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PoleCam HD Cart System Instruction & Admin Manual



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Intertest Inc.



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Introduction:

Congratulations on your investment in the PoleCam HD Cart System, InterTest's 1" diameter ultraviolet and white light visual inspection and bore examination system (VIBES). All PoleCam HD Cart systems combine a high-definition color camera with robust positioning hardware. An operator can conduct on-the-spot white light, magnetic particle and fluorescent penetrant inspections of intricate components with minimal fixturing.

Many features enhance VIBES system performance and versatility these include:

Generous Movement Envelope

Controlled by either hand or with optional motors, the camera boom travel is 51 inches* horizontally and 16 inches* vertically.

Illumination Control

VIBES systems have both white and UV light capability. Intensity is controlled independently and operation can be UV, white, or both simultaneous.

Video Camera

The SeeUV PoleCam Cart System has motor driven remote controlled focus to ensure crisp, high- definition video images. They capture color video at a resolution of 1920 x 1080 pixels with selectable output formats DVI 1080/30 fps, 720/60 fps or VGA/120 fps.



High Definition Color Images

Illumination, optics, and CMOS imager are optimized for life-like video reproduction of the target surfaces. Color rendition replicates direct viewing of surfaces.

Interchangeable Optics

Five optical adapters allow quick tool-less change of direction of view with corresponding options in field of view (magnification).

System Component selection:

1. EM15472 iShot PoleCam HD 1000 6' length, 1.00" diameter
2. EM17405 iShot PoleCam HD Cart Controller
3. EM15446 iShot PoleCam HD Camera Control unit
4. EM15455 iShot PoleCam HD Dual light sources (1 white & 1 UV LED)
5. EM15475 iShot PoleCam HD 45 degree DOV optical adapter
6. EM16313 iShot PoleCam HD 60 degree DOV optical adapter
7. EM15477 iShot PoleCam HD 90 degree wide DOV optical adapter
8. EM16312 iShot PoleCam HD 0 degree DOV optical adapter
9. EM15018 PoleCam Slide fixture 51" range
10. EM16937 DVI (M) to HDMI (F) Type A Adapter
11. EM17063 17" Monitor



Cautions and warnings.

Safety Precautions

This manual covers the PoleCam HD Cart System, its functions, and use. To ensure safe operation read this manual before operating the equipment. By doing so, you will become familiar with the equipment's capabilities and better understand its functions. Save manual for future reference.

Follow all warnings and instructions in the manual and marked on the equipment.

Operational, General Safety Considerations and Precautions

Always observe the guidelines and precautions that follow.

There are no user-serviceable parts inside the controller. Refer all service to InterTest Customer Service and Support Group.



IMPORTANT: To ensure operator safety, read and understand this manual before using the system.

To avoid injury, read and understand the associated documentation of support components prior to operation. Direct any questions about equipment operation to InterTest Customer Service and Support Group at 908-496-8008 or via email to service@intertest.com.

Cautionary Symbols and Symbol Terminology

Table A describes the various symbols that are used in this manual and mounted on the equipment. The severity level of a potential hazard varies. Refer to for hazard level descriptions.

Table A — Manual and Equipment Safety Symbols

Symbols	Definitions
	WARNING/CAUTION: Risk of electric shock.
	WARNING/CAUTION: Refer to instruction manual.
	WARNING/CAUTION: Avoid exposure to water and liquids.
	WARNING/CAUTION: Avoid eye and skin exposure to UVA Light.



Warnings

Stop operation immediately when any abnormality or defect occurs. Use during an abnormal condition; such as emitting smoke, burning odors, after damage from dropping, invasion of foreign objects, etc. may cause fire and/or electrical shock. Disconnect the power plug from the electrical outlet at once and contact InterTest Inc for service.

Care & Maintenance

Boom Hazard

- Use care when moving the SeeUV PoleCam HD Cart System. The pole protrudes well past the end of the cart.
- Retract pole before moving unit. It is recommended that the pole be holstered for movement and long-term storage
- Do not subject to loads.
- Do not jar or impact with other items.

Light Sources, Light Guides & Cables

- Do not look directly at UV light; damage to your eyes may occur.
- Use care when removing light guides from light sources after use, they will be hot.
- Do not expose to moisture or direct sunlight.
- Do not expose positioning mechanism to abrasive particulate or environments with airborne debris.
- Always replace blown fuses with identically rated ones.
- Never bypass the grounding circuits of system components.
- Bundle all excess cordage to prevent snagging.
- Do not operate near intense electromagnetic fields.
- With the exception of lamp and fuse replacement, refer all service to InterTest technicians.

Cart

- Engage both wheel locks prior to system operation.

Light Guides

- Do not pull or otherwise exert tensional force
- Do not subject to tight bend radii.
- Do not use a fiber-based light guide with an ultraviolet light source
- Do not allow light guide jack to strike floor.

Monitor

- Clean as needed using a cloth dampened with glass-cleaning solution.
- Do not block ventilation ports



- Refer to owner's manual before adjusting monitor settings.

Lubricant

- Lubricate the taper roller bearing at the bottom of the elevation lead screws.
- Use NLGI #2 equivalent bearing grease. Use a small amount annually.
- Monthly wipe down vertical support rods with light oil such as 3-in-1.

Control Units

- Clean intake and exhaust ports on a regular basis. Keep clear and free from dust

Only use the specified power supply.



Do not use in proximity to energized electrical equipment

Do not connect or disconnect any cable while the unit is energized.

Some surfaces may be warm to the touch. Use caution when handling.

Disclaimers

InterTest Inc. disclaims any responsibility and shall be held harmless for any damages or losses uncured by the user with the use of this product. Including the following:

1. Fire, earthquake or any other Act of God. Acts by third parties; misuse by the user, whether intentional or accidental; use under conditions outside of noted operating range.
2. Malfunction or non-function resulting in indirect, additional or consequential damage including but not limited to loss of expected income and suspension of business activities.
3. Use not in compliance with this manual's instructions.
4. Malfunctions resulting from misconnection.
5. Unauthorized repairs or modifications.
6. Notwithstanding the foregoing, InterTest's liabilities shall not exceed the purchase price of the product.

Warranty

InterTest, Inc. guarantees products manufactured by InterTest, Inc. to be free from defects in materials and workmanship for a period of one (1) year, from the date of original purchase. All other products not manufactured by InterTest, Inc. will carry the OEM's limited warranty, which will be passed to the purchaser through and supported by InterTest, Inc. InterTest, Inc.'s obligation under this limited warranty shall be confined to the repair or exchange of any part, or parts thereof, that prove defective under normal use and service for which the product was intended or designed.



This limited warranty covers products that upon our examination are deemed to be defective.

This limited warranty is in lieu of all other warranties, express or implied, including the warranties of merchantability and fitness for use. We neither assume, nor authorize any other person to assume for us, any other liabilities in connection with the sale of InterTest, Inc. equipment. This warranty does not apply to any equipment that has been subject to accident, negligence, alteration, abuse, unauthorized repair, improper storage, or other misuse.

This limited warranty applies only to the original purchaser and cannot be assigned or transferred to any third party without express written consent from InterTest, Inc.

This limited warranty does not apply to consumable items, expendable items or normal wear and tear, nor does it apply to failure due to radiation, overheating and / or below freezing temperatures. .

InterTest, Inc. assumes no responsibility, either expressed or implied, regarding the improper usage of this equipment or interpretation of test data derived from the use of this equipment. InterTest, Inc.'s responsibility and obligations, in all cases, are limited strictly to the repair and/or replacement costs outlined above.

The laws of the State of New Jersey shall govern this warranty.

Note: In the event the equipment cannot be returned to InterTest, Inc. The customer agrees to pay all travel and living expenses incurred to have an InterTest, Inc. representative evaluate, assess or affect a warranty repair in the field.

Copyrights and Rights of Portrait

There may be a conflict with the Copyright Law and other laws when a customer uses, displays, distributes or exhibits an image picked up by a television camera without permission from the copyright holder. Please also note that transfer of an image or file covered by copyright is restricted to use with the scope permitted by the Copyright Law.

Registered Trademark Information

InterTest® is a registered trademark of InterTest, Inc.
iShot® is a registered trademark of InterTest, Inc.
iShot® Imaging™ is a trademark of InterTest, Inc.



IMPORTANT: If you are in possession of a printed or electronic version of this document, be aware that it may not be the current revision. To ensure that you are using the most up-to-date revision of this document, contact the InterTest Customer Service and Support Group or reference the downloads portal under this product on www.intertest.com.

System Components

Camera Control Unit, Light Sources, Monitor, On-Screen Display Unit & Cart

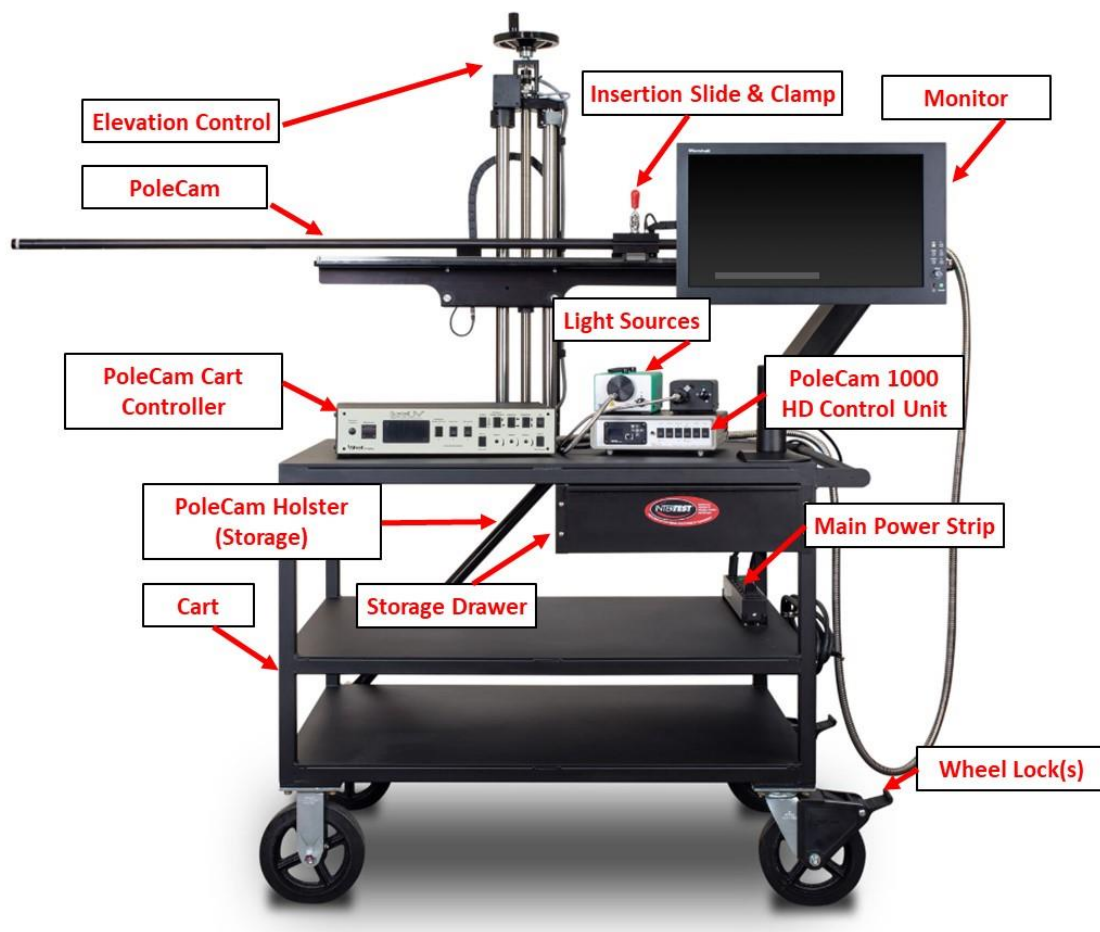


Figure 1 PoleCam HD Cart System

Standard

- | | |
|------------------------|---|
| 1. Cart | Wheeled cart with storage drawer |
| 2. Elevation/Insertion | Elevation/Insertion Assembly with PoleCam Clamp |
| 3. CCU | Camera Control Unit |
| 4. PoleCam | Pole system with imbedded CMOS video sensor and flexible umbilical |
| 5. Light Sources | UV & White Light Sources |
| 6. On-Screen Display | On-Screen Control/Display Unit (OSD) |
| 7. Monitor/Swing Arm | Monitor mounted on a swing arm |
| 8. Optical Adapters | PoleCam attachments that provides different Directions and Fields of View (FOV) |
| 9. Power Supplies | AC for CCU & AC to DC Adapters for light sources |
| 10. DVI Cable | Cable that carries images to OSD unit to be displayed |

Available Optical Adapters / Tips

1. 0 Degree
2. 45 Degree
3. 60 Degree
4. 90 Degree Narrow Field of View
5. 90 Degree Wide Field of View
6. PoleCam Protective End Cap



**PoleCam Optical
Adapters**

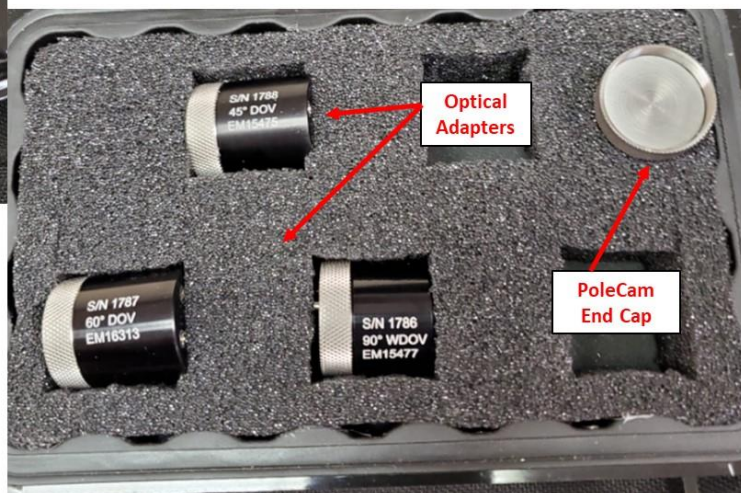


Figure 2 PoleCam Optical Adapters



**PoleCam
Protective Cap**



Figure 3 PoleCam Protective Cap

Note: It is recommended to Store the PoleCam 1000HD using the protective cap

Controls and connections for PoleCam

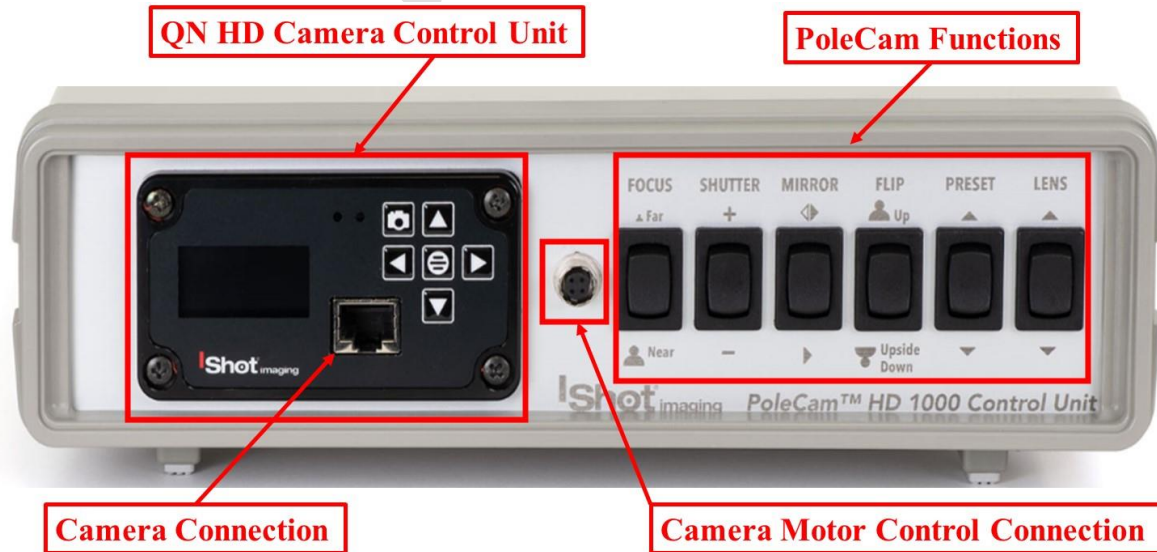


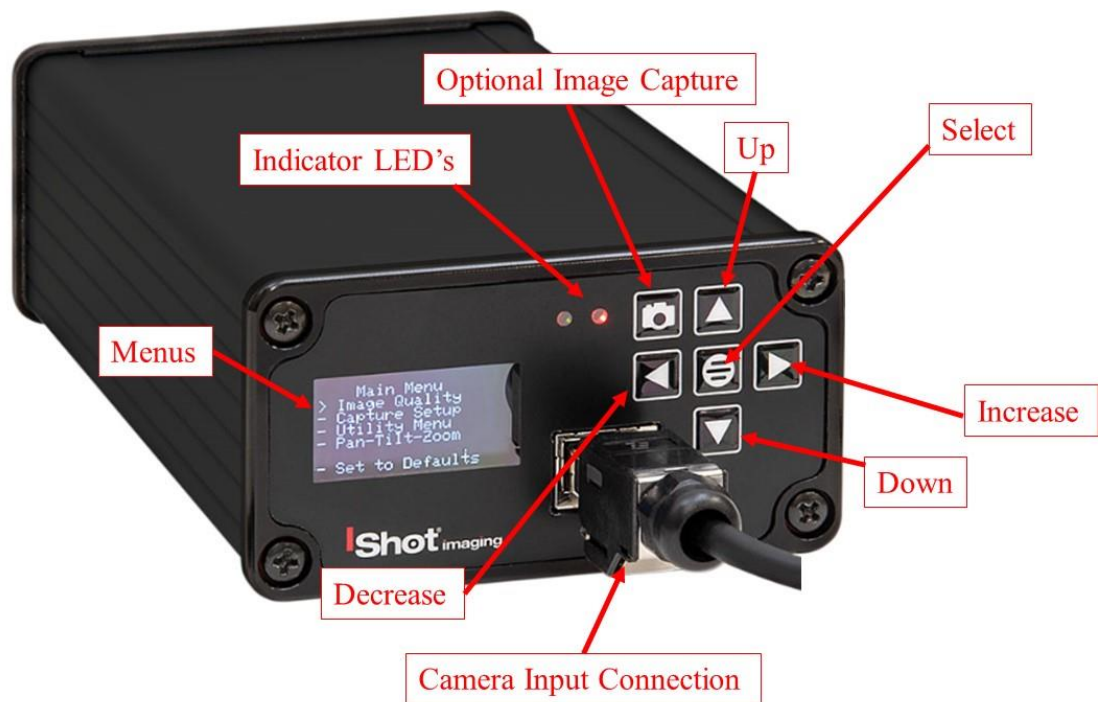
Figure 4 Control Unit Connections & Controls Front



Figure 5 Power Connections Rear & CCU ON/OFF



Figure 6 ON/OFF Controls Light Sources



LED 1	Green if camera head is connected and comm channel is locked, Yellow if not
LED 2	Power

Figure 7 Labeled Front of Camera CCU

Camera Controls



Button Number	Function	Options	Notes
1	Focus	Near / Far	
2	Shutter	+/-	
3	Mirror	Left / Right	
4	Flip	Up / Upside Down	
5	Preset	2 Available	Toggles between the 1st two presets in the camera control unit
6	Lens	Lens Color Correction	cycles thru the lens corrections stored in the control unit.

Figure 8 Labeled Front of Control Unit



Figure 9 Light Source Controls / Slider for Fine Light Control

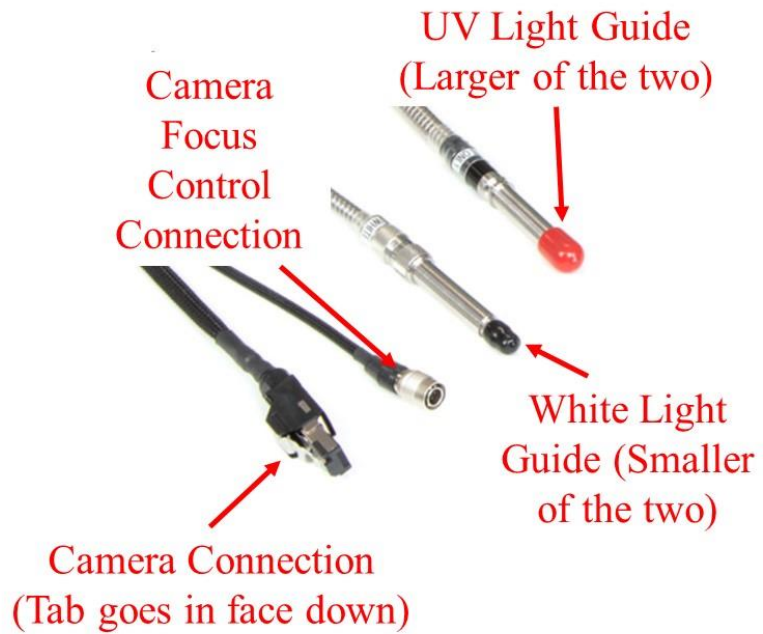


Figure 10 PoleCam Connections



Figure 11 Connected PoleCam Control System & Lightsources

General Operation

- Remove PoleCam from Storage Holster
- Make sure Main Power is turned OFF See Figure 12
- Install PoleCam on Elevation / Insertion Slide See Figure 13
 - 1) Place Insertion Slide/ Clamp all the way to the right
 - 2) Line Up PoleCam with end of Slide Assembly line Black Line/Label Face Up
 - 3) Clamp Pole. Make sure it is centered in the groove
- Connect PoleCam to the Cart Control Unit per Figures 11 & 14
- Install PoleCam Tip/Lens needed See Figure 16
- Connect external recording device (Optional) as shown in Figure 15
- Turn on Power on each Unit then Turn On Main Power Strip Per Figure 12
- Adjust settings with front panel toggles to optimize performance for intended use per Figure 7 & 8

After power is applied to the control units & turned ON, Right indicator LED will light up on the front of the Camera CCU See Figure 7, wait 5-10 seconds, until the Main Menu appears in the CCU Screen. OSD will appear in 20-30 Seconds provided it has been activated. See Figure 16 & 18. Turn on the light source(s), White/UV as needed See Figures 6, 9 & 12.

NOTE: On-Screen Display is configured for 1080P.

Settings changes will be saved automatically on power down. If any parameter is changed a back step in menu is required for it to be saved on power down.

Change of settings is performed by moving through menu to desired function then pressing the appropriate button for one step increments of value change or if the button is held down rapid steps through multiple values will occur.

Unit is shipped with default settings as noted on pages 30-31. Typical common use settings are accessed by front panel toggles.

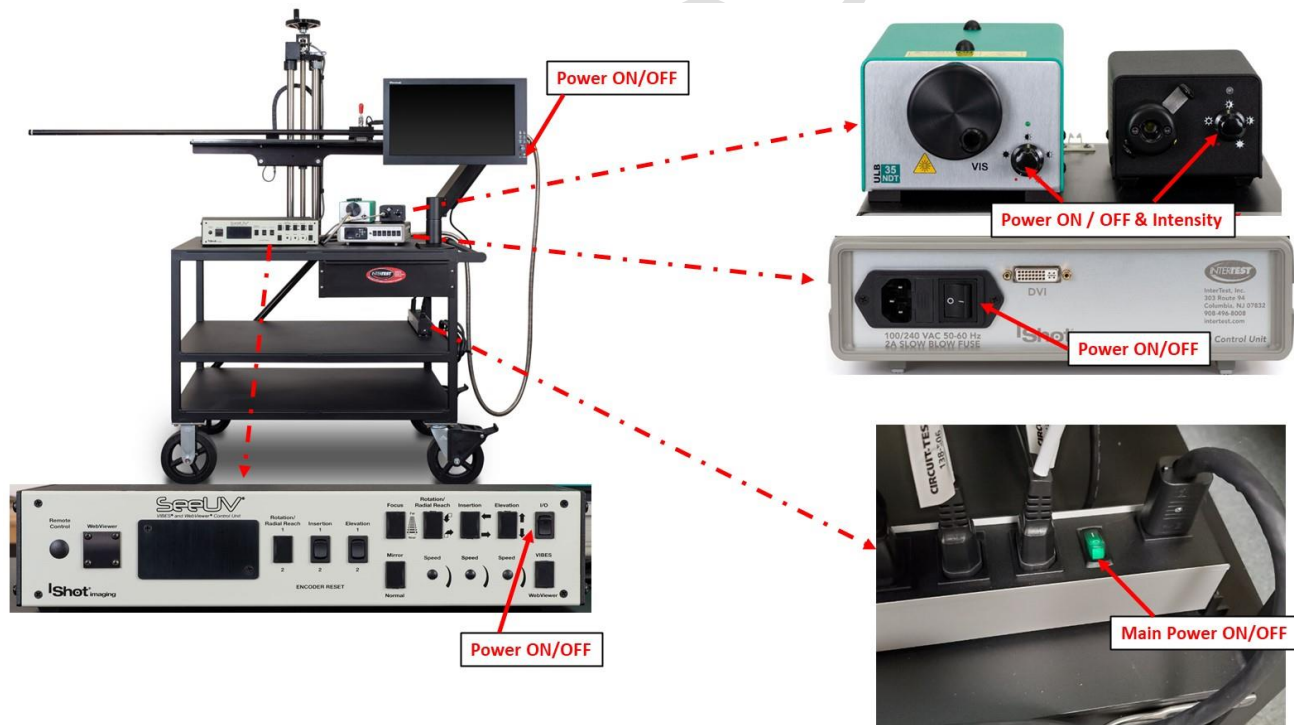


Figure 12 Power ON/OFF

Pole Mounting & System Connections

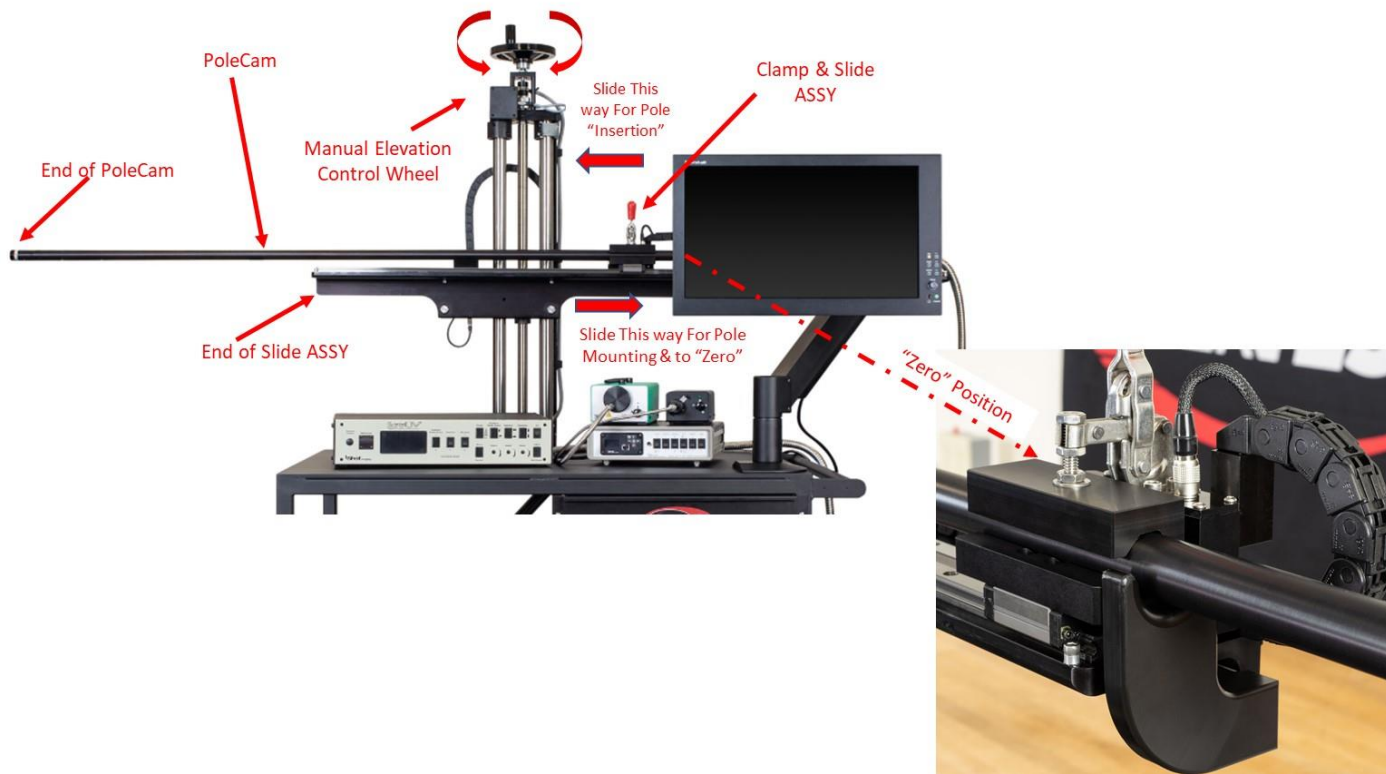


Figure 13 PoleCam Installation

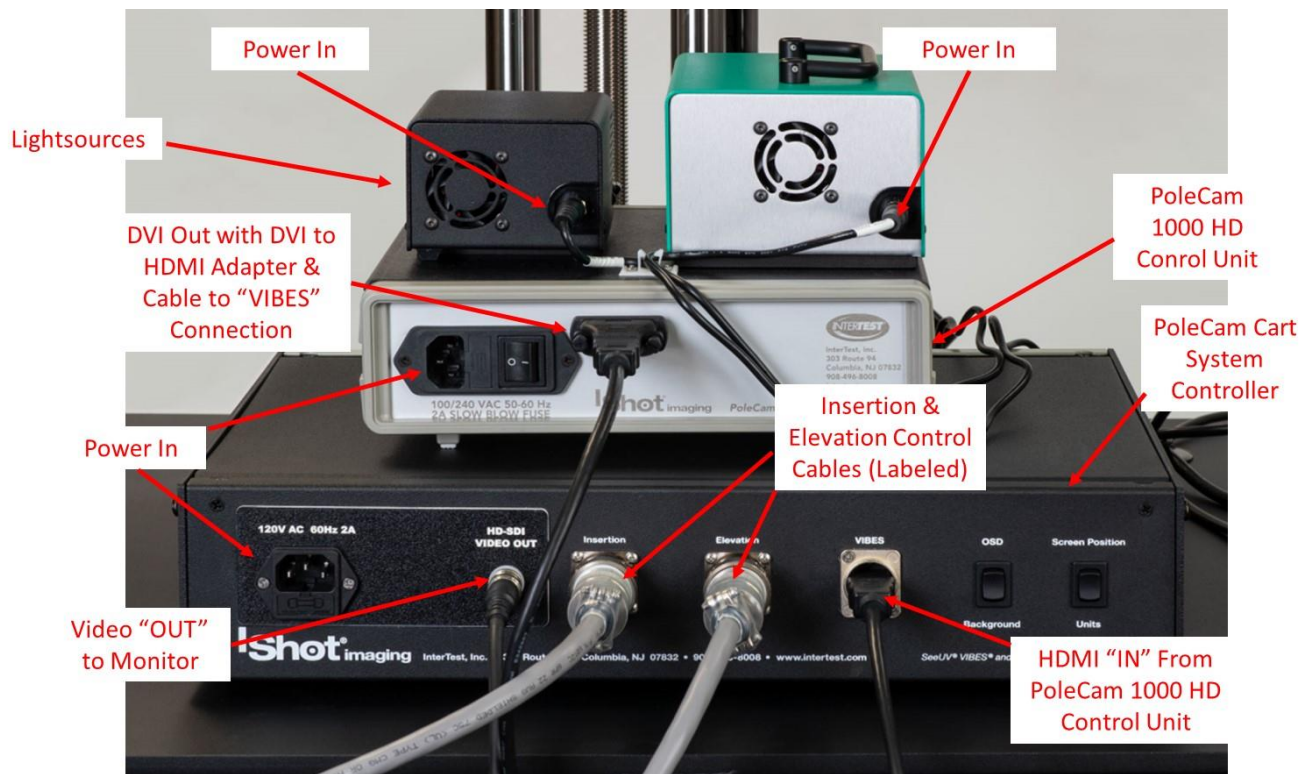


Figure 14 System Connections

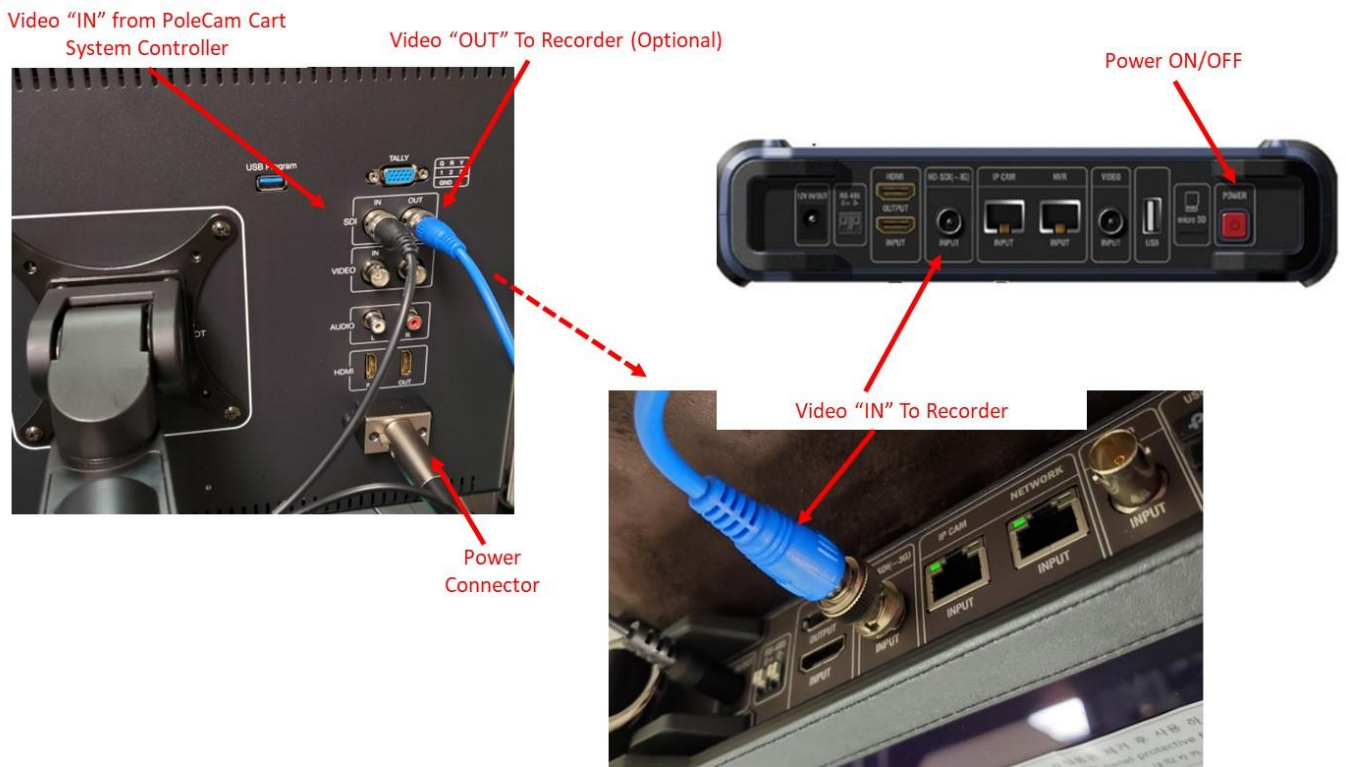


Figure 15 External Recording Connection (Optional)

**Line Up Pins & White Dot on
Optical Adapter to Holes & White
Dot on PoleCam HD**

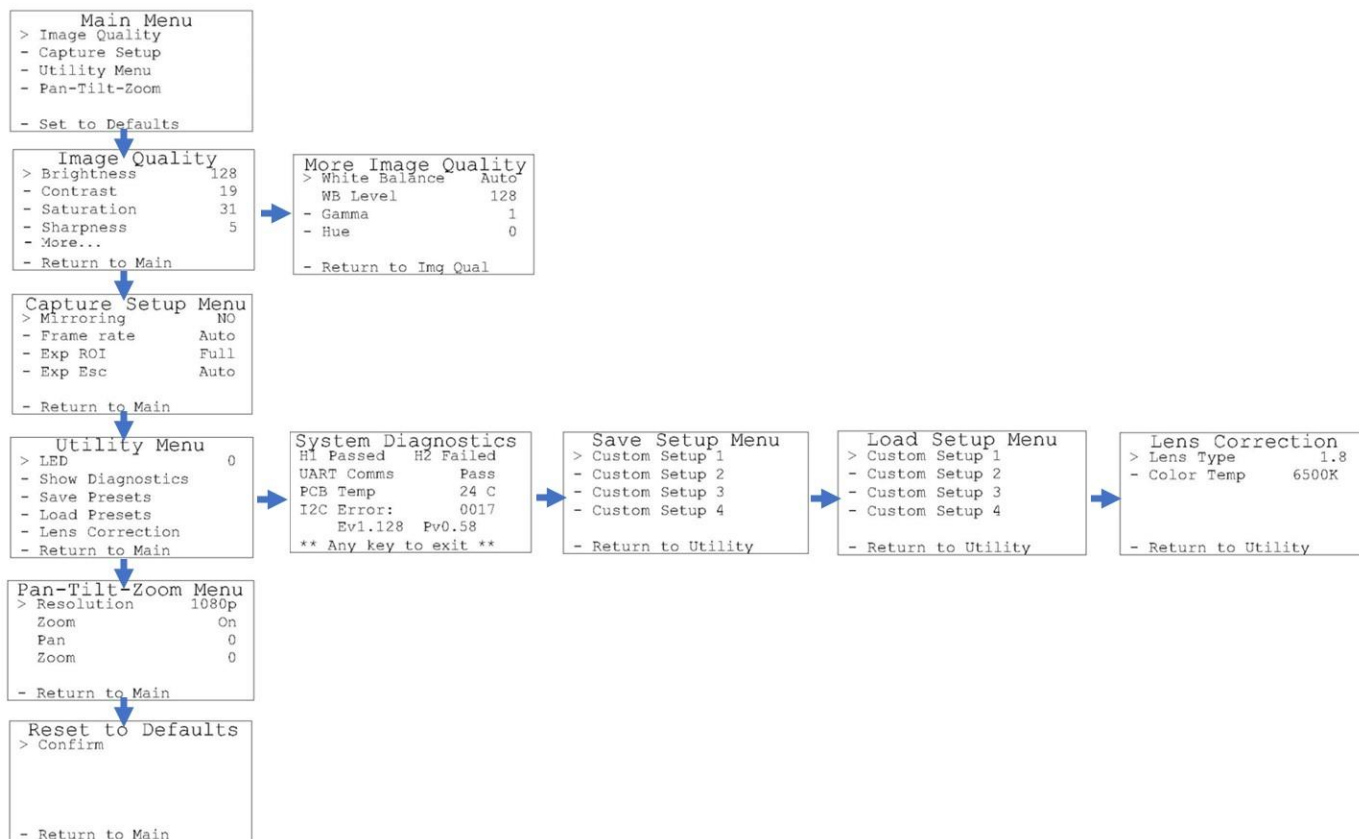


**Push Optical Adapter On & Then
Tighten by Hand as Shown**

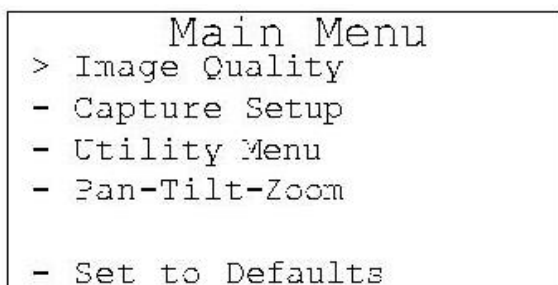
Figure 16 Tip Installation



Operation & Menu Top Level Camera/PoleCam Control Unit



Menu Tree



Menu tree home.



Image Quality

```
Image Quality
> Brightness      128
- Contrast        19
- Saturation      31
- Sharpness       5
- More...
- Return to Main
```

Brightness: 0 to 255, Default: 128

Contrast: 0 to 63, Default: 16

Saturation: 0 to 63, Default: 31

Sharpness: 0 to 31, Default: 5

More continues to options on More Image Quality page.

Return to Main: returns to top of menu tree and saves settings.

```
More Image Quality
> White Balance   Auto
  WB Level        128
- Gamma           1
- Hue             0
- Return to Img Qual
```

White Balance: Auto or Set Set mode allows user to select fixed value.

WB Level: 0 to 255 Default: Auto
50 appears to be about neutral in fluorescent lighting.

Gamma: 0, 1, or 2 Default: 1

Hue: -180 to 180 Default: 0

Return to Img Qual: returns to previous page, Image Quality.



Capture Setup

```
Capture Setup Menu
> Mirroring          NO
- Frame rate        Auto
- Exp ROI           Full
- Exp Esc           Auto
- Return to Main
```

Mirror: No, H, V, HV.

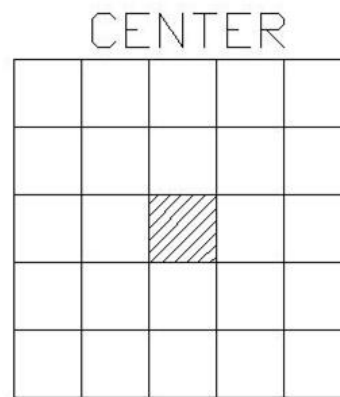
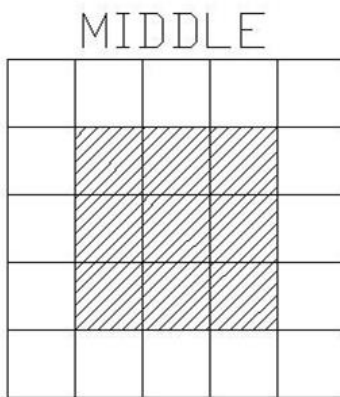
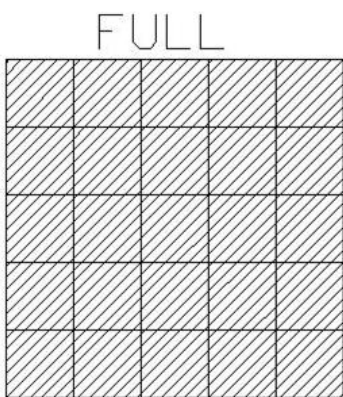
Default: No

Frame Rate: Auto, 1 to 30 Hz in 1080
1 to 60 Hz in 720
1 to 120 Hz in VGA

Default: Auto

Exp ROI: Full, Middle, Center Exposure Region Of Interest. Area analyzed to adjust Image

Exp ROI: Full, Middle, Center Exposure Region Of Interest. Area analyzed to adjust Image



EXP Sec: Auto, 1, 1/2, 1/3, 1/4, 1/5, 1/6, Default: Auto

Length of time image is exposed in seconds

1/7, 1/8, 1/9, 1/10, 1/15

1/20, 1/25, 1/30, 1/50,

1/60, 1/100, 1/120, 1/250

1/500, 1/1000, 1/5000,



1/10000, 1/20000, 1/30000

Utility Menu

```
Utility Menu
> LED 0
- Show Diagnostics
- Save Presets
- Load Presets
- Lens Correction
- Return to Main
```

LED:	0 to 10 Light intensity level (not used in PoleCam)
Show Diagnostics	Displays system diagnostics status
Save Presets	Allows current settings to be stored for later recall
Load presets	Allows previously stored settings to be restored
Lens Correction	For setting color correction of the lens installed

System Diagnostic

```
System Diagnostics
H1 Passed H2 Failed
UART Comms Pass
PCB Temp 24 C
I2C Error: 0017
Ev1.128 Pv0.58
** Any key to exit **
```

1080/30 (H1): Locked/Failed Camera type attached

1080/60 (H2): Locked/Failed Camera type attached (not used in PoleCam)

Note: Only one camera type will read as “Locked. The other will indicate fail

UART Comms:	Pass/Fail	USB communication functioning
PCB Temp:	xx-xx C typ	Temp on PCB
I2C Error:	00xx	
Ev#.### Pv#.##	firmware revision loaded in CCU.	



```
Save Setup Menu
> Custom Setup 1
- Custom Setup 2
- Custom Setup 3
- Custom Setup 4

- Return to Utility
```

Allows up to 4 sets of camera settings to be stored for later recall and use.

Load Presets

```
Load Setup Menu
> Custom Setup 1
- Custom Setup 2
- Custom Setup 3
- Custom Setup 4

- Return to Utility
```

Allows recall and use of any of 4 previously store sets of camera settings.

Lens Correction

```
Lens Correction
> Lens Type      A-E
- Color Temp     6500K

- Return to Utility
```

Allows setting lens installed and color temp for image correction.

LENS TYPE: A, B, C, D, E

Color Temp: 2800K, 4500K or 6500K



Pan Tilt Zoom Menu

```
Pan-Tilt-Zoom Menu
> Resolution      1080p
  Zoom           On
  Pan            0
  Tilt           0
- Return to Main
```

Resolution:

DVI output 1080p, 720p
In 1080p Pan, Tilt & Zoom Disabled

Zoom: On/Off Default: Disabled

Pan: +/- 320 in 720p Default: Disabled

+/- 640 in 480

Tilt: +/-180 in 720p Default: Disabled

+/- 300 in 480

Set to defaults

```
Reset to Defaults
> Confirm
- Return to Main
```

Confirm: changes settings to the factory default settings and returns to Main Menu.

Return to Main: Returns to top of Menu Tree (Main Menu), without changing settings.



Shutter Table:

The shutter increment and decrement functions have 18 total steps as seen in the following table. The shutter value can be set to any value between 1/1 to 1/20000 using the direct command. If the shutter value is set to a different value than one in the table, the increment and decrement commands will set the shutter value to the next highest or next lowest shutter step respectively. If the shutter is given a decrement command while at shutter value 1/1 the shutter value will go into auto mode.

Step #	Shutter Speed	qr st value
0	Auto	00 00
1	1	00 01
2	1/2	00 02
3	1/3	00 03
4	1/4	00 04
5	1/8	00 08
6	1/15	00 0F
7	1/25	00 19
8	1/30	00 1E
9	1/50	00 32
10	1/60	00 3C
11	1/100	00 64
12	1/250	00 FA
13	1/500	01 F4
14	1/1000	03 E8
15	1/5000	13 88
16	1/10000	27 10
17	1/20000	4E 20

Tip Installation

See figure 16 Insertion & Elevation Controls

Manual rotation of control wheel for elevation adjustment

Manual horizontal movement by hand on the Polecam

See figure 13



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Polecam Cart System Controller



Figure 17 On-Screen Display, OSD, Controls

Button Function	Function	Notes
Power On/Off	Turn On Main System Power to OSD Unit	Switch Will Illuminate
Insertion Encoder Rest Button	Zeros Insertion Encoder	Pressing Up will reset insertion depth Down will reset Reference Value See Figure 12
Elevation Encoder Rest Button	Zeros Elevation Encoder	Pressing Up will reset Elevation Height Down will reset Reference Value See Figure 12
On-Screen Display ON/OFF & Background ON/OFF	Press UP to Turn ON OSD	
On-Screen Display ON/OFF & Background ON/OFF	Press Down to Turn ON Background for Encoder Values	
Screen Position & Units Inches /CM	Press UP to Cycle OSD in each corner of the Screen	Each Button Press Moves OSD to One of the Four Corners
Screen Position & Units Inches /CM	Press Down to Cycle Units Between Inches & CM's	

Figure 18 OSD Button Functions

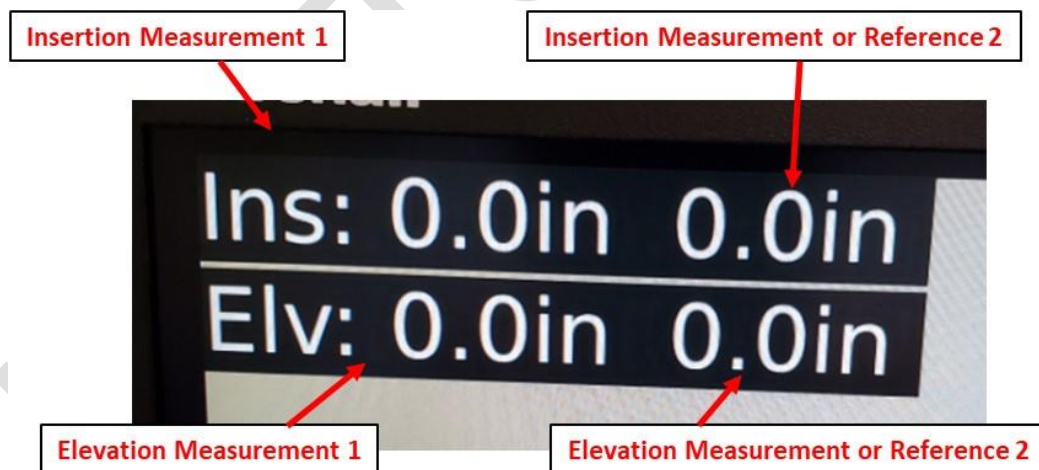


Figure 19 Insertion & Elevation Values



Specifications

Camera Head

Image Sensor	1/6 CMOS 2MP		
Active Array (H x V)	1920 x 1080		
Image Area (mm)	2.73 x 1.55		
Output Format	1080/30P	720/60P	VGA/120
Output Type	DVI & USB	DVI & USB	USB
Minum illumination			
S/N ratio			
Environmental	Temperature	RH	
Operational	0 to 60 C	90% non condensing	
Storage	neg 20 to 85 C	non condensing	
Weight	3 g	without cable	

Camera Cable

	PVC	PFA
Temperture	neg 55 to 105 C	neg 65 to 210 C
Length	15 m max	15 m max
Weight	31 g/m	24g/m
Diameter	4.1 mm	3.7 mm

Camera Control Unit (CCU)

Power Supply (USB 3 C)	5V 1A	with LED driver active
Environmental	Temperature	RH
Operational	0 to 60 C	90% non condensing
Storage	negative 20 to 85 C	non condensing
Size	87 x 47 x 170	W x H x L
Weight	370 g	
Remote communications	RS232	
	Still Photo Capture	
Output 1	DVI	1080/30p & 720/60p
Output 2	USB 2	1080/30p, 720/60p, 640x480/120p
LED driver output		
constant current P/S	Up to 1A	10 step control



Cart System

SeeUV PoleCam HD Cart System	
Boom Diameter	Pole Cam HD 1.0" (2.54cm)
Boom Length	72" (182.8 cm)
Insertion Length	52" (132.1 cm)
Elevation Range	36-52" (91 cm to 132 cm)
Elevation Control	Manual
Rotation Range	Fix
Rotation Control	N/A

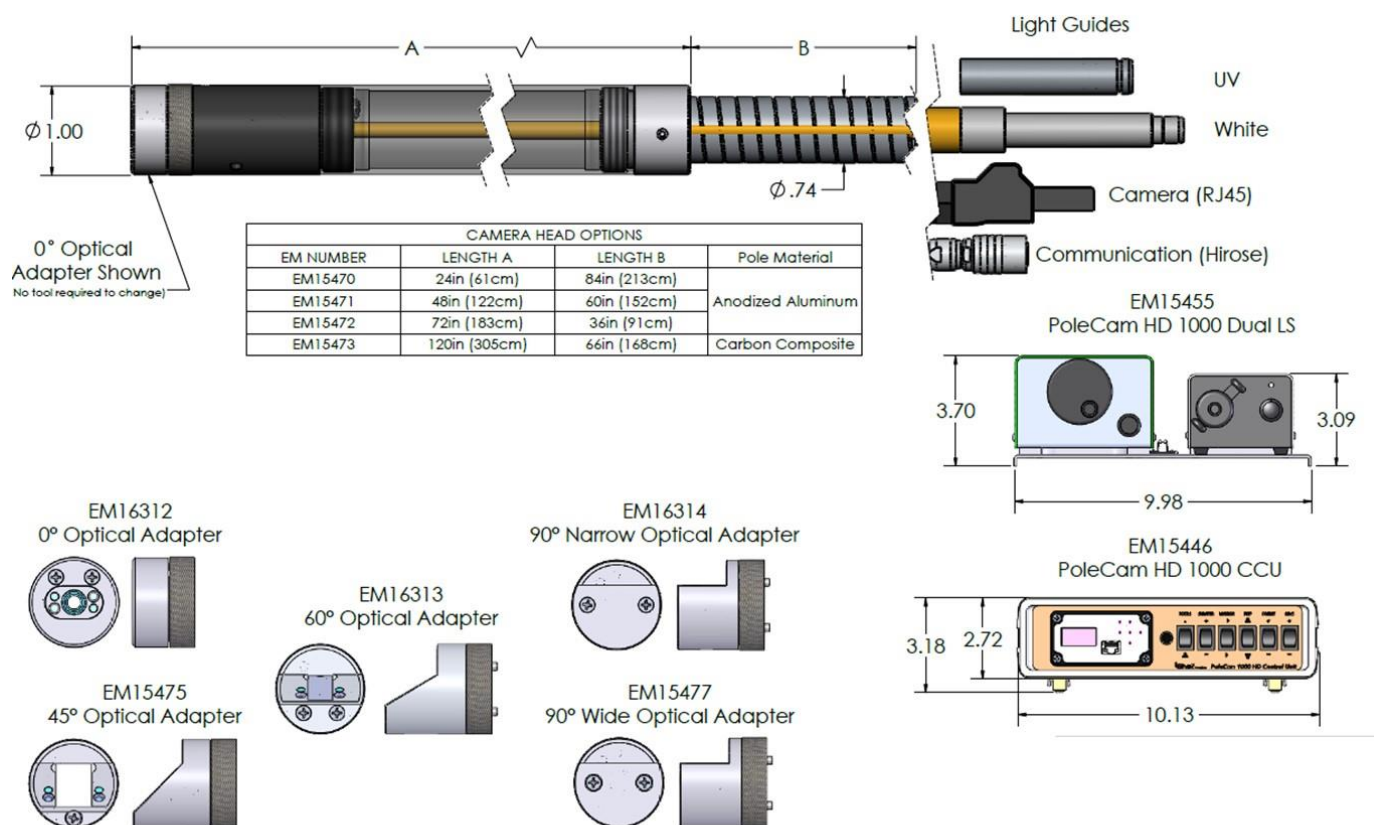
Optical Adapters (Tips)

Direction of View (Degrees)	Lens (mm)	Field of View at Distance	Line Pairs at Distance	Indication Capability at Distance
0	2.5	65 x 37mm at 25mm	•11 line pairs/mm at 25mm	0.068mm Indication at 25mm
45	7.1	36 x 20mm at 50mm	•11 line pairs/mm at 50mm	0.038mm Indication at 50mm
60	7.1	36 x 20mm at 50mm	•11 line pairs/mm at 50mm	0.040mm Indication at 50mm
90 Wide	2.5	80 x 41mm at 25mm	•8 line pairs/mm at 25mm	0.068mm Indication at 25mm
90 Narrow	7.1	36 x 20mm at 50mm	•11 line pairs/mm at 50mm	0.040mm Indication at 50mm



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Controller & Camera Mechanical Specifications





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Imager Control Menu Values & Defaults

Menu Tier	Item	Sub Item	Sub sub item	Values	Default
1	Image Quality				
		Brightness		0 to 255	128
		Contrast		0 to 63	19
		Saturation		0 to 63	31
		Sharpness		0 to 31	5
		Return to Main			
		White Balance	auto		x
			set	0 to 255	
		Gamma		0, 1, 2	1
		Hue		-180 to 180	0

Menu Tier	Item	Sub Item	Sub sub item	Values	Default
2	Capture setup	Mirror		No, H, V, HV	No
		Frame rate (fps)	auto		x
			set	1 to 30 Hz in 1080	
				1 to 60 Hz in 720	
		(USB 2 only)		1 to 120 Hz in VGA	
		Exp ROI		full, middle, center	
		Exp Sec	auto		x
			set	auto, 1, 1/2, 1/3, 1/4,	
				1/5, 1/6, 1/7, 1/8, 1/9,	
				1/10, 1/15, 1/20, 1/25,	
				1/30, 1/50, 1/60, 1/100,	
				1/120, 1/250, 1/500,	
				1/1000, 1/5000,	
				1/10000, 1/20000,	
				1/30000	
		Return to Main			



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Menu Tier	Item	Sub Item	Sub sub item	Values	Default
3	Utility menu				
		LED level	0 to 10		
		Show Diagnostics	H1	pass, fail	
			H2	pass, fail	
			UART com	pass, fail	
			PCB Temp	°C	
			I2C error	pass, fail	
			Ev	1.112	
			Pv	0.58	
		Save Presets			
			Save Setup 1		
			Save Setup 2		
			Save Setup 3		
			Save Setup 4		
			Return to utility menu		
		Load Presets			
			Custom setup 1		
			Custom setup 2		
			Custom setup 3		
			Custom setup 4		
			Return to utility menu		
		Lens correction			
			lens type	1.8, 2.5, 4, 8, 15	
			Color temp	2000, 4500, 6500K	

Menu Tier	Item	Sub Item	Sub sub item	Values	Default
4	Pan Tilt Zoom Menu				
		Resolution		1080p/30	x
				720p/30	
				480	
		Zoom	(in down scale modes only)	on/off	
		Pan		+,- 640 in VGA	
				+,- 320 in 720	
		Tilt		+,- 640 in VGA	
				+,- 320 in 720	

Menu Tier	Item	Sub Item	Sub sub item	Values	Default
5	Set to Defaults				
		InterTest			
		Reset to Defaults			
		Confirm			
		Return to Main			

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Care & Maintenance

Overall System

- Do not expose to moisture or direct sunlight.
- Do not operate near intense electromagnetic fields.

Trouble Shooting

- Ensure camera connection is tight and secure.
- Ensure power is proper voltage and current for unit, and connection is tight and secure.
- Ensure DVI connection is tight and secure.
- Ensure a proper lens is in place on camera.
- Ensure all menu settings are as desired and correct for equipment in use.
- Restart - disconnect power supply and reconnect power supply

Returns for Repair or Service

In the event the product needs repair, send it to the Service Department at the main office in Columbia, NJ. An RMA (Return Material Authorization Number) must be issued prior to the unit being returned. **Call InterTest, Inc. at (908) 294-8008 to obtain an RMA Number** from customer service. Shipments returned without an RMA will have an administrative fee applied to the transaction.



Provide the product number, serial number and a brief description of the problem or damage when obtaining an RMA number

Return Evaluation Procedure

Once a return is received by InterTest, Inc. it will be evaluated. The fee for any repair evaluation not sent in under warranty is \$55 (USD credited against cost of repair). This cost is in addition to any other charges required. Prior to any repairs being completed, a repair evaluation will be issued and payment arranged. Payment via credit card is preferred and will expedite the repair process.

Once payment is arranged, the authorization to repair the product is given. Completed repairs will ship back to the customer using the pre-arranged shipping methods.



Parts and Accessories

[illegible]



Admin Section

This section of the manual is intended for high level users that take responsibility for use at an OEM level. Settings, programming, and remote communication through RS 485 allow expanded use.

Caution: users at this level are beyond warranty coverage. Contact InterTest tech support for further details.

Dip Switch Settings

This list documents the DIP Switch functions on the SCB300 board.

Firmware version:		1.06			
	Number	On	Off	FirstVersion	
	1	Show Company Name on OLED	Don't show	0	
	2	N/A	N/A	0.56	(Used to show serial number or not in Utility menu, removed for Lens Correction)
	3	N/A	N/A		
	4	N/A	N/A		
	5	N/A	N/A		
	6	AEQ Report Mode	Normal Mode	1.03	Set to On to use cable testing mode. Follow supplied procedure.
	7	DS954 (New Serdes FW)	DS914 (Old Serdes FW)	1.02	With DIP8 set to OFF this selects old or new SerDes firmware to upgrade.
	8	Regular Run Mode	Firmware Upgrade Mode	1.02	Set this to Off to upgrade Firmware; ON to use the system normally.

Main Menu

Line	Text	Notes	FirstVersion
0	** Intertest QN HD **		0
1	Main Menu	Top level menu	0
2	<i>Image Quality</i>	Image quality related	0
3	<i>Capture Setup</i>	Image capture related: FPS, Exposure, Mirroring	0
4	<i>Utility Menu</i>	LED Level, Diagnostics, Save Preset, Load Preset	0
5	<i>Pan-Tilt-Zoom</i>	Resolution, Zoom, Pan, Tilt	0
6			
7	<i>Reset to defaults</i>		0
	<i>Bold-Italics means item is a submenu</i>		
	Control ID provided for commands that go to the ISP		



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Image Menu

Line	Text	Control ID	Notes	Default	FirstVersion			
0	** Intertest QN HD **							
1	Image Quality			Default	FirstVersion			
2	Brightness	0x01	Brightness adjustment	0x80	0			
3	Contrast	0x02	Contrast adjustment	19	0	Default changed in 0.58		
4	Saturation	0x03	Saturation adjustment	0x1F	0			
5	Sharpness	0x05	Sharpness adjustment	5	0	Default changed in 0.58		
6	More ...		More adjustments in this submenu		0			
7	Return to Main		Return to Main menu		0			
	Bold-Italics means item is a submenu							
	Control ID provided for commands that go to the ISP							

More Image Quality

Line	Text	Control ID	Notes	Default	FirstVersion			
0	** Intertest QN HD **				0			
1	More Image Quality...				0			
2	White Balance Mode	0x0C	Auto/Manual		0			
3	White Balance Level	0x0D	Blue <----> Red		0			
4	Gamma	0x06	Non-linear gain	0x00	0			
5	Hue	0x17	Hue adjustment	0x00	0			
6						Compression removed 0.58		
7	Return to Image Quality				0			
	Bold-Italics means item is a submenu							
	Control ID provided for commands that go to the ISP							
	Yellow highlighted cells denote controls that are new in this version.							

Capture Menu

Line	Text	Control ID	Default	Notes	Default	FirstVersion		
0	** Intertest QN HD **							
1	Capture Menu							
2	Mirroring	0x04		None, H, V, HV	0x00	0		
3	Frame Rate	0x0A		1-30fps in 1080, 1-60 in 720, 1-120 in 480	0x00	0		
4	Exp ROI: Full, Mid, Center	0x10, 0x11, 0x12, 0x13		Full = 5x5 equally weighted; Middle = Central 3x3 extra weighted; Center = Central 1x1 extra weighted		0		
				Choose Automatic or set the exposure time {1s, 1/2s, 1/3 1/4, 1/5, 1/6, 1/7, 1/8, 1/9, 1/10, 1/15, 1/20, 1/25, 1/30, 1/50, 1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/5000, 1/10000, 1/20000, 1/30000s}				
5	Exp Time: Auto/Manual	0x15				0		
6								
7	Return to Main					0		
	Bold-Italics means item is a submenu							
	Control ID provided for commands that go to the ISP							
	Yellow highlighted cells denote controls that are new in this version.							
	First version is the first version that that particular line's description is valid for							



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Utility Menu

Line	Text	Control ID	Notes	Default	FirstVersion
0	** Intertest QN HD **				0
1	Utility Menu				0
2	LED Level	N/A	Off-10 where 10=1A. Works for LEDs upto a total of <8V in series.		0
3	<i>Diagnostics</i>	N/A	I2C Test, Lock Status, PCB Temp		0
4	<i>Save Preset</i>	N/A	4 user presets		0
5	<i>Load Preset</i>	N/A	4 user presets		0
6	<i>Lens Correction</i>	N/A	New in 0.56, replaces Serial Number		0.56
7	Return to Main				0
	<i>Bold-Italics means item is a submenu</i>				
	Control ID provided for commands that go to the ISP				

Save Preset

Line	Text	Control ID	Notes	FirstVersion
0	** Intertest QN HD **			0
1	Save Preset			0
2	User Setup 1	N/A	Save to user 1	0
3	User Setup 2	N/A	Save to user 2	0
4	User Setup 3	N/A	Save to user 3	0
5	User Setup 4	N/A	Save to user 4	0
6				
7	Return to Utility			0
	<i>Bold-Italics means item is a submenu</i>			
	Control ID provided for commands that go to the ISP			



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Load Preset

Line	Text	Control ID	Notes	FirstVersion
0	** Intertest QN HD **			0
1	Load Preset			0
2	User Setup 1	N/A	Save to user 1	0
3	User Setup 2	N/A	Save to user 2	0
4	User Setup 3	N/A	Save to user 3	0
5	User Setup 4	N/A	Save to user 4	0
6				
7	Return to Utility			0
	<i>Bold-Italics means item is a submenu</i>			
	Control ID provided for commands that go to the ISP			

Diagnostics

<i>Bold-Italics means item is a submenu</i>			Each hex digit yields 4 bits in binary:		
Control ID provided for commands that go to the ISP			Dec	Hex	Binary
			0	0	0000
Interpreting I2C Error Codes:			1	1	0001
The code is presented as a 1 byte number in Hex			2	2	0010
Convert the Hex code to Binary			3	3	0011
Each bit indicates the pass/fail status of a device on the I2C bus			4	4	0100
Bit 0 = Deserializer			5	5	0101
1 = Serializer			6	6	0110
2 = MIPI Bridge			7	7	0111
3 = Image Sensor			8	8	1000
4 = DVI output chip			9	9	1001
5 = Thermometer			10	A	1010
6 = I2C DAC for LED Level control			11	B	1011
7 = EEPROM			12	C	1100
			13	D	1101
1 in the bit indicates pass.			14	E	1110
So for example 0xF7 indicates that everything passed except the image sensor.			15	F	1111



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PTZ Menu

Line	Text	Control ID	Notes	Default	FirstVersion
0	** Intertest QN HD **				0
1	PTZ Menu				0
2	Resolution	0x0B	however host has to query for it to take effect. In the next software update this will be auto-Available in 720/480 mode only. Currently this is set to crop only, which is zoom on or reduced FOV, and at a higher frame rate (60, 120 for 720,480 respectively). By software update it will allow the option for scaling (keep full FOV), at which point this control will do something. It is active but lined-out in the GUI right now.	0x00	0
3	Zoom	0x07	If not in 1080 and zoom is enabled then this allows horizontal pan	0x00	0.4
4	Pan	0x08	If not in 1080 and zoom is enabled then this allows vertical pan	0x00	0
5	Tilt	0x09		0x00	0
6					
7	Return to Main				0
	<i>Bold-Italics means item is a submenu</i>				
	Control ID provided for commands that go to the ISP				
	Yellow highlighted cells denote controls that are new in this version.				

Reset to Defaults

Line	Text	Control ID	Notes	FirstVersion
0	** Intertest QN HD **			0
1	Reset to Defaults			0
2	Confirm	N/A	Select confirm to reset	0
3				
4				
5				
6				
7	Return to Main		Select to exit	0
	<i>Bold-Italics means item is a submenu</i>			
	Control ID provided for commands that go to the ISP			



Lens Correction

Line	Text	Control ID	Notes	Default	FirstVersion
0	** Intertest QN HD **				0
1	Lens Correction				0
2	Lens Type	N/A	TBD	0	0
3	Color Temp	N/A	2800, 4500, 6500K options (0,1,2)	0	0
4					
5					
6					
7	Return to Utility				0
	<i>Bold-Italics means item is a submenu</i>				
	Control ID provided for commands that go to the ISP				

SCB300B Firmware Upload Procedure

The SCB300B board allows for both the old and new SerDes to be used and automatically detected when plugged in to the RJ45 jack. In order to do this we must program both the versions of the ISP (EM37180) code into the correct SPI Flash for the system to work properly. In order to make this easy there is a new firmware programming mode that has been added to the PIC firmware (v1.02+) that is accessed via the DIP switches on the SCB300B board.

To use the Firmware programming mode:

- 1. Set DIP8 to the OFF position o Normally DIP8 will be in the ON position to run the camera (Pv1.02+)
- 2. Set DIP7 to OFF for the Old 914 SerDes or to ON for the New 954 SerDes
- 3. Then power on the board using a PC
- 4. The LCD screen should show either 914 or 954 depending on what was set on DIP7
- 5. If it shows a regular main menu then DIP8 is in the ON position. Turn it off and cycle power.
- 6. Start the EM_Download_Tool software o The tool should say “USB Init OK” at the top
- 7. Select “Browse” and navigate to the supplied *914*.bin or *954*.bin file depending on which you are trying to program
- 8. Select “Download” and within ~10 seconds the download should be successfully completed
- 9. If you want to program the other SerDes then flip DIP7 and power cycle the board, following from step 3 onwards.
- 10. Once you have programmed both Flash chips set DIP8 to the ON position to enter RUN mode next time you power cycle the board.



SCB300B AEQ Procedure

The SCB300B board adds a new AEQ mode that replaces the special firmware we had for the SCB300A.

This AEQ mode is accessed by setting DIP6 to the ON position, but follow the steps below for best results.

1. Set DIP6 to the OFF position (this is normal running mode).
2. Power up the board with the camera head you wish to measure connected
3. Once the system is up and running and you see an image flip DIP6 to the On position
4. Within a few seconds you should see the LCD screen readout an AEQ value a. It will tell you which camera head was detected
 - b. If there is no camera it will say there is no lock
 - c. At this point you can unplug/replug cameras to redo AEQ measurements but the most reliable measurement is made with the camera plugged in before powering on the system, and with AEQ mode off at first and then turned on after the camera is running.
5. You can turn off AEQ mode by flipping DIP6 to the Off position. The main menu will return.



NOTES:

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InterTest Inc.

