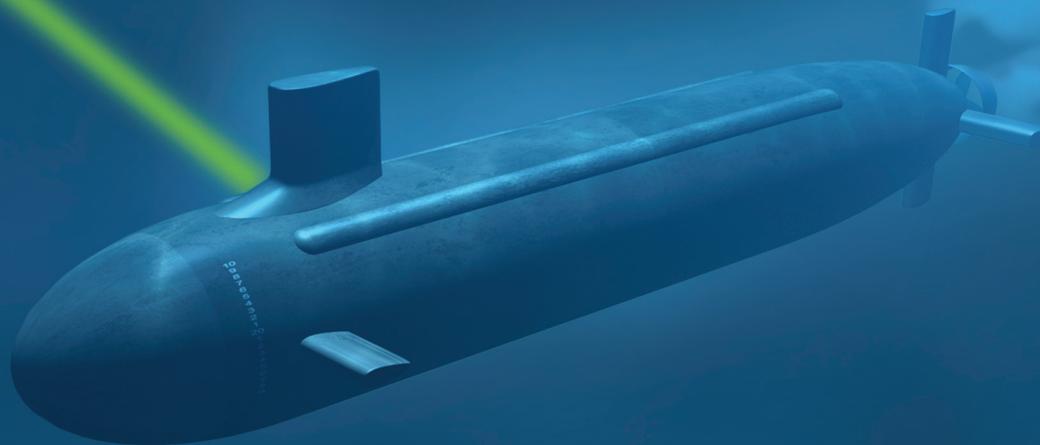
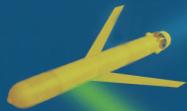


NEPTUNE UNDERWATER OPTICAL COMMUNICATIONS



NEPTUNE™

SA Photonics' Neptune™ is a compact, low-power, high data rate underwater optical communication system for any underwater environment, including littoral and deep ocean environments.

SA Photonics

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NEPTUNE™ UNDERWATER OPTICAL COMMUNICATIONS

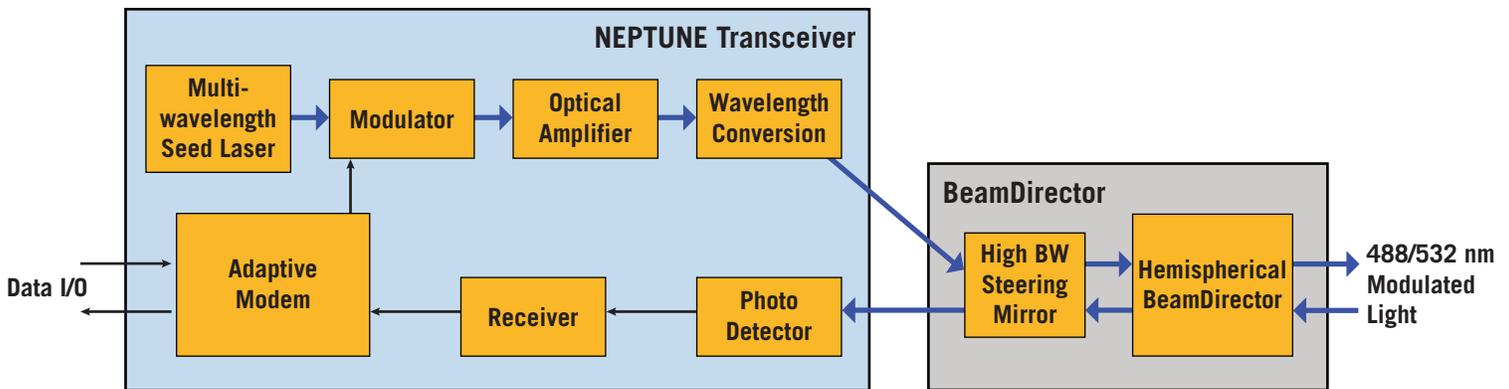
SA Photonics has developed Neptune™, a low-power, compact, high data rate system for underwater communications and data transfer in both littoral and deep ocean environments. Optical communications can provide significant benefits when transmitting data underwater, including substantially higher data rates, reduced loiter time, and increased stealth and safety.

Neptune™ consists of a flexible laser transmitter that provides adaptive modulation capability based upon water conditions and link distance. Coupled with a highly sensitive optical detection system, Neptune™ offers a very robust and reliable communications

link. Data rates up to 250 Mbps at distances up to 200 m are supported, depending on water turbidity.

Neptune™ is also equipped with SA Photonics' innovative BeamDirector system for full hemispherical beam steering and high bandwidth closed loop beam tracking to accommodate reliable communications in the presence of platform vibration and movement, even in rough seas. Acquisition between two nodes is automated so that operation is simple and fast.

SA Photonics is a pioneer in the development and deployment of innovative photonics solutions for commercial and defense applications.



SPECIFICATION CHART

Parameter	NEPTUNE Performance
Wavelength	532 nm / 486 nm
Transmit Power	> 5 W (average)
Data Rates	10 - 250 Mbps
Modulation	Offset QPSK, PPM
Path Loss	> 110 dB
Operating Distance	10 - 200 m
Beam Tracking	Full Hemispherical
Tracking Bandwidth	> 200 Hz
Acquisition Time	< 1 min