



# Weld-i™ HD 625



Weld-i™ HD 625

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

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Table of Contents

Contact Information ..... 6

Introduction: ..... 6

    Detail ..... 7

Cautions and warnings..... 7

    Safety Precautions..... 7

    Operational, General Safety Considerations and Precautions ..... 7

    Cautionary Symbols and Symbol Terminology ..... 8

    Warnings..... 8

    Disclaimers ..... 8

Warranty..... 9

Copyrights and Rights of Portrait ..... 10

Registered Trademark Information ..... 11

System Components ..... 11

    Standard..... 11

    Options..... 12

Controls and connections ..... 12

Camera Controls..... 14

General Operation..... 16

Operation & Menu Top Level Camera Imager Control Unit..... 17

    Menu Tree..... 17

    Image Quality..... 18

    Capture Setup ..... 19

    Utility Menu ..... 20



System Diagnostic ..... 20

Load Presets ..... 21

Lens Correction..... 21

Pan Tilt Zoom Menu ..... 22

Set to defaults ..... 22

Weld-I Functions ..... 23

    Weld-I 625HD ..... 23

    Focus ..... 23

    Light Control ..... 24

    Light Source (Optional Lighting) ..... 24

    Filter ..... 25

    Shutter Control..... 25

    Shutter Table: ..... 25

    Arc ON/OFF ..... 26

QNHD Serial Commands: ..... 27

    Software Disclaimer ..... 27

    Communication Specifications: ..... 27

    Communication Pin-Out ..... 28

QNHD Command List..... 28

    Inquiries: ..... 32

    Weld-i™ HD 625 RS232 Motor/Arc Commands ..... 34

    How to use a computer to externally send commands..... 34

    Changing Arc-on and Arc-Off settings..... 35

    Hyper-Terminal Instructions: ..... 35



Specifications..... 38

- Camera Head ..... 38
- Camera Cable..... 38
- Camera Control Unit (CCU)..... 38
- Controller & Camera Mechanical Specifications ..... 39
- Imager Control Menu Values & Defaults ..... 40

Table of Figures..... 42

Care & Maintenance ..... 42

- Overall System..... 42

Trouble Shooting ..... 43

- Returns for Repair or Service ..... 43
- Return Evaluation Procedure ..... 43

Parts and Accessories ..... 45

Admin Section..... 46

- Dip Switch Settings ..... 46
- Main Menu ..... 47
- Image Menu..... 47
- More Image Quality ..... 47
- Capture Menu ..... 48
- Utility Menu ..... 48
- Save Preset..... 48
- Load Preset..... 49
- Diagnostics ..... 49
- PTZ Menu..... 50



Reset to Defaults ..... 50

Lens Correction..... 51

SCB300B Firmware Upload Procedure ..... 51

SCB300B AEQ Procedure..... 52

NOTES:..... 53

Intertest Inc.



## Contact Information

To contact us, please refer to the information below:

### Corporate Headquarters

InterTest, Inc.

303 Route 94

Columbia, NJ 07832 USA

Telephone (USA and Canada): 800-535-3626

Telephone (Outside the USA and Canada): 908-496-8008

Facsimile: 908-496-8004

### Visit us on the Internet

[www.intertest.com](http://www.intertest.com)

### General Information via Email

[info@intertest.com](mailto:info@intertest.com)

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## Introduction:

The iShot® Weld-i™ HD 625 Weld Camera Monitoring System by iShot® Imaging combines a specially housed, high definition color weld camera with air- or water-cooling capabilities to allow it to withstand the punishing environments of automated welding. Features a 1/6 CMOS 2MP, HD Camera / CCU capable of a video output of 1080/30P, 720/60P or VGA120. The CCU also has the ability to be remotely controlled via the rear panel RS-232 connection

EM16595 iShot Weld-i 625 QNHD CCU

### Weld-i™ 625 QNHD HS Camera

1. EM17427 iShot Weld-I 625 HD 7.1mm Camera Head with 18" PFA Cable Pigtail
2. EM17428 iShot Weld-I 625 HD 15mm Camera Head with 18" PFA Cable Pigtail

## Detail

To view item details for the Weld-i™ 625, use the link provided below

[Weld-i 625HD Website Link](#)

## Cautions and warnings.

**CAUTION: DO Not Pinch, Kink or Repeatably bend the Camera Cable. The Cable Shielding Can be Damaged & Lead to Intermittent Failures**

## Safety Precautions

This manual covers the Weld-i™ 625 equipment including, 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.

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 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:





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](http://www.intertest.com).

## System Components

### Standard

- |                              |   |
|------------------------------|---|
| 1. CCU                       | Camera Control Unit,                        |
| 2. Camera Weld-i™ 625<br>15M | Welding Camera and flexible umbilical up to |
| 3. Lighting                  | LED (Weld-i™ 625)                           |
| 4. Power Supplies            | AC  |

5. DVI Cable

Cable that carries display images to external monitor

Options

1. RS232 Cable
2. Lens Filter(s)

Cable connecting to the RS 232 comm port  
Spot filter(s) for camera

Controls and connections

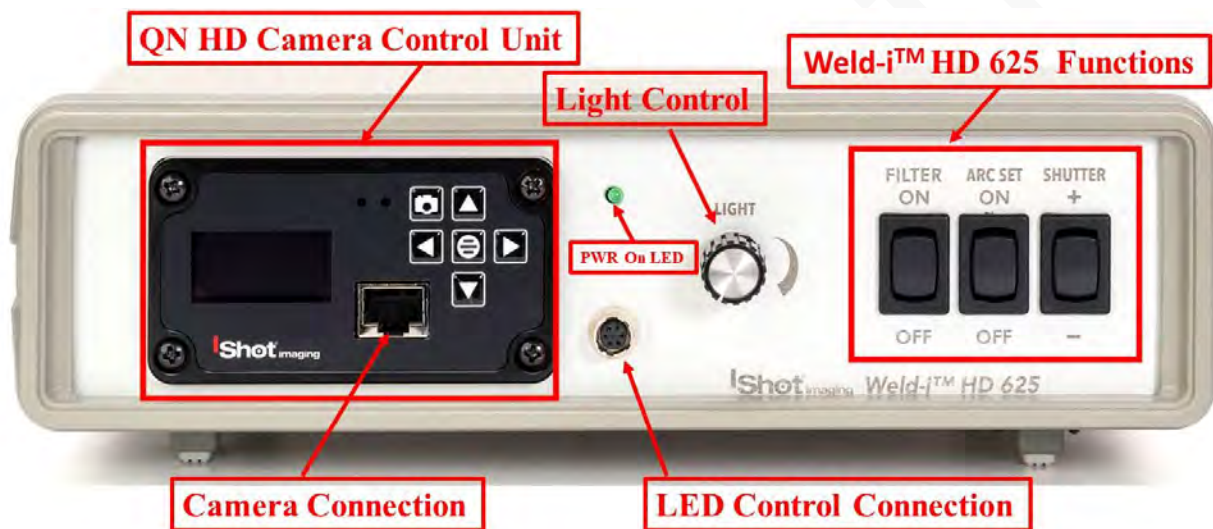


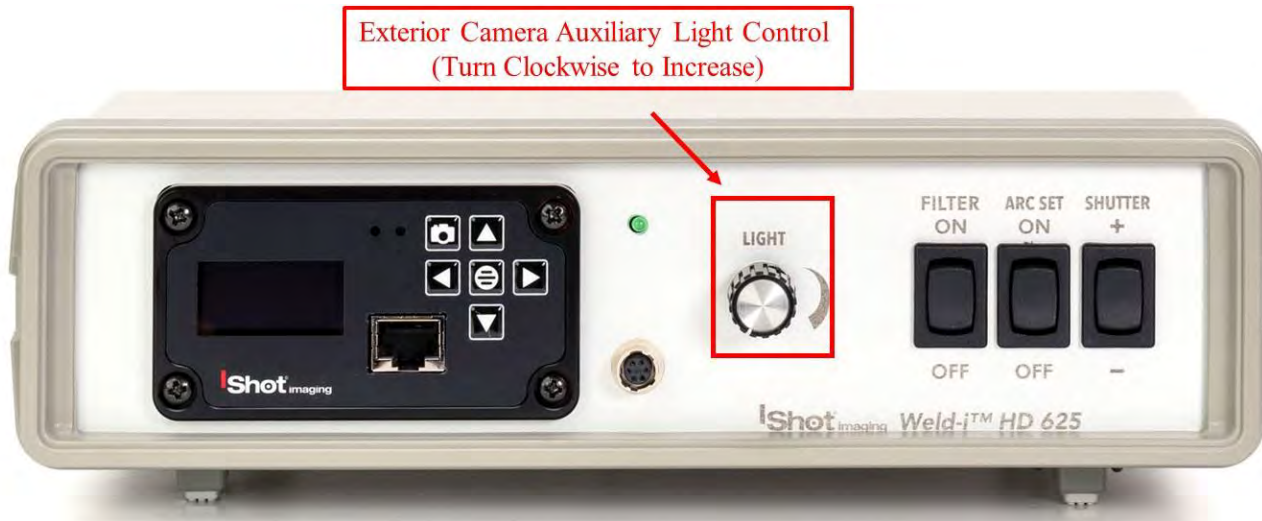
Figure 1 Control Unit Connections & Controls Front

**Power Connection**



Figure 2 Power Connections Rear CCU, ON/OFF

**CAUTION: DO Not Pinch, Kink or Repeatably bend the Camera Cable. The Cable Shielding Can be Damaged & Lead to Intermittent Failures**



Exterior Camera Auxiliary Light Control  
(Turn Clockwise to Increase)

Figure 3 Exterior Camera Auxiliary Light Control



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

Figure 4 Labeled Front of Camera CCU.

Note: See Operation & Menu Top Level Camera Imager Control Unit Section for Menu Tree Structure

## Camera Controls



Weld-I 625HD			
Button Number	Function	Options	Notes
1	Filter ON/OFF	On / Off	Up for <b>On</b> / Down for <b>Off</b>
2	Arc On/Off	On / Off	Push Up <b>Arc On</b> Push Down <b>Off</b>
3	Shutter	+/-	Up increases up Shutter Speed / Down Decreases

Figure 5 Front of Control Unit Weld-I 625HD Functions

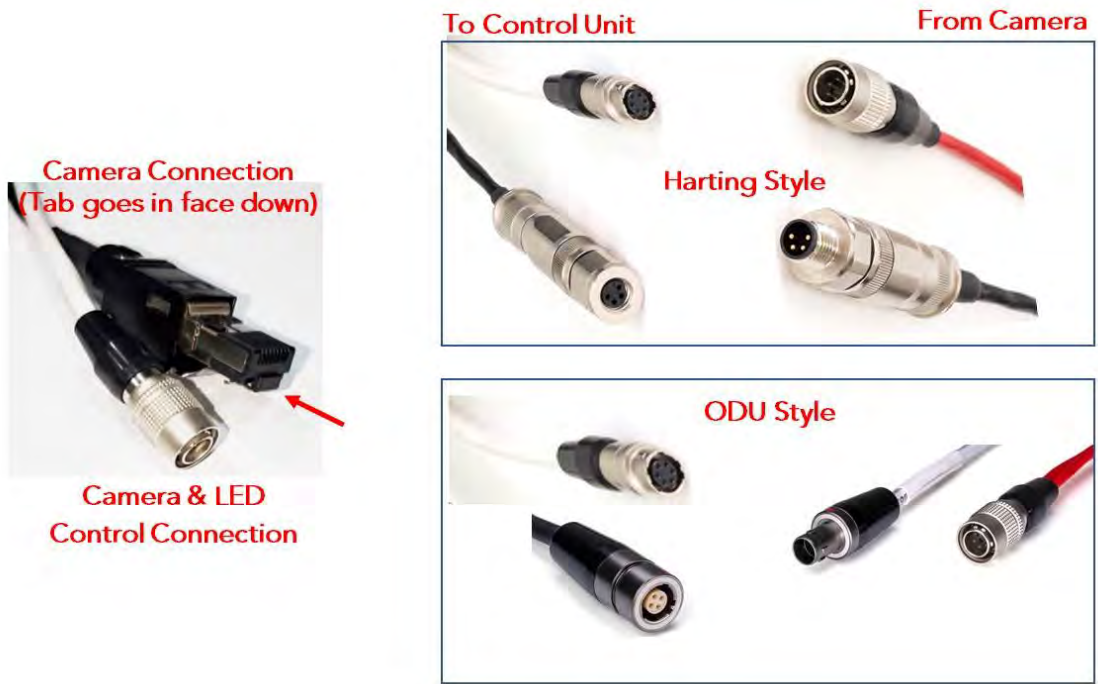


Figure 6 Weld-i™ 625 HD Connections

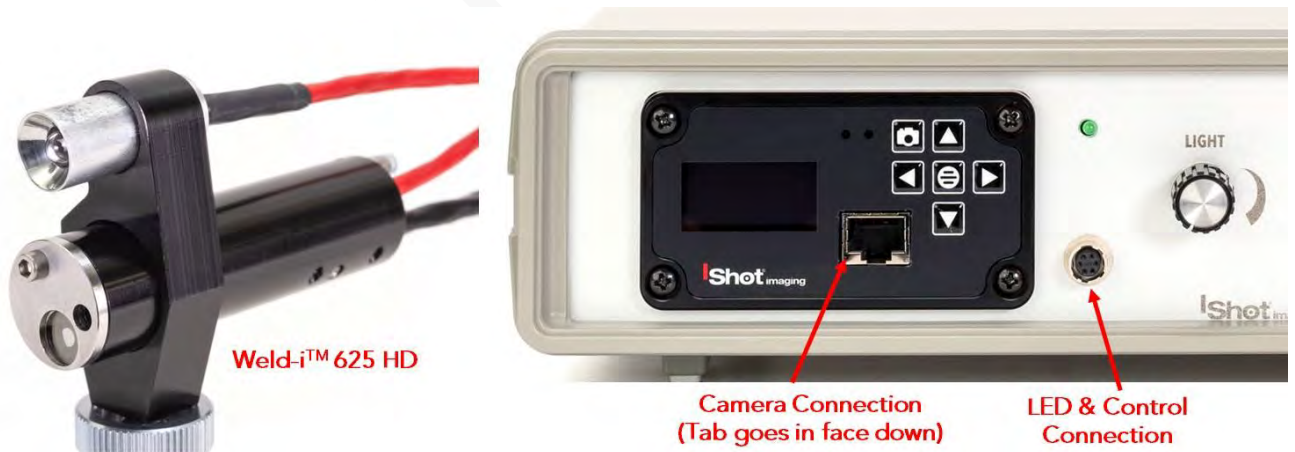


Figure 7 Connected System

## 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. Note, 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.



## Operation & Menu Top Level Camera Imager Control Unit

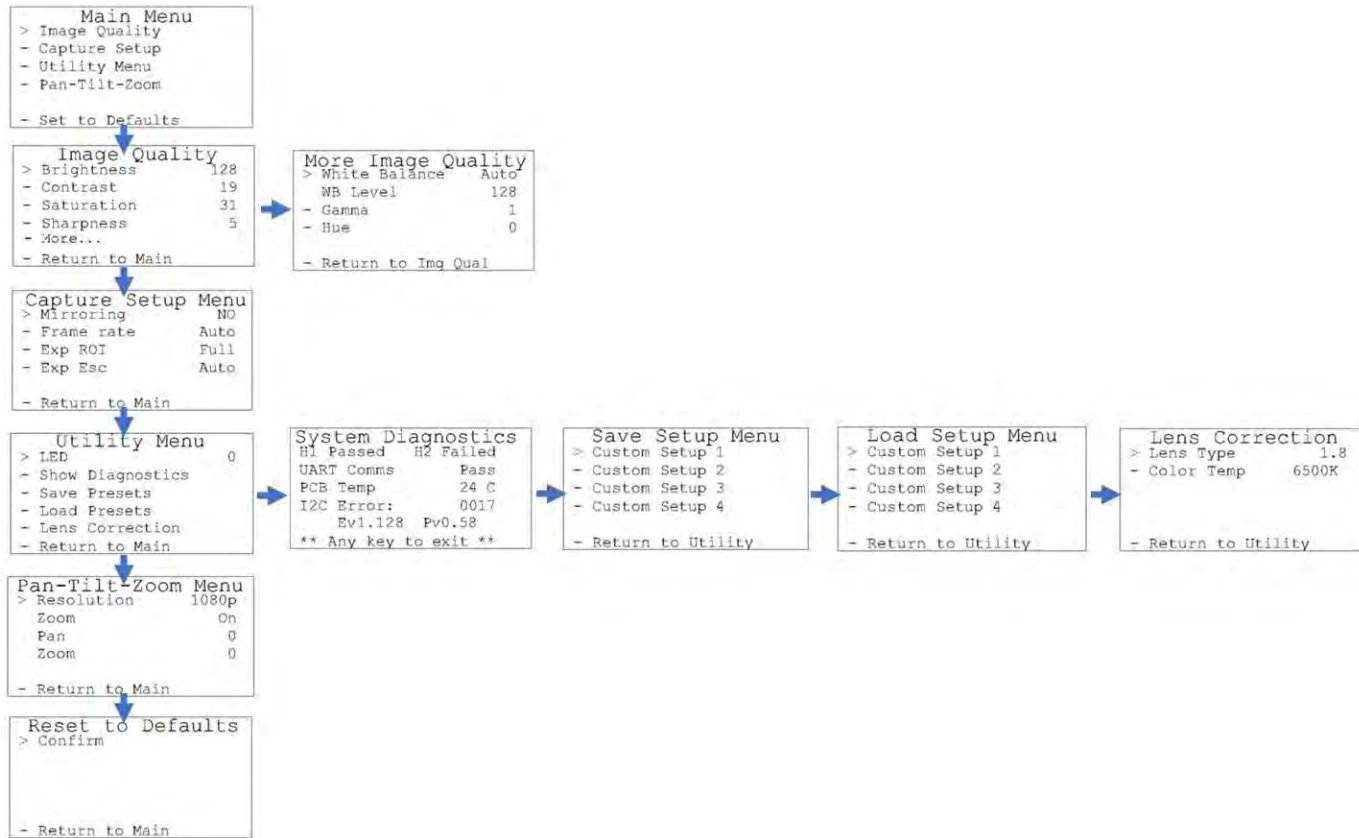


Figure 8 HD CCU Menu Tree

### Menu Tree

```

Main Menu
> Image Quality
- Capture Setup
- Utility Menu
- Pan-Tilt-Zoom

- Set to Defaults
  
```

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

```

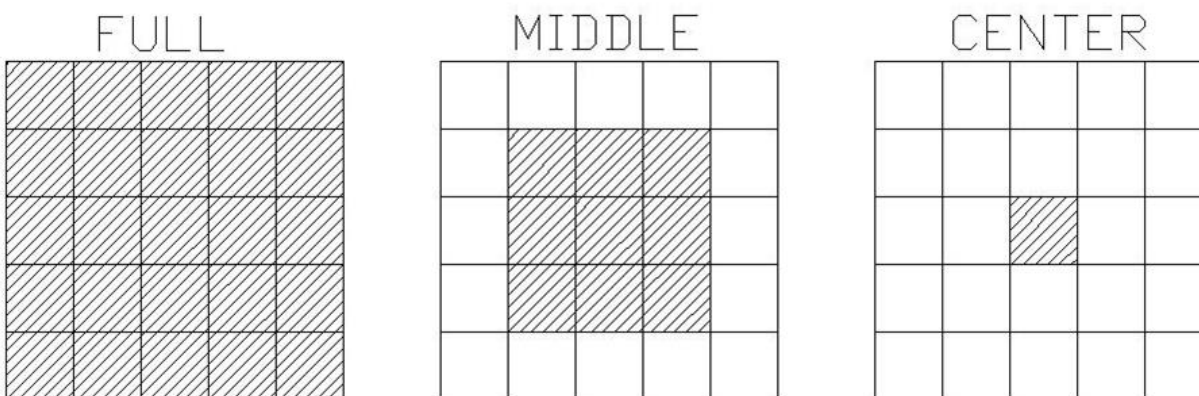
Capture Setup Menu
> Mirroring          NO
- Frame rate        Auto
- Exp ROI           Full
- Exp Esc           Auto
- Return to Main
    
```

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

Frame Rate: Auto, 1 to 30 Hz in 1080 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 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
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

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.

## Weld-I Functions

### Weld-I 625HD

When the Weld-I 625HD system is not in use under weld conditions (during weld setup) it is best to disengage the filter to allow more light to pass to the camera sensor. To Close the filter, push UP on the rocker switch labeled 'Iris/Filter'. (Figure 10) To remove the filter, push down

### Focus

Loosen the camera retention screw using a 0.035" Hex Key while holding the camera cable. This will help prevent the camera from rotating. Changes in camera rotation may change the relative position of the internal filters which may induce unwanted reflections. Adjust / rotate the internal camera as needed.

To adjust the focus near/far. Turn the focus adjustment screw using a 5/64" hex key after loosening the camera retention screw. Focus Far, counterclockwise, Focus Near clockwise. Tighten the camera retention screw



Figure 9 Focus Adjustment

### Light Control

**Weld-i™ HD 625** Intensity is adjusted using the control knob on the front panel of the Control Box labeled 'Lamp Intensity'. (Figure 11) Twisting the knob to the 'CLOCKWISE' will increase intensity while twisting the knob to the 'COUNTER CLOCKWISE' will decrease the intensity.



Figure 10 Weld-i™ HD 625 Light Control

### Light Source (Optional Lighting)



Figure 11 Weld-i™ HD 625 Light Control



## Filter

Places the lens filter in the internal lens assembly



Figure 12 Filter On/Off

## Shutter Control

Shutter Speed is how quickly the shutter is opening and closing and affects how much motion blur is in each frame of video. To change the Shutter speed, push UP on the rocker switch labeled 'Shutter' (Figure 13). to increase Push DOWN on the rocker switch (Figure 13) to decrease. Reference Shutter table (Figure 14)



Figure 13 Shutter Control

## Shutter Table:

The shutter increment and decrement functions have 26 total steps as seen in the following table. The shutter value can be set to any value between 1/1 to 1/30000 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.

Shutter Value	qr Value	st Value
1/1	00	01
1/2	00	02
1/3	00	03
1/4	00	04
1/8	00	08
1/15	00	0F
1/25	00	19
1/30	00	1E
1/50	00	32
1/60	00	3C
1/100	00	64
1/250	00	FA
1/500	01	F4
1/1000	03	E8
1/2000	07	D0
1/3000	0B	B8
1/4000	0F	A0
1/5000	13	88
1/6500	19	64
1/8000	1F	40
1/10000	27	10
1/12500	30	D4
1/15000	3A	98
1/17500	44	50
1/20000	4E	20
1/30000	75	30

Figure 14 Shutter Table

### Arc ON/OFF

Activates the stored shutter value used for welding. Factory Default is 1/500

To adjust Arc ON/OFF settings see; [Changing Arc-on and Arc-Off settings](#) and [How to use a computer to externally send commands](#).



Figure 16 ARC On/Off

## QNHD Serial Commands:

Overview of communication:

RS232 Standard

9600 Baud Rate

8 byte packet size

Non parity

### Software Disclaimer

SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTOR(S) "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTOR(S) BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE\*

### Communication Specifications:

Each command or inquiry packet is made up of 8 bytes. The first byte will contain the target address followed by command or inquiry action byte, command byte, command modifier byte, three data bytes, followed by the end byte. The address will be either 0x42 for functions handled by the camera, or 0x43 for commands handled by the CCU. The action byte will be either 0x01 for a command or 0x09 for an inquiry. The command byte will specify which parameter or action is to be modified, taken, or inquired about. The command modifier byte determines what changes are made to the parameter specified in the



command byte as defined below. The data bytes contain the values for the parameters to be set at during a direct command. The end byte is always 0xff to signify the end of a packet.

### Communication Pin-Out

3.5mm TRS Plug

Tip: TX

Ring: Rx

Sleeve: GRND

### QNHD Command List

Command		Command HEX	Definition
AUX_Light	Off	43 01 01 00 00 00 00 FF	Off
	Direct	43 01 01 01 00 00 qr FF	on, % of max,(qr = 0x00 to 0x63)
	Up	43 01 01 02 00 00 00 FF	Light Increase 10%
	Down	43 01 01 03 00 00 00 FF	Light Decrease 10%
Image_Capture	Save	43 01 02 00 00 00 00 FF	Save image to SD
Custom_Setup	Save	43 01 03 01 00 00 0q FF	Save 1-4 (q = 1 to 4)
	Load	43 01 03 02 00 00 0q FF	Load 1-4 (q = 1 to 4)
Mirror	Direct	42 01 04 01 00 00 0q FF	q: 0-3 0 = No mirroring 1 = Horizontal mirror 2 = Vertical mirror 3 = Horizontal and vertical mirror
Frame_Rate	Auto	42 01 0A 00 00 00 00 FF	Auto
	Direct	42 01 0A 01 00 00 qr FF	1 - 30 qr: 01 to 1E 1080p
		42 01 0A 01 00 00 qr FF	1 -60 qr: 01 to 3C 720p
		42 01 0A 01 00 00 qr FF	1 - 120 qr: 01 to 78 640x480
EXP_ROI	Direct	42 01 11 01 00 00 00 FF	Full
		42 01 11 01 00 00 01 FF	Middle
		42 01 11 01 00 00 02 FF	Center



Command		Command HEX	Definition
EXP_ESC	Up	42 01 15 02 00 00 00 FF	See Shutter Table
	Down	42 01 15 03 00 00 00 FF	
	Direct	42 01 15 01 00 qr st FF	
	Auto	42 01 15 01 00 00 00 FF	
Brightness	Reset	42 01 01 04 00 00 00 FF	0 to 255, default 128 qr:00 to FF
	Direct	42 01 01 01 00 00 qr FF	
Contrast	Reset	42 01 02 04 00 00 00 FF	0 to 63, default 19 qr: 00 to 3F
	Direct	42 01 02 01 00 00 qr FF	
Saturation	Reset	42 01 03 04 00 00 00 FF	0 to 63, default 31 qr: 00 to 3F
	Direct	42 01 03 01 00 00 qr FF	
Sharpness	Reset	42 01 05 04 00 00 00 FF	0 to 31, default 5 qr: 00 to 1F
	Direct	42 01 05 01 00 00 qr FF	
Reset_to_Default		42 01 80 04 00 00 00 FF	Reset above 4 to Default value
WB Mode	Auto	42 01 0C 01 00 00 00 FF	Set WB to be auto or manual
	Manual	42 01 0C 01 00 00 01 FF	
WB Value	Direct	42 01 0D 01 00 00 qr FF	0 to 255, 128 default qr: 0x00 - 0xff Only works if WB is in manual mode
	Increment	42 01 0D 02 00 00 00 FF	
	Decrement	42 01 0D 03 00 00 00 FF	
	Reset	42 01 0D 04 00 00 00 FF	
Gamma	Reset	42 01 06 04 00 00 00 FF	Reset
	Direct	42 01 06 01 00 00 0q FF	0 to 2, default 1 q: 0-2
Hue	Reset	42 01 17 04 00 00 00 FF	neg 180 to 180, default 0 v: 0 for positive, 1 for negative. qr: 00 - B4
	Direct	42 01 17 01 0v 00 qr FF	



Command		Command HEX	Definition
Lens_Type	Direct	42 01 1B 01 00 00 00 FF	A
		42 01 1B 01 00 00 01 FF	B
		42 01 1B 01 00 00 02 FF	C
		42 01 1B 01 00 00 03 FF	D
		42 01 1B 01 00 00 04 FF	E
		42 01 1B 01 00 00 05 FF	F
		42 01 1B 01 00 00 06 FF	G
		42 01 1B 01 00 00 07 FF	H
<hr/>			
Color_Correction	Direct	42 01 1A 01 00 00 00 FF	2800K
		42 01 1A 01 00 00 01 FF	4500K
		42 01 1A 01 00 00 02 FF	6500K
<hr/>			
Resolution	Direct	42 01 0B 01 00 00 0q FF	q: 0 = 1920 x 1080
			q: 1 = 1280 x 720
			q: 2 = 640 x 480 (USB only)
<hr/>			
Zoom	Direct	42 01 07 01 00 00 01 FF	<p>This will work only in 720p or 480p mode, not in 1080p mode.</p> <p>q: 0 = Full frame (works in 1080p, 720p and 480p mode)</p> <p>q: 1 = Crop 1280x720p (works only in 720p)</p> <p>q: 2 = Crop 640x480p (works only in 480p mode when in USB mode)</p> <p>Works with ePTZ Pan and Tilt registers below. First crop to size as listed above, then offset the cropped area across the sensor as per Pan (Horizontal offset) and Tilt (Vertical offset)</p>



Command		Command HEX	Definition
Pan	Disabled		Disabled in 1080 Resolution
	Reset	42 01 08 04 00 00 00 FF	Reset to 0
	Direct	42 01 08 01 0v qr st FF	<p>Called Pan in UVC; Uses sensor windowing to adjust which part of the frame is shown.</p> <p>Limits are:</p> <ul style="list-style-type: none"> <li>• 1080p: Not available, always show full image               <ul style="list-style-type: none"> <li>• 720p, Zoom = 1:                   <ul style="list-style-type: none"> <li>o Max, min X = +/- 320 This is (1920-1280)/2</li> <li>qr st: 00 00 - 01 40</li> <li>v: 1 = negative 0 = positive</li> </ul> </li> <li>• 480p (USB Mode), Zoom = 2:                   <ul style="list-style-type: none"> <li>o Max, min X = +/- 640 This is (1920-640)/2</li> <li>qr st: 00 00 - 02 80</li> <li>v: 1 = negative 0 = positive</li> </ul> </li> </ul> </li> </ul>
Tilt	Disabled		Disabled in 1080 Resolution
	Reset	42 01 09 04 00 00 00 FF	Reset to 0
	Direct	42 01 09 01 0v qr st FF	<p>Called Tilt in UVC; Uses sensor windowing to adjust which part of the frame is shown.</p> <p>Limits are:</p> <ul style="list-style-type: none"> <li>• 1080p: Not available, always show full image               <ul style="list-style-type: none"> <li>• 720p, Zoom = 1:                   <ul style="list-style-type: none"> <li>o Max, min Y = +/- 180 This is (1080-720)/2</li> <li>qr st: 00 00 - 00 B4</li> <li>v: 1 = negative 0 = positive</li> </ul> </li> <li>• 480p (USB Mode), Zoom = 2:                   <ul style="list-style-type: none"> <li>o Max, min Y = +/- 300 This is (1920-480)/2</li> <li>qr st: 00 00 - 01 2C</li> <li>v: 1 = negative 0 = positive</li> </ul> </li> </ul> </li> </ul>
Save Settings	Enable	43 01 03 04 00 00 00 FF	
	Disable	43 01 03 03 00 00 00 FF	



Inquiries:

Command	Inquiry Hex	Reply HEX	Definition
AUX_Light	43 09 01 00 00 00 00 FF	43 09 01 00 00 00 qr FF	% of max,(qr = 00 to 64)
Mirror_H	42 09 04 00 00 00 00 FF	42 09 04 00 00 00 0q FF	q: 0 = No mirroring 1 = Horizontal mirror 2 = Vertical mirror 3 = Horizontal and vertical
Frame_Rate	42 09 0A 00 00 00 00 FF	42 09 0A 00 00 00 qr FF	1 - 30 qr: 01 to 1E in 1080p 1 - 60 qr: 01 to 3C in 720p 1 - 120 qr: 01 to 78 in 480p
EXP_ROI	42 09 11 00 00 00 00 FF	42 09 11 00 00 00 00 FF	Full
	42 09 11 00 00 00 00 FF	42 09 11 00 00 00 01 FF	Middle
	42 09 11 00 00 00 00 FF	42 09 11 00 00 00 02 FF	Center
EXP_ESC	42 09 15 00 00 00 00 FF	42 09 15 00 00 00 00 FF	Auto
	42 09 15 00 00 00 00 FF	42 09 15 00 00 qr st FF	qr st: See Shutter Table
Brightness	42 09 01 00 00 00 00 FF	42 09 01 00 00 00 qr FF	0 to 255 qr: 00 to FF
Contrast	42 09 02 00 00 00 00 FF	42 09 02 00 00 00 qr FF	0 to 63 qr: 00 to 3F
Saturation	42 09 03 00 00 00 00 FF	42 09 03 00 00 00 qr FF	0 to 63 qr: 00 to 3F
Sharpness	42 09 05 00 00 00 00 FF	42 09 05 00 00 00 qr FF	0 to 31 qr: 00 to 1F
WB Mode	42 09 0C 00 00 00 00 FF	42 09 0C 00 00 00 0q FF	q: 0 - auto 1 - manual
WB Value	42 09 0D 00 00 00 00 FF	42 09 0D 00 00 00 qr FF	0 to 255 qr: 00 to ff
Gamma	42 09 06 00 00 00 00 FF	42 09 06 00 00 00 0q FF	0 to 2 q = 0-2





Command	Inquiry Hex	Reply HEX	Definition
Hue	42 09 17 00 00 00 00 FF	42 09 17 00 0v 00 qr FF	neg 180 to 180 v: 0 = Positive, 1 = Negative qr: 00 to B4
Lens_Type	42 09 1B 00 00 00 00 FF	42 09 1B 00 00 00 00 FF	Lens A
		42 09 1B 00 00 00 01 FF	Lens B
		42 09 1B 00 00 00 02 FF	Lens C
		42 09 1B 00 00 00 03 FF	Lens D
		42 09 1B 00 00 00 04 FF	Lens E
		42 09 1B 00 00 00 05 FF	Lens F
		42 09 1B 00 00 00 06 FF	Lens G
		42 09 1B 00 00 00 07 FF	Lens H
Color_Correction	42 09 1A 00 00 00 00 FF	42 09 1A 00 00 00 00 FF	2800K
		42 09 1A 00 00 00 01 FF	4500K
		42 09 1A 00 00 00 02 FF	6500K
Resolution	42 09 0B 00 00 00 00 FF	42 09 0B 00 00 00 00 FF	1080
		42 09 0B 00 00 00 01 FF	720
		42 09 0B 00 00 00 02 FF	480
Zoom	42 09 07 00 00 00 00 FF	42 09 07 00 00 00 0q FF	q : 0 =Off, 1 = On
Pan	42 09 08 00 00 00 00 FF	42 09 08 00 0v qr st FF	720: neg 320 to 320 480: neg 640 to 420 v: 0 = Positive, 1 = Negative, qr st: 720: 00 00 to 01 40 480: 00 00 to 02 80
Tilt	42 09 09 00 00 00 00 FF	42 09 09 00 0v qr st FF	720: neg 180 to 180 480: neg 300 to 300 v: 0 = Positive, 1 = Negative qr st: 720: 00 00 to 00 B4 480: 00 00 to 01 2C



Command	Inquiry Hex	Reply HEX	Definition
Read P Version	43 09 E0 00 00 00 00 FF	43 09 EE 00 00 qr st FF	Returns PIC Version qr st in hex. LCD shows in decimal.
Read E Version	43 09 E1 00 00 00 00 FF	43 09 EE 00 00 qr st FF	Returns EM Version qr st in hex. LCD shows in decimal.

### Weld-i™ HD 625 RS232 Motor/Arc Commands

Command		Command HEX	Definition
Motor Control	off	44 01 01 00 00 00 00 FF	Turns both motors off
	Filter/Iris Motor Control	44 01 01 01 00 00 0q ff	q: 0 = turn filter/iris motor off q: 1 = filter up or Iris close q: 2 = filter down or iris open
	Focus Motor Control	44 01 01 01 00 01 0q ff	q: 0 = turn focus motor off q: 1 = focus far q: 2 = focus near
Arc Settings	Arc_Set_Specific	44 01 02 01 01 qr st ff	Sets the Arc On setting to the Hex value qr st. See table.
	Arc_Set_Current	44 01 02 01 01 00 00 ff	Sets the Arc On Setting to current shutter value
	Arc_Off_Set_Specific	44 01 02 01 02 qr st ff	Sets the Arc Off setting to the Hex value qr st. See table
	Arc_Off_Set_Current	44 01 02 01 02 00 00 ff	Sets the Arc Off setting to current shutter value
	Arc_Off	44 01 02 00 00 00 00 ff	Turns Arc function off
	Arc_On	44 01 02 01 00 00 00 ff	Turn Arc function on
	Arc_Reset	44 01 02 04 00 00 00 ff	Resets Arc shutter value to default Arc shutter value

### How to use a computer to externally send commands.

1. Connect a Dsub9 cable to the RS-232 port on the back of the Weld i unit.
2. Connect cable to computer using an RS-232 COM port.
3. Open a terminal program with following settings. (See example HyperTerminal instructions below)
  - a. 9600 Baud Rate
  - b. 8 byte packet size
  - c. No parity
  - d. 1 stop bit
  - e. No handshaking
  - f. Set to the COM port the Weld I unit is connected to.
4. Input the desired command bytes from the table.
5. Byte 1 of the response will tell you if the command was successful or not.

- a. 50 means command executed properly
- b. 60 means command did not execute. Check the command you sent for errors.

### Changing Arc-on and Arc-Off settings.

To change the Arc-on and Arc-off shutter values follow the steps above using the proper command for which function you want to change. The shutter table can be used a reference, but you can set the functions to a value not on the table. For example, here is how to set the Arc-On value to shutter value 1/2500:

1. Follow the above to step 4.
2. The command to set a specific shutter value to Arc-On is 44 01 02 01 01 qr st ff.
3. Since we want a value of 2500, we first convert that to a hex number and receive 09 C4
4. We replace qr and st in the command to 09 C4 respectively.
5. Pressing the Arc-On key should now change the shutter to value 1/2500 even through power cycles until this process is repeated with a different shutter value.

### Hyper-Terminal Instructions:

1. Connect USB to COM Port adapter like EM61715.



Figure 17 USB to Serial Adapter

2. Open a session of Device Manager to determine/set COM Port

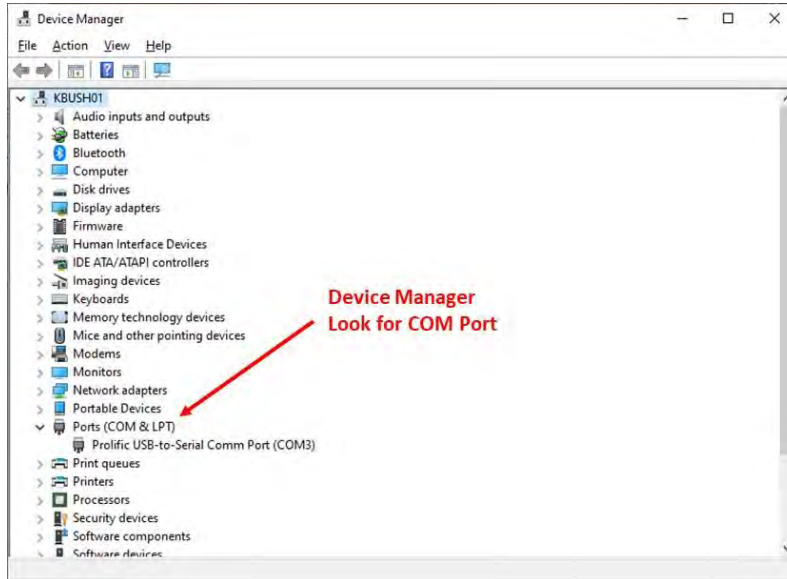


Figure 18 PC COM Port Number

3. Open a Hyperterminal program. This example is using: Terminal program: Terminal v1.9b by Br@y++. Download a copy here:  
<https://www.narom.no/undervisningsressurser/the-cansat-book/the-primary-mission/using-the-radio/terminal-program/>
4. Set the COM port based on step 2 & the baud rate etc. based on settings outlined in "How to use a computer to externally send commands" above.

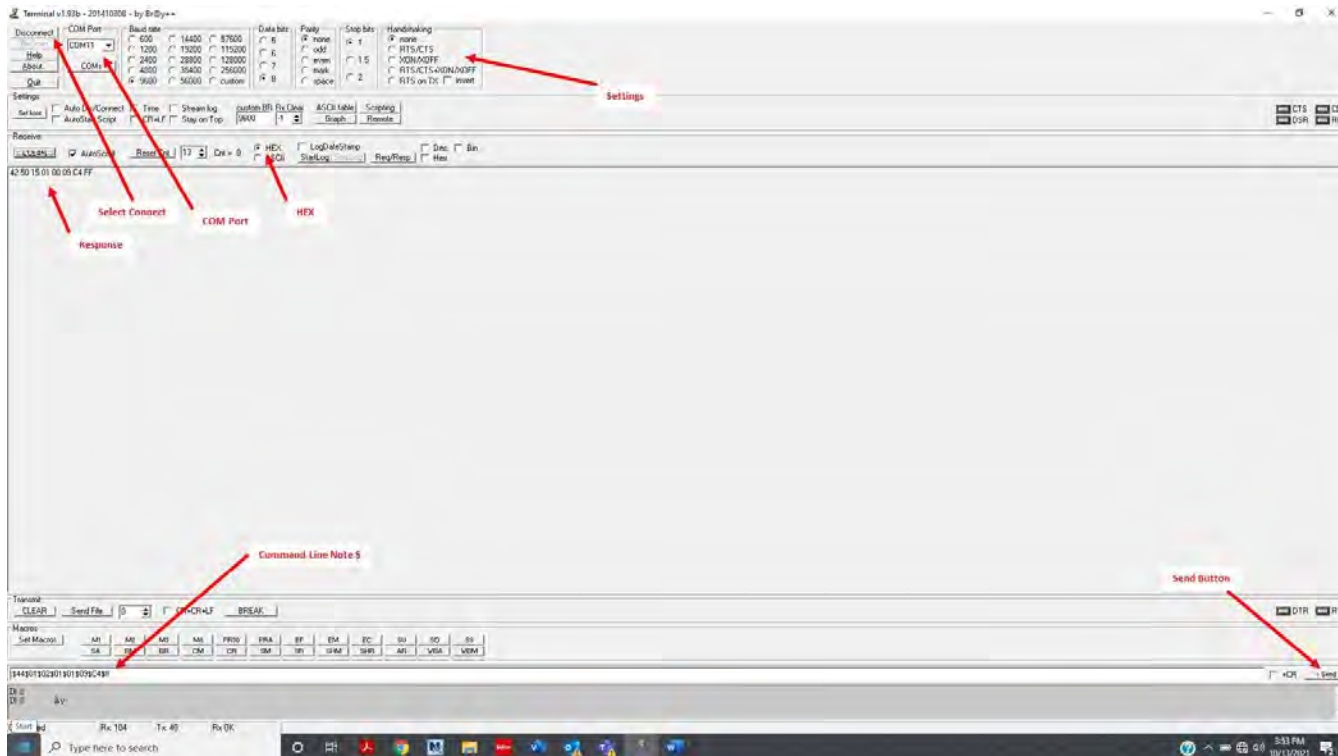


Figure 19 HyperTerminal Screen

5. If using the command line. A \$ must be used before each character. In this example \$44\$\$01\$02\$01\$01\$09\$C4\$ff.



## 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 (Low Speed)</b>	1080/30P	720/60P	VGA/120
<b>Output Format (High Speed)</b>	1080/60P	720/90P	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>Temperture</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>	0-12VDC @ 0.5A	Variable

### Controller & Camera Mechanical Specifications

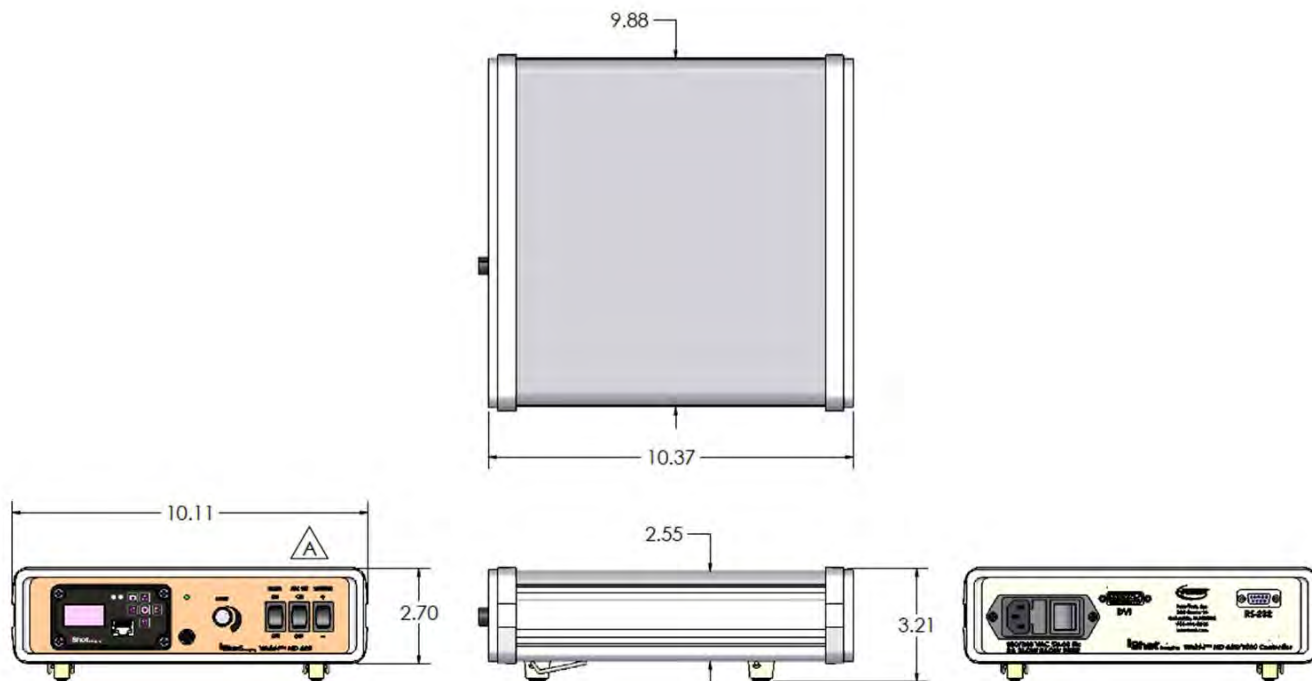


Figure 20 CCU Dimensions

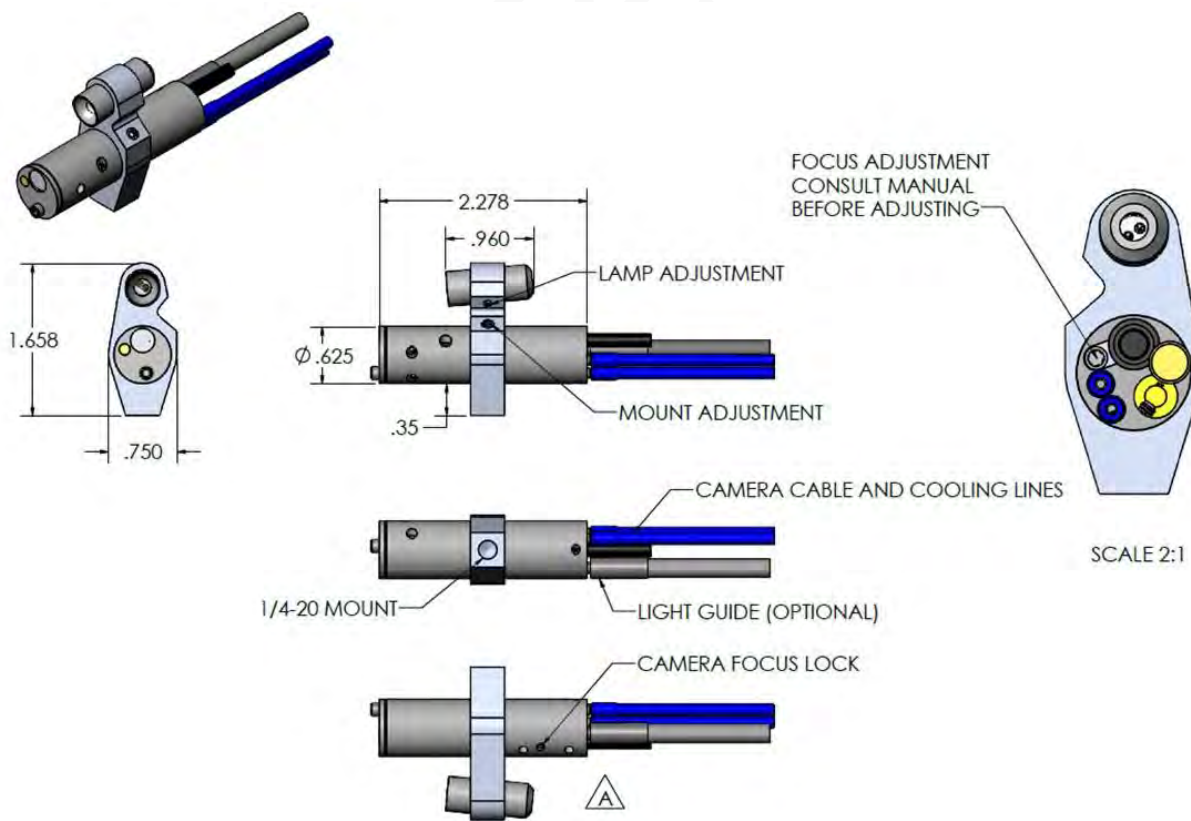


Figure 21 Camera Dimensions



### 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			







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 Control Unit Connections & Controls Front .....	12
Figure 2 Power Connections Rear CCU, ON/OFF .....	12
Figure 3 Exterior Camera Auxiliary Light Control .....	13
Figure 4 Labeled Front of Camera CCU. ....	13
Figure 5 Front of Control Unit Weld-I 625HD Functions .....	14
Figure 6 Weld-i™ 625 HD Connections .....	15
Figure 7 Connected System .....	15
Figure 8 HD CCU Menu Tree .....	17
Figure 9 Focus Adjustment. ....	23
Figure 10 Weld-i™ HD 625 Light Control.....	24
Figure 11 Weld-i™ HD 625 Light Control.....	24
Figure 12 Filter On/Off .....	25
Figure 13 Shutter Control .....	25
Figure 14 Shutter Table.....	26
Figure 14 Arc On/Off.....	26
Figure 16 ARC On/Off .....	26
Figure 17 USB to Serial Adapter .....	35
Figure 18 PC COM Port Number .....	36
Figure 19 HyperTerminal Screen.....	37
Figure 20 CCU Dimensions .....	39
Figure 21 Camera Dimensions .....	39
Figure 21 Connector Styles / Types .....	46

## 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.



For Service of this product:

InterTest, Inc.

303 State Route 94

Columbia, NJ 07832

1-800-535-3626

+1 908 496 8008

Email: [service@intertest.com](mailto:service@intertest.com)

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



### Parts and Accessories

(See Figure 22 Connector Styles / Types)

Intertest PN	Description
	<b>QNHD Weld-I 625</b>
EM16937	DVI (M) to HDMI (F) Type A Adapter
EM17427	Weld-i 625 HD Camera Head, 7.1mm Lens (Harting Style)
EM17428	Weld-i 625 HD Camera Head, 15mm Lens (Harting Style)
EM16595	Weld-i 625 HD Control Unit
EM17651	Weld-i 625 HD Camera PFA Cable 3M (Harting Style)
EM17652	Weld-i 625 HD Camera PFA Cable 5M (Harting Style)
EM17653	Weld-i 625 HD Camera PFA Cable 10M (Harting Style)
EM17654	Weld-i 625 HD Camera PFA Cable 15M (Harting Style)
EM119606	WELD-I-625 WINDOW SHIELD SAPPHIRE .280"
EM163512	SPATTER SHIELD RETAINER, WELD-I 625 HD
EM119625	FRONT CAP, WELD-I 625 HD
EM10939	LAMP FOR 6W ARGON AUXILIARY LIGHT
EMEM17472	iShot Weld-i 625 HD 3.1M Light Guide
EM17473	iShot Weld-i 625 HD 5.1M Light Guide
EM17474	iShot Weld-i 625 HD 10.1M Light Guide
EM17475	iShot Weld-i 625 HD 15.1M Light Guide
EM61654	HT SILICONE RUBBER TUBING 1/16" ID 1/8" (By the foot)
EM1119612	WELD-I-625 MOUNT BRACKET(Non LED)
EM65028	ALLEN KEY LONG 5/64"
EM65025	ALLEN KEY LONG .035"
EM13169	Weld-i 625 HD Cam Head, 7.1mm Lens, ODU
EM13171	Weld-i 625 HD Camera PFA Cable 3M, ODU
EM13172	Weld-i 625 HD Camera PFA Cable 5M, ODU
EM13173	Weld-i 625 HD Camera PFA Cable 10M, ODU
EM13174	Weld-i 625 HD Camera PFA Cable 15M, ODU



Figure 22 Connector Styles / Types

### 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 232 allow expanded use. Caution: users at this level are beyond warranty coverage. Contact InterTest tech support, [service@intertest.com](mailto:service@intertest.com), for further details.

### Dip Switch Settings

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

Number	On	Off	FirstVersion	
Firmware version: 1.06				
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	<b>Image Quality</b>	Image quality related	0
3	<b>Capture Setup</b>	Image capture related: FPS, Exposure, Mirroring	0
4	<b>Utility Menu</b>	LED Level, Diagnostics, Save Preset, Load Preset	0
5	<b>Pan-Tilt-Zoom</b>	Resolution, Zoom, Pan, Tilt	0
6			
7	<b>Reset to defaults</b>		0
	<b>Bold-Italics means item is a submenu</b>		
	Control ID provided for commands that go to the ISP		

### 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	<b>More ...</b>		More adjustments in this submenu		0
7	Return to Main		Return to Main menu		0
	<b>Bold-Italics means item is a submenu</b>				
	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
	<b>Bold-Italics means item is a submenu</b>				
	Control ID provided for commands that go to the ISP				



### 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
<b><i>Bold-Italics means item is a submenu</i></b>						
Control ID provided for commands that go to the ISP						
First version is the first version that that particular line's description is valid for						

### 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	<b><i>Diagnostics</i></b>	N/A	I2C Test, Lock Status, PCB Temp		0
4	<b><i>Save Preset</i></b>	N/A	4 user presets		0
5	<b><i>Load Preset</i></b>	N/A	4 user presets		0
6	<b><i>Lens Correction</i></b>	N/A	<b>New in 0.56, replaces Serial Number</b>		<b>0.56</b>
7	Return to Main				0
<b><i>Bold-Italics means item is a submenu</i></b>					
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
<b><i>Bold-Italics means item is a submenu</i></b>				
Control ID provided for commands that go to the ISP				





### Load Preset

Line	Text	Control ID	Notes	FirstVersion
0	<b>** Intertest QN HD **</b>			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
	<b><i>Bold-Italics means item is a submenu</i></b>			
	Control ID provided for commands that go to the ISP			

### Diagnostics

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



### 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
<b><i>Bold-Italics means item is a submenu</i></b>					
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
<b><i>Bold-Italics means item is a submenu</i></b>				
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
	<b><i>Bold-Italics means item is a submenu</i></b>				
	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
- 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:

A series of horizontal lines for taking notes, spanning most of the page width. A large, light gray watermark reading "InterTest Inc." is diagonally overlaid across the center of the page.



NOTES cont...

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