POLECAM HD 1000 Camera Control Unit
Instruction & Admin Manual

INTERTEST, INC.

InterTest, Inc. • 303 Route 94 • Columbia, NJ 07832
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Contact Information

To contact us, please refer to the information below:

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Visit us on the Internet
www.intertest.com

General Information via Email
info@intertest.com

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Introduction:

The PoleCam HD is a bore viewing tool used for internal surface visual examinations during fluorescent penetrant and magnetic particle testing as well as for general remote white light and UV visual inspections. It provides 1080/30 color HD video views of component internals with dual independently controlled white and UV illumination. PoleCam HD's performance is optimized for remote observation of fluorescent indications. It provides crisp color views of component internal surfaces displayed on a color monitor. Five optical adapters allow quick tool-less change of direction of view with corresponding options in field of view (magnification). Standard PoleCam lengths of 2, 4, 6, and 10' with custom lengths up to 14' and a diameter of 1.00" provide high definition video of component internals over a wide range of applications. Remote control of focus assures outstanding image resolution from near contact to infinity.

System Component selection:

1. EM15472 iShot PoleCam HD 1000, 2, 4, 6' and 10' lengths, 1.00" diameter
2. EM15446 iShot PoleCam HD Camera Control unit
3. EM15455 iShot PoleCam HD Dual light sources (1 white & 1 UV LED)
4. EM15475 iShot PoleCam HD 45 degree DOV optical adapter
5. EM16313 iShot PoleCam HD 60 degree DOV optical adapter
6. EM15477 iShot PoleCam HD 90 degree wide DOV optical adapter
7. EM16314 iShot PoleCam HD 90 degree narrow DOV optical adapter

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8. EM16312 iShot PoleCam HD 0 degree DOV optical adapter
9. EM15018 PoleCam Slide fixture 48" range
10. Color display include numerous options of HDMI and PC types

Details:

To view item details, use links provided below to corresponding item numbers above. PoleCam general link is https://intertest.com/ishotr-seeuvr-1-0-inch-uv-polecam-hd-1000-camera-system.html

1. https://intertest.com/ishotr-seeuvr-polecam-hd-1000-6-foot-pole-5-foot-cable.html
2. https://intertest.com/ishot-polecam-hd-camera-control-unit.html
3. https://intertest.com/ishot-see-uv-polecam-hd-1000-dual-ls.html
4. https://intertest.com/ishotr-seeuvr-polecam-hd-45-degree-dov-optical-adapter.html
5. https://intertest.com/ishotr-seeuvr-polecam-hd-60-degree-dov-optical-adapter.html
6. https://intertest.com/ishotr-seeuvr-polecam-hd-90-degree-dov-with-wide-fov-optical-adapter.html
7. https://intertest.com/ishotr-seeuvr-polecam-hd-90-degree-dov-with-narrow-fov-optical-adapter.html
8. https://intertest.com/ishotr-seeuvr-polecam-hd-0-degree-dov-optical-adapter.html
9. https://intertest.com/polecam-slide-fixture-48-range.html

Cautions and warnings.

Safety Precautions

This manual covers the QN HD Camera equipment including PoleCam, its functions, and use. It also covers precautions to be taken to ensure safe operation. Please read this manual thoroughly 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 the InterTest Customer Service and Support Group.

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

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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 may be included 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.

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:

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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. What does the product spec say about operating temperature range? This includes QN HD, LLG, focus motor, etc.

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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

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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

Standard

1. CCU — Camera Control Unit,
2. PoleCam — Pole system with imbedded CMOS video sensor and flexible umbilical
3. Optical Adapters — PoleCam attachments that provides differen Directions and Fields of View.
4. Power Supplies — AC for CCU & AC to DC Adapters for light

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		sources
5.	DVI Cable	Cable that carries display images to external monitor

Options

1.	MicroSD	Removable storage for captured images Must be CLASS 10 (10MB/s) or better (UHS-1, 2, or 3)
2.	RS232 Cable	Cable connecting to the RS 232 comm port

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

Controls and connections

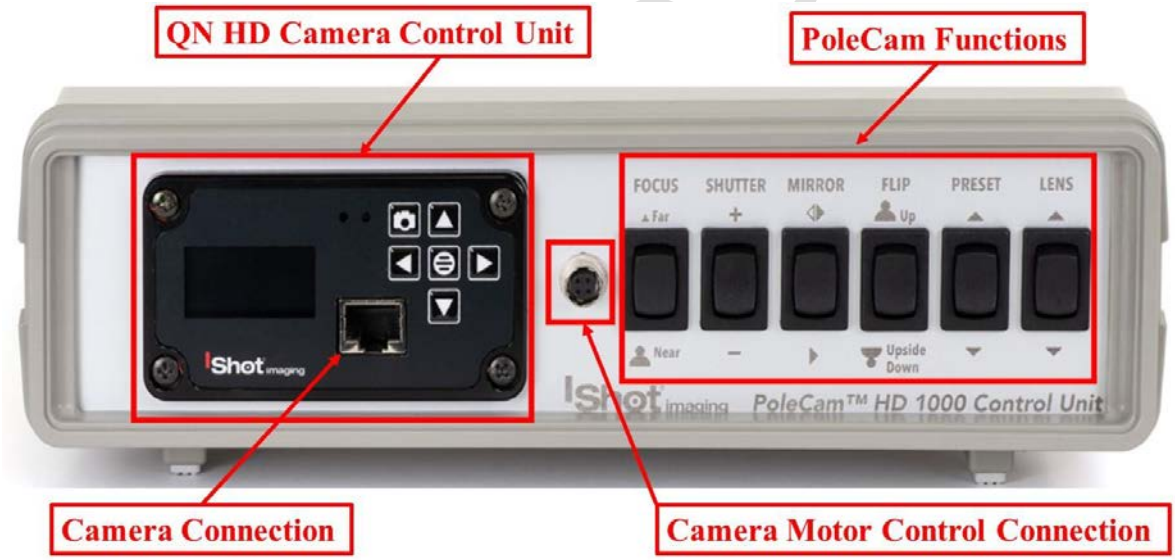

Figure 1 Control Unit Connections & Controls Front

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Figure 2 Power Connections Rear & CCU ON/OFF

Figure 3 ON/Off Controls Light Sources

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

Figure 4 Labeled Front of Camera CCU

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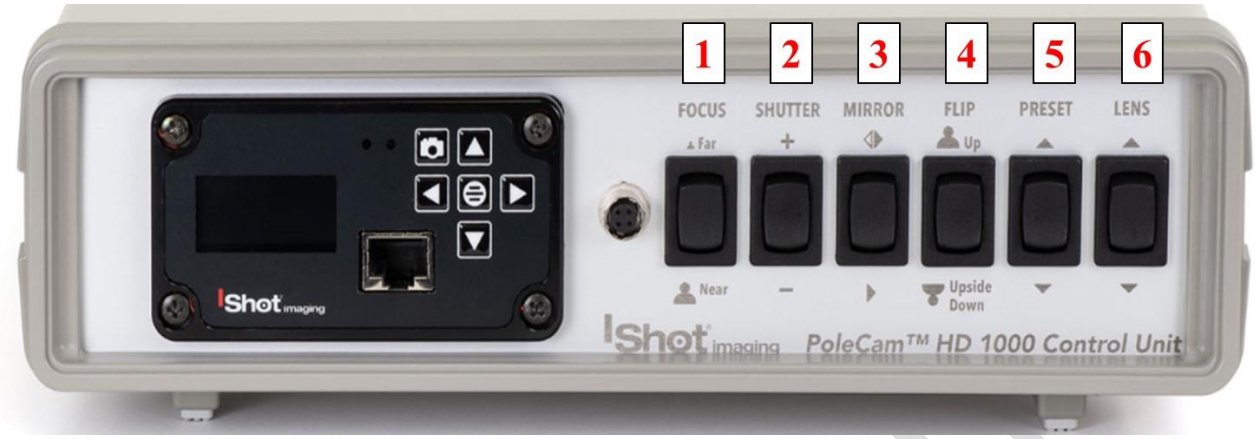
Camera Controls



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 5 Labeled Front of Control Unit

…

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Figure 6 Light Source Controls

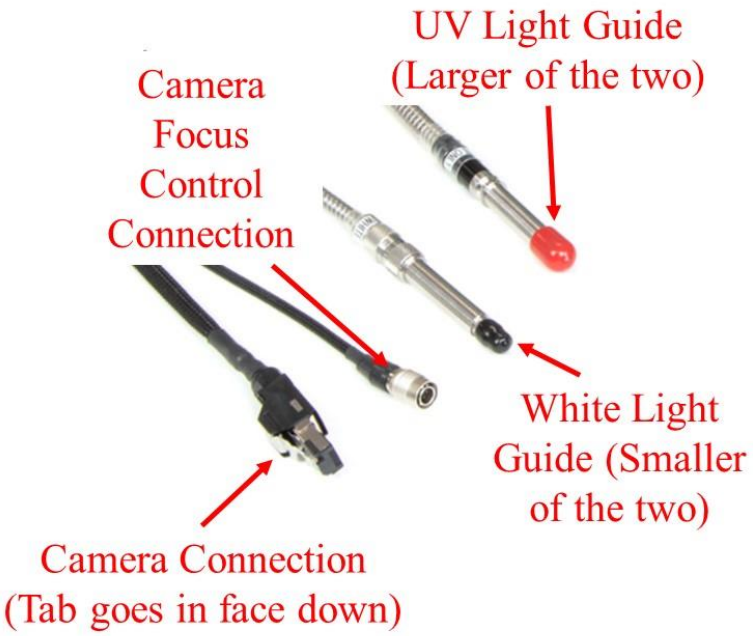

Figure 7 PoleCam Connections

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Figure 8 Connected System

General Operation

After power is applied to the control unit & turned ON, Right indicator LED will light up on the front of the Camera CCU See Figure 2 & 3, wait 5 seconds, until the Main Menu appears in the CCU Screen. Turn on the light source(s) as needed. White/UV

If faster response time is needed operate in 720p with Zoom On (crop mode) rather than Off (scale mode). Scale mode still reads the whole sensor array thus running as if in 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.

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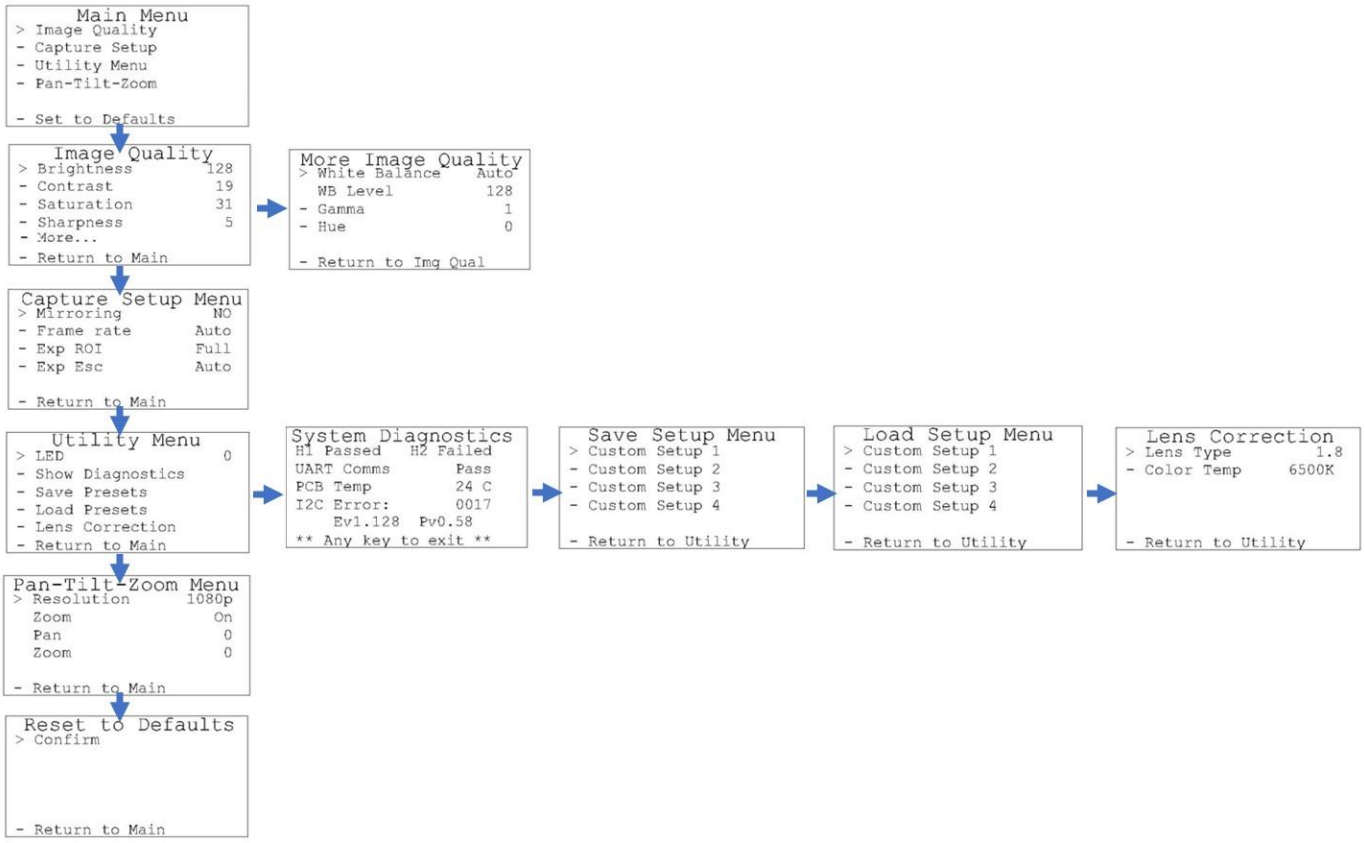
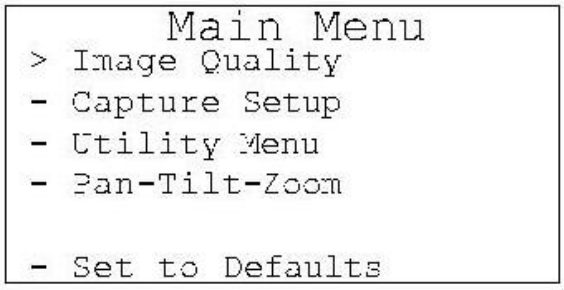
Operation & Menu Top Level Camera Imager Control Unit



Menu Tree



Menu tree home.

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Image Quality

Brightness: 0 to 255, Default: 128

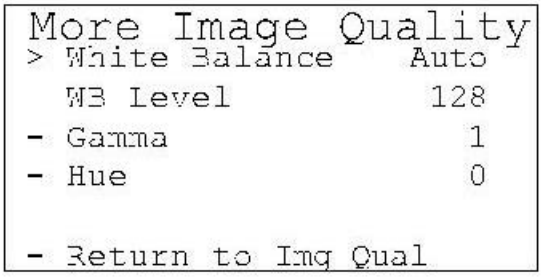
Contrast: 0 to 63, Default: 16

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.



.

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.

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Capture Setup

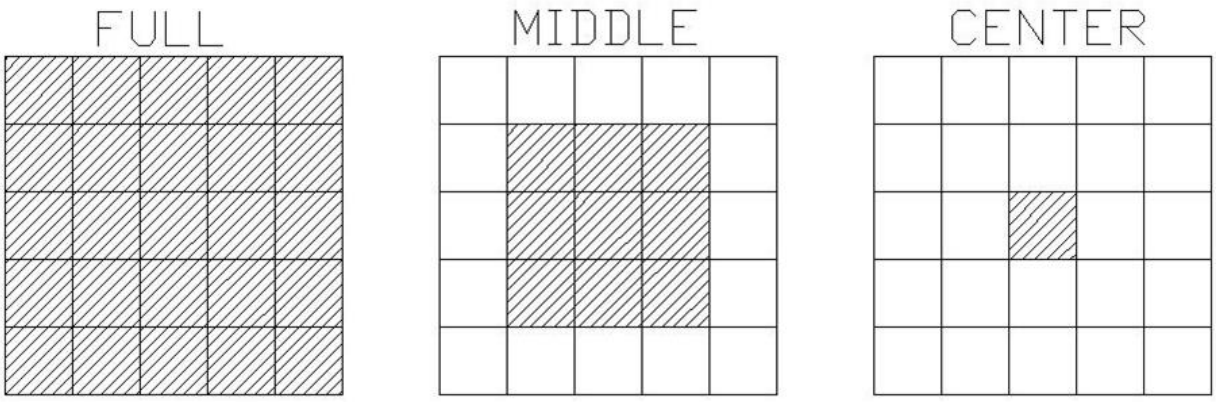
```
Capture Setup Menu
> Mirroring          NO
- Frame rate        Auto
- Exp ROI           Full
- Exp Esc           Auto

- Return to Main
```

Mirror: No, H, V, HV. Default: No

Frame Rate: Auto, 1 to 30 Hz in 1080 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, ½, 1/3, ¼, 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

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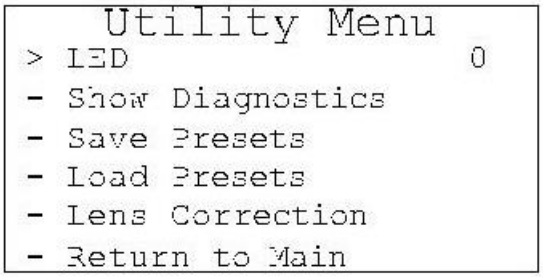
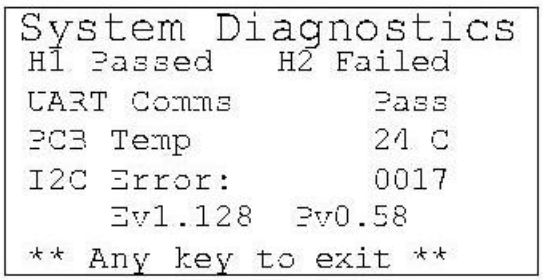
Utility Menu



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



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.	

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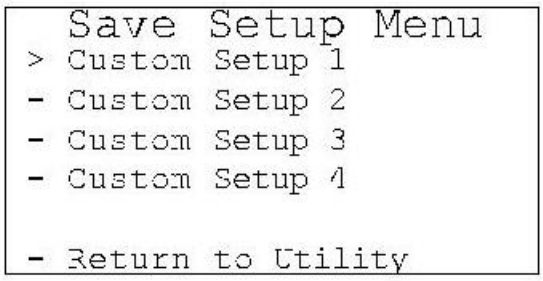
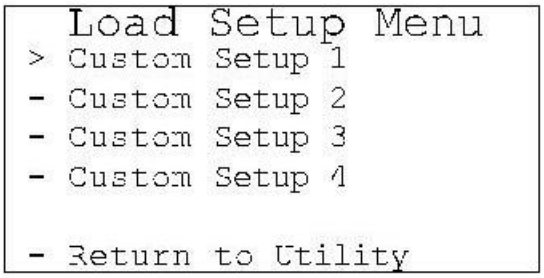


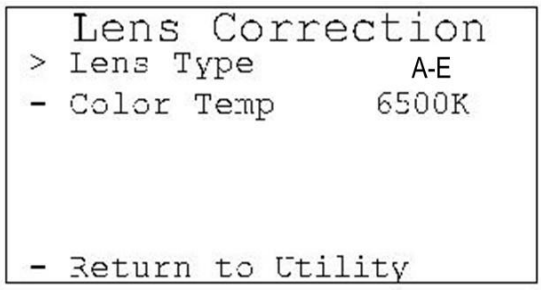
Allows up to 4 sets of camera settings to be stored for later recall and use.

Load Presets



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

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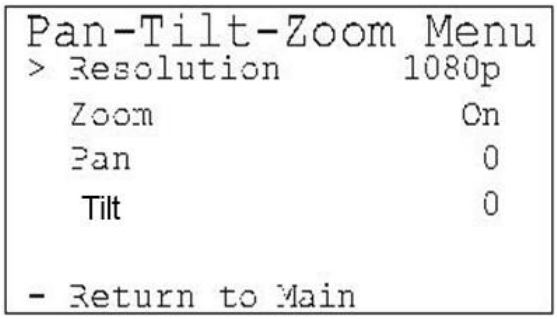
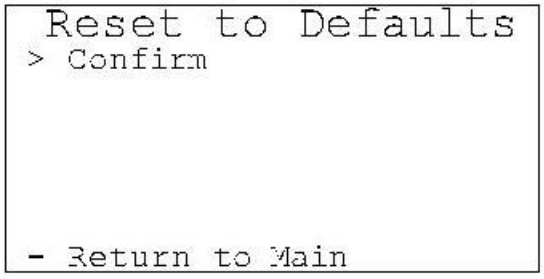
Pan Tilt Zoom Menu



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



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.

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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

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	

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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

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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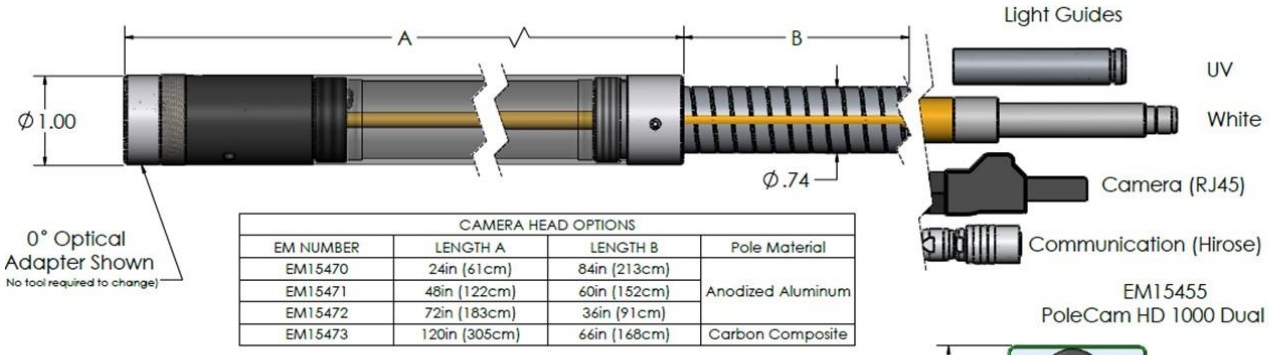
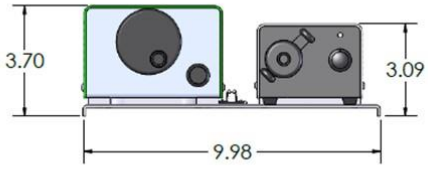
Controller & Camera Mechanical Specifications

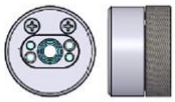


CAMERA HEAD OPTIONS			
EM NUMBER	LENGTH A	LENGTH B	Pole Material
EM15470	24in (61cm)	84in (213cm)	Anodized Aluminum
EM15471	48in (122cm)	60in (152cm)	
EM15472	72in (183cm)	36in (91cm)	
EM15473	120in (305cm)	66in (168cm)	Carbon Composite

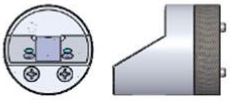
EM15455
PoleCam HD 1000 Dual LS



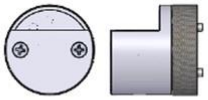
EM16312
0° Optical Adapter



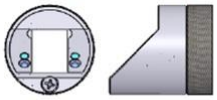
EM16313
60° Optical Adapter



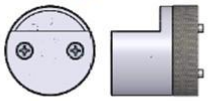
EM16314
90° Narrow Optical Adapter



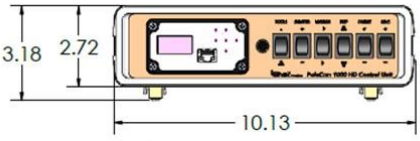
EM15475
45° Optical Adapter



EM15477
90° Wide Optical Adapter



EM15446
PoleCam HD 1000 CCU



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Imager Control Menu Values & Defaults

Menu Tier	Item	Sub Item	Sub sub item	Values	Default
1	Image Quallity				
		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	ºC	
			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

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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.

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For Service of this product:

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303 State Route 94

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Parts and Accessories

Intertest PN	Description
EM15470	SeeUV PoleCam HD 1000 Cam Head, 2ft POLE
EM15471	SeeUV PoleCam HD 1000 Cam Head, 4ft POLE
EM15472	SeeUV PoleCam HD 1000 Cam Head, 6ft POLE
EM15473	SeeUV PoleCam HD 1000 Cam Head 10ft POLE
EM16312	0 DEG Optical Adapter, PoleCam HD
EM15475	45 DEG Optical Adapter, PoleCam HD
EM16313	60 DEG Optical Adapter, PoleCam HD
EM16314	90 DEG NARROW Optical Adapter, Pole
EM15477	90 DEG WIDE Optical Adapter, PoleCam HD
EM16937	DVI (M) to HDMI (F) Type A Adapter
EM18815	POLECAM SLIDE FIXTURE, 12" RANGE
EM18816	POLECAM SLIDE FIXTURE, 20" RANGE
EM18717	POLECAM SLIDE FIXTURE, 28" RANGE
EM15018	POLECAM SLIDE FIXTURE, 48" RANGE
EM15213	POLECAM SLIDE FIXTURE, 79" RANGE
EM15000	POLECAM SLIDE FIXTURE, 8’ RANGE
EM15455	iShot See UV PoleCam HD 1000 Dual LS
EM15446	iShot See UV PoleCam HD 1000 CCU

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Admin Section

Need some intro here. Something like:

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	***Image Quality***	Image quality related	0
3	***Capture Setup***	Image capture related: FPS, Exposure, Mirroring	0
4	***Utility Menu***	LED Level, Diagnostics, Save Preset, Load Preset	0
5	***Pan-Tilt-Zoom***	Resolution, Zoom, Pan, Tilt	0
6			
7	***Reset to defaults***		0
	Bold-Italics means item is a submenu		
	Control ID provided for commands that go to the ISP		

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Released 8-13-20

Image Menu

Line	Text	Control ID	Notes			
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		
5	Exp Time: Auto/Manual	0x15		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}		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	***Diagnostics***	N/A	I2C Test, Lock Status, PCB Temp		0
4	***Save Preset***	N/A	4 user presets		0
5	***Load Preset***	N/A	4 user presets		0
6	***Lens Correction***	**N/A**	**New in 0.56, replaces Serial Number**		**0.56**
7	Return to Main				0
	Bold-Italics means item is a submenu				
	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
	Bold-Italics means item is a submenu			
	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
	Bold-Italics means item is a submenu			
	Control ID provided for commands that go to the ISP			

Diagnostics

Bold-Italics means item is a submenu	**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-	0x00	0
3	Zoom	0x07	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	0.4
4	Pan	0x08	If not in 1080 and zoom is enabled then this allows horizontal pan	0x00	0
5	Tilt	0x09	If not in 1080 and zoom is enabled then this allows vertical pan	0x00	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.				

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
	Bold-Italics means item is a submenu			
	Control ID provided for commands that go to the ISP			

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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
	Bold-Italics means item is a submenu				
	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.

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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.

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