

Tornado-S Low Light Camera (Stainless Steel)

Operator & Installation Manual

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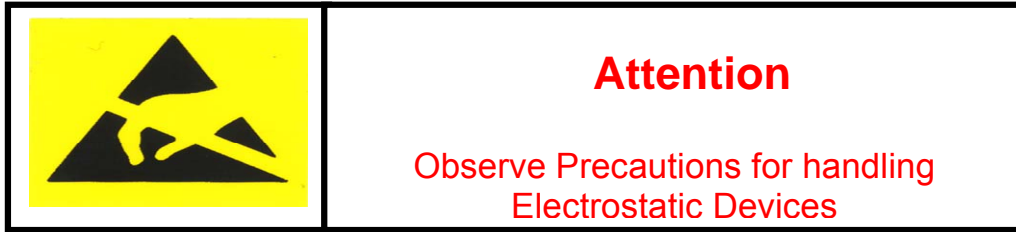
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Handling of Electrostatic-Sensitive Devices



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 Ω 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.

F110.0

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 out with 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.

F167.1

Safety Statements



Caution!

Throughout the manual certain safety 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	<i>Tritech International Ltd.</i> 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 TORNADO low light level camera incorporates the latest innovations in CCD sensor technology.

Complemented by an auto iris lens the system approaches the performance of a SIT camera at a fraction of the cost. A switch mode power supply board provides all the necessary voltages for the camera module.

A 3 stage line driver compensates for attenuation of the video signal as it passes along the umbilical.

The camera module is protected from damage in the event of accidental misconnection. The overall package provides an extremely robust unit that will push the limits under use in harsh environments.

Optional features

Customer specified connectors

OPERATING CONDITIONS

The camera is compatible with any video recorders or monitors working with PAL standard.

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



Caution!

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



Caution!

Before attaching the connector to the camera ensure that the O-ring is on position, clean and lightly smear with silicon grease.

An internal jumper and a small potentiometer are fitted on the Long Line Driver board to give up to 3 stages of boost to the video signal as required.

SETTING UP PROCEDURES

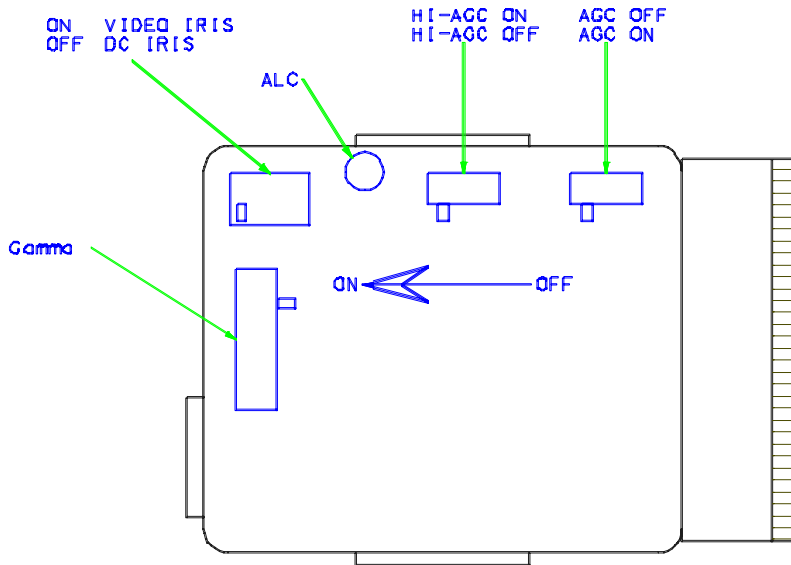
Video

A few settings are accessible on the video module and can be modified by the user depending on applications requirement. It is important to realise that these settings will directly affect the video quality.



Caution!

The iris setting (video mode) must not be change under any circumstance as damage can occur on the lens auto iris module.



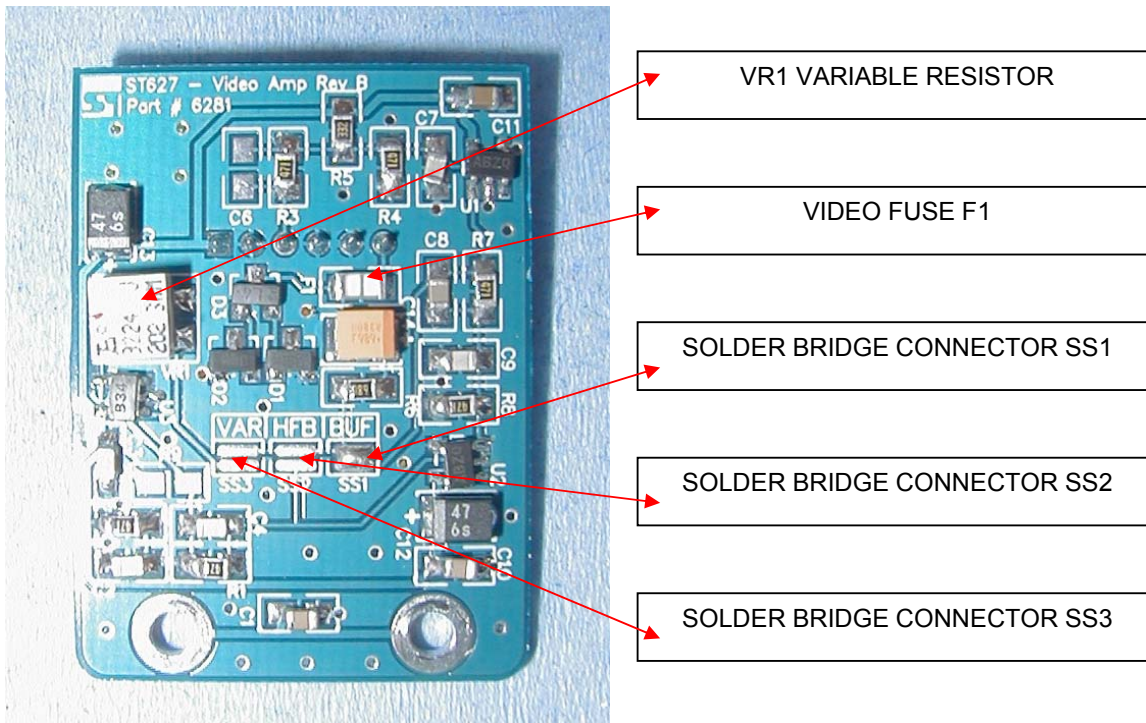
Long line amplifier (Rev B)

If there is a need to drive a long coaxial cable then the video amplifier board is required (Seen pictured below). A solder link can be made in one of the three possible positions to set the compensation circuit for the long line amplifier. Unless otherwise agreed the camera will always be supplied with the solder link in position SS1. Video line protection is provided via a quick blow 250mA fuse at F1.

Position 1- SS1 _____unity gain (standard buffered video output)

Position 2- SS2 _____high frequency boost (standard buffered video output with colour boost)

Position 3- SS3 _____high frequency and DC boost gain variable using VR1 (As with setting SS2 but allows manual adjustment of signal amplitude via variable resistor at VR1 up to a maximum of (2Vp-p).



Caution!

When selecting and changing the video line compensation settings via the solder bridges at SS1, SS2 & SS3 ensure that only one solder connection is made at any one time on the board. For example – if SS3 setting is required then SS1 & SS2 do not require soldered as well.

DISASSEMBLY PROCEDURES

To access the internal part of the camera, unscrew the 3 (2.5mm Hex) screws on the connector end-cap, gently pull the connector end-cap from the main body tube, you may require the aid of a vice with vee blocks to hold the main body tube.



Caution!

Be aware that the camera module and electronics are attached to the connector end-cap and will slide out of the body tube when the camera is parted.

Before re-assembly inspect the O-ring for integrity, if any doubt change it. The O-ring should be cleaned and lightly smeared with silicon grease

Reassemble the camera in the reverse order.

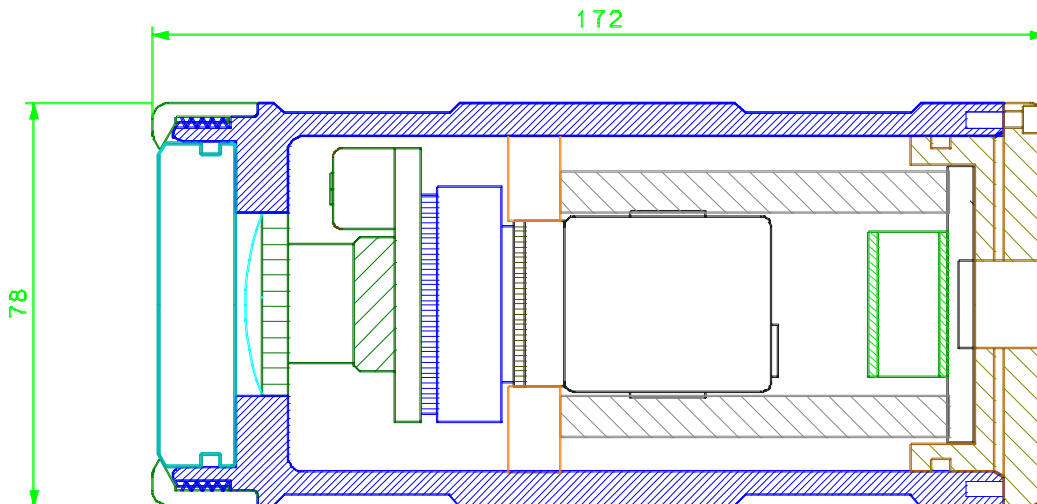


Caution!

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.

ILLUSTRATION TORNADO-S

(Connector not shown in the illustration below)



APPENDIX 1 PRODUCT SPECIFICATION

APPENDIX 2 TORNADO CAMERA CONNECTOR CONFIGURATION