



Customer:	Monterey Bay Aquarium Research Institute (MBARI) 7700 Sandholdt Road Moss Landing, California 95039-9644 United States	Account Manager:	Kim Swords
Attention Of:	Brett Hobson	Telephone No:	+1 281 890 2120
Cc:	-	Quote Number:	QUO-28184-W2J6
Issued By:	Kim Swords	Date:	07-Jul-2016

Subject: KS-2406 : BlueComm™ 100

Brett

I want to begin by thanking you for your interest in Sonardyne and allowing us to quote.

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 three variants. BlueComm 100 is optimized for shallow water 'high ambient light' operating environments and offers a good balance between data rate and range. BlueComm 200 sends data at up to 12.5 Mbps and is suitable for deep or night time operations. The dual laser configuration of BlueComm 5000 supports data transfer rates of up to 500 Mbps.

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 meters.

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 meters. Delivering 5 Mbps at 10 meters range, BlueComm 100 is a short range, highly reliable solution.



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 meters. 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 5000 uses two rapidly modulated off frequency lasers to produce simultaneous bi-directional communications. The equipment is optimized 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.

Stock Code	Type No.	Delivery	Qty	Unit Price USD	Total Price USD
602-0100 BlueComm™ 100 System System includes 2 x bi-directional links 2 x test cables Manual on CD	8360-006-A1	-	1	46,230.00	46,230.00
				Subtotal	46,230.00
				Freight	1,849.00
				Grand Total (USD)	48,079.00

TERMS AND CONDITIONS OF QUOTATION:

- This Sonardyne Quotation and any Purchase Order that is issued for Products or Services is subject to and in accordance with:
 - the terms of any existing Master Sales Agreement (MSA) the Customer has with Sonardyne governing the purchase of that Product or Service, or, if no MSA exists, Sonardyne's Supply of Products and Services Terms, a copy of which can be found at <http://www.sonardyne.com/terms/sales-usa.pdf> or can be supplied upon request, as amended by the Terms and Conditions of this Quotation, and
 - applicable Product Specification(s) which can be found at <http://www.sonardyne.com/products.html> collectively called "Sonardyne Sales Terms"
- All Purchase Orders placed against this Quotation must reference this Quotation Number and be subject to the Sonardyne Sales Terms. Purchase Orders are subject to acceptance by Sonardyne through issuance of a Sales Order Acceptance form. The prices in this Quotation remain valid for 30 days from the date of this Quotation.
- Sonardyne reserves the right to withdraw or modify this Quotation without notice.
- Prices quoted are in USD.

The prices quoted use a current exchange rate of USD1.38/GBP. The prices may be adjusted at the discretion of Sonardyne as a result of any movement of the actual exchange rate, published by OANDA, beyond +/- USD0.03 (the daily midpoint price of the relevant trading days) between the date of this quotation and the date of a valid order



placement. Alternatively the Customer may, at Purchase Order placement, agree to purchase the products and/or services in GBP.

5. A delivery schedule for the Products and/or Services can only be confirmed upon receipt of the Purchase Order.
6. Prices quoted are Ex Works, subject to the Sonardyne Supply of Products and Services Terms:
 - a. Sonardyne Products: Sonardyne Inc., Houston, TX, USA, and, if applicable,
 - b. Deployment machines: Oslo, Norway,
 - c. Gate Valves: Norway or Sweden (which will be confirmed on receipt of the order).
7. Prices are exclusive of any applicable taxes, levies, import or export duties or fees, which will be invoiced as applicable.
8. Any additional costs incurred, such as shipping, will be invoiced at cost + 1.5%.
9. Products are supplied in Sonardyne standard export packaging, unless otherwise stated.
10. Prices exclude any specialist quarantine certificates, certificates of conformity or any special packaging requirements, which are chargeable in addition
11. Products may be subject to USA and other relevant export licence controls.
12. Products may include software (whether embedded in any Product or provided as a software package or otherwise).
 - a. Where this quotation refers to price in respect of software this shall be deemed to be a licence fee and therefore no transfer of ownership in any software, copyright and intellectual property rights shall be implied or given.
 - b. In the event of a Sonardyne engineer installing any software (whether at the site of the Customer or Sonardyne), it is deemed that the Customer has read and accepted the Sonardyne Sales Terms including the terms relating to provision of software.

All dealings and transactions between the Customer (and any of its representatives) and any Sonardyne company (and any of its representatives) MUST be in compliance with all applicable bribery and corruption legislation, including UK Bribery Act 2010 and US Foreign Corrupt Practices Act 1977. Sonardyne may require written assurances and evidence of compliance with the legislation.

Should you require further information concerning this Quotation please do not hesitate to contact the undersigned.

With best regards,
Kim Swords

+1 281 890 2120
kim.swords@sonardyne.com

The copyright and other intellectual property rights of any third parties which may be referenced in this Quotation are hereby duly acknowledged.