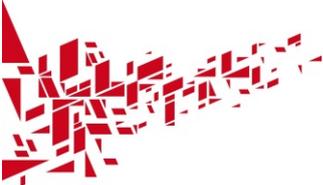




Blacktip II Subsea Camera

USER MANUAL



Blacktip II - User Manual

Revision History

Rev.No	Description	Date of Rev
1.0	Issued for use	25.03.21

Contents

Contact	3
Safety information.....	3
Warranty	3
1 General Description.....	4
1.1 Regarding these Instructions for Use.....	4
1.2 The Blacktip II Subsea Camera	4
1.3 Main Features	4
2 Technical Specifications	5
2.1 Power	6
3 Installation Instructions	6
3.1 Unpacking and testing.....	6
3.2 Function test.....	7
3.3 Mechanical Installation.....	7
3.4 Electrical installation	8
3.4.1 Camera subsea connector.....	8
4 Operational Instructions.....	8
4.1 Hazards and protective measures.....	8
4.2 Over-temperature precautions	8
4.3 Camera Control.....	8
4.3.1 RS232 Control (RS485 optional).....	8
4.3.2 Bipolar control:.....	9
4.3.3 Tri-state control:.....	10
5 Maintenance	11
5.1 General maintenance	11
5.2 Service and Repair.....	11
5.3 Packing & Shipping.....	11



Blacktip II - User Manual

Contact

for assistance / clarification on any of the contents of this manual, please contact:

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Safety information

IMPORTANT! The Imenco Blacktip II Subsea Camera is a technically advanced product. Please make sure to read and understand all sections of this manual before installing or operating this product. Installation of this product should only be performed by qualified personnel.

WARNING! This product contains no user serviceable parts. *Do not open, alter or disassemble this product.* Failure to comply with this warning can result in damage to equipment and void of warranty. The camera is filled with inert gas at manufacture.

WARNING! *The housing is NOT connected to any Protective Earth circuits.*

The metal housing has no electrical contact with any of the circuits inside the camera. This is to isolate the camera housing from other equipment that includes dangerous high voltage and to minimize corrosion that otherwise might be intensified by electrical contact to other nearby metal equipment or structures exposed to the sea water.

Warranty

Be sure to read and comply with **Imenco's Terms & Conditions** that the Blacktip camera was sold under.



1 General Description

1.1 Regarding these Instructions for Use

The intended use of these instructions is to provide and guide the operator/user of the equipment with instructions on the technical specifics of the product, how it functions, the safety aspects of its use, how to prepare, operate and maintain the product.

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1.2 The Blacktip II Subsea Camera

The Blacktip II colour cameras incorporate a 1/3-type CMOS image sensor and feature a 10x optical zoom (+ 16x digital zoom). With its ultra-compact and lightweight body, this is an ideal camera for restricted space applications, and for tooling.

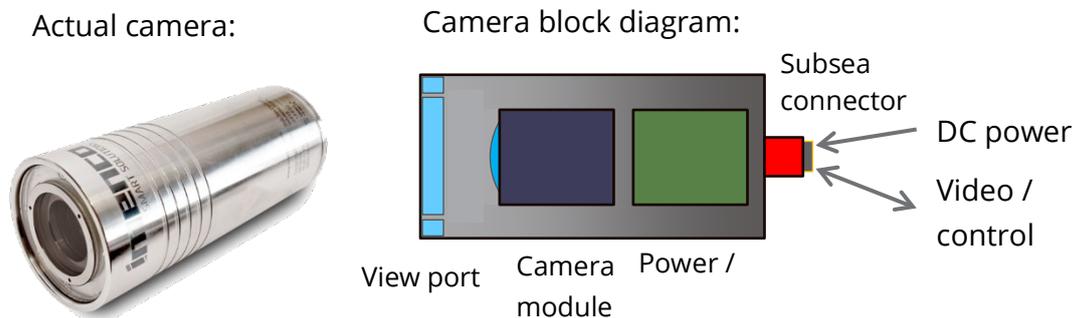


Figure 1 - the Blacktip II Camera

1.3 Main Features

- Compact light weight camera
- 10x Optical Zoom
- Titanium housing



Blacktip II - User Manual

2 Technical Specifications

Image Resolution	1080P @ 25/30 – PAL / NTSC (CVBS)
Video output format	Composite video
Minimum illumination	0,5 lux
Zoom	10x optical (+16x digital) F 1.8 to 3.4
View angle in water (wide)	43° hor.
Minimum Working Distance	0.01 m in water @ Zoom 1x
Front Port - Camera	Sapphire glass
Housing	Titanium
Depth rating	4.000 MSW
Camera control	RS232 / RS485, Bipolar / Tristate
Standard connectors	5507-1508 / MCBH/ CS-MSAJ-9-BCR *
Power requirements	24VDC (12 – 36) – 5W
Main dimensions (ex conn.)	Ø 58 x 143
Mass in air / water	0,8kg / 0,5kg
Operating temperature range	-5°C to +50°C



Blacktip II - User Manual

2.1 Power

The camera is powered by a DC voltage applied to two power connector pins. The circuit includes reverse polarity protection, but the polarity must be correct for the camera to power up. See the accompanying QC document for the specific pin-out of your product.

The camera housing is not connected to any pin in the subsea connector or any terminal of the electrical circuits inside the camera.

IMPORTANT! *The camera housing is not connected to Protective Earth.*

3 Installation Instructions

Make sure that **Imenco's Terms & Conditions** are followed when using this product.

3.1 Unpacking and testing

When having received the camera do a visual inspection for damage of the packet or any of the parts.

The packet should include:

- Blacktip II Camera
- User manual, this document
- Case
- Memory stick, with software and manual for RS232 / RS485 versions
- Pressure Test Certificate
- QC document
- Test Interface Box (optional)
- Dummy Connector (optional)



Blacktip II - User Manual

3.2 Function test

A preliminary function test should be performed prior to full scale installation. This is to familiarize the user with the control functions and to verify that the system is fully operational after shipment.

Follow these steps to power up and check the proper functioning of the camera:

- 1) Clear necessary space on your working desk and gather the
 - a. The Blacktip II camera
 - b. Power supply providing DC between 12V and 36V, minimum 20W
 - c. Test cable
 - d. Monitor with SD video input
- 2) Do not power up the camera yet.
Lubricate the subsea connector and mate it properly.
- 3) Now turn on the DC power to the Camera.
- 4) Changes to settings and camera control is done by means of the *Imenco serialCommander* software or by the Visca software if the camera is configured for RS232 / RS485.

3.3 Mechanical Installation

Installation of this product should only be performed by qualified personnel.

Do not open the camera when carrying out the installation.

Mount the camera on a secure and vibration free surface and strap the cable for stress relief to the supporting structure.

The camera should be electrically isolated from the mounting base in order to minimize any corrosion current between the relatively noble Titanium housing of the camera and surrounding metal structures.

The main logo printed on the camera indicates the top of image.



3.4 Electrical installation

IMPORTANT!

- Installation of this product should only be performed by qualified personnel.
- Verify that the connector pin assignments match with the system where the camera is being installed. Mind the connector pin numbers and wire colours as necessary.
- Do not connect/disconnect the subsea connector when the power is ON.

3.4.1 Camera subsea connector

The Blacktip camera can be supplied with various connector configurations. Please refer to supplied QC for your specific camera.

4 Operational Instructions

4.1 Hazards and protective measures

The Blacktip II Camera does not generate or use dangerous high electrical voltages. The camera is filled with inert gas at atmospheric pressure. Follow the safety information at the beginning of this manual.

4.2 Over-temperature precautions

The camera is designed for operation in water that will absorb the heat generated by the camera. Imenco acknowledges that the camera must be checked on deck before operation as well as tested and demonstrated in house, but the conditions when operating the camera in air may not provide sufficient cooling. Remember that sunlight and/or high outside temperature will add significant heat to the camera.

4.3 Camera Control

The Blacktip II Camera is designed to be controlled by means of different protocols:

The control pins are electrically isolated from the internal electronics.

4.3.1 RS232 Control (RS485 optional).

Basic camera functions like Zoom, Focus and White balance can be controlled by the *Imenco serialCommander* software supplied with the camera. See separate user manual for this product.

Full control and access to all camera module settings can be done in the Visca Control software supplied with the camera.



Blacktip II - User Manual

4.3.2 Bipolar control:

Bipolar control gives no control of camera module settings.

Control voltage input $\pm 5\text{vdc}$ to $\pm 24\text{vdc}$, for pin numbering please refer to connector pin-out in the QC document.

Autofocus on / off:

- Controlled by applying control voltages over the focus pins and zoom pins

Manual focus:

- Controlled by applying control voltage over the focus pins

Zoom control

- Controlled by applying control voltage over the zoom pins

	Focus pins	Zoom pins
Focus near		
Focus far		
Zoom Tele		
Zoom Wide		
Auto focus		

Figure 2 - Bipolar control signal matrix



4.3.3 Tri-state control:

Tri-state gives no control of camera module settings

Default reference voltage is set to +12VDC, for pin numbering please refer to connector pin-out in the QC document.

Autofocus on / off:

- Controlled by \pm DC voltage compared to the reference voltage over focus pin and zoom pin

Manual focus:

- Controlled by alternating \pm DC voltage compared to the reference voltage over focus pin

Zoom control

- Controlled by alternating \pm DC voltage compared to the reference voltage over zoom pin

	<u>Focus pin</u>	<u>Zoom pin</u>
	●	●
Focus near	<	
Focus far	>	
Zoom Tele		<
Zoom Wide		>
Auto focus on/off	<	<

Figure 3 - Tri-state control signal matrix



5 Maintenance

5.1 General maintenance

After use in seawater or other corrosive environments, rinse the unit and cables in fresh water.

Inspect the front port for dirt and dust and remove any surface dirt using compressed air. Clean the front port glass using a mild detergent and a soft cloth. Do not use alcohol or solvent based cleaning solutions because that could damage the pressure seals and glass coating. Avoid circular wiping patterns.

Reapply silicon-based lubricant to the connector regularly as needed.

5.2 Service and Repair

This product contains no user serviceable parts. Service and modifications are to be carried out by Imenco personnel or by qualified third party after appointment. Failure to comply may result in personal injury, damage to equipment and loss of warranty.

If the Blacktip camera seems to be not working properly, please try to speed up the service that Imenco can provide by describing the problem in specific terms from the person who have first handed observed the fault. Remember if necessary, to describe the system where the camera is installed since the root cause sometimes can originate outside a failing part in an advanced system.

5.3 Packing & Shipping

The packing & shipping of the goods shall generally be according to Imenco's approved procedures.

Warning: *The Blacktip II camera includes fragile parts which must not be subject to vibrations and shock during transport.*
