fixed lenses available while keeping the rest of the camera the same.

5. Supply Chain Disclosure. Interested vendors must disclose the source of origin for manufacturing materials.