Tritech International Limited

Please read this manual carefully before setting-up and using your unit

Super SeaSpy Camera

Operator & Installation Manual

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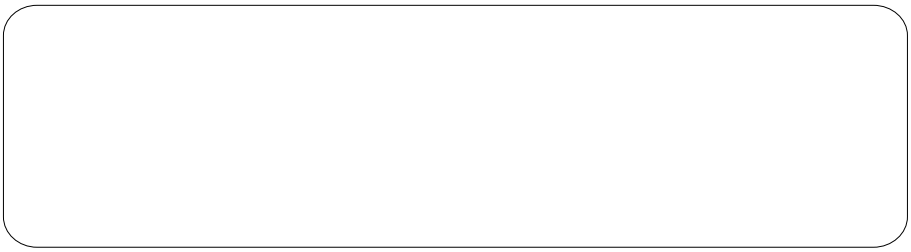
Supplied by



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Handling of Electrostatic-Sensitive Devices

Attention

Observe Precautions for handling Electrostatic Devices

Caution

Handling of Electrostatic-Sensitive Devices

Certain semiconductor devices used in the equipment are liable to damage due to static voltages.

Observe the following precautions when handling these devices in their unterminated state, or sub-units containing these devices:

- Persons removing sub-units from any equipment using electrostatic sensitive devices must be earthed by a wrist strap via a 1M• resistor to a suitable discharge reference point within the equipment.
- Soldering irons used during any repairs must be low voltage types with earthed tips and isolated from the Mains voltage by a double insulated transformer. Care should be taken soldering any point that may have a charge stored.
- Outer clothing worn must be unable to generate static charges.
- Printed Circuit Boards (PCBs) fitted with electrostatic sensitive devices must be stored and transported in appropriate anti-static bags/containers.

Warranty Statement

Tritech International Limited herein after referred to as **TIL**

TIL 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.

The unit/system 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.

Note: Any customer acceptance testing (if applicable) must be performed at either TIL premises or at one of their approved distributors unless mutually agreed in writing prior to despatch.

Conditions:

These include, but are not limited to, the following:

1 The warranty is only deemed to be valid if the equipment was sold through TIL or one of its approved distributors.

2 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.

3 The warranty is not transferable, except or as applies to Purchaser first then to client.

4 TIL must be notified immediately (in writing) of any suspected defect and if advised by TIL, the equipment subject to the defect shall be returned by the customer to TIL, via a suitable mode of transportation and shall be freight paid.

5 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 outwith the control of TIL.
(**Note:** The warranty does not apply in the event where a defect has been caused by isolation incompatibilities.)

6 The warranty does not cover the transportation of personnel and per diem allowances relating to any repair or replacement.

7 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.

8 Any equipment or parts returned under warranty provisions will be returned to the customer freight prepaid by TIL

9 The warranty shall become invalid if the customer attempts to repair or modify the equipment without appropriate written authority being first received from TIL.

10 TIL retains the sole right to accept or reject any warranty claim.

11 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 TIL notified of the damage.

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

Note: If the instrument 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.

Statutory Compliances

Waste Electrical and Electronic Equipment Directive (2002/96/EC - WEEE)
Tritech International Limited is very aware of its responsibilities to the environment and to the sustainability of the resources of our planet. The European Commission has issued the above Directive in an effort to reduce the impact on the environment due to electronic appliances being committed to landfill after they have come to the end of their useful life.

When the appliance referred to in this manual is no longer serviceable, it MUST NOT be discarded by placing in landfill, dumping in the sea or incineration. SEPARATE collection is mandatory.

The owner of the appliance should either return it and its associated leads & accessories, if appropriate, to Tritech International Limited with a certificate of decontamination (we reserve the right to protect our staff from the effects of any contamination) or sent to an appropriate treatment or recycling agency.

Any goods manufactured after 08/2005 that fall within the scope of the WEEE Directive are marked as shown opposite and will have the date of manufacture and the manufacturer's identification marks.

Safety Statements

 NOTE	***Throughout the manual certain potential problems, or further information relating to the installation, maintenance, understanding or use of the apparatus will be highlighted to the operator by indications identified by the adjacent symbol and text.***
 CAUTION!	***Throughout the manual certain safety or operational related comments and requirements will be highlighted to the operator by indications identified by the adjacent symbol and text.***
 DANGER!	***Throughout the manual certain safety or operational related comments and requirements that could lead to injury or loss of life will be highlighted by the adjacent symbol and text.***

Technical Support

Contact your local agent or Tritech International Ltd

	**Mail**	***Tritech International Ltd.*** Peregrine Road, Westhill Business Park, Westhill, Aberdeen, AB32 6JL, UK
	**Telephone**	++44 (0)1224 744111
	Fax	++44 (0)1224 741771
	**Email**	support@tritech.co.uk
	Web	www.tritech.co.uk

An out-of-hours emergency number is available by calling the above telephone number

If you have cause to use our Technical Support service, please ensure that you have the following details at hand **prior** to calling:

- System Serial Number (if applicable)
- Fault Description
- Any remedial action implemented

Due to the expansion of equipment capabilities and the fact that new sub-modules are continually being introduced, this manual cannot detail every aspect of the operation.

Introduction

The Tritech PCAM1Z-S Super SeaSpy underwater video camera is a compact, high resolution, full colour camera with integral low voltage lighting. Built to survive in the harsh underwater inspection environment the Super SeaSpy has been designed to be compact and rugged while at the same time provide a high quality colour picture.

The camera has integrated white ring LED's providing uniform illumination across the viewing area. A feedback loop automatically adjusts the lighting level so optimum picture quality is achieved, regardless of the reflectivity of work surfaces. The light can also be adjusted manually, via single wire control, compatible with several standards. In warm environments, the LED's are protected by a temperature sensor.

The SeaSpy has an internal focus adjustment that allows the focal range to be set between 20mm and infinity. The camera power supply provides excellent protection for the efficient operation of the camera module. Fitted with an integral video line driver the SeaSpy compensates attenuation of the video signal when used over various umbilical lengths. This line driver is adjustable and is protected against over-voltage.

A water corrected port is fitted to optimise the picture quality. This water corrected view port results in a camera that provides a crisp picture during close proximity viewing in murky water.

Features

- **High resolution colour CCD sensor**
- **Standard depth rating of 4,000 metres**
- **Highly resistant to shock and vibration**
- **Wide power supply 12Vdc to 48Vdc**
- **LED brightness control (manual or auto)**
- **Wide angle version available**

Applications

- **ROV inspection work**
- **ROV tooling package monitoring**
- **Hazardous environments**
- **Harbour, river and canal inspection**
- **Police, customs and emergency services**
- **On-line industrial machinery inspection**
- **Restricted access areas**

Operating conditions

The camera is compatible with any video recorders or monitors working with PAL\NTSC depending on transmission standard selected at point of sale.

The camera should not be used out of the limit conditions specified in this manual. For any special requirement please contact TRITECH INTERNATIONAL LTD.

CAUTION!

The camera has internal temperature sensing circuitry which will protect the camera from damage due to overheating. However it is advised that the camera should not be operated out of water for extended periods.

Before attaching the connector to the camera ensure that the O ring is in position, clean and lightly smeared with appropriate silicon grease.

CAUTION!

The power supply is polarised. Please ensure that the correct polarity is used before switching on the unit. Incorrect electrical connections may damage the internal electronics.

SAFETY OF USE

Danger!

THE LIGHT RADIATION EMITTED FROM THE CAMERAS LED LIGHTS IS EXTREMELY CONCENTRATED AND MAY DAMAGE THE EYE IF SHINED DIRECTLY ONTO IT.

DO NOT STARE DIRECTLY AT THE LIGHTS WHEN OPERATIONAL

Internal Layout & Configuration

6-PIN DIN MATES TO WATER BLOCK CONNECTOR

CAMERA PSU & CONTROL PCB

VIDEO MODULE RETAINING WASHER

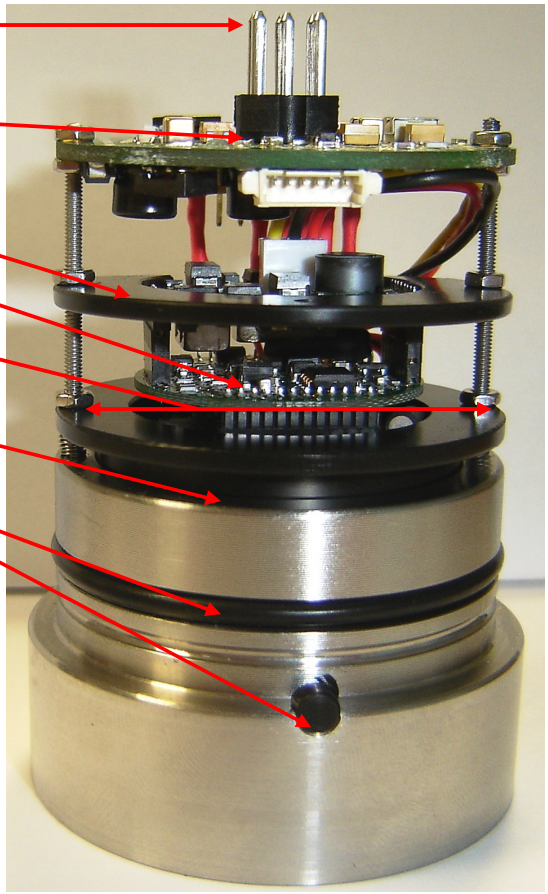
CAMERA VIDEO MODULE PCB STACK

CAMERA FOCUS ADJUSTMENT NUTS

VIDEO MODULE MOUNTING COLLAR

CAMERA MAIN BODY O-RING

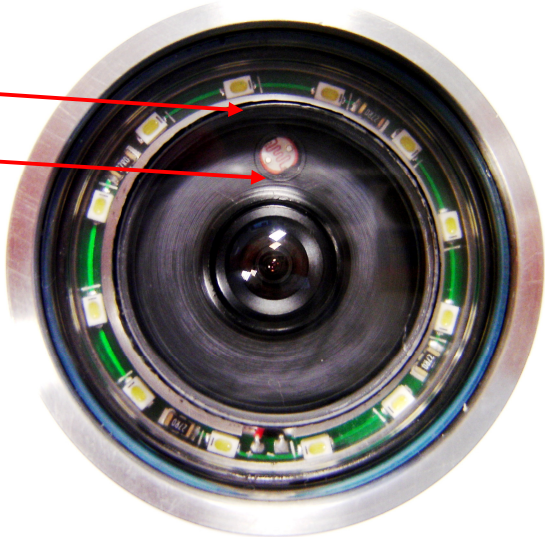
BODY LOCATING PIN (Indicates Top of Picture)



12 x SMD LED RING PCB

LDR SENSOR FOR LIGHT CONTROL CIRCUIT

For orientation purposes the LDR sensor also indicates the top of picture.



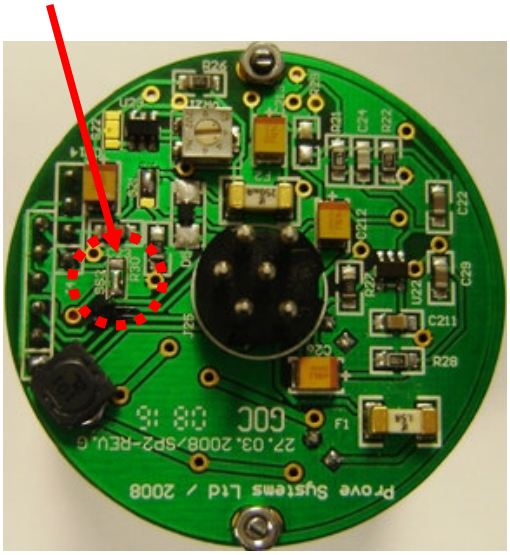
The camera can be set up to allow either of two different analogue control methods for manual light control via the use of solder splashes on the top of the PSU PCB.
Solder splash jumper points are also used to configure the line driver options.
These are detailed below with the standard DEFAULT settings highlighted.

NOTE

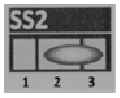
Upon initial power up the Super Seaspy camera will start up in ***Dynamic Light Control mode***. This means that the ring led's will react automatically to any changes in the reflectivity of the work surface or scenery ambient light conditions: - In darker areas the ring led's will brighten and the reverse in lighter areas.

Manual control mode of the ring led's can be obtained by applying an analogue voltage to +/- LIGHT line (PIN1 on Tritech connector).
If you wish to return to Dynamic Light Control mode, after making a manual control input, the camera must be switched OFF for several seconds. Upon switching ON again the camera will revert to Dynamic Light Control Mode.

SS2 MANUAL ELECTRONIC LIGHT CONTROL SETUP:

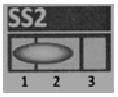


FOR +\- SINGLE WIRE (Tri-State Control)
Link solder pads 2 & 3 together



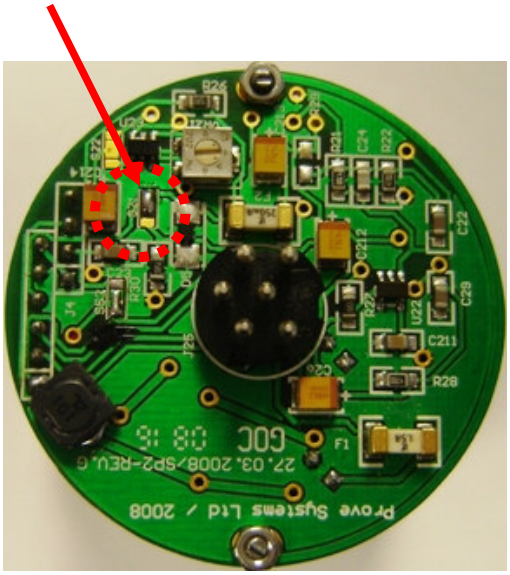
+/- LIGHT is supplied with +5 to +24 volts, LED's Brighten
+/- LIGHT is linked to 0 volts, LED's DIM
+/- LIGHT is left un-connected, LED's remain constant

FOR +\- SINGLE WIRE (Bi-polar Control)
DEFAULT SETTING

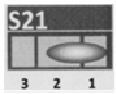


+/- LIGHT is supplied with +5 to +24 volts, LED's Brighten
+/- LIGHT is supplied with -5 to -24 volts, LED's Dim
+/- LIGHT is left un-connected or 0 volts, LED's remain constant

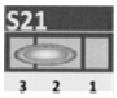
S21 VIDEO OUTPUT SETUP:



TO ENABLE VIDEO OUTPUT
(Without Amplification)
Link solder pads 1 & 2 together
- Amplification & video filter are OFF
DEFAULT SETTING

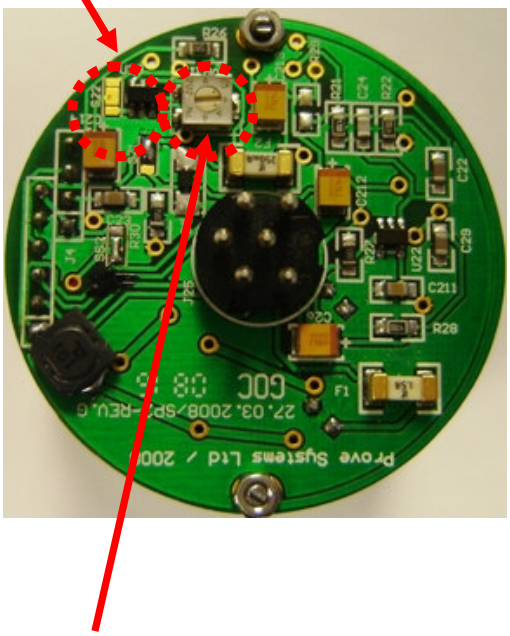


TO ENABLE VIDEO OUTPUT
(With Amplification)
Link solder pads 2 & 3 together
- Amplification & video filter are ON

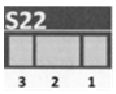


To select the Specific amplification MODE refer to S22 Video Amplifier Setup described below.

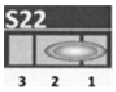
S22 VIDEO AMPLIFIER SETUP:



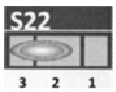
No solder links on S22 pads
No video amplification **DEFAULT SETTING**
(S21 must have pads 1 & 2 linked)
- Buffer with gain of one: OFF
- Set amplifier with high-frequency boost: OFF



Video Amplification (Medium length cable)
Link solder pads 1 & 2 together
- Buffer with gain of one: ON
- Set amplifier with high-frequency boost: OFF



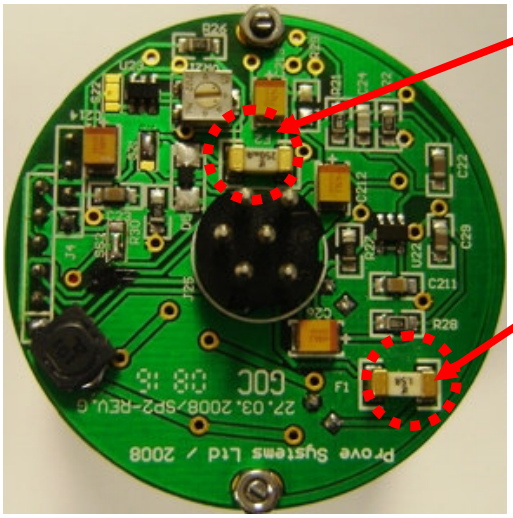
Video Amplification (Long length cable setting)
Link solder pads 2 & 3 together
- Buffer with gain of one: ON
- Set amplifier with high-frequency boost: ON
- Standard buffered video output with colour boost



VR21 VIDEO AMPLIFIER GAIN TRIMMER

Allows a manual adjustment of video signal amplitude via variable resistor, up to a maximum of (2Vp-p)
To have any effect S22 must have pads 2 & 3 linked and S21 must have pads 2 & 3 linked.

FUSE INFORMATION



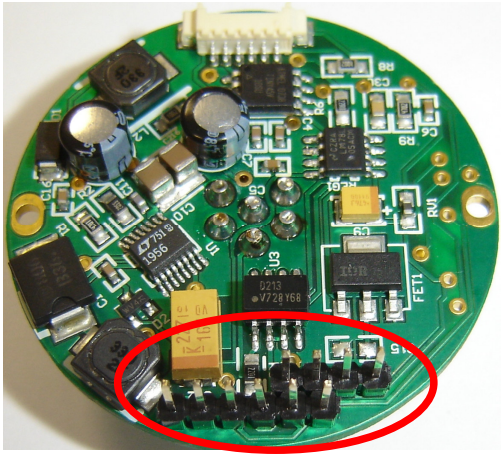
VIDEO LINE FUSE – F2

250mA quick blow fuse protects all the outputs of the camera module and amplifier.
0451.250MRL-
LITTELFUSESMD250mA
REF. Farnell: 9922148

POWER SUPPLY FUSE – F1

1.5A quick blow fuse protects all the camera power supply circuitry against over voltage and reverse polarity.
R45101.5L — LITTELFUSE- 1.5A
REF. Farnell 1453905

INTERNAL WIRING CONNECTIONS



LED & SENSOR CONNECTIONS 1 to 4

				1	2	3	4
1	2	3	4	5	6		

CAMERA MODULE CONNECTIONS 1 to 6

LED & SENSOR CONNECTIONS

1. +10V to LED board (red)
2. Light sensor + (pink)
3. Light sensor – (pink)
4. GND LED PWM (black)

CAMERA MODULE CONNECTIONS

1. +10V Supply to camera module (red)
2. Not connected
3. Not connected
4. Video from module (yellow)
5. Module supply GND
6. Not connected

Focus

By rotating the nuts on each side of the camera module (shown in the picture in section INTERNAL LAYOUT & CONFIGURATION) this will compress or release the module mounting collar and will affect the focus accordingly.

Disassembly procedures

To access the internal part of the camera.

Unscrew the water block and disconnect it carefully.
Extract the nylon cord fitted between the front part of the housing and the camera body.(**Note** there are two cords - the front one retains the port and should not normally be removed)
Gently pull off the body as straight as possible.
Before reassembly the operator **MUST** carefully inspect the O' ring and all sealing surfaces. If in any doubt change the O' ring, clean it and lightly smeared with silicon grease.
Reassembly of the camera is done in reverse order. Make sure to check that the water block O' ring is in position and correctly align the water block with the main 6-pin din connector before pushing it gently in position.

To disassemble the water corrected port from the housing, unscrew the water block and remove it.
Extract the nylon cord maintaining the port in position.
Using a large nylon washer to protect the body inject air inside the body to a pressure of 1 bar max. The acrylic port will be dislodged by this light pressure and removed easily. Take care not to over-pressure the body so as to eject the port - and ensure that it is retained during this operation.

CAUTION!

Maintenance of water integrity is the responsibility of the user.
Internal damage caused by water ingress is not covered by product warranty unless the cause can clearly be identified as a manufacturing defect.

Part list

HEAD HOUSING	PCAM1Z-H01
BODY HOUSING	PCAM1Z-H02
PSU/DRIVER BOARD	PCAM1Z-PSU
WATER CORRECTED PORT	PCAM1Z-WP01
VIDEO MODULE	PCAM1Z-V482
VIDEO MODULE MOUNTING COLLAR	PCAM1Z-V00
LED BOARD	PCAM1Z-L12
SUNDRIES KIT	PCAM1Z-S1
O-RING SET	PCAM1Z-R03

APPENDIX 1 Product Specification

APPENDIX 2 Super SeaSpy Camera Pin Configuration

APPENDIX 3 Super SeaSpy Circuit Diagrams