IT CONCEPTS
International Technology Concepts

Remote Visual Inspection

Product Manual

EXTREME series

Videoscope Models
E2-4-100
E2-4-150
E2-4-200
E2-4-300

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Introduction

Thank you for purchasing an Extreme 4mm Videoscope.

This manual provides you the information necessary to operate and maintain an Extreme Videoscope.

Table of Contents

1.0 Warnings and Precautions

GENERAL WARNING AND PRECAUTIONS

- **READ -** For operator safety, be sure to read and understand this user manual before using an Extreme Videoscope.

- **POSSIBLE EXPLOSION HAZARD -** Do not use in explosive environments.

- **ELECTRICAL SHOCK HAZARD -** The Extreme Videoscope handpiece covers should never be removed. There are no user serviceable parts inside the Extreme Videoscope handpiece. Direct all service requirements to an IT Concepts Service Center.

- **VENTILATION –** Any light source, display or other peripheral electrical item used with an Extreme Videoscope requires adequate ventilation to prevent overheating. Do not cover or drape one of these items. To ensure adequate airflow, be sure to provide a minimum 2 inch (5.1cm) distance between the front and rear of these items and any solid objects.

- **LAMP REPLACEMENT -** Use caution when replacing the lamp, it may be hot. Only use IT Concepts 24W Metal Halide Arc Lamp part number: 401-0036

- **EARTH GROUND REQUIRED - ELECTRICAL SHOCK HAZARD -** Proper use of an Extreme Videoscope requires the presence of a protective earth ground path at the AC power source. Use of two-conductor extension cords or any other actions that may result in the loss of this ground path are in violation of the product's safe operating requirements.

- **WARNING - ULTRAVIOLET, INFRARED, AND INTENSE VISIBLE RADIATION EMITTED FROM THE LAMP SOURCE. SKIN OR EYE INJURY MAY RESULT.**

    1. Avoid exposure of eyes and skin to lamp while in operation.

    2. Do not operate a light source without a light guide cable installed.

    3. Turn off the light source or turn the brightness control to minimum before directly viewing the distal end of an Extreme Videoscope.

- **EXTREME VIDEOSCOPE DISCONNECTION -** Always turn off the display before disconnecting an Extreme Videoscope.

- **WARNING –** Use of an Extreme Videoscope in a manner not specified by the manufacturer may impair the product's ability to protect the user from harm.

- **WARNING –** An Extreme Videoscope should never come in direct contact with any voltage or current source. Damage to the product and/or electrical shock to the operator may result!

1.0 Warnings and Precautions (continued)

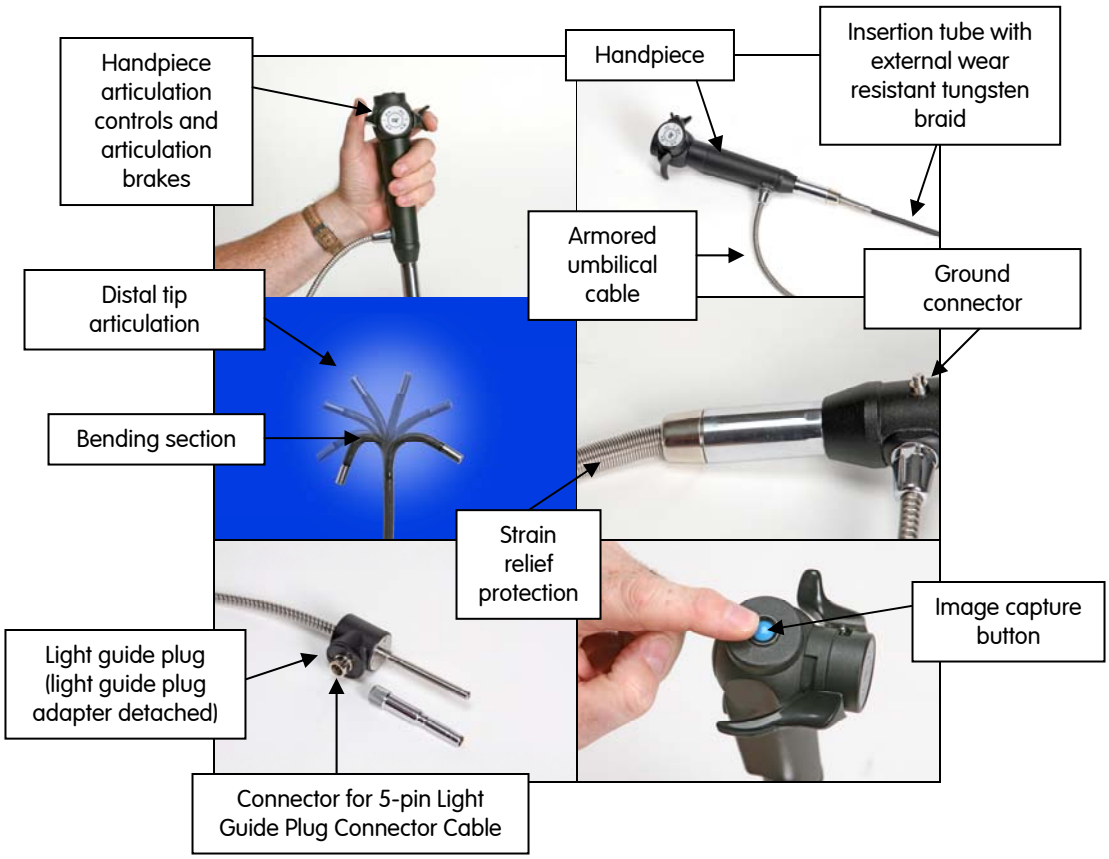
EXTREME VIDEOSCOPE USAGE PRECAUTIONS

- Do not bend or twist the bending section at the end of the insertion tube by hand. Always use the articulation controls to move the tip.
- Whenever inserting or withdrawing an Extreme Videoscope, first adjust the articulation controls to the central neutral position to straighten the distal tip
- Never apply excessive force when inserting or withdrawing an Extreme Videoscope. The bending section is vulnerable to tension and compression forces and may be damaged.
- Never try to force articulation knobs beyond their mechanical stops.
- Protect Extreme Videoscopes from unnecessary moisture, heat, dust and shock.
- Never leave an Extreme Videoscope unattended when it is connected to an operating light source.
- Extreme Videoscopes are never to be used to observe within a human or animal body.

2.0 Overview

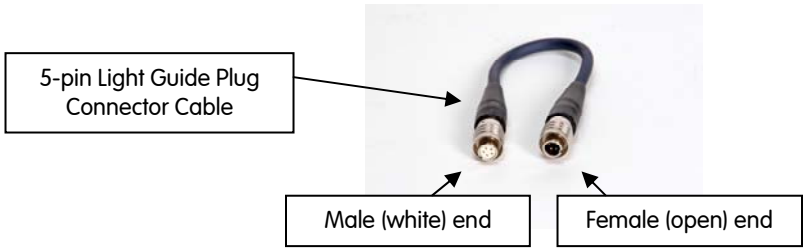
Extreme Videoscopes have been designed for use in combination with IT Concepts video imaging hubs, image capture and display devices and light sources. Extreme Videoscopes are intended for industrial Remote Visual Inspection (RVI) applications such as the interior inspection of engines, pipes, and other difficult-to-access areas. Extreme Videoscopes allow quality control, troubleshooting and maintenance tasks to be performed with the smallest amount of equipment downtime, while maximizing safety, efficiency and operational time.

3.0 Nomenclature



4.0 Operation

To use an Extreme Videoscope with an IT Concepts video imaging hub or image capture and display device, open the case and identify the 5-pin light guide plug connector cable.



Remove the Extreme Videoscope from the case holding the handpiece with one hand and the insertion tube with the other. Place the Extreme Videoscope on a flat surface. Insert the male (white) end of the 5-pin light guide plug connector cable into the Extreme Videoscope light guide plug connector. Insert the female (open) end of the 5-pin light guide plug connector cable into the video imaging hub or image capture and display device umbilical cable socket. Insert the light guide plug into a light source.

Verify that all plugs and connectors are securely in place. Power on the video imaging hub or image capture and display device. An image will now appear on the video imaging hub or image capture and display device. Adjust the light source intensity control to provide an appropriate amount of light for the object being viewed.

The image capture and display device which is most typically used with an Extreme Videoscope is the iCapture. Please see appendix B for iCapture product information.

5.0 Optimum Imaging Results with Extreme Videoscopes

The Extreme series of Videoscopes are different from typical Videoscopes that utilize CCD image sensors. In terms of imaging performance the Extreme series of Videoscopes fits neatly between conventional Fiberscopes and CCD Videoscopes. For most industrial applications Fiberscopes are acceptable, an Extreme Videoscope is better, but a CCD Videoscope is best. Extreme Videoscopes can deliver satisfactory, high fidelity images which reveal sufficient information for users to make sound RVI decisions. The best Extreme Videoscope images can be obtained when due attention is paid to the following points.

a. The display needs to be adjusted so that the brightness level is low and the contrast level is high. This combination of adjustments is essential to produce satisfactory images.

b. The advanced color digital imaging sensor used in the Extreme Videoscope is not sensitive enough for satisfactory operation beyond 3cm (scope tip to inspection target).

c. The Extreme Videoscope is not suitable for use in ambient light. The Extreme Videoscope is most suitable for use in enclosed areas where the inspection target is illuminated by the Extreme's light source.

d. Extreme Videoscope images are best viewed on small displays.

e. The color fidelity of the 4mm Extreme is not as brilliant as a Videoscope with a CCD sensor. Color and hue settings need to be adjusted to high levels to obtain the best results.

6.0 Side View Tip Adapters

Optional side view tip adapters are available for Extreme Videoscopes. Side view tip adapters allow the Videoscope's direction of view to be changed from 0° forward viewing to 90° side viewing. Before a side view tip adapter can be attached to the distal tip of an Extreme Videoscope, the scope's head guard must be removed. The head guard is a simple protective ring that is threaded on to the very distal tip of the Extreme Videoscope. When the head guard has been removed a side view tip adapter can be threaded on to the distal tip of the Extreme Videoscope. A double threaded arrangement is employed to securely attach a side view tip adapter to the distal tip of the Extreme Videoscope.

The exercise of removing and attaching Extreme Videoscope head guards and side view tip adapters needs to be done with care. Head guards and side view tip adapters are small and are easily dropped and lost if care is not employed. Extreme Videoscope head guards and side view tip adapters should be removed and attached over a suitable clean flat surface with good lighting. No force should be required to remove or attach Extreme Videoscope head guards and side view tip adapters. The process should be done by hand only. Tools such as pliers should NEVER be used for removing and attaching Extreme Videoscope head guards and side view tip adapters.

The side view tip adapter double thread arrangement can be tricky, particularly for users with large and/or worn fingers. When the head guard has been removed, the side view tip adapter should be introduced to the distal tip with both items perpendicular to each other. The side view tip adapter should be rotated in a clockwise motion to engage the first thread on the Extreme Videoscope distal tip. When this thread has been engaged and the side view tip adapter has been rotated a couple of times the side view tip adapter will appear to lose the thread. At this point the side view tip adapter should be carefully pushed forward to engage the second thread. When the second thread has been engaged and the side view tip adapter has been rotated a couple of times in a clockwise direct the side view tip adapter will lock into place. Excessive force is not required to correctly complete this procedure.

4mm Extreme Videoscope with head guard in place.

4mm Extreme Videoscope with head guard removed.

6.0 Side View Tip Adapters (continued)

4mm Extreme Videoscope with side view tip adapter removed.

4mm Extreme Videoscope with side view tip adapter in place.

4mm Extreme Videoscope with head guard attached and U.S. penny for size reference.

7.0 User Serviceable Parts

Extreme Videoscopes have no user serviceable parts.

7.0 Maintenance/Cleaning

Extreme Videoscopes should be cleaned after each use.

Use a soft clean cloth or cotton swabs with a 70% alcohol to water solution to clean the distal tip, bending section and insertion tube.

If the Extreme Videoscope handpiece requires cleaning it may be carefully wiped down with a damp cloth and a light household cleaner if necessary. All moisture must be removed from the handpiece when cleaning is complete. The Extreme Videoscope handpiece is not waterproof.

Never immerse or soak the Extreme Videoscope handpeice.

9.0 Service

To obtain service for your iTool, contact one of the following locations.

Always contact IT Concepts before shipping a product for service or repair.

North America
IT Concepts, LLC
3390 Saxonburg Blvd.
Building A, Suite 250
Glenshaw, PA 15116
USA
Tel. (412) 767-5840
E-mail. itoolsystemservice@itconceptsworld.com
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Europe, Middle East and Africa
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Georg-Ohm-Str. 2
35633 Lahnau
Germany
Tel. +49 (6441) 6792990
E-mail. info@itconceptsworld.de
Web. www.itconceptsworld.de

Rest of the World
IT Concepts, LLC
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USA
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E-mail. itoolsystemservice@itconceptsworld.com
Web. www.itconceptsworld.com

10.0 Warranty

IT Concepts warrants its products, when new, to be free from defects in material and workmanship and to perform in accordance with manufacturer's specifications under normal use and service for a period of one year from the date of purchase from IT Concepts. IT Concepts obligation under this warranty is limited to the repair or replacement of products determined by IT Concepts to be defective within the warranty period at no cost to the original purchaser, except for return shipping expenses. It shall be the purchaser's responsibility to return the product to IT Concepts. The warranty does not cover lamps, accessories, or optional equipment not manufactured by IT Concepts, but these items may be covered by separate manufacturers' warranties. This warranty extends to the original purchaser and cannot be assigned or transferred to any third party. This warranty shall not apply to any damage or product failure determined by IT Concepts to have been caused by misuse, accident (including shipping damage), neglect, improper maintenance, modification or repair by someone other than IT Concepts. These express warranties are in lieu of any other warranties, express or implied, including the warranties of merchantability and fitness for a particular purpose, and no other person has been authorized to assume for IT Concepts any other liability in connection with the sale of its products. IT Concepts shall not be liable for any loss or damages, whether direct or indirect, incidental, or consequential, resulting from the breach of any express warranty set forth herein.

11.0 About IT Concepts

As our web site name suggests, International Technology Concepts is a company with business activities throughout the world. We believe that the cross cultural communication of ideas, needs, cost saving initiatives and innovative thinking makes us stronger and more likely to succeed. After all, wherever we live and work in the world, we all know a good thing when we see one and we all smile in the same language.

Our design and manufacturing competencies in areas such as optics, fiber optics, video electronics and fine mechanics are concentrated on RVI. Since 1990 our cosmopolitan resources have allowed us to respond quickly to the demands of our customers and create practical and cost effective solutions for demanding applications.

IT Concepts is a privately owned U.S. corporation and our headquarters are in Pleasanton, California. This location is our worldwide business hub with customer service, manufacturing, repair and inventory resources.

The primary manufacturing and R&D for our products takes place at two sites in Russia. The largest is in St. Petersburg where we have our main manufacturing and R&D location with extensive optical, video, electronics and software resources. The newest facility is in Novgorod, where we have a state-of-the-art electronics fabrication facility.

In Germany we have a newly formed subsidiary that provides customer support and product service for customers in Europe, the Middle East region and Africa.

We offer an extensive range of RVI products to customers throughout the world. The products that we have represent serious competition for any RVI products that maybe encountered in today's marketplace. It is our aim to provide products with features that are necessary for the user and avoid pushing customers to buy features that are expensive, but not really necessary.

4mm Extreme Videoscope Specifications

	E2-4-100	E2-4-150	E2-4-200	E2-4-300
Diameter:	4.0mm (0.157 in)	4.0mm (0.157 in)	4.0mm (0.157 in)	4.0mm (0.157 in)
Working Length:	1.0m (3.3 ft)	1.5m (4.9 ft)	2.0m (6.6 ft)	3.0m (9.8 ft)

Videoscope

Camera:	Advanced color digital image sensor
Video Output:	NTSC
Articulation:	Manual 2-way 120° up/down articulation with force variance braking control
Direction of View:	0° Forward
Field of View:	60°
Depth of Field:	6mm (0.236 in) to 23mm (0.905 in)
Optimum Working Distance:	7mm (0.276 in)
Freeze Frame & Image Capture:	Easy access push-button switch on handpiece
Outer Layer Insertion Tube Sheathing:	Tungsten briad
Insertion Tube Construction:	Multiple layer industrial design with tungsten wire, polyurethane sheathing and a steel monocoil core
Insertion Tube Bend Radius:	35mm (1.38 in)
Operating Temperature:	
Working Length	-10° to 80° C (14° to 176° F)
Housing and Light Guide Cable	-10° to 50° C (14° to 122° F)
Fluid Resistance:	Working length will withstand immersion in water, mineral and synthetic lubricating oils and hydraulic fluids, aviation fuel, kerosene, gasoline and diesel fuel.
Pressure Resistance:	Working length is resistant to 1 bar (14.5 psi)
Hazardous Environments:	Not rated for use in hazardous environments

Side View Tip Adapter

Direction of View:	90° Side
Field of View:	60°
Depth of Field:	See note 1.
Optimum Working Distance:	See note 1.
Adapter Connection:	Double threaded arrangement

Note 1. Specifications not yet released.
Note 2. Specifications are subject to change without notice.

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iCapture smart

The iCapture is a mini image capture and display device for use with Videoscopes and CCD Cameras. The iCapture features a bright LCD display to view live video or stored still images. Images can be effortlessly saved to a memory card for later transfer to a personal computer.

In addition to its image capture capabilities, the iCapture can provide power for IT Concepts Videoscopes and CCD Cameras. This feature means the iCapture is a practical and highly portable alternative to a fully featured video imaging hub.

Specifications (part number: 010-0073)
Display
Type: 4 in (10.2 cm) TFT LCD
Resolution: 960 x 234 pixels
Video
System: NTSC/PAL
Connector: IT Concepts 5-pin
Media
Flash Memory: CompactFlash Type I
Format: FAT16
File Formats: BMP or TIFF
Capacity: Up to 500 images

The iCapture Smart is powered by a 100-240V AC adapter with a stabilized 9-12V DC output.

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