Sonardyne
SOUND IN DEPTH

SUBSEA TECHNOLOGY

BlueComm is a through-water wireless optical communication system, developed to transmit subsea data, stream video and perform tetherless vehicle control at very high speeds. The BlueComm modem family is currently made up of four variants. Our entry level BlueComm 100 offers a good balance between data rate and range. BlueComm 200 sends data at up to 10 Mbps and is suitable for deep or night time operations. BlueComm 200 UV is best suited for ROV or AUV applications that require the use of artificial lights, for example, when recording video. The dual laser configuration of BlueComm 5000 supports data transfer rates of up to 500 Mbps.

SONARDYNE BLUECOMM
UNDERWATER WIRELESS OPTICAL COMMUNICATION SYSTEM

TECHNOLOGY OVERVIEW

BlueComm uses the electromagnetic spectrum rather than acoustic pressure waves to transmit high volumes of data. Typically operating in the 450nm Blue Light region of the spectrum, BlueComm can achieve data rates of greater than 500 Mbps. Optical data transmission is highly efficient, enabling 1 Gb of data to be transmitted with the energy contained within a single lithium D-sized cell over distances greater than 150 metres.

As a high speed communication platform, BlueComm is an Ethernet connected device allowing plug-and-play connectivity to clients' own subsea networks. As such, this allows for easy expansion of pre-existing networks, increasing productivity by increasing speed. Its flexible system architecture, means that BlueComm can be integrated with Sonardyne's comprehensive array of acoustic navigation, control and monitoring devices.

Complementary Sonardyne acoustics communications provide long range (>4 km), low bandwidth command and control. This capability enables functions such as data recording to be turned 'on' and 'off' remotely from the surface, and health or QC information to be transmitted.

BlueComm 100 uses an array of high power light emitting diodes (LEDs) that are rapidly modulated to transmit data. The receiver uses photodiodes allowing peak performance in all lighting conditions, including very shallow 'high ambient light' conditions. Both the receivers and emitters are packaged into a small 5 kg unit rated to 4,000 metres. Delivering 5 Mbps at 10 metres range, BlueComm100 is a short range, highly reliable solution.

WHAT YOU NEED TO KNOW

➜ 1-500 Mbps rates achievable

➜ Up to 150 metre operating range

➜ Depth ratings to 4,000 metres

➜ Enables fast and efficient data recovery via AUV, ROV or surface deployed dunking system

➜ Integrated long range acoustic communications and positioning

➜ Highly energy efficient communications provides long battery life

➜ Compatible with standard subsea Ethernet networks

➜ Can be integrated with long range acoustic communications and positioning systems

BlueComm 200 also uses an array of rapidly modulated LEDs but has a separate photomultiplier tube as its receiving element. The photomultiplier tube allows a much more sensitive receive capability allowing communication ranges of up to 150 metres. Due to the sensitivity of the photomultiplier receiver, the emitter is packaged separately to prevent interference. BlueComm 200 is excellent as a long range remote to ROVs.

BlueComm 200 UV is very similar to the BlueComm 200. It operates at a shorter wavelength in the UV spectrum meaning it has higher tolerance to visible light. The system is capable of operating at ranges of up to 75 metres. The UV system is ideal for AUV and ROV operations where light sources are used to illuminate the scene and may be in the line of sight of the modems. It ensures a consistent performance regardless of the visible light conditions in the environment.

BlueComm 5000 uses two rapidly modulated off frequency lasers to produce simultaneous bi-directional communications. The equipment is optimised for peak data transfer performance with transfer speeds of 500 Mbps being achievable. BlueComm 5000 is excellent at large data offloads from deployed sea bed nodes or fast 'fly-by' data collections by field resident AUVs.

BLUECOMM SUMMARY SPECIFICATIONS

BlueComm 100

Light Source	LED, integrated Transmitter and Receiver
Range	10 metres maximum
Bandwidth	1-5 Mbps data transfer rates
Operating Scenario	Optimised for all lighting conditions
Optics	Custom beam patterns and wave lengths
Communications	Ethernet connected

BlueComm 200

Light Source	LED, separate Transmitter and Receiver
Range	150 metres maximum
Bandwidth	2-10 Mbps data transfer rates
Operating Scenario	Optimised for maximum range
Optics	Custom beam patterns and wave lengths. White light emitters to prevent ROV lights from interfering with transmission
Communications	Ethernet connected

BlueComm 200 UV

Light Source	LED, separate Transmitter and Receiver
Range	75 metres maximum
Bandwidth	2-10 Mbps data transfer rates
Operating Scenario	Wireless AUV or video recording
Optics	Custom beam patterns and wave lengths
Communications	Ethernet connected

BlueComm 5000

Light Source	Dual laser based
Range	7 metres maximum
Bandwidth	Up to 500 Mbps data transfer rates
Operating Scenario	Optimised for fastest data transfer
Optics	Focused beam pattern
Communications	Ethernet connected

Options and Accessories

	Subsea network cameras
	In-sync light sources
	Subsea networks switches
	External battery packs
	Integrated acoustic positioning and telemetry
	Data loggers

BlueComm modems
BlueComm is a wireless, high speed optical communications technology that can transfer data underwater at broadband speeds. Data rates of 500 Mbps can be achieved.
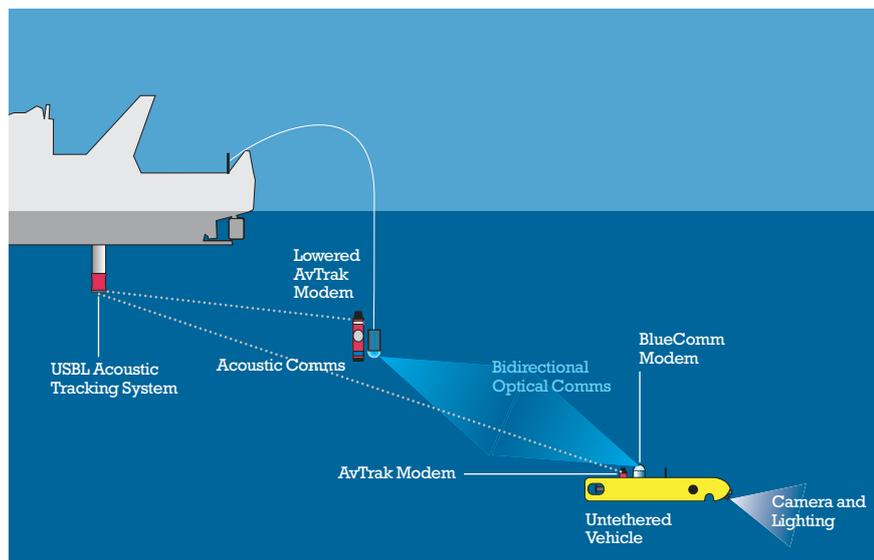

BlueComm 200
BlueComm 200 uses modulated LEDs and a separate photomultiplier tube as its receiving element.

System monitoring
Diagnostic software allows the status of a BlueComm communications link to be monitored and optimised in real-time.
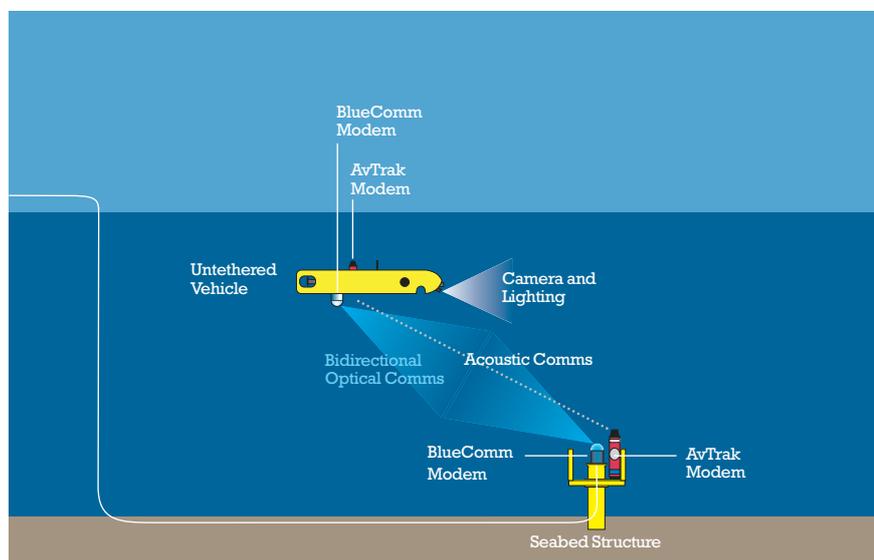
EXAMPLE BLUECOMM APPLICATIONS

Tetherless Vehicle Command and Control

BlueComm allows a high bandwidth link to an untethered vehicle making difficult ROV manoeuvres simpler. The link is capable of returning all control data as well as multiple video streams across an area of over 7 million cubic metres.

AUV Data Collection

BlueComm allows autonomous vehicles to wirelessly communicate with seabed structures retrieving high volumes of data while still maintaining an acceptable safety stand-off distance.
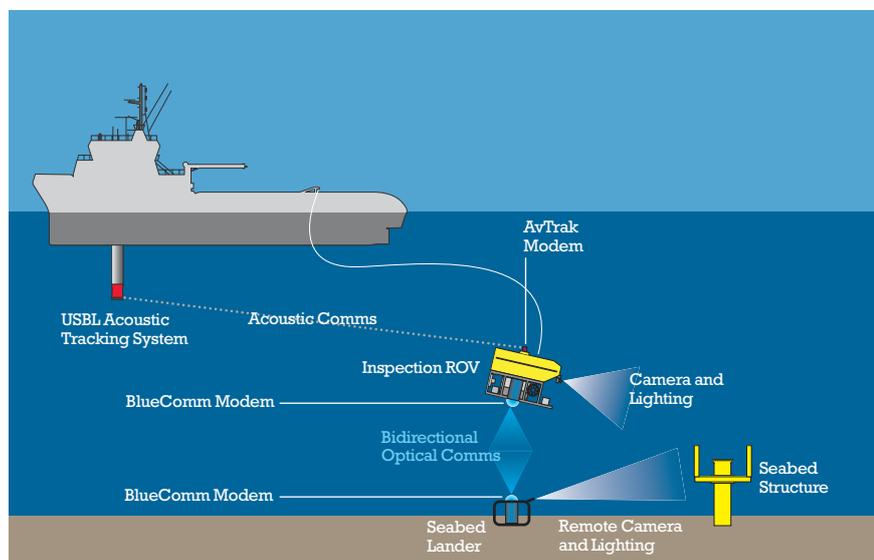
Dual Perspective Video Inspection and Monitoring

A Bluecomm based video lander system allows a cost-effective second video perspective providing HD video streams and lighting to aid complex well intervention procedures.

Cutting the tether

As water depths increase, conventional ROVs and their associated tether, launch and recovery systems need to be larger and heavier, requiring larger and more expensive vessels. BlueComm can eliminate the need for such tether cables, offering a new degree of freedom in underwater robotics.

Data harvesting and control

High speed wireless communications are not just useful for controlling ROVs and AUVs. Wherever there is a subsea application requiring control, monitoring or the point-to-point transmission of data, 'going wireless' is now a credible alternative.

Remote 'eyeball'

BlueComm can be used to provide a remote 'eyeball' on specific subsea operations removing the need for a second ROV. Complementary acoustic positioning and communications provides long range command and control of the camera and optical link including wake-up, pan, tilt, zoom, lighting and sleep mode control functions.

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Global Headquarters
T. +44 (0) 1252 872288
F. +44 (0) 1252 876100
sales@sonardyne.com

Aberdeen, UK
T. +44 (0) 1224 707875
F. +44 (0) 1224 707876
sales@sonardyne.com

Houston, USA
T. +1 281 890 2120
F. +1 281 890 7047
usa.sales@sonardyne.com

Singapore
T. +65 6542 1911
F. +65 6542 6937
asia.sales@sonardyne.com

Rio das Ostras, Brasil
T. +55 22 2123 4950
F. +55 22 2123 4951
brasil.sales@sonardyne.com

**24 Hour Emergency
Telephone Helpline**
T. +44 (0) 1252 877600
support@sonardyne.com