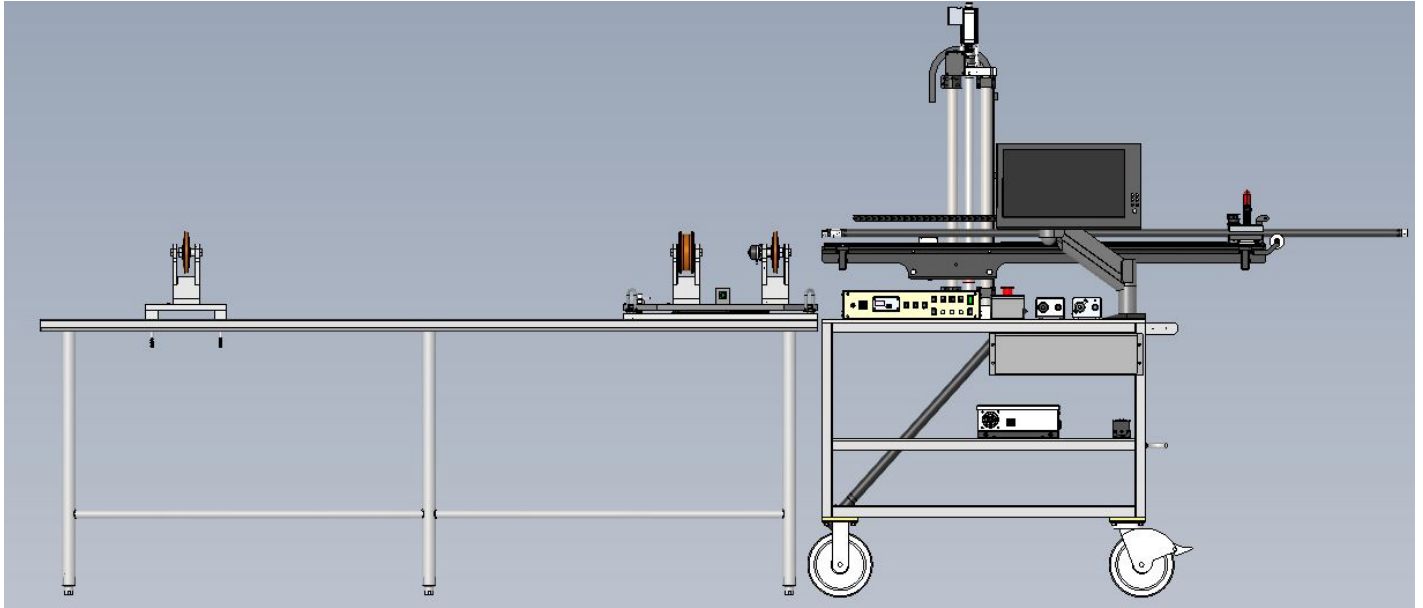




SeeUV®



## SeeUV® VIBES® Shaft & Coupler Inspection System (SCIS)

*Instruction & Admin Manual*

EM18076 SeeUV® Pole Cam HD Sys. w/ Motorized H & V

EM13068 Fixture for Coupler + Shaft GTF1100



**Table of Contents**

Contact Information.....4

Introduction:.....4

Cautions and Sarnings .....5

    Safety Precautions .....5

    Operational, General Safety Considerations and Precautions .....5

    Cautionary Symbols and Symbol Terminology.....5

    Warnings.....6

    Care & Maintenance .....6

    Disclaimers .....7

Warranty .....7

Copyrights and Rights of Portrait.....8

Registered Trademark Information.....8

System Components .....9

    Camera Control Unit, Light Sources, Monitor, On-Screen Display Unit & Cart.....9

        Standard ..... 9

        Optional ..... 10

        Available Optical Adapters / Tips..... 12

        Tip Installation ..... 14

Light Source Connections.....14

Camera Controls .....16

Pole Cam Controller.....17

    Optical Tip Presets .....18

General Operation.....18

    Pole Mounting & System Connections.....20

    Optional Coupler/Shaft Fixture .....21

        Coupler Setup One ..... 22

        Setup Steps (Coupler) ..... 22

        Coupler Setup Two ..... 23

        Shaft Setup One ..... 24

        Setup Steps (Shaft)..... 24

        Shaft Setup Two ..... 24

Pole Cam Cart System Controller .....26

Insertion Encoder Operation .....28

Camera Control Unit Menu Structure.....29



Menu Tree .....	29
Image Quality .....	30
More Image Quality .....	30
Capture Setup (Not Used in Pole Cam).....	30
Utility Menu .....	31
System Diagnostic.....	31
Save Setup .....	32
Load Presets (Not used in Pole Cam).....	32
Lens Correction.....	32
Pan Tilt Zoom Menu.....	33
Set to defaults .....	33
Shutter Table: .....	34
Specifications.....	34
Camera Head .....	34
Camera Cable .....	35
Camera Control Unit (CCU).....	35
Cart System.....	36
Optical Adapters (Tips).....	36
Controller & Camera Mechanical Specifications .....	37
Imager Control Menu Values & Defaults .....	38
Table of Figures.....	40
Care & Maintenance .....	40
Overall System.....	40
Trouble Shooting .....	40
Returns for Repair or Service .....	41
Return Evaluation Procedure .....	41
Parts and Accessories.....	42
NOTES:.....	43



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## Introduction:

Congratulations on your investment in the **SeeUV® Shaft & Coupler Inspection System (SCIS)**, InterTest's one-inch diameter ultraviolet and white light visual inspection and bore examination system (VIBES®). This system combines a high-definition color camera with mechanical, robust, and repeatable positioning hardware for the visual inspection of shafts and coupler components inside aircraft and aerospace engines. An operator can conduct on-the-spot white light, magnetic particle, and fluorescent penetrant inspections of intricate components with minimal fixturing.

The SeeUV® Shaft & Coupler Inspection System will be referred to as the "SCIS," but may include such descriptions as "Pole Cam" and/or "Pole Cam HD." Pole Cam and/or Pole Cam HD refers specifically to the camera hardware mounted on the cart.

Many features enhance SCIS 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.

\*movement options in vertical, horizontal, or rotational movement available.

### Illumination Control

SCIS has both white and UV light capability. Intensity is controlled independently and operation can be UV, white, or both simultaneous.

### Video Camera

The SCIS 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). 0°, 45°, 60°, 90° Narrow, 90° Wide

To view optic details, see optical adapters [here](#).

## Cautions and Sarnings

### Safety Precautions

This manual covers the **SeeUV® Shaft & Coupler Inspection System (SCIS)**, 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](mailto: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
	<b>WARNING/CAUTION: Risk of electric shock.</b>
	<b>WARNING/CAUTION: Refer to instruction manual.</b>
	<b>WARNING/CAUTION: Avoid exposure to water and liquids.</b>



**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 SCIS. 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 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.



### Umbilical Camera Cable/Light Guides

- Do not twist/rotate the camera umbilical cable more than one turn. Internal damage will result



### 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.  
**VIBES®** is a registered trademark of InterTest, Inc.  
**SeeUV®** is a registered 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](http://www.intertest.com).**



## System Components

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

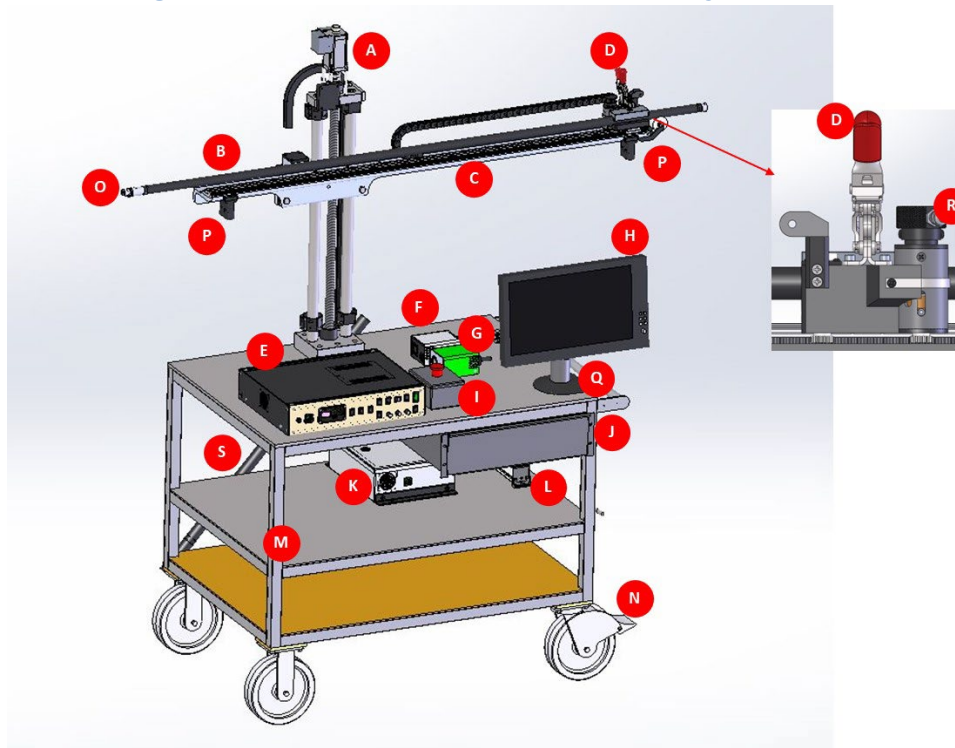


Figure 1 SCIS Cart

- A. Vertical Positioning Motor/Encoder & Knob
- B. Pole for SCIS
- C. SCIS Boom
- D. Destako Clamp for SCIS
- E. Camera Control Unit
- F. UV Light Source
- G. White Light Source
- H. Monitor
- I. "E" Emergency Stop
- J. Storage Drawer
- K. AC to DC Power Unit
- L. Power Strip
- M. Cart
- N. Cart Wheel Locks
- O. Camera /Optical Adapters
- P. Boom Horizontal Position Stops
- Q. Monitor Swing Arm
- R. Horizontal Position Motor/Encoder & Knob
- S. Pole Cam Storage Quiver

### Standard

- |                        |                                                                    |
|------------------------|--------------------------------------------------------------------|
| 1. Cart                | Wheeled cart with storage drawer                                   |
| 2. Elevation/Insertion | Elevation/Insertion Assembly with Pole Cam Clamp                   |
| 3. CCU                 | Camera Control Unit                                                |
| 4. Pole Cam            | 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  | Pole Cam attachments that provide 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                           |

### Optional

1. Rotational Fixture to hold a specific shaft and or a coupler

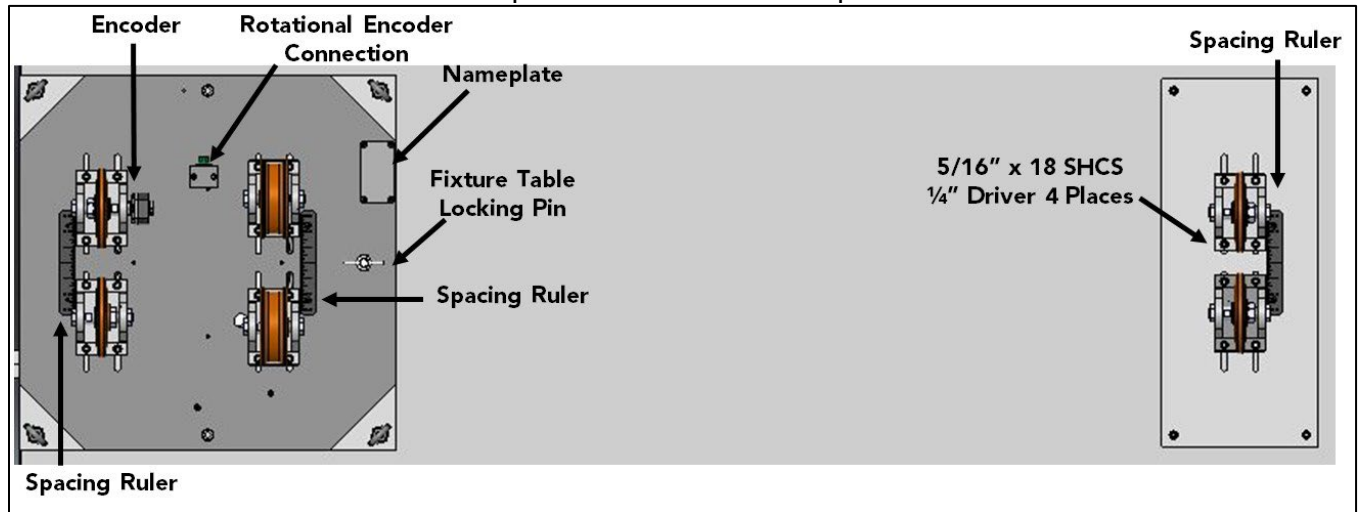


Figure 2 Rotational Fixture

Note: Also, Reference Fixture DWG.

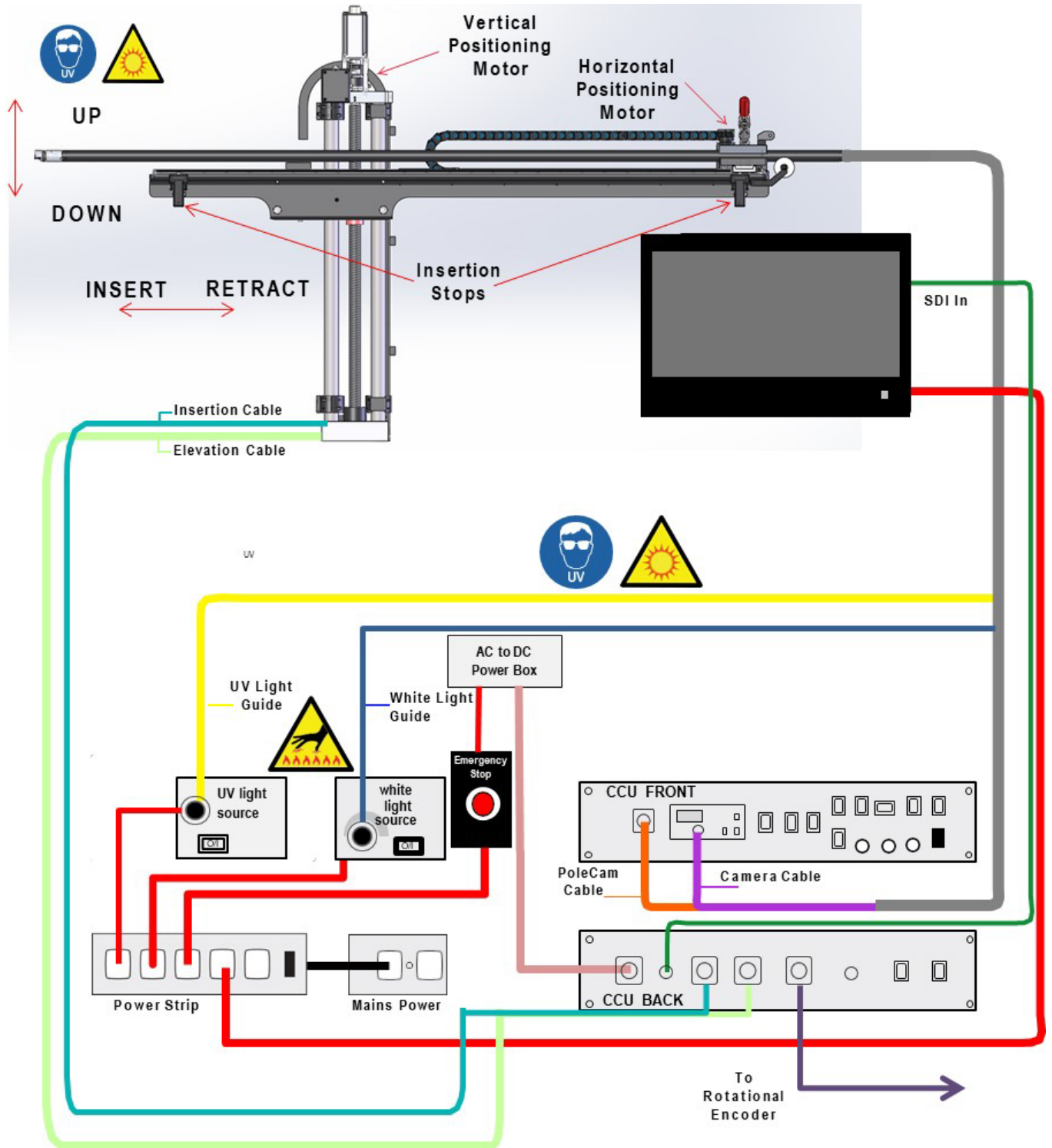


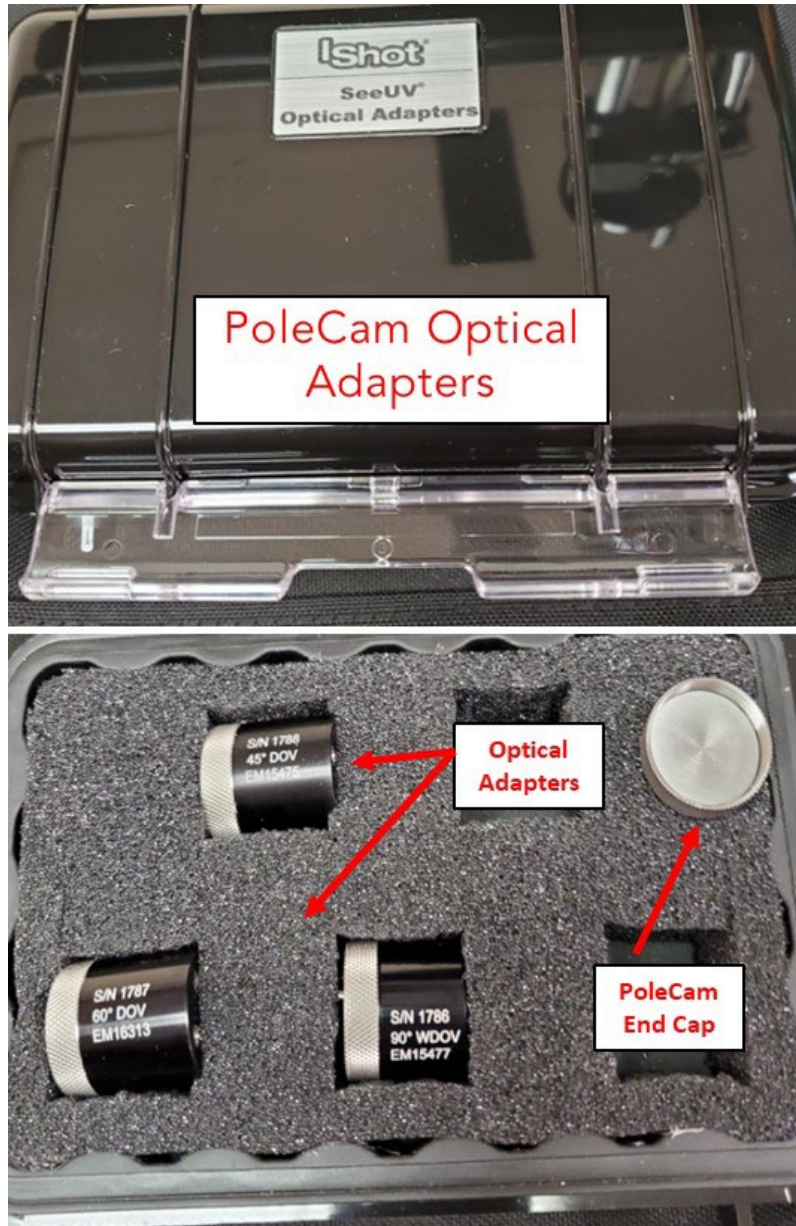
Figure 3 Interconnection Diagram



### 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. Pole Cam Protective End Cap

**Note: Each adapter is labeled with the Field of View, FOV, direction & a serial number**



**Figure 4 Pole Cam Optical Adapters**



**PoleCam  
Protective Cap**



**Figure 5 Pole Cam Protective Cap**



**Note: It is recommended to Store the Pole Cam using the protective cap**



**Do not power on any light sources while the end cap is installed. Damage will result**



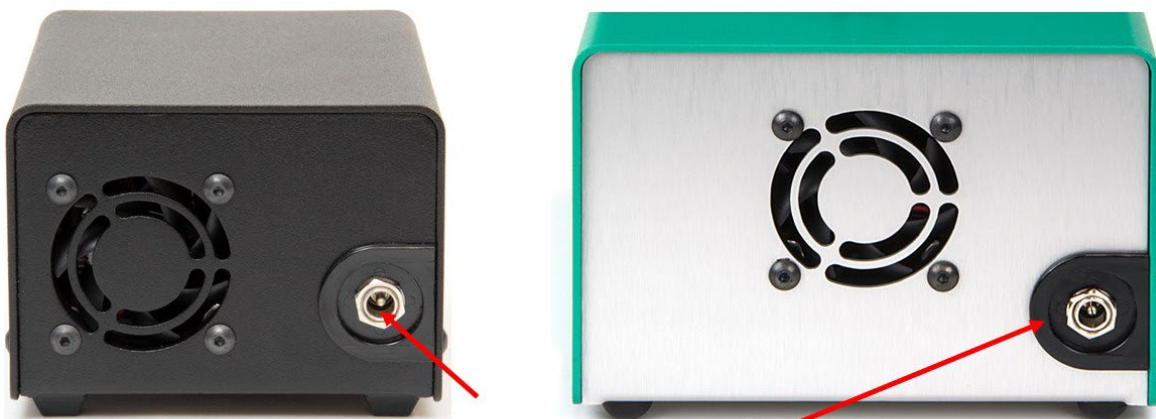
### Tip Installation



**Figure 6 Optical Tip Installation**

- 1) Align the interior pins & the white dots on the adapter & camera pole
- 2) Finger-tighten the knurled ring. Do not overtighten

### Light Source Connections



**Power Connections**

**Figure 7 Power Connections Rear**

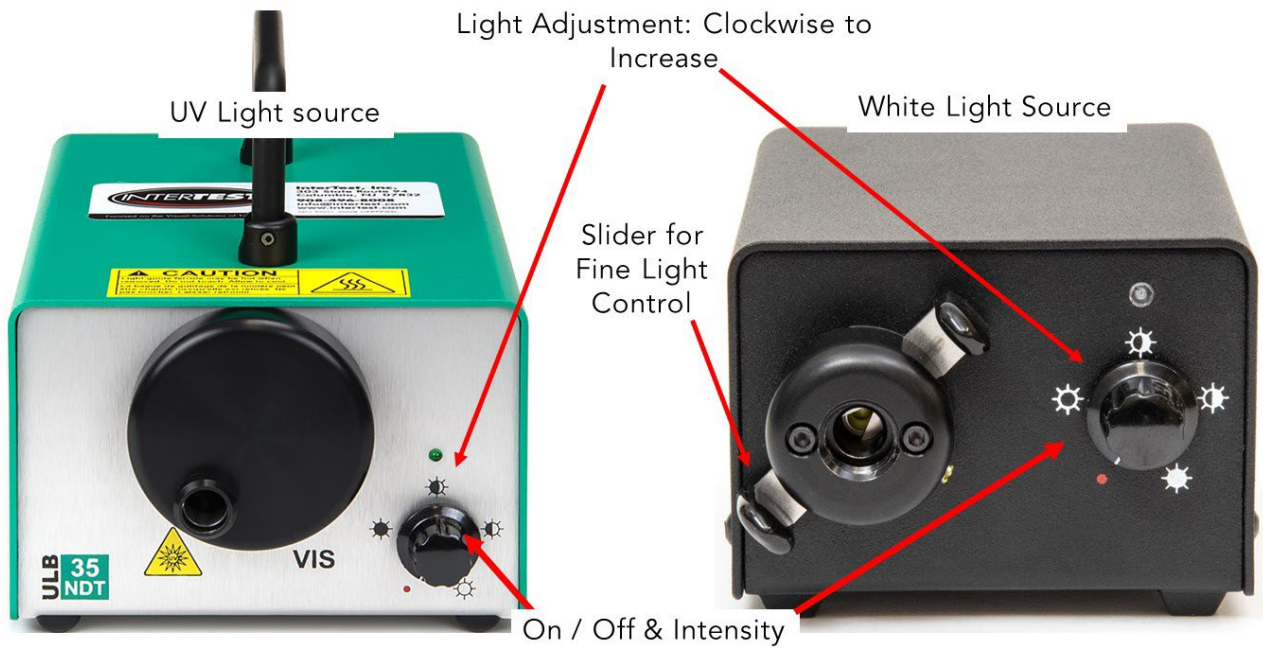
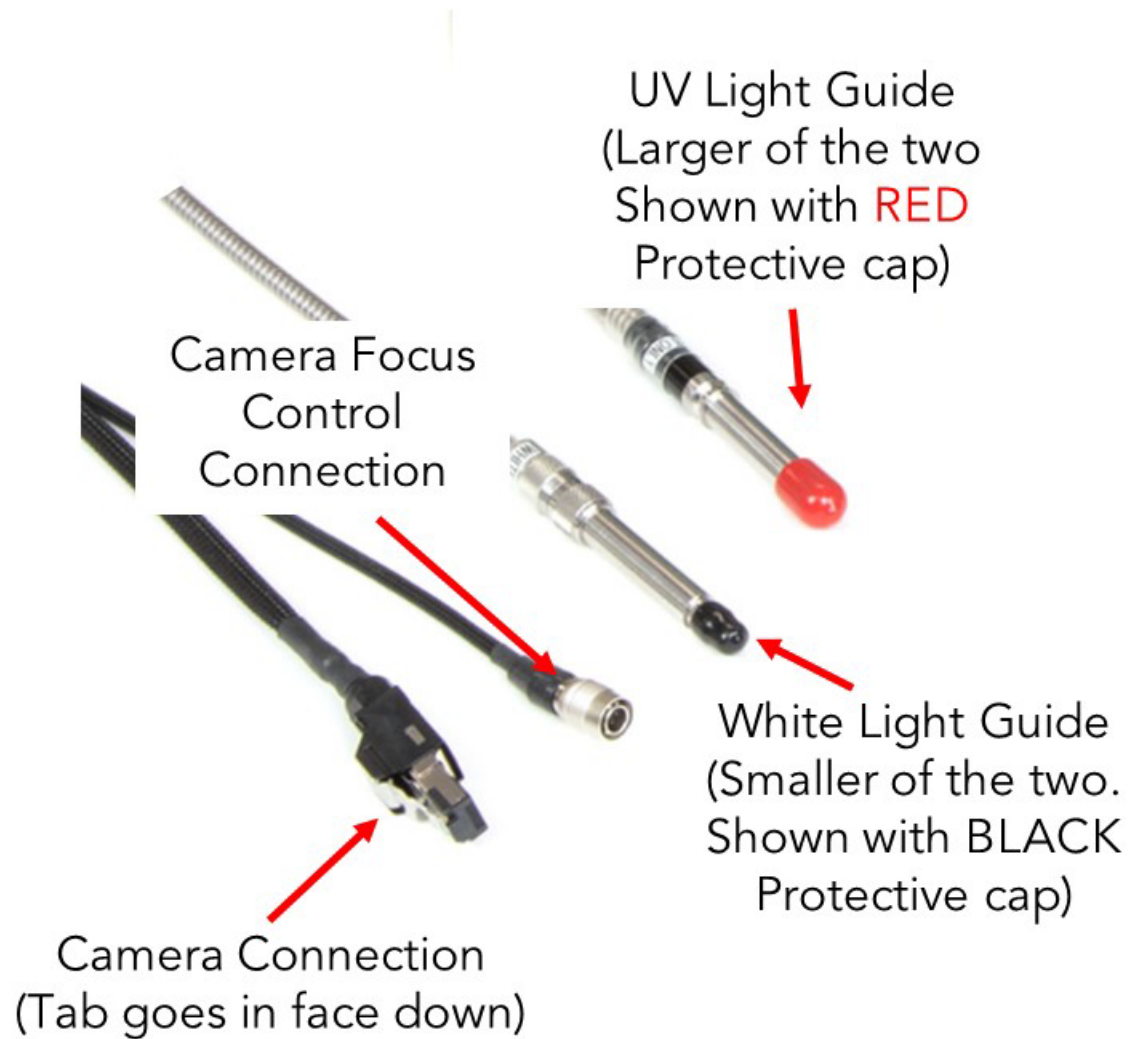


Figure 8 ON/OFF Controls Light Sources



**Figure 9 Camera & Light Source Connections**

### Camera Controls

For Control Unit Menu Tree see Figure 26





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

Figure 10 Labeled Front of Camera CCU

### Pole Cam Controller

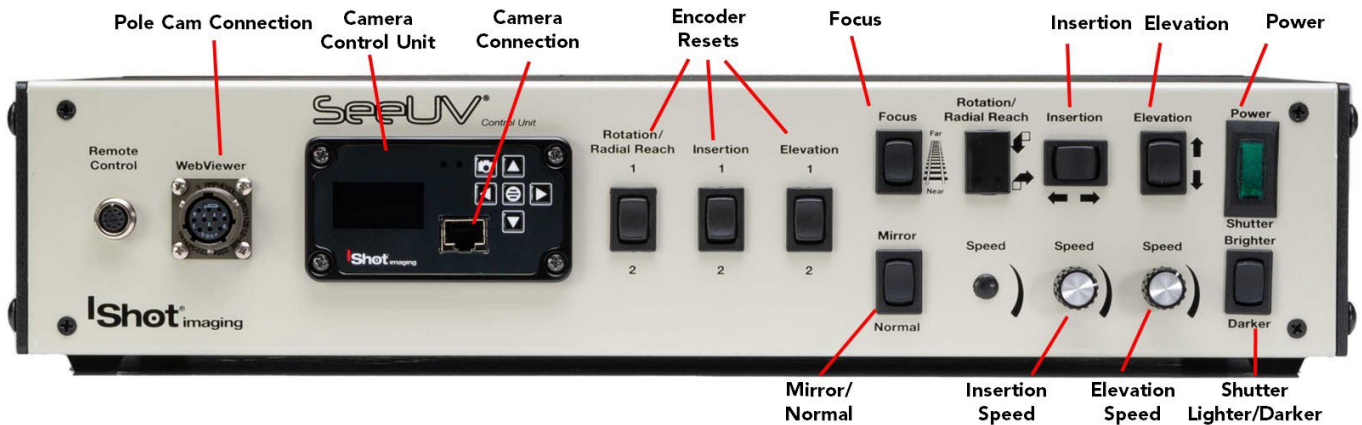


Figure 11 Pole Cam Controller Front

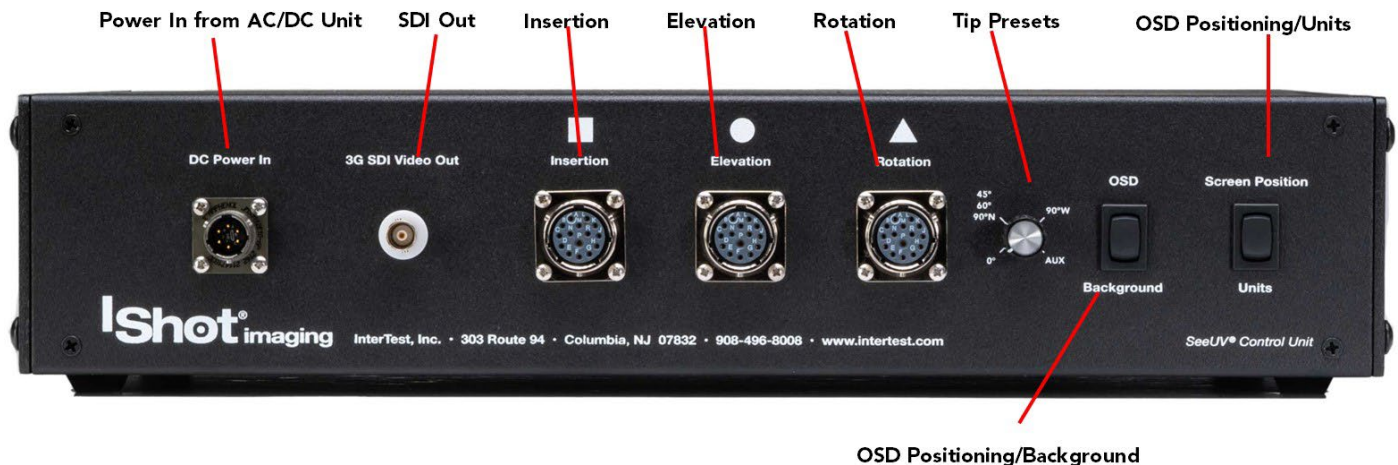


Figure 12 Pole Cam Controller Rear

### Optical Tip Presets



Figure 13 Optical Adapter Preset Switch

#### The Optical Tip Preset Switch:

Several Presets have been preprogrammed into the control unit

-When changing between adapters. Select the proper tip. Control Unit takes approximately 5 seconds to change/update to the new settings

-0° Direction of View (2.5mm Lens)

-45°, 60° & 90° Narrow Direction of View (7.1mm Lens)

-90° Wide Forward & Aft Direction of View (QN HD RA Lens)

### General Operation



-Remove Pole Cam from Storage Holster

-Make sure Main Power is turned OFF See Figure 14

-Install Pole Cam on Elevation / Insertion Slide See Figure 15

1) Place Insertion Slide/ Clamp all the way to the right

2) Line Up Pole Cam with end of Slide Assembly line Black Line/Label Face Up

- 3)  Clamp Pole. Make sure it is centered in the grove. **Do not overtighten** 
- 4) Connect Pole Cam to the Cart Control Unit per Figure 16
- 5) Install Pole Cam Tip/Lens needed See Figure 6
- 6) Connect Light Sources. See Figure 7, Figure 8, Figure 9
- 6) Connect external recording device (Optional) as shown in Figure 17
- 7) Turn on Power on each Unit then turn ON Main Power Strip Per Figure 14
- 8) Adjust settings with front panel toggles switches to optimize performance for intended use per Figure 11

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.

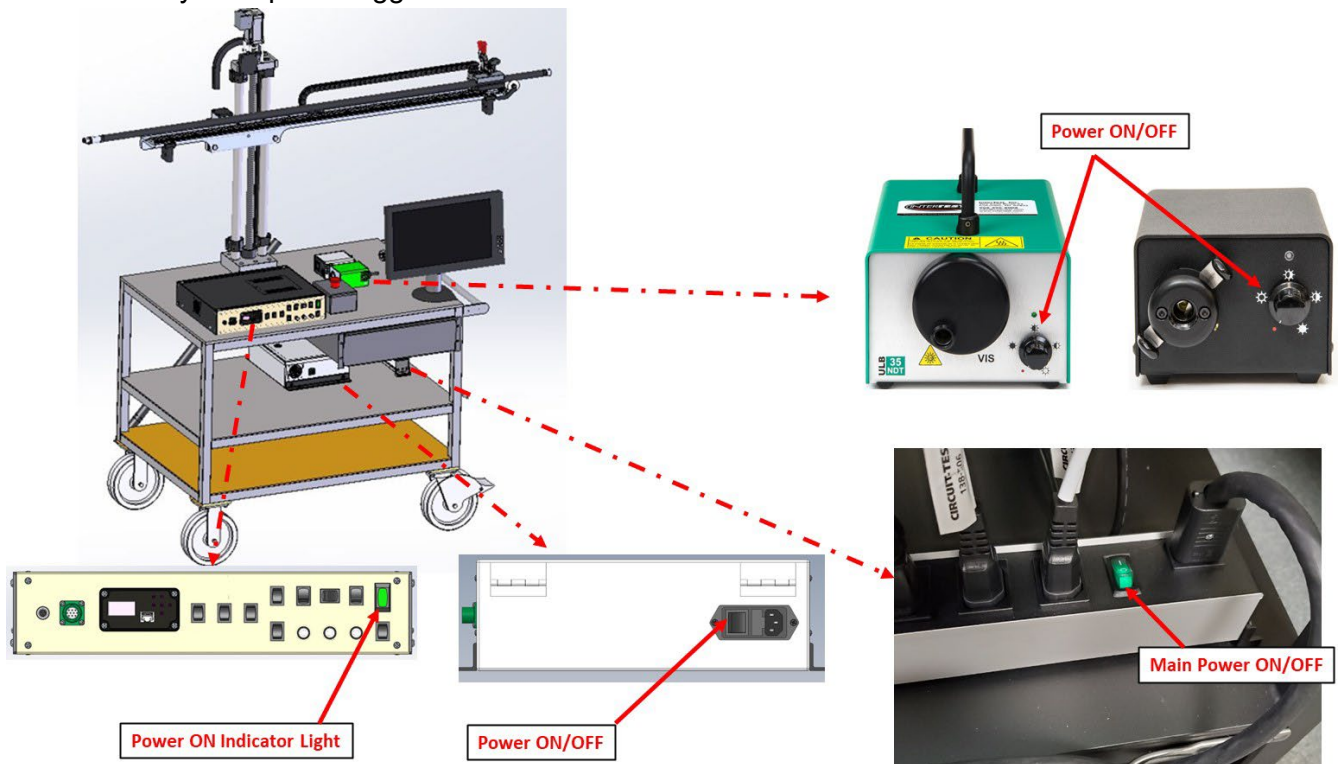


Figure 14 Power ON/OFF





### Pole Mounting & System Connections

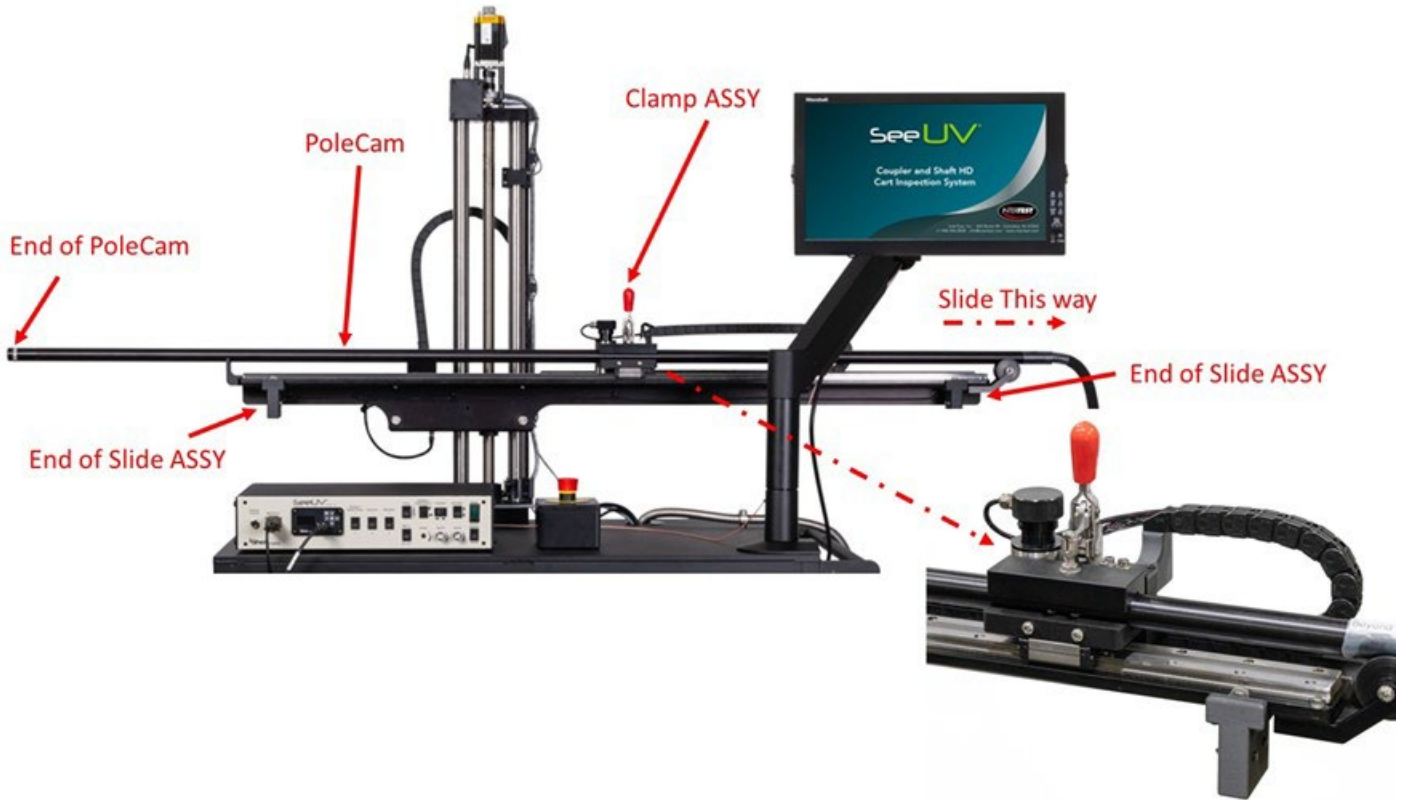


Figure 15 Pole Cam Installation

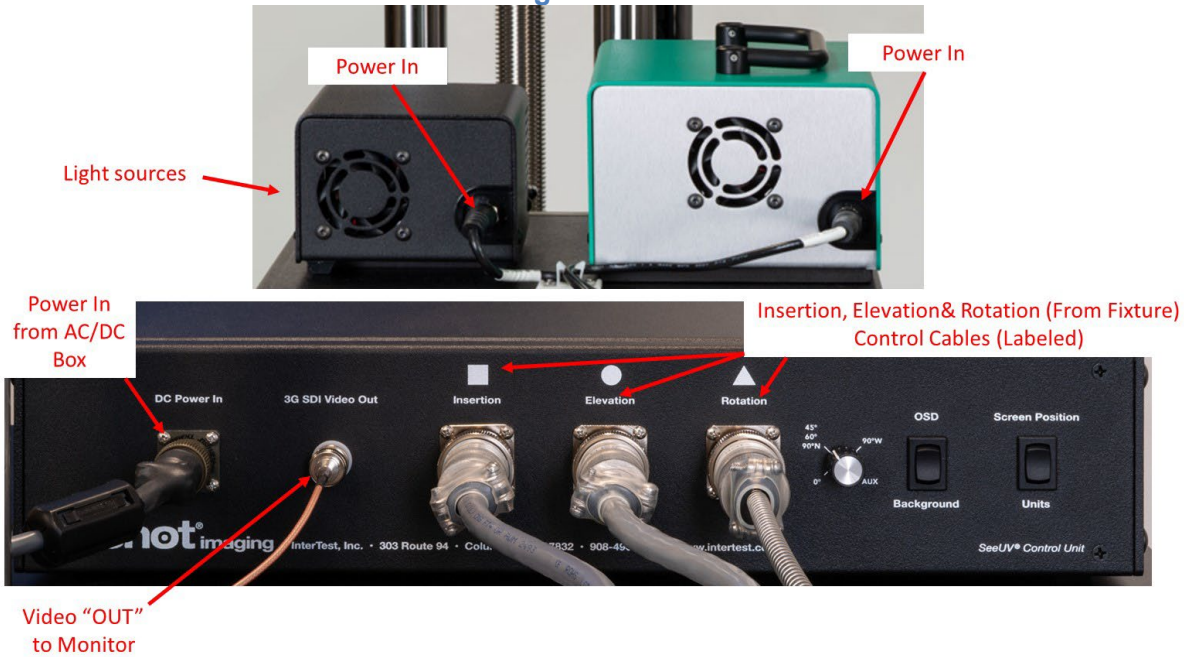


Figure 16 System Connections

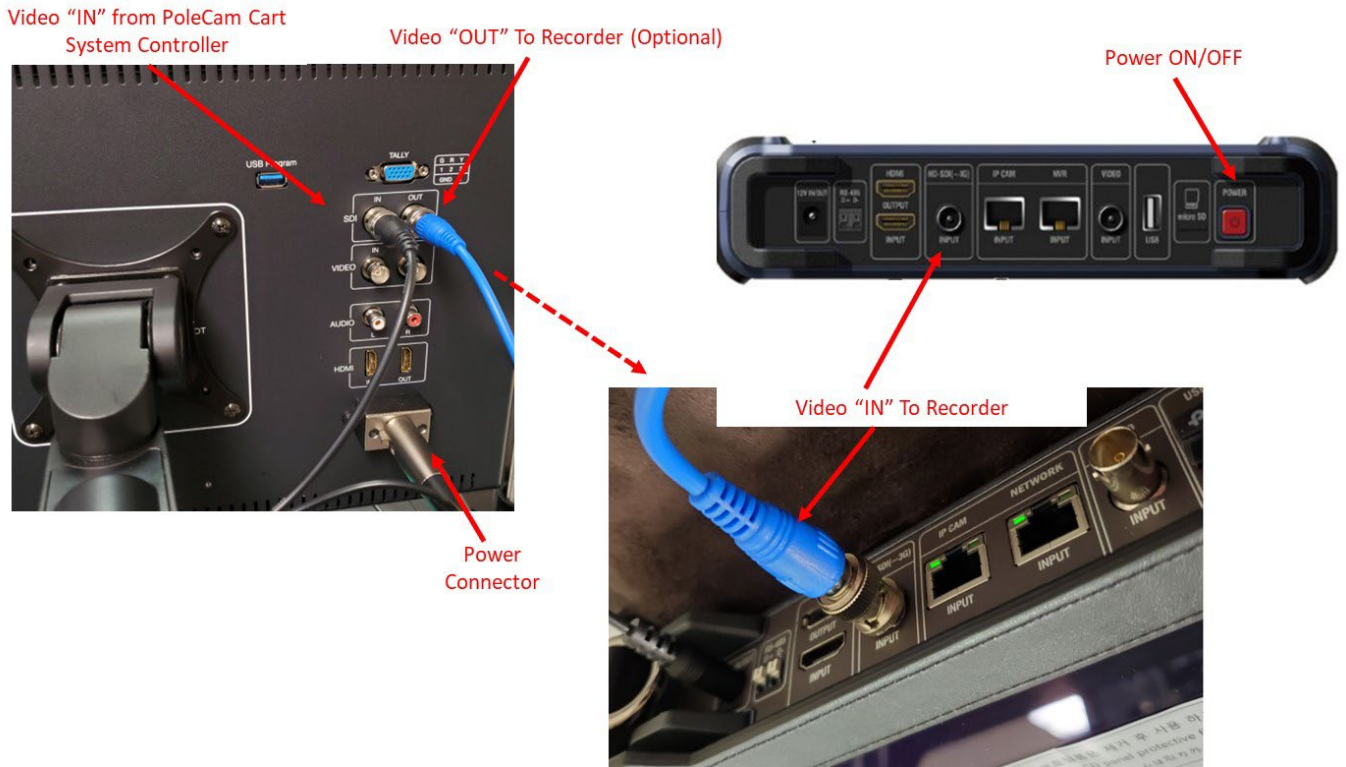


Figure 17 External Recording Connection (Optional)

### Optional Coupler/Shaft Fixture

For fixture setup/installation see DWG "Part Fixture Layout DWG"

## Coupler Setup One

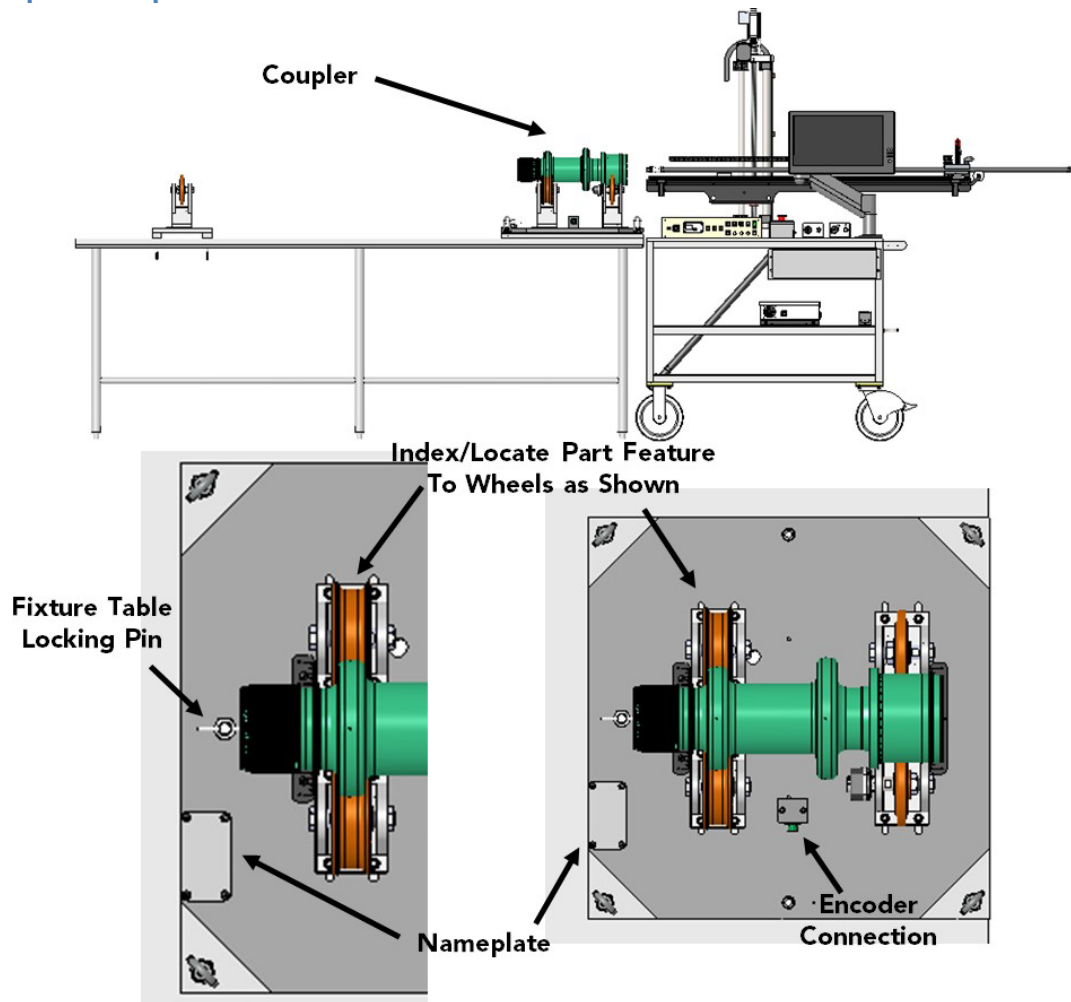





Figure 18 Coupler Setup One

### Setup Steps (Coupler)

- 1) Lock cart wheels 
- 2) Retract Pole Cam to a safe distance 
- 3) Power system down.
- 4) Rotate fixture, if needed see Figure 18 or Figure 19
  - a. Disconnect encoder cable
  - b. Pull-up on locking pin & rotate if needed
  - c. Relock lacking pin in place.
  - d. Reconnect encoder cable
- 5) Mount part on fixture & index as shown

Note: Assure encoder cable is free to move with fixture turning table rotation 

- a. Use "Setup Rulers" on the fixture to equally space rollers on the fixture. See Figure 2 Rotational Fixture

### Coupler Setup Two

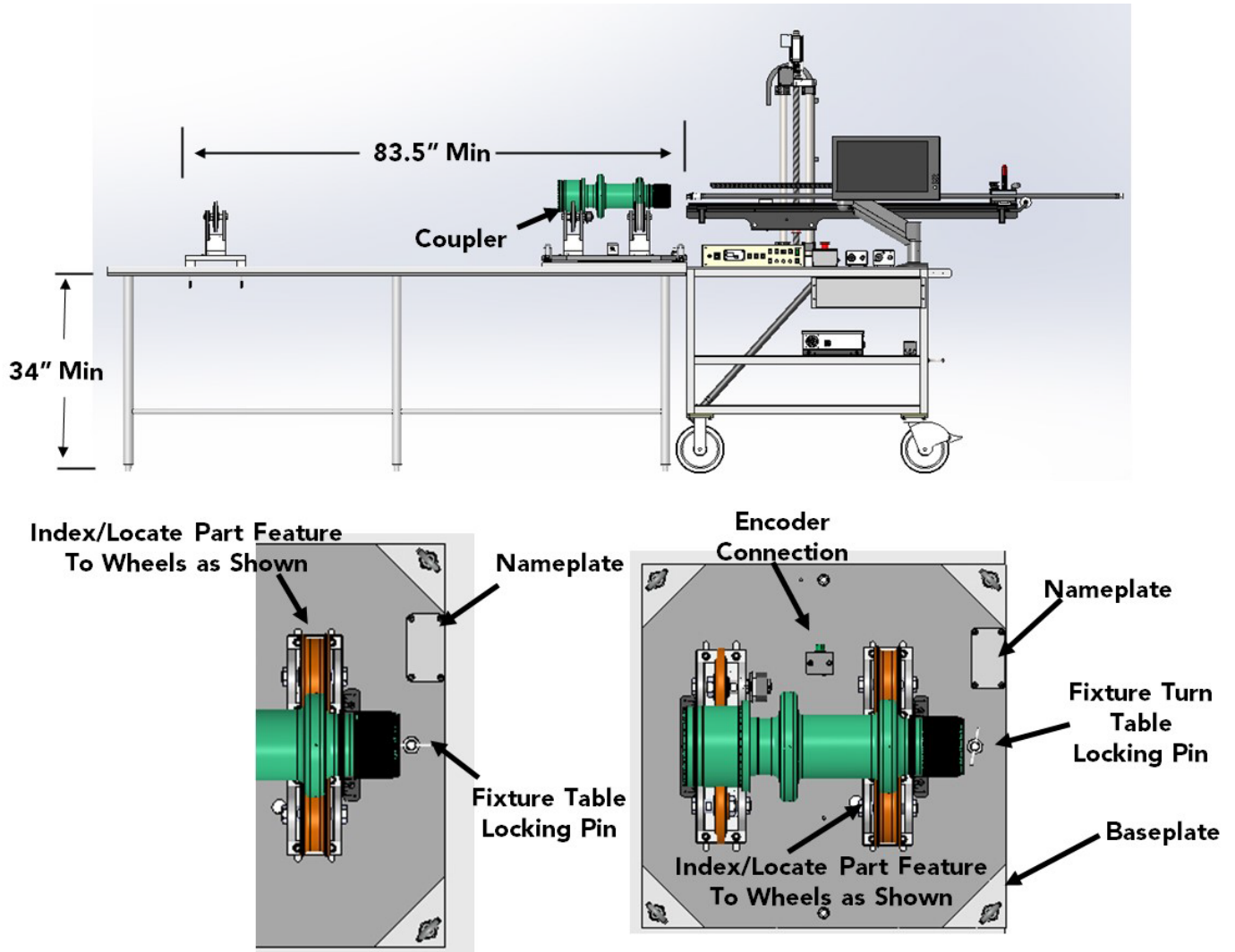


Figure 19 Coupler Setup Two

## Shaft Setup One

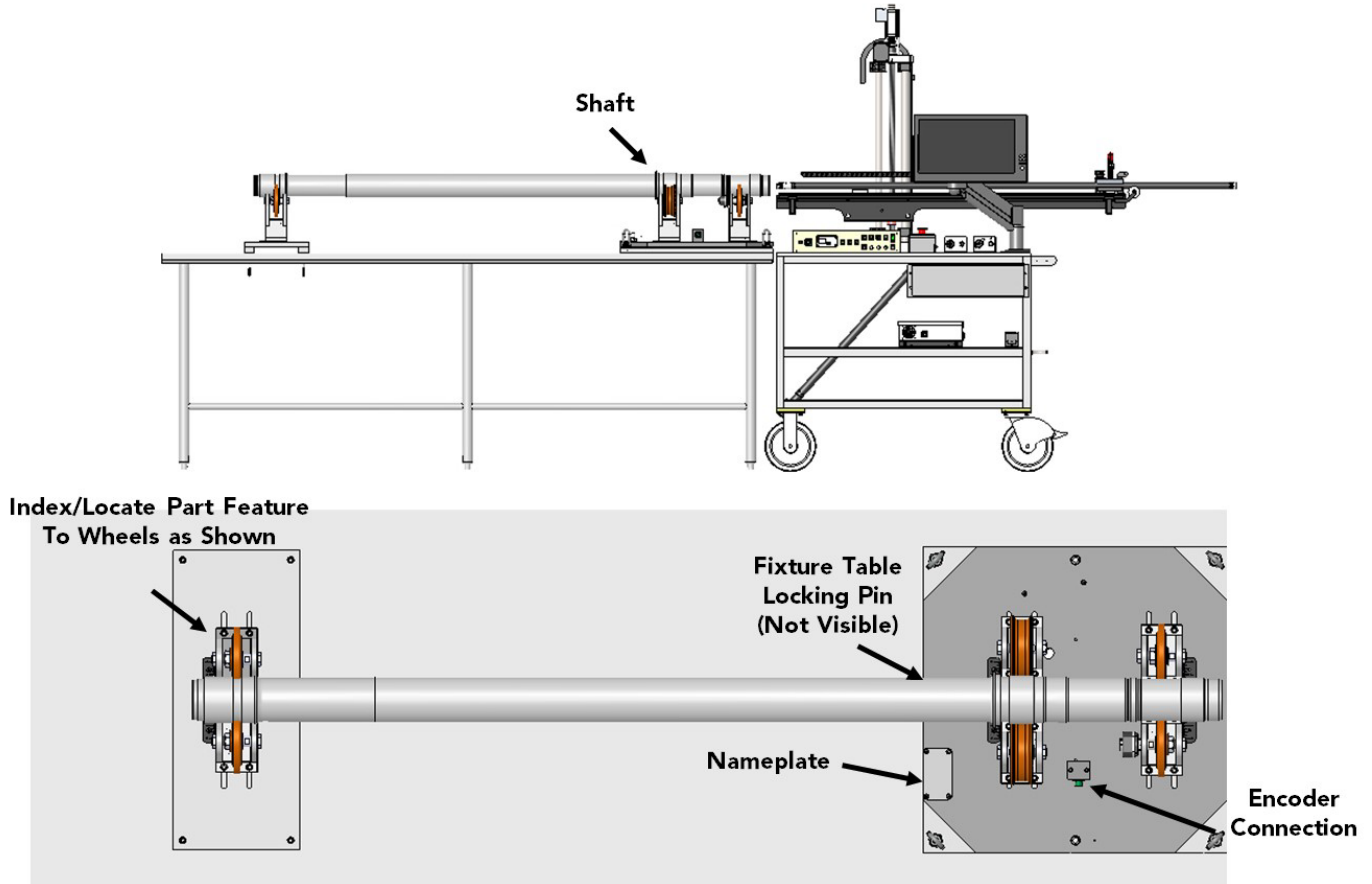


Figure 20 Shaft Setup One

### Setup Steps (Shaft)

- 1) Lock cart wheels
- 2) Retract Pole Cam to a safe distance
- 3) Power system down.
- 4) Rotate fixture, if needed see Figure 20 or Shaft Setup Two Figure 21  
 Note: Unlike the Coupler, the shaft is flipped end for end & the fixture is not rotated.
  - a. Disconnect encoder cable
  - b. Pull-up on locking pin & rotate if needed
  - c. Relock lacking pin in place.
  - d. Reconnect encoder cable
- 5) Mount part on fixture & index as shown
  - a. Use "Setup Rulers" on the fixture to equally space rollers on the fixture. See Figure 2 Rotational Fixture or Fixture Setup DWG

### Shaft Setup Two

Note, the part needs to be rotated, not the fixture



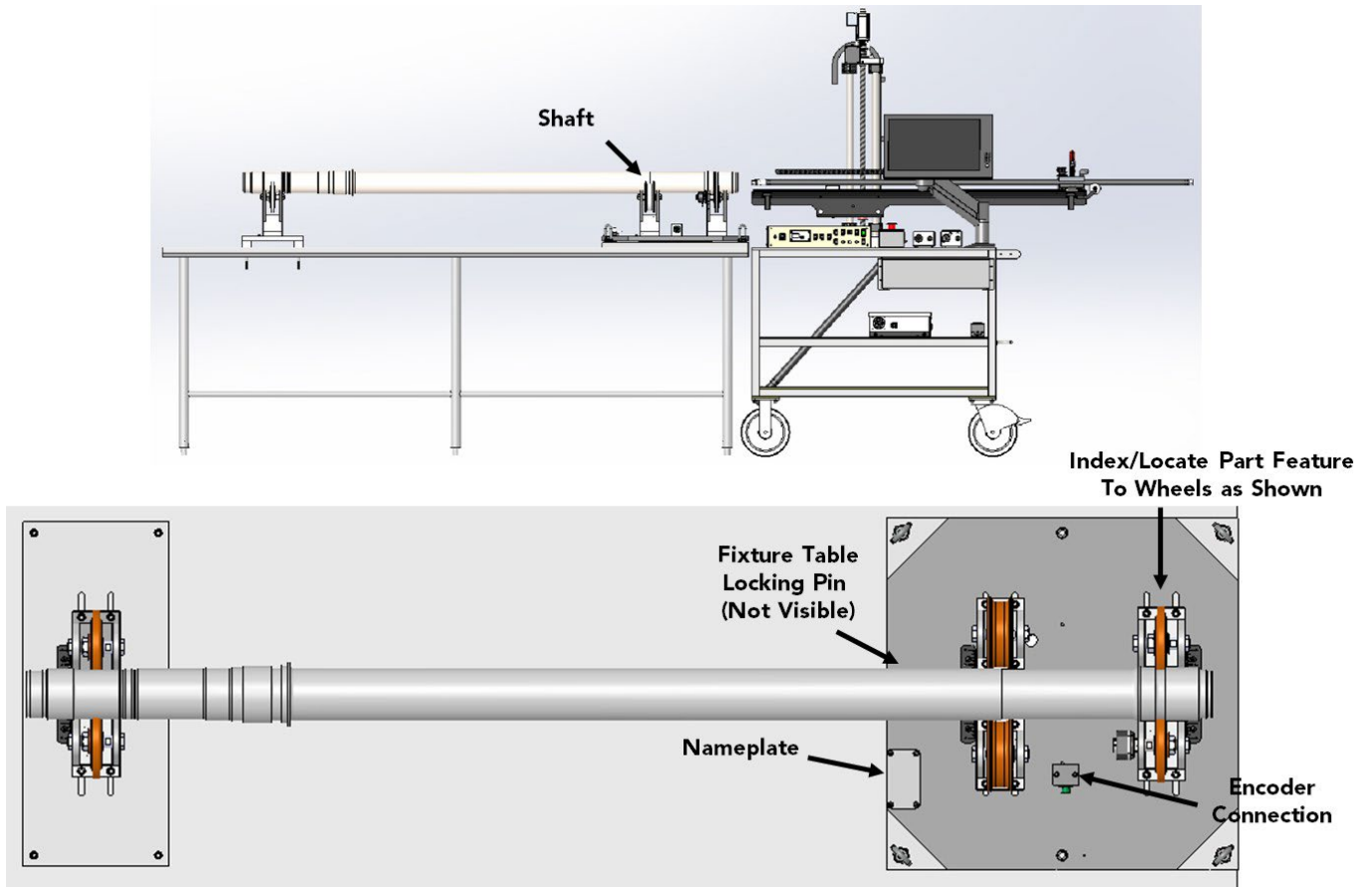


Figure 21 Shaft Setup Two

Pole Cam Cart System Controller

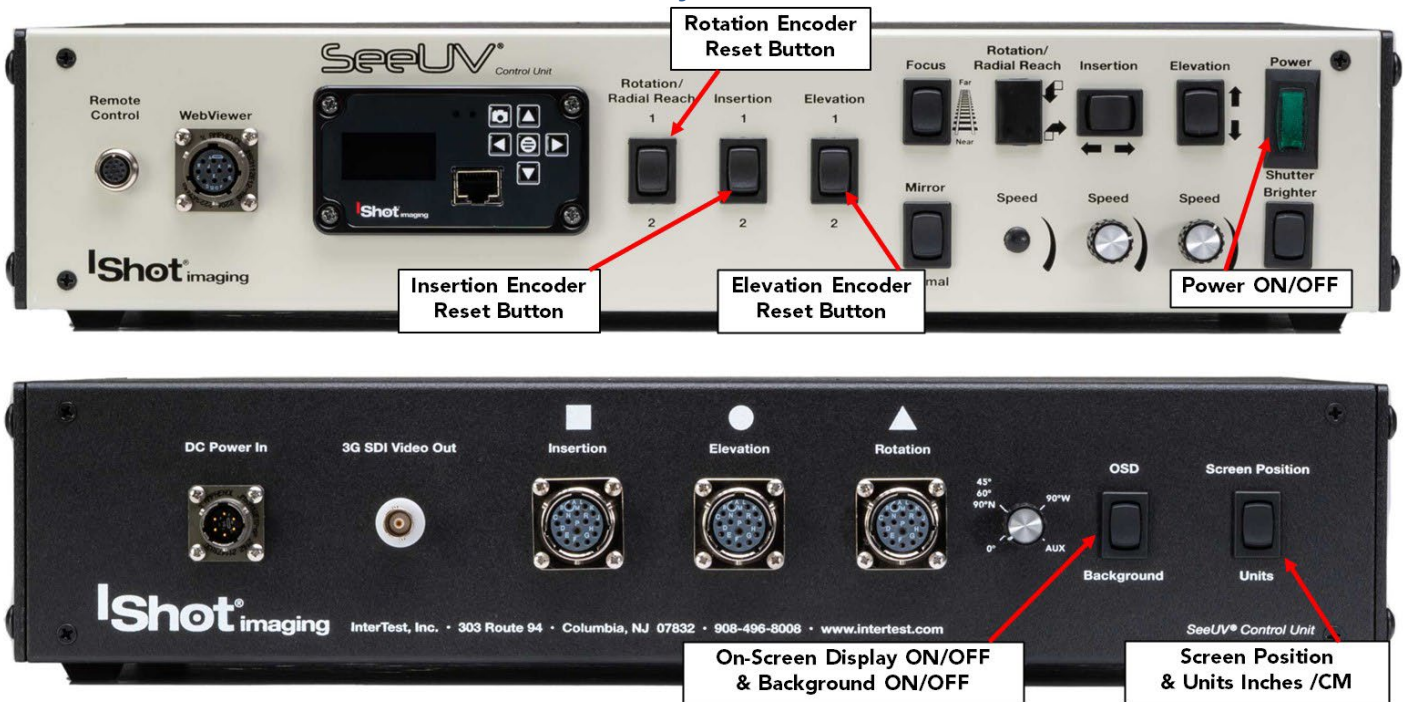


Figure 22 On-Screen Display, OSD, Controls

For cart setup: Position in place and lock two wheels by pushing down on the brakes with foot. Verify that the Pole Cam head is fully retracted before loading and unloading components to avoid system damage.

Use a fixture to provide proper alignment of part's rotating axis and positioner's rotating axis. Verify clearance when the Pole Cam head makes entry into component. Use vertical, horizontal and radial reach controls as needed to position head.

Move the Pole Cam® head with insertion, elevation and radial reach controls to a position suitable for inspection (refer to Figure 11 on page 11). **Update with system images when you get to this point.**

**Insertion:**

To control horizontal position of the Pole Cam® boom, use the Control Box switches  $\rightleftarrows$  to **insert/retract** the Pole Cam® boom into the part

Push  $\leftarrow$  on the Control Box to **insert** boom into of the part.

Push  $\rightarrow$  on the Control Box to **retract** boom out of the part

**Note:** the speed of insertion is controlled by the speed knob directly below the button

**Elevation:**

To control elevation of the Pole Cam® boom, use the Control Box switches  $\updownarrow$  to raise and lower the Pole Cam® boom

Push  $\uparrow$  on the Control Box to move the Pole Cam® boom **up**.



Push ↓ on the Control Box to move the Pole Cam boom **down**.

**Note:** the speed of insertion is controlled by the speed knob directly below the button

**Note:** Rotational Encoder is on the part fixture. See Figure 2

Button Function	Function	Notes
Power On/Off	Turn On Manin System Power to OSD Unit	Switch Will Illuminate
Insertion Encoder Rest Button	Zeros Insertion Encoder	Pressing Up will reset insertion depth Down will rest Reference Value See Figure 22
Elevation Encoder Rest Button	Zeros Elevation Encoder	Pressing Up will reset Elevation Height Down will reset Reference Value See Figure 22
Rotation Encoder Rest Button	Zeros Elevation Encoder	Pressing Up will reset Elevation Height Down will reset Reference Value See Figure 22
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 23 OSD Button Functions

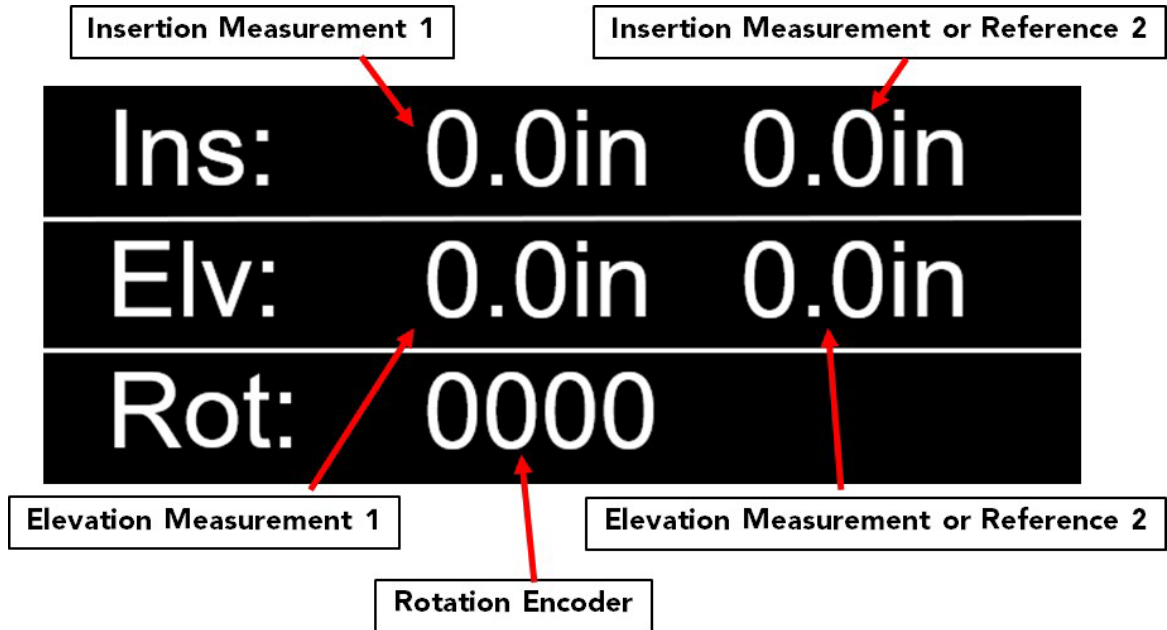


Figure 24 Insertion, Rotation & Elevation Values

Insertion Encoder Operation

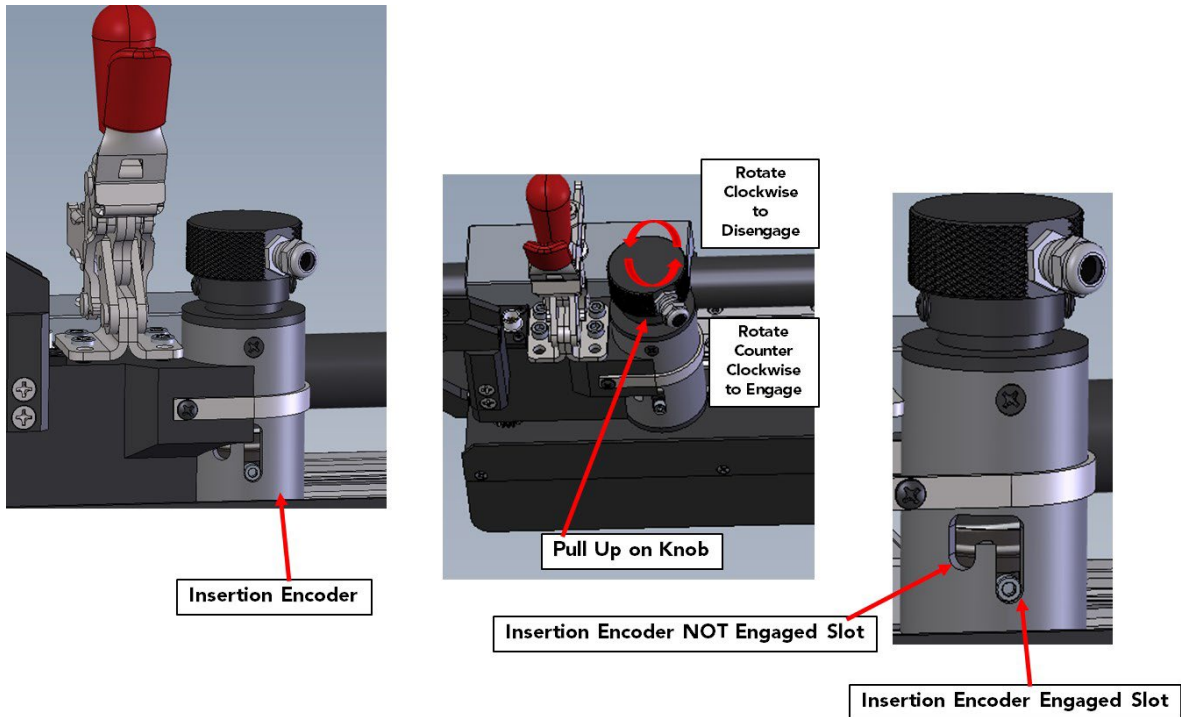


Figure 25 Insertion Encoder

The Insertion Encoder can be disengaged for manual Insertion. Lift up on knob & rotate to engage/disengage. Note location of the Cap Screw. Short slot is Disengaged. Long slot is engaged.



### Camera Control Unit Menu Structure



Figure 26 Camera CCU Menu Tree

**Note:**



Changes to camera settings can only be saved to Setup 1. Camera Setup 2-4 are set at the factory



Be sure to "Turn Off" UV Correction when doing White Light Inspection. See Figure 26

**Menu Tree**



Menu tree home.





### Image Quality

```

Image Quality
> Brightness      126
- Contrast       19
- Saturation     31
- Sharpness      5
- More...
- Return to Main

```

Brightness: 0 to 255, Default: 128  
 Contrast: 0 to 63, Default: 19  
 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

```

More Image Quality
> White Balance Auto
  WB Level      128
- Gamma         1
- Hue           20
- More...
- 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 (Not Used in Pole Cam)

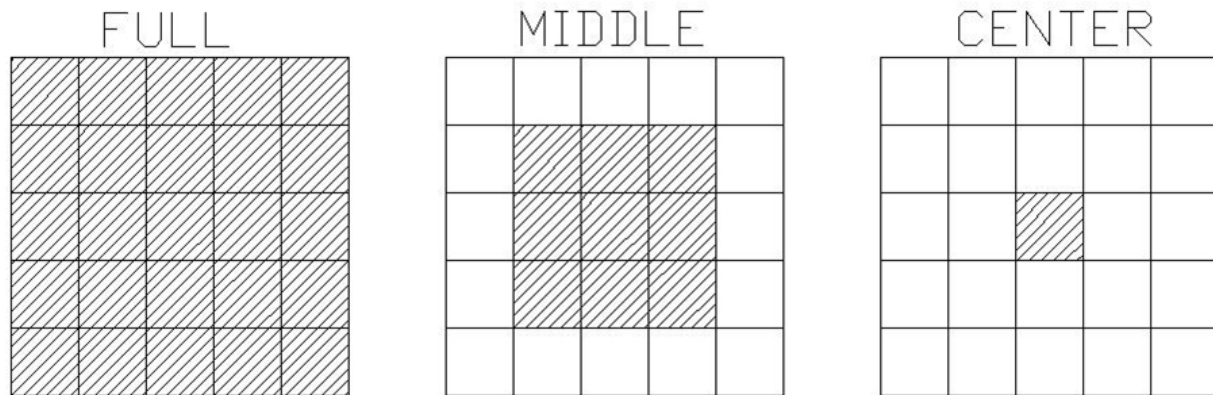
```

Capture Setup Menu
> Mirroring      NO
- Frame Rate    Auto
- Exp ROI       Full
- Exp Sec       Auto
- Return to Main

```

Mirror: No, H, V, HV. Default: No  
 Frame Rate: Auto, 1 to 30 Hz in 1080 Default: Auto  
 1 to 60 Hz in 720  
 1 to 120 Hz in VGA

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 per second  
 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



LED: 0 to 10 Light intensity level Constant Current @ 8VDC  
 (See Aux Light QNHD Command List for RS232)  
**Not used in Pole Cam**

Show Diagnostics Displays system diagnostics Status

Save Presets Allows current settings to be stored for later recall  
**Do not use in Pole Cam.**

Load presets Allows previously stored settings to be restored

Lens Correction For setting color correction of the lens installed

### System Diagnostic



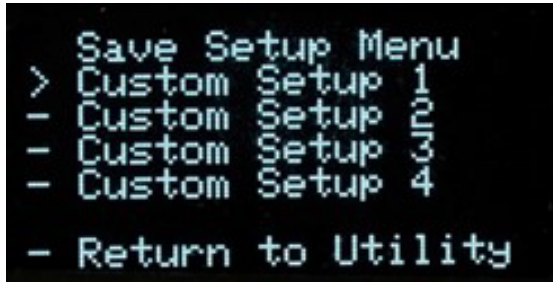
1080/30 (H1): Locked/Failed Camera type attached



1080/60 (H2): Locked/Failed Camera type attached (Not used in Pole Cam)  
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



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

**Note:**

- Presets 2-4 are locked out in Pole Cam.
- Preset 1 can be modified & accessed by using the “Aux” setting on the Optical Adapter Switch. See Figure 13.

### Load Presets (Not used in Pole Cam)



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

### Lens Correction



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:	USB output	1080p, 720p, 480	Default: 1080p
	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

## Specifications

### Camera Head

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



### Camera Cable

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

### Camera Control Unit (CCU)

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



## Cart System

<b>SeeUV Pole Cam HD Cart System</b>	
<b>Boom Diameter</b>	Pole Cam HD 1.0" (2.54cm)
<b>Boom Length</b>	58" (147.5 cm)
<b>Insertion Length</b>	69.25" (176 cm)
<b>Elevation Range Between Stops</b>	15" (38cm)
<b>Elevation Range Measured to Camera Centerline</b>	46.5"-61.5" (118-156 cm)
<b>Elevation Control</b>	Yes
<b>Rotation Range</b>	360° Continuous with Fixture
<b>Rotation Control</b>	Manual with Fixture



### Umbilical Camera Cable/Light Guides

-Do not twist/rotate the camera umbilical cable more than one turn. Internal damage will result

## 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



Controller & Camera Mechanical Specifications

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	.068MM INDICATION AT 25MM
45	7.1	36 X 20MM AT 50MM	11 LINE PAIRS/MM AT 50MM	.038MM INDICATION AT 50MM
60	7.1	36 X 20MM AT 50MM	11 LINE PAIRS/MM AT 50MM	.040MM INDICATION AT 50MM
90 WIDE	2.5	80 X 41MM AT 25MM	8 LINE PAIRS/MM AT 25MM	.068MM INDICATION AT 25MM
90 NARROW	7.1	36 X 20MM AT 50MM	11 LINE PAIRS/MM AT 50MM	.040MM INDICATION AT 50MM

EM16312 0° Optical Adapter

EM16313 60° Optical Adapter

EM16314 90° Narrow Optical Adapter

EM15475 45° Optical Adapter

EM15477 90° Wide Optical Adapter

EM13405 WEBVIEWER 2023 CCU ASSY. PART ROTATION

EM15401 WHITE LED LIGHT SOURCE KIT

EM14465 UV LED LIGHT SOURCE KIT

Dimensions: 76.293, 1.000, 0.74, 3.500, 17.010



### 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	
					1 to 120 Hz in VGA	
			(USB 2 only)			
			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		



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			



## Table of Figures

Figure 1 SCIS Cart .....	9
Figure 2 Rotational Fixture .....	10
Figure 3 Interconnection Diagram.....	11
Figure 4 Pole Cam Optical Adapters .....	12
Figure 5 Pole Cam Protective Cap.....	13
Figure 6 Optical Tip Installation.....	14
Figure 7 Power Connections Rear .....	14
Figure 8 ON/OFF Controls Light Sources.....	15
Figure 9 Camera & Light Source Connections.....	16
Figure 10 Labeled Front of Camera CCU.....	17
Figure 11 Pole Cam Controller Front .....	17
Figure 12 Pole Cam Controller Rear.....	18
Figure 13 Optical Adapter Preset Switch .....	18
Figure 14 Power ON/OFF .....	19
Figure 15 Pole Cam Installation .....	20
Figure 16 System Connections .....	20
Figure 17 External Recording Connection (Optional).....	21
Figure 18 Coupler Setup One.....	22
Figure 19 Coupler Setup Two.....	23
Figure 20 Shaft Setup One.....	24
Figure 21 Shaft Setup Two.....	25
Figure 22 On-Screen Display, OSD, Controls.....	26
Figure 23 OSD Button Functions.....	27
Figure 24 Insertion, Rotation & Elevation Values.....	28
Figure 25 Insertion Encoder.....	28

## 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 +1 908 496-8008 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.

### For Service of this product:

**InterTest, Inc.**

**303 State Route 94**

**Columbia, NJ 07832**

**1-800-535-3626**

**+1 908 496 8008**

**<http://www.intertest.com>**



