



Customer:	Monterey Bay Aquarium Research Institute (MBARI)	Account Manager:	Kim Swords
	7700 Sandholdt Road Moss Landing, California 95039-9644 United States		8280 Willow Place Drive North, Suite 130 Houston, Texas 77070 USA
Attention Of:	Brett Hobson	Telephone No:	+1 281 890 2120
Cc:	-	Quote Number:	QUO-44274-D2J7
Issued By:	Kim Swords	Date:	01-October-2021

Subject: KS-3016 : BlueComms 5000 << ROM >>

Brett,

I want to begin by thanking you for your continued interest in Sonardyne and allowing Sonardyne to provide ROM pricing for our Bluecomm 5000 system. The BlueComm 5000 is our highest bandwidth offering for subsea communications. It uses two rapidly modulated lasers of difference wavelengths to produce simultaneous bi-directional communications. The equipment is optimized for peak data transfer performance at two different ranges. At the closest range $1\text{m} \pm 0.08\text{m}$, it enables full-duplex $>500\text{Mbps}$ communications. At the furthest range $5\text{m} \pm 0.50\text{m}$, the BlueComm 5000 Mobile can offload data at 600Mbps and upload at 150Mbps to a BlueComm 5000 Remote. At both ranges a seamless network connection is established allowing files to be transferred using standard protocols (FTP). The systems are fitted with Solid State storage so read/write speeds are optimized and data redundancy is ensured.

These systems operate in the visible light spectrum and are sensitive to sunlight and artificial lights. It is recommended that they are operated in dark environments at depth ($>200\text{m}$) and that artificial light sources are switched off during their use.

Each half of BlueComm 5000 system emits a cone of light using either blue (450nm wavelength) or green (532nm wavelength) lasers and is capable of receiving the other color. The angle for the receiving and emitting cones is 12 degrees. The emitter and receivers need to be in each-others' cones to enable the data transfer.

The Bluecomm 5000 wireless optical communication systems is composed of the following units:

BlueComm 5000 Mobile

Every BlueComm 5000 system has a Mobile, which is typically mounted on a subsea vehicle (ROV/AUV/manned submersible) and used to harvest data from BlueComm Remotes or to download data to a BlueComm Gateway. The Mobile receives blue laser light and emits a class 3b (NOHM 10cm) green laser light with a transmit power less than 30 mW.



BlueComm 5000 Gateway

The Gateway enables wireless subsea communications of >500Mbps at 1m $\pm$ 0.08m. This means that the lasers need to be close to each other. This type of transmission is therefore better suited for data transfers when the vehicle has already docked. A Gateway can be mounted on a permanent docking station on the seafloor or on a garage deployed from a vessel. It can be used to upload and download data from a BlueComm 5000 Mobile. The Gateway receives green laser light at >500Mbps and emits blue laser light with a transmit power of less than 1mW at up to >500Mbps.

BlueComm 5000 Remote

As part of a BlueComm 5000 system an operator can deploy many Remotes as required. These are typically deployed where information is gathered. The Mobile will be used to harvest data from these Remotes. The vehicle where the Mobile is deployed will need to hover over the Remote unit by standing at between 4.5m and 5.5m and within each other's 1m diameter cones. The Remote receives green laser light at up to 150Mbps data rates and emits blue laser light with a transmit power of less than 30mW at up to 600Mbps.

A BlueComm 5000 optical communications systems can be configured to support as many Mobile, Remotes and Gateway units as are required. The only condition is that only a Mobile unit can communicate with either a Remote or a Gateway unit. Remotes cannot be used to communicate to each other or a Gateway. Similarly, mobile units cannot exchange data with each other.

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

With best regards,
Kim Swords

+1 281 890 2120
<mailto:kim.swords@sonardyne.us>



Stock Code	Type No.	Delivery	Qty	Unit Price USD	Total Price USD
TBC	8363	-	1	79,200.00	79,200.00
BlueComm 5000 Gateway System (Dock)					
Anodized Aluminum Housing					
3000m Depth Rated					
Supports Duplex Data Rates up to 1000 Mbps at 1m ±0.08m					
100/1000 Base T Ethernet Communication Interface					
Transmit Wavelength 450nm					
Receive Wavelength 532nm					
Typical power consumption 14W					
On-board data storage up to 2TB					
Software					
Manual					
Comms and Power Cable Tail					
TBC	8363	-	1	84,960.00	84,960.00
BlueComm 5000 Mobile System (Vehicle)					
Anodized Aluminum Housing					
3000m Depth Rated					
Dual Functionality					
Paired with Remote					
Receive/Transmit Data Rates 600/150 Mbps at 5m ±0.50m					
Paired with Gateway					
Supports Duplex Data Rates up to 1000 Mbps at 1m ±0.08m					
100/1000 Base T Ethernet Communication Interface					
Transmit Wavelength 532nm					
Receive Wavelength 450nm					
Typical power consumption 14W					
On-board data storage up to 2TB					
Software					
Manual					
Comms and Power Cable Tail					
Subtotal					164,160.00
Grand Total (USD)					164,160.00



TERMS AND CONDITIONS OF QUOTATION:

1. This Sonardyne Quotation and any Purchase Order that is issued for Products or Services is subject to and in accordance with:
 - a. 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 <https://www.sonardyne.com/terms/sales-usa/> or can be supplied upon request, as amended by the Terms and Conditions of this Quotation, and
 - b. applicable Product Specification(s) which can be found at <https://www.sonardyne.com/products.html> collectively called "Sonardyne Sales Terms"
2. 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.
3. Sonardyne reserves the right to withdraw or modify this Quotation without notice.
4. Prices quoted are in USD.

The prices quoted use a current exchange rate of USD1.44/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, Yateley, UK, 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 +15%.
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.

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