

Operation Manual

12820x Series HandHeld+ Videoscope



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INTRODUCTION

Thank you for selecting Instrument Technology, Inc. (ITI) to fulfill your remote viewing needs.

Since 1967, ITI has been the Leader in Remote Viewing. ITI consistently provides cutting edge technology to customers world-wide.

ITI specializes in the design, development and manufacture of Remote Viewing Instruments (RVI) and systems including Borescopes, Fiberscopes and Videoscopes.

ITI offers over 2,000 standard products as well as products custom designed for unique applications. No matter which ITI product is used, our customers find they are able to observe hostile and difficult to reach environments never dreamed possible before. Though ITI products can solve many remote viewing problems, it is always best to select the proper instrument for any given application. Only then can success be assured.

Your satisfaction is guaranteed with all products purchased from Instrument Technology, Inc. Feel free to contact ITI or your local ITI Representative with any questions.

WARRANTY

Instrument Technology, Inc. warrants that the equipment is fit for the purposes described herein for a period of one year after the date of shipment when used in accordance with the directions for use, and agrees to repair or replace any such defective component part at no cost to the customer.

There are no other express or implied warranties. ITI's sole obligation and purchaser's exclusive remedy for breach of any warranty shall be limited to repair or replacement of the product at the option of ITI. This warranty does not cover, and ITI will not be liable for any resulting direct, proximate, incidental or consequential damages. This warranty does not apply if the product has been subject to misuse, negligence, accident or improper application, nor shall ITI be responsible for work done or repairs made by others.

▲ WARNING: Read this manual completely.

SAFETY INFORMATION DEFINITIONS

- **▲DANGER:** Indicate[s] a hazardous situation which, if not avoided, will result in death or serious injury. The signal word "DANGER" is to be limited to the most extreme situations. DANGER [signs] should not be used for property damage hazards unless personal injury risk appropriate to these levels is also involved.
- **▲WARNING:** Indicate[s] a hazardous situation which, if not avoided, could result in death or serious injury. WARNING [signs] should not be used for property damage hazards unless personal injury risk appropriate to this level is also involved.
- **▲CAUTION:** Indicate[s] a hazardous situation which, if not avoided, could result in minor or moderate injury.

CAUTION: [Signs] without a safety alert symbol may be used to alert against unsafe practices that can result in property damage only.

- **NOTICE:** [this header is] preferred to address practices not related to personal injury. The safety alert symbol shall not be used with this signal word. As an alternative to "NOTICE" the word "CAUTION" without the safety alert symbol may be used to indicate a message not related to personal injury.

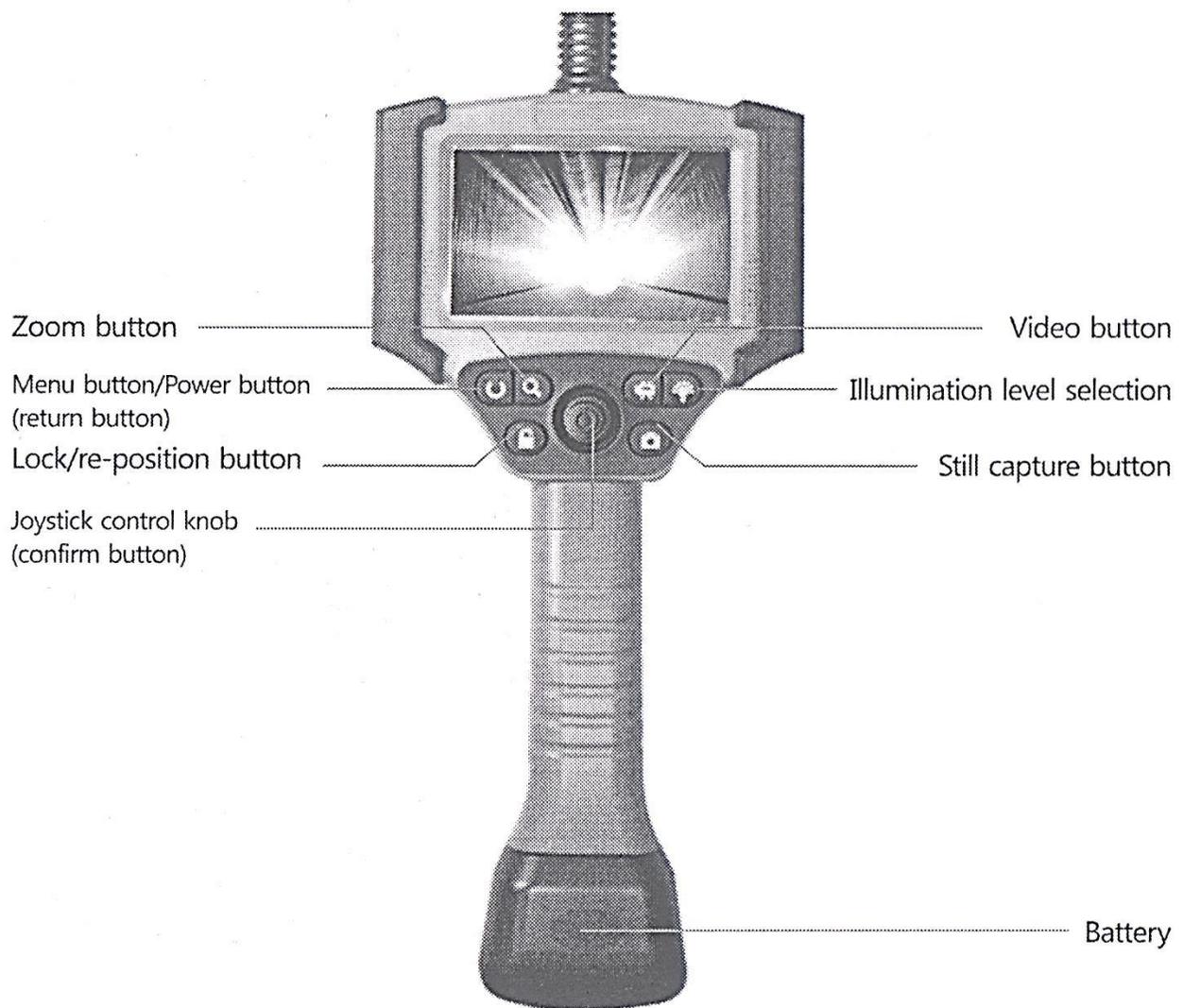


Figure 1, HandHeld+ VS Controls

Front Side Controls

Power/Menu Button:

- Press and hold for 3 beeps to power ON device
- Press and release to enter or leave Menu mode

Zoom Button:

- Press to zoom 2X, 3X, and again to return to 1X zoom

Video Button:

- Press and release to start video recording
- Press again to stop recording

Illumination Level Button:

- 5 levels of brightness plus OFF

Still Capture Button:

- Press and release to capture still image

Joystick Lock/Reposition:

- Press button to lock articulation in position. The Lock icon appears in the upper left corner of the display.
Press button again to unlock the position; Lock icon will clear from the display.

Joystick/Confirm Button:

- Joystick controls the articulation of the working length tip.
Pressing the center of the joystick confirms a selection while in Menu mode.
Actuate the joystick Up, Down, Left, and Right to move through the menu options accordingly.

Side Ports

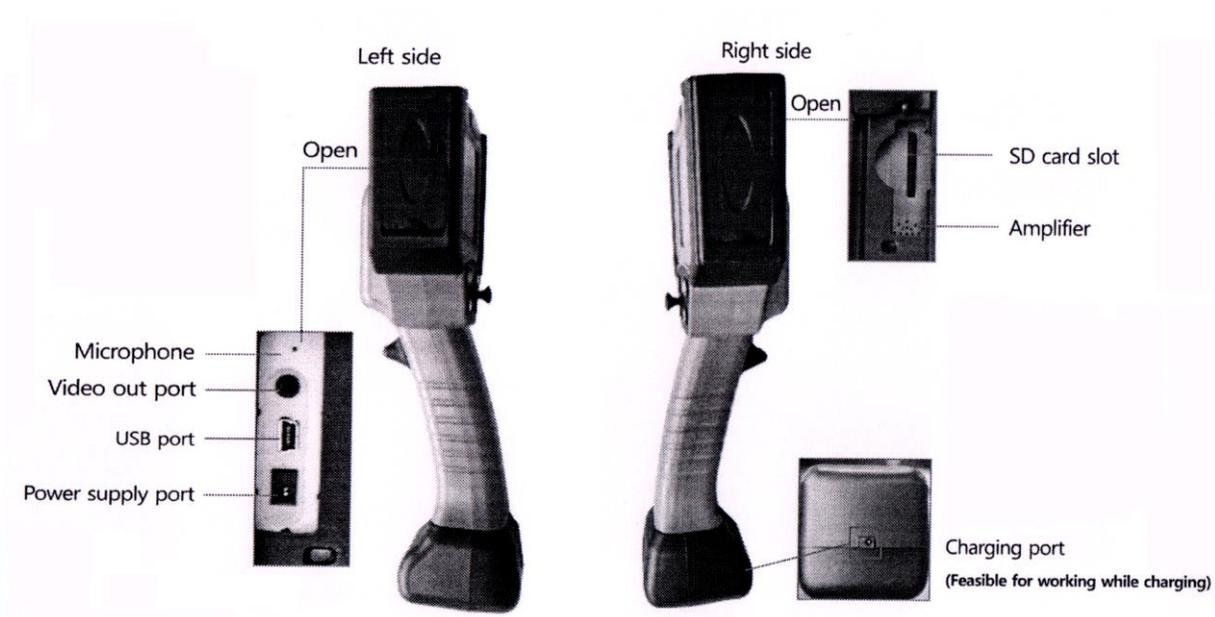


Figure 2, Side Port Connections

Working Length (Probe)

Warning: Working Length is NOT removable.



Figure 3, Working Length (controller not shown)

Battery Installation and Removal



Figure 4, Battery Pack

Videoscope Operation

1. Make sure the battery and SD card are installed before turning on the device.
2. Turn on the device and assure LED's are operating. Adjust illumination level as needed.
 - a. **WARNING:** operating camera continuously for greater than 2 hours may shorten life of imaging sensor. Allow camera tip to cool for 20 minutes prior to reuse.
3. Insert working length into inspection area.
 - a. **CAUTION:** Straighten bending section prior to removal.
 - b. **CAUTION:** Do not articulate in confined spaces. Avoid obstacles and restricted areas.
4. Use the joystick to direct tip to area to be inspected.
5. Adjust illumination and/or zoom for optimal image.
6. Capture still image or video recording.
 - a. Still image will display a camera icon in the upper left corner
 - b. Video record will display a movie camera icon in the upper left corner while recording; push button again to end recording.
7. Playback
 - a. Browsing:

With the Joystick at home position press button for 4 seconds until the image/video record gallery displays on screen. Up to 6 images can be displayed on each page. Use the joystick to advance to next image or next page (or return to previous image or previous page.)

Note: a movie camera icon on the preview image indicates a video file; no icon appears on the still image file.
 - b. Editing:

Still images can be cropped by zooming in, positioning and saving the image.

 1. Select the image to edit.
 2. Press zoom button to enlarge and use the joystick to the desire area.
 3. Press the joystick to initiate the "Trim This Photo" dialog box to appear.
 4. Select from the choice given and press the joystick again to confirm your choice. A new file is created if YES was selected.
 - c. Deleting file:

Within file editing, a file can be deleted

 1. Select image to delete.
 2. Press and hold joystick for 2-3 seconds and a "Delete This File" dialog box will appear.
 3. Select from the choice given and press the joystick again to confirm choice (Yes or No)
 - a. Notice: default option is No

Menu Operation

1. Enter Menu mode by pressing and release of the Power button.
2. 2 modes are available :
 - A. Picture mode that includes:
 - a. White balance (if present) Auto, A type, B type, C type
 - b. AGC (if present) Auto, x4, x8, x16
 - c. Exposure (if present) 11 setting from EV+1.7 to -1.7
 - d. Image mode (if present) Normal, Bright
 - e. Screen brightness Up/Down - +5 to -5
 - f. Screen contrast Up/Down - +5 to -5
 - g. Image proportion 4:3, 16:9
 - h. Auto save On/Off
 - B. System mode:
 - a. Date/Time set Yr/Mn/Dy – Time – 24hr.
 - b. Language EN, JP, CH, DE, FR, IT, NL, TR, DA, FIN, KR, PT, RU, ES
 - c. Format (SD Card) Yes/No
 - d. Power frequency 50Hz, 60Hz
 - e. Sounds
 1. Shutter On/Off
 2. Start_Up Sound 1,2,3,None
 3. Beep On/Off
 4. Volume
 - f. TV system NTSC/PAL
 - g. Auto shut down Off, 5 min, 10 min, 15 min, 30 min
 - h. Firmware updates No/Yes

Specifications

WORKING LENGTH

Diameter	Ø2.85mm (.112")	Ø4.5mm (.177")	Ø6.2mm (.244")*	Ø8.4mm (.331")
Length	1m/1.5m	1.5m/3m	1.5m/3m/6m	1.5m/3m/6m
Material	Stainless Steel	Tungsten	Tungsten	Tungsten
Articulation	2-Way	4-Way	4-Way	4-Way
Angle Nominal**	140°	150°/120°	160°/150°/120°	160°/150°/120°
Mode	Motor Joystick	Motor Joystick	Motor Joystick	Motor Joystick
Ingress Rating	IP64	IP64	IP64	IP64

IMAGING

Camera Sensor	CMOS	CMOS	CMOS	CMOS
Pixels	160k	640x480	1280x720	1280x720
Viewing Angle	90°	60°/90°	120°	120°
f/number	4.0	2.8/4.8	5.0	5.0
Depth of Field	5-50mm	8-80mm (90°)	5-50mm	5-50mm
		60mm – INF (60°)	15mm - INF	15mm - INF
Zoom	1x to 3x	1x to 3x	1x to 3x	1x to 3x
Illumination	5 Levels	5 Levels	5 Levels	5 Levels
Display Monitor	4.3", 800x480	4.3", 800x480	4.3", 800x480	4.3", 800x480

RECORD/PLAY

Photo	jpg 1024x768
Video	avi 800x400
Storage	SD Card

POWER

Battery	Li-ion, 3.7V
Capacity	6000mAh
Operating	4 hours
Charge	5 hours
AC Charger	100-240VAC, 50/60Hz

MENU

File Save/Delete	
14 Languages	
Time/Date	
Format SD Card	

KIT INCLUDES

HH Videoscope	AC Power Supply
Battery Pack	w/foreign adapters
32GB SD Card	Video Output Cable
Case and Foam	Manual

OUTPUTS

Video Port	NTSC/PAL
USB Port	File Transfer to PC

PHYSICAL

Material, Handle	ABS and TPE
Temp, Operating	-10°C to 50°C (14°F to 122°F)
Weight, HH+	.95kg (2.1lbs)
Weight, Kit	5.73kg (12.6lbs)
Size, Kit	56cmx45.7cmx16cm (22"x18"x6.3")

OPTIONS

Wireless	WiFi to phone/tablet
Audio	Microphone
Infrared (IR)	940nm LED
Ingress Protection	IP67 for diameters 4.5mm and larger

* 6.2mm diameter is 6.4mm (.252") for IP67

** Reduce articulation angles 30° for IP67

Trouble Shooting

Symptom	Remedy
Abnormal bending angle	Check the cable; should be straightened before each use.
No images	Check the connection to the power supply.
Out of Focus Image	Adjust distance of camera tip to object of interest. Turn off the Videoscope and clean the lens.

⚠WARNING

- Do not immerse in water unless scope is specifically configured for immersion.
- Do not allow to contact a power source. The device is an electrical conductor.

⚠CAUTION

- Do not disassemble. No user serviceable components. Warrantee will be voided.
- Check batteries before use. Do not use if any sign of damage, corrosion or liquid ingress.
- Inspect the equipment before each use. Do not use if any sign of damage or liquid ingress.

CAUTION

- Do not use out of -10°C to 50°C temperature range.
- Do not use in a corrosive environment.
- Do not use near a magnetic environment.
- Do not use in extremely dusty environments.
- Keep the equipment clean, do not scratch the monitor.
- Do not operate when working length is coiled or bent, this can damage the articulation wires. Working length should be nearly straight when operating to achieve best operation.
- To avoid damage to the probe during inspection, keep the probe straight during insertion and removal.
- Clean probe and distal tip after use.
- Store in the case with battery removed.

Repair Policy

If your equipment requires factory attention, contact ITI's Customer Service Dept. at (413) 562-3606 for a Return Material Authorization. Please be prepared to furnish your model and serial numbers. Return the equipment to ITI, freight prepaid.

Ship to:

Instrument Technology, Inc.
33 Airport Road
Westfield, MA 01085-1357

Please note Return Material Authorization on Purchase Orders, and all shipping documents.

Upon receipt of your equipment, ITI will assess its condition to determine if repairs are needed. If repairs are required, we will quote repair costs and a schedule for repairs. Your options at this point are:

1) Accept Repair

To proceed with the repair, ITI will require a purchase order for the full quoted repair price.

2) Decline Repair - Upgrade to a New Instrument

Choosing this option requires a purchase order for the new equipment at its quoted price. ITI will ship out the next available unit.

3) Decline Repair

Please Note - Most repair evaluations require a partial or complete disassembly of the equipment. Once disassembled, it is impossible to return it to the customer in "as received" condition. At the customer's option, ITI will either return your equipment in its disassembled state, or dispose of it.

