oculus

blueprint subsea

Oculus DSL Extender

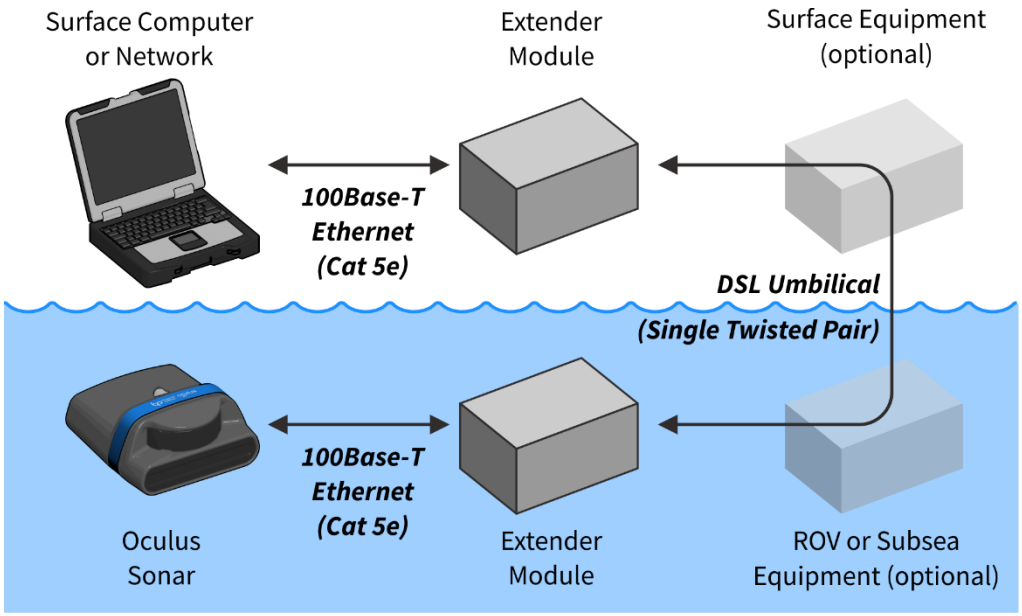
User Manual

1. Introduction

Data produced by Oculus multi-beam sonars is transmitted using the 100Base-TX ethernet standard over CAT-5 cabling from the 6-pin connector on the rear of the product.

As 100Base-TX communication requires 4 conductors (arranged as two twisted-pairs) this may not be suitable for direct use on systems such as ROV's that have only a single spare twisted pair in the umbilical for sensor data communications.
To overcome this, the **Oculus Extender** modules convert data between 4-wire 100Base-TX and 2-wire DSL (Digital Subscriber Line) standards.

The diagram below shows the general configuration of Extender Modules required to convert 100Base-T Ethernet signals from the Sonar to DSL signals over a Single-Twisted-Pair in an Umbilical Cable and back into 100Base-T Ethernet signals on the surface:



Additionally, data can be sent over umbilical's longer than the 100m limit prescribed by the 100Base-TX standard while still maintaining 100Mbps throughput. Up to 300m can be achieved depending on the type/quality of twisted pair used (with electrical screening being considered for longer cable lengths over 150m).

Throughout the documentation the following symbols are used to indicate special precautions or procedures:

WARNING!
This symbol indicates a warning you should follow to avoid bodily injury or damage to your equipment.

CAUTION
This symbol denotes precautions and procedures you should follow to avoid damage to your equipment.

NOTE
This symbol denotes special instructions or tips that should help you get the best performance from your system.

1.1. Extender Module Power Supplies

All Extender Modules will accept a DC input supply voltage in the range of 18V to 32V DC, making them suitable for 24V operation.

However, to support the introduction of the range of Low-Voltage Oculus Sonars, newer Extender Modules will support 9V to 32V DC operation making them suitable for both 12V and 24V DC operation.

If the serial number of your module is larger than that shown in the table below, for its part number then it will support a 9V to 32V DC power supply operating range:

Module Part Number	**Serial Number** ***(where 9-32V support started)***
BP01223	008836
BP01224	008895
BP01404	009352

1.2. Handling Exposed Electrical Connections

Care should be taken when handling the exposed wire ends of unterminated cable whips or connector pins, as a charge of static electricity may have built up on the user and could damage the Extender Module electronics when touched.

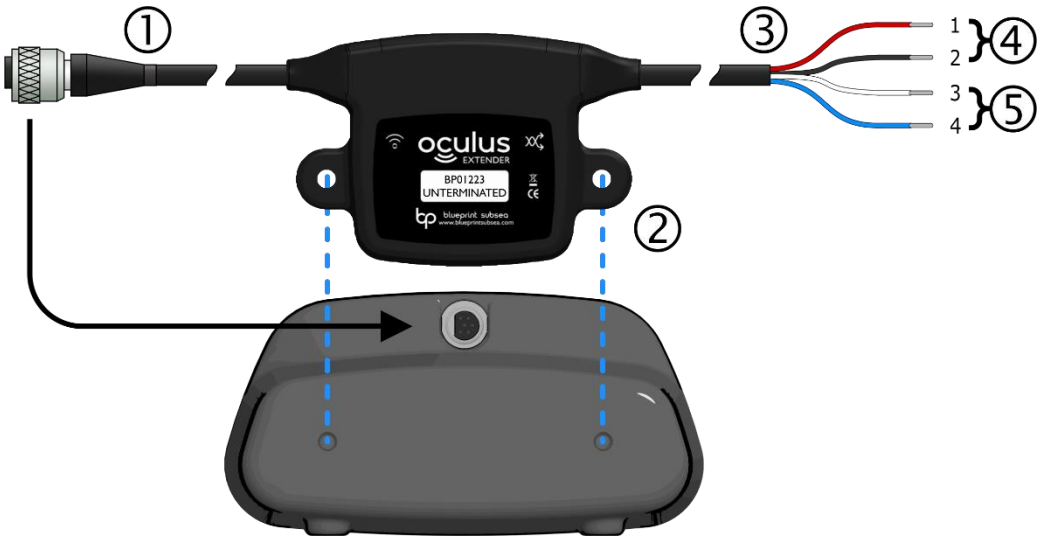
To minimise risk of damage, it is recommended that users should wear an ‘earthing’ strap or take other suitable anti-static (ESD) precautions when terminating cable-whips into their own systems.

2. Subsea Oculus Connection

2.1. Unterminated Whip Extender Module (P/N BP01223)

The Oculus ethernet module has two protruding cable whips, one terminated with a 6-way round connector that connects to the sonar, while the other external unterminated cable-whip has 4 exposed conductors that should be connected into the subsea system (ROV etc.):

1. Screw the 6-way Ethernet-Whip Connector ① into the corresponding 6-way connector on the back face of the Oculus Sonar.
2. Using two M4 x 16mm screws (P/N BP01319), secure the Extender Module to the rear of the Oculus sonar housing with the two tapped mounting holes ②.
3. On the DSL-Whip ③, connect the RED and BLACK wires ④ to a DC power supply from the ROV or subsea system.
4. Connect the BLUE and WHITE data wires ⑤ (for DSL- and DSL+) to a twisted pair in the umbilical or tether that goes to the surface.



	Wire Colour	Function
④	RED	POWER POSITIVE
	BLACK	GND
⑤	WHITE	DSL+
	BLUE	DSL-
	GREEN	Not Used
	YELLOW	Not Used

For further details on operating voltages, please see the above Extender Module Power Supplies section (page 3).

Before handling the exposed electrical connection, please see the above Handling Exposed Electrical Connections section (page 3).

2.2. Other Terminated Whip Modules

In additional to the above generic 'Unterminated Whip' Extender Module, other configurations of the module are available with different connectors moulded onto the external cable-whip suitable for connection into a variety of ROV and subsea systems.

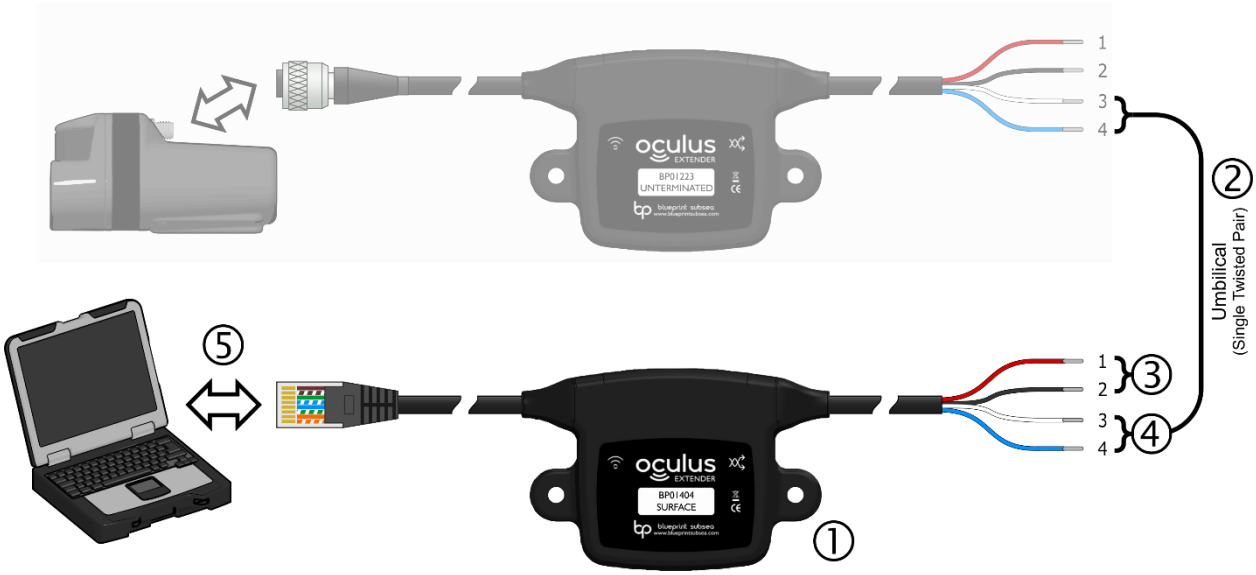
These modules should be mounted on the Oculus as described above and connected into the subsea system according to the manufacturer's instructions.

3. Surface/Network Connection

3.1. Surface Extender Module (P/N BP01404)

There are several surface solutions for converting the DSL signal back into 100Base-TX form that can then be subsequently connected directly into laptops/workstations or a larger network.
One solution available is to use the Surface Module, that is similar to the Oculus Module, as it provides an unterminated cable whip that should be connected into the topside hardware of the Subsea System (ROV etc), and a second cable terminated with an RJ45 plug that provides connection to a 100Base-TX network:

1. Attach the Ethernet Extender Surface Module ① to your own console or surface station using two M3 screws.
2. Connect a DC power supply to the Surface Module on its RED and BLACK wires ③.
3. Connect the DSL+ and DSL- twisted pair BLUE and WHITE wires ④ into the Umbilical/Tether ②.
4. Plug the RJ45 connector into the workstation or network ⑤. The ethernet extenders provide a 'transparent' network link that requires no direct management or configuration – however the Sonar may need to be configured appropriately for the network (i.e. IP address, subnet mask, DHCP etc. – for further details refer to the Oculus Sonar manual).



For further details on operating voltages, please see the above Extender Module Power Supplies section (page 3).

Before handling the exposed electrical connection, please see the above Handling Exposed Electrical Connections section (page 3).

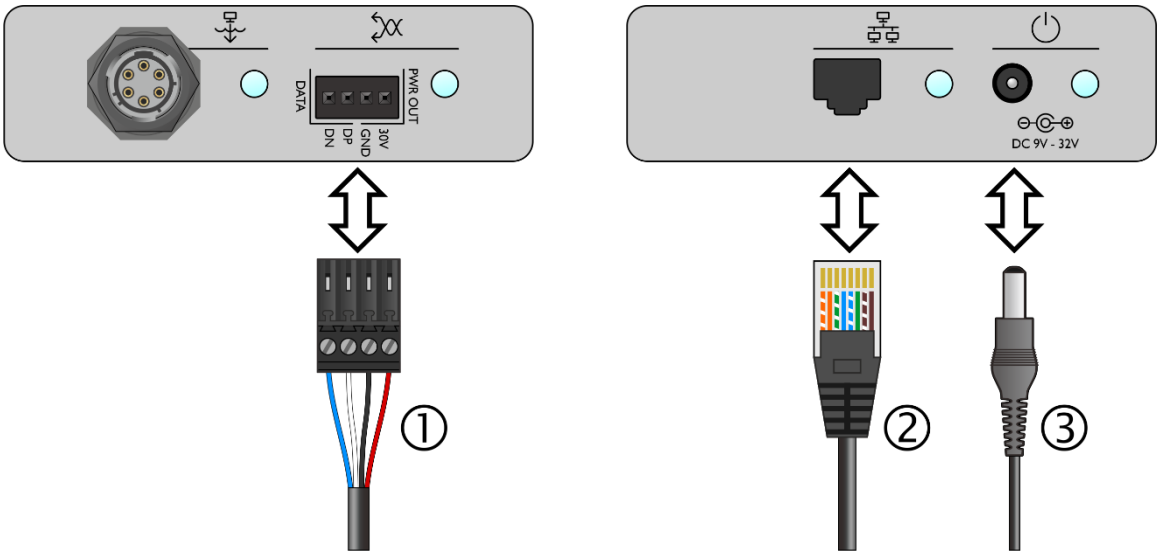
	Wire Colour	Function
③	RED	POWER POSITIVE
	BLACK	GND
④	WHITE	DSL+
	BLUE	DSL-
	GREEN	Not Used
	YELLOW	Not Used

3.2. Oculus Hub

If you have an Oculus Hub top-side box, this incorporates an inbuilt Extender Module, capable of converting the DSL signal back into 100Base-TX form that can then be subsequently connected directly into laptops/workstations or a larger network.
To connect the subsea Extender Module to the Oculus Hub:

1. Using the supplied 4-way 3.5mm pitch screw-terminal connector plug (Weidmüller BL-series 3.5mm connector part number 1615690000, RS components part number 762-5990, Blueprint P/N BP001341), connect the DSL signal from the subsea Extender Module (or third-party subsea interface) into pins 3 and 4 labelled “DP” and “DN” for the WHITE and BLUE cables respectively – see image below ①.

   If you are supplying power from the Oculus Hub to the Sonar and subsea extender module, then connect the RED and BLACK wires to pins 1 and 2 labelled “PWR” and “GND” respectively – see image below ①.
2. Connect a standard RJ45 terminated CAT-5e network patch lead between the connector on the opposite end of the Oculus Hub ② and your network router or laptop computer.
3. Power up the Oculus Hub using its supplied Mains-to-DC 24V PSU module ③.
4. If the link between the Oculus Hub and subsea module is good, and data is being exchange, then the indicator next to ① will illuminate GREEN (or BLUE if the link is good, but no data is being exchanged).



Pin		Wire Colour	Function
1	PWR	RED	POWER OUT
2	GND	BLACK	GND
3	DP	WHITE	DSL+
4	DN	BLUE	DSL-

Note: POWER OUT should only be used if 24V DC power is being supplied from the Hub to the sonar and/or subsea equipment (up to 50W if using the Oculus Hub supplied PSU module).

4. Product Support

4.1. Website

For the latest software and firmware updates, as well as production information, manuals and datasheets, visit

www.blueprintsubsea.com

We welcome any feedback you may have about our products, from bug reports to ideas for new features or hardware to support – please use the contact details on the website (or shown below) to get in touch.

4.2. Technical Support

If your products are not operating properly, please consult the 'Troubleshooting' section of this manual and further information on the Blueprint website to see if the problem can be easily remedied.

However, if you need further support, you can contact us via your distributor or directly at…

- Web — www.blueprintsubsea.com (for access to on-line resources and technical support)
- Email — enquiries@blueprintsubsea.com
- Telephone — +44 (0)1539 531536 (9:00am to 5:00pm, Monday to Friday, UK Time)

For all the above please provide the following information to help us with your technical support request…

- Part and Serial Numbers of the system components. These are located on the labels of each item, and are in the form "BPxxxxx.xxxxxx".
- Version number of any software and firmware you are using.
- The operating system name, version, type (32 bit or 64 bit) and service pack upgrade your computer is using.
- Brand and model of your computer (processor type and memory configuration are also useful if known).
- Name of the distributor where the system was purchased from.

If you need to return your products, please…

- Contact us (using the details above) for returns information and shipping details.
- Pack your products back in their original packaging (or other suitable container), and include written documentation including your contact details (including contact phone number), a description of the problem and any symptoms occurring.
- If your product is still under warranty, please include a copy of your receipt (showing proof and date of purchase).
- Please return the product back to Blueprint Subsea, using an insured courier and delivery confirmation.

4.3. Limited Warranty Policy

The manufacturer, Blueprint Design Engineering Limited (trading as Blueprint Subsea and hereafter after referred to as Blueprint), warrants that at the time of shipment all products shall be free from defects in material and workmanship and suitable for the purpose specified in the product literature.

Conditions

Unless other terms are specifically requested and mutually agreed in writing prior to dispatch, the conditions of the warranty include, but are not limited to:

- The warranty is only deemed to be valid if the equipment was sold through Blueprint or one of its approved distributors.
- The warranty commences immediately from the date of customer acceptance and runs for a period of 365 days. Customer acceptance will always be deemed to have occurred within 72 hours of delivery.
- The equipment must have been installed and commissioned in strict accordance with approved technical standards and specifications and for the purpose that the system was designed.
- The warranty is not transferable.
- Blueprint must be notified immediately (in writing) of any suspected defect and if advised by Blueprint, the equipment subject to the defect shall be returned by the customer to Blueprint, via a suitable mode of transportation and shall be freight paid.
- The warranty does not apply to defects that have been caused by failure to follow the recommended installation or maintenance procedures, or defects resulting from normal wear & tear, incorrect operation, fire, water ingress, lightning damage or fluctuations in vehicles supply voltages, or from any other circumstances that may arise after delivery that is out with the control of Blueprint. (Note: The warranty does not apply in the event where a defect has been caused by isolation incompatibilities.)
- The warranty does not cover the transportation of personnel and per diem allowances relating to any repair or replacement.
- The warranty does not cover any direct, indirect, punitive, special consequential damages or any damages whatsoever arising out of or connected with misuse of this product.
- Any equipment or parts returned under warranty provisions will be returned to the customer freight prepaid by Blueprint
- The warranty shall become invalid if the customer attempts to repair or modify the equipment without appropriate written authority being first received from Blueprint.
- Blueprint retains the sole right to accept or reject any warranty claim.
- Each product is carefully examined and checked before it is shipped. It should therefore be visually and operationally checked as soon as it is received. If it is damaged in anyway, a claim should be filed with the courier and Blueprint notified of the damage.
- Any customer acceptance testing (if applicable) must be performed at either Blueprint premises or at one of their approved distributors unless mutually agreed in writing prior to despatch.

Blueprint reserve the right to change specifications at any time without notice and without any obligation to incorporate new features in instruments previously sold.

If the system is not covered by warranty, or if it is determined that the fault is caused by misuse, repair will be billed to the customer, and an estimate submitted for customer approval before the commencement of repairs.

4.4. Notices

Neither Blueprint Design Engineering Limited, or their affiliates shall be liable to the purchaser of this product, or third parties, for losses, costs, damages or expenses incurred by the purchaser or third parties as a result of accident, misuse, abuse, modification of this product or a failure to strictly comply with the operating and maintenance instructions.

All information in this document is believed to be correct at the time of going to press, Blueprint Design Engineering Ltd cannot be held responsible for any inaccuracies or omissions. If you find an error or feel we have missed important or useful information, please contact us. The latest version of the manual is always available to download from the website.

Specifications and information contained in this document are subject to change without notice, and does not represent a commitment on the part of Blueprint Design Engineering Ltd.

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Distributor...

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