

# CASE STUDY

## OPTOELECTRONIC INTERCONNECTS FOR SHIPBOARD ETHERNET & VIDEO



### The Customer's Challenge

Security and safety of large ships have become a critical issue in recent years, necessitating the monitoring of the waters immediately surrounding the ships for incoming threats. Mounting a forward-looking infra-red (FLIR) camera system at the bow of the ship would provide an excellent monitoring solution; however, the distance from the bow to the control deck was too far to run the HD-SDI video and Ethernet over standard copper cables due to electromagnetic interference (EMI) and signal integrity problems. Therefore, the prime contractor installing the system turned to the Inneos ruggedized active optical cables (AOC) to provide a cable run up to 100m.

### The Design Solution

The Inneos family of active optical cables are highly ruggedized, wide temperature modules that support a wide range of protocols, including HD-SDI video, HDMI video, 10/100/1000 Ethernet, RS-422/485, and TTL control. The active optical cables were designed to interface with standard copper connectors of the existing FLIR systems since the electrical-to-optical conversion is performed in the backshell of the AOC. This eliminated the need to redesign and requalify the host systems which reduced the cost of the solution and shortened the timeline to implementation. For this application, the HD-SDI video, Ethernet and RS-422/485 signals were transmitted over multimode fibers, which did not exhibit any signal degradation over 100m and were immune to EMI, which was particularly important in the noisy electrical environment onboard the ship.



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To meet the needs of the prime contractor, Inneos supplied AOCs with ruggedized 38999-style connectors for both the electrical and optical connectors, which then allowed the long-run of fiber cable to be pulled through the conduit onboard the ship. Inneos also designed interface cables so that the AOCs could connect directly to the standard camera system connectors based on the specific pinout. The ruggedized, environmentally-sealed backshell design allowed the AOC cables to be deployed directly on the mast with camera system.



### The Results

The Inneos active optical cables allowed the video to be run completely uncompressed with outstanding signal quality over the long-distance from the bow to the control room onboard the ship. The video quality and Ethernet control signal integrity far exceeded the expectations of the captain and crew, such that once the system was installed for the test deployment, they kept it for subsequent operational deployments. Pairing the Inneos ruggedized active optical cables with the forward-looking infra-red camera system provided enhanced operational safety and security for the ship and crew.

