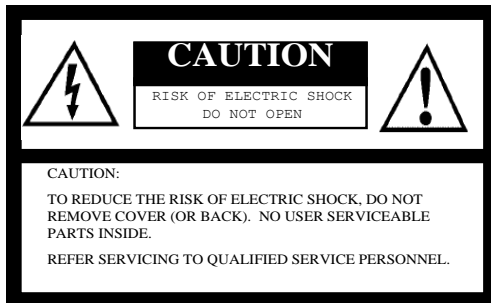




STC-AF133 Series Control Software Manual

**1.3 Mega Pixels
16:9 Format Auto Focus Camera**

Safety Precautions



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

For U.S.A

Warning:

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the instruction manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

For Canada

Warning:

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Product Precautions

- Handle the camera with care. Do not abuse the camera. Avoid striking or shaking it. Improper handling or storage could damage the camera.
- Do not pull or damage the camera cable.
- During camera use, do not wrap the unit in any material. This will cause the internal temperature of the unit to increase.
- Do not expose the camera to moisture, or do not try to operate it in wet areas.
- Do not operate the camera beyond its temperature, humidity and power source ratings.
- While the camera is not being used, keep the lens or lens cap on the camera to prevent dust or contamination from getting in the CCD or filter area and scratching or damaging this area.
- Do not keep the camera under the following conditions:
 - In wet, moist, and high humidity areas
 - Under hot direct sunlight
 - In high temperature areas
 - Near an object that releases a strong magnetic or electric field
 - Areas with strong vibrations
- Use a soft cloth to clean the camera. Use pressured air spray to clean the surface of the glass. DO not scratch the surface of the glass.

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I. Software Installation

A. System Requirements

1. Operating System: Windows 2000, XP (x86/x64), Vista (x86/x64), Windows 7 (x86/x64)
The software can operate with either 32bit (x86) or 64bit (x64) systems.
2. The .Net Framework 2.0 runtime is needed for installing AF133Ctrl software.
Prior to installing the AF133Ctrl software the .Net Framework 2.0 runtime must be installed.

If the .Net Framework 2.0 runtime is not installed prior to the software installation, the following window will appear and the installation process will be cancelled (Figure 1).

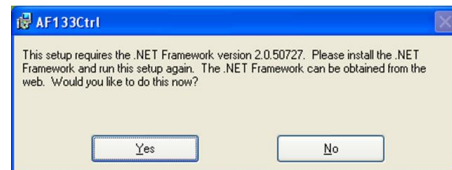


Figure 1

The .Net Framework 2.0 runtime can be downloaded from the following link. This is installed in advanced for Vista systems [Microsoft .NET Framework 2.0 Service Pack2]

<http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=5b2c0358-915b-4eb5-9b1d-10e506da9d0f>

B. Software Installation

1. Double-click the "Setup.msi" from the AF133Ctrl folder to install software, then select the "Next" button (Figure 2).

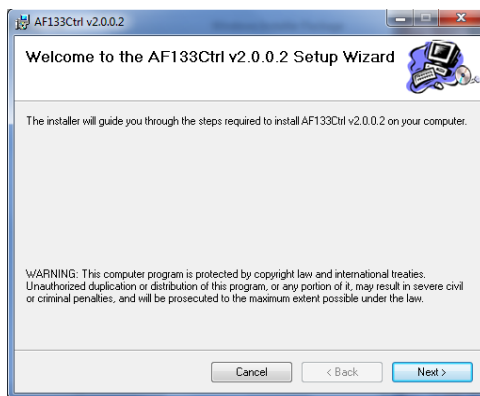


Figure 2

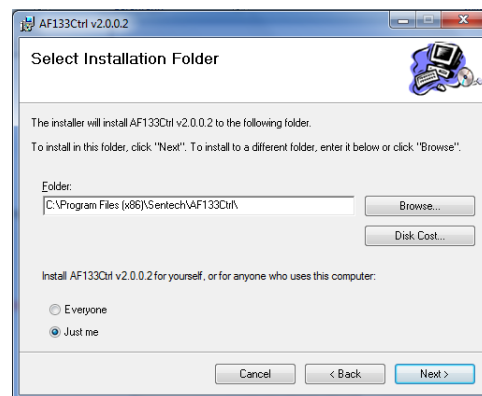


Figure 3

2. If necessary, change the installation folder. Then select the "Next" button (Figure 3).
3. Select the "Next" button. *To confirm and proceed with installation select "next" (Figure 4).

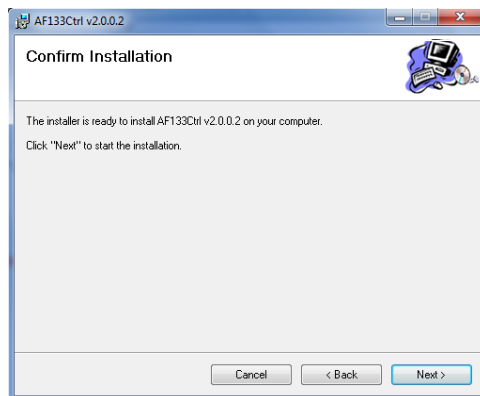


Figure 4

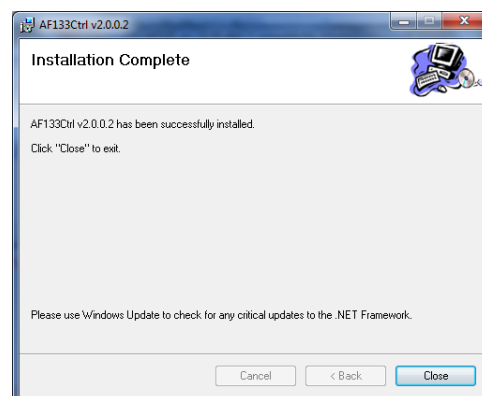


Figure 5

4. Complete the software installation by selecting the "Close" button (Figure 5).

C. Hardware Settings

1. Video Cable (Figure 6)

The video output cable is Mini HDMI (camera)-HDMI (monitor) or Mini HDMI (camera) –DVI (monitor) to display the video.

2. Power Cable Connector (Figure 7)

The *power input* cable connects to the 'B' connector of the STC-AF133 camera as indicated below:

Connector Model Number of the camera: S2B-ZR-SM4A (Manufactured by JST)

Suggested Mating Connector Model Number: ZHR-02 (Manufactured by JST)

3. Software Communication Cable Connector (Figure 7)

The *communication* cable connects to the 'C' connector of the STC-AF133 camera as indicated below:

Connector Model Number of the Camera: S4B-ZR-SM4A (Manufactured by JST)

Suggested Mating Connector Model Number: ZHR-04 (Manufactured by JST)

4. Hardware Communication Cable Connector (Figure 7)

The *external hardware* cable connects to the 'D' connector of the STC-AF133 camera as indicated below:

Connector Model Number of the Camera: SM06B-SRSS (Manufactured by JST)

Suggested Mating Connector Model Number: SHR-06 (Manufactured by JST)

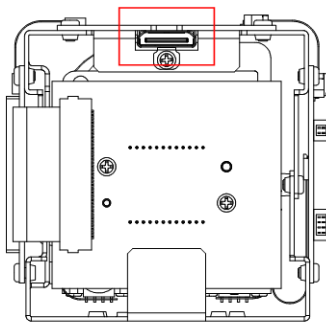


Figure 6

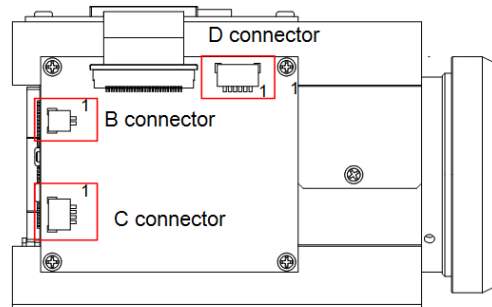


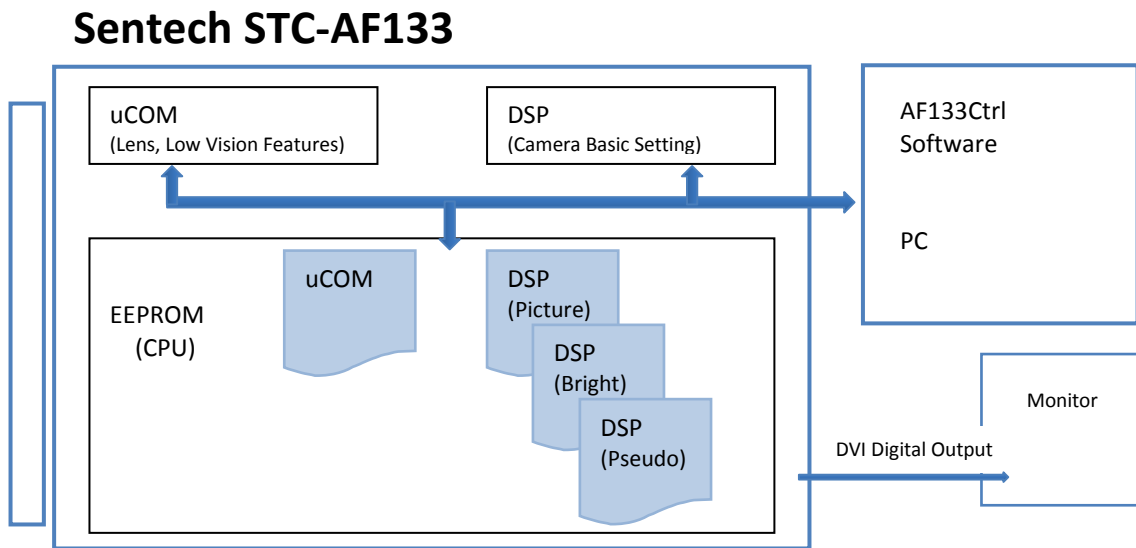
Figure 7

Please refer to the specification manual for the STC-AF133 for the connector pin assignment.

II. General Operation of the AF133Ctrl Software

A. Important Operating Principles to Successfully Use the Software and Avoid Problems

- **NOTE:** This software has very strong features that are important to understand in order to successfully utilize the capabilities of this program.
 - This camera has a uCOM processor, DSP device and EEPROM device on board. This combination of devices provides exceptional power and control over the camera when used properly with the Sentech software (See Diagram 1).
1. Users should store a copy of the camera’s default settings first. Do this for the “uCOM” and each “DSP picture mode” (See Section “E” on page 11).
 2. Select the “Read All” button in order to retrieve all stored EEPROM settings after connecting to the camera. Select “EEPROM→DSP” or “EEPROM→uCOM” to individually retrieve either the EEPROM’s “DSP” or “uCOM’s” settings.
 3. To upload saved EEPROM files from disk, you must select the “OPEN DSP’s EEPROM” or “OPEN uCOM’s EEPROM.”
 4. The user can store 3 unique DSP picture modes (Picture Mode, Bright Mode and Pseudo Mode), as well as 1 universal uCOM configuration, on the EEPROM of the camera.
 5. If you desire to retain any adjustment of the “uCOM” or “DSP” you must execute the “uCOM→EEPROM” and/or “DSP→EEPROM” (See Section “C” on page 10).



3 Picture Modes

- Picture Mode ← Picture DSP + uCOM
- Bright Mode ← Bright DSP + uCOM
- Pseudo Mode ← Pseudo DSP + uCOM

Diagram 1

B. Changing the Camera Setting

1. Execute the AF133Ctrl software.
2. The following UART communication window opens when “COMM” menu then “Port Setting” is selected (Figure 9).

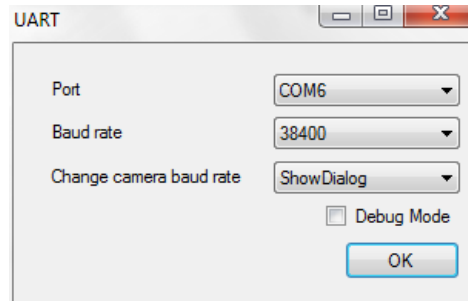


Figure 9

3. Select the port number.

- **NOTES:**

To determine the correct port number, users may need to open their computers 'Device Manager' and open the 'Ports' section. Identify the 'Sentech USB Serial Port' (Figure 10: COM6).



Figure 10

Once identified, set the appropriate port value in the 'UART' dialog box (Figure 9).

4. The BPS (Baud Rate) automatically adjusts to fastest available baud rate.
5. Select the “OK” button to close the UART window.
6. To retrieve the camera’s current setting select the “Read All” button in the lower-left corner of the screen.
7. To change camera settings select the pre-set value buttons, use the slide bars, or enter the values directly. Please Note: Hit your “Enter” key after inputting new values in fields to maintain changes (Figure 9).

C. Saving Settings to the EEPROM

When the settings are saved to the EEPROM, the camera will maintain its settings even after it is powered off.

- **NOTE:** It is highly suggested that the operator save the camera’s default EEPROM settings onto computer’s hard drive for future reference.
- **NOTE:** This camera provides three different color modes (Picture, Bright, or Pseudo color). When you save DSP parameters, you must save each color mode parameter set individually. Conversely, there is only one parameter setting for uCOM. Therefore, only one uCOM profile set is required to be saved.

1. Select the color mode you want to adjust then change any value you wish.
2. After manipulating the settings, select the “DSP->EEPROM” button in the lower left corner of the screen to save the DSP settings of the current color mode to the EEPROM. The “Compare” dialog box below appears (Figure 11). This shows all parameters which have been changed from the EEPROM data. Remove check mark if you do not want to update then click “OK”. By doing this you can save all parameters with check mark.
3. Select the “uCOM->EEPROM” button in lower left corner of the screen to save the microprocessor settings to the EEPROM. As described previously, the “Compare” dialog box below appears (Figure 11). This shows all parameters which have been changed from the EEPROM data. Remove check mark if you do not want to update then click “OK”. By doing this you can save all parameters with check mark.
4. Now, if you like to change to a different picture mode, go to “uCom Picture Mode” tab and select a desired “Picture Mode.” The dialog box below will appear after changing the “Picture Mode.” Please click “OK” to confirm the change. This is a courtesy reminder that the “Picture Mode” has just changed.

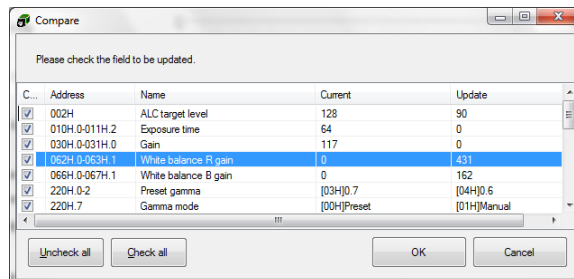


Figure 11

D. Loading Settings from the EEPROM to the Camera

The settings will load from the EEPROM to the camera, and then the camera will go back to the EEPROM default settings.

1. Select “EEPROM->DSP” button in lower left corner of the screen to load the previously saved DSP settings of the current color mode from the EEPROM.

Select “EEPROM->uCOM” button in lower left corner of the screen to load the previously saved microprocessor settings from the EEPROM.

2. Verify the settings to load in the following window (Figure 13):

Uncheck the settings that are not to be loaded from the EEPROM.

Then select the “OK” button to load settings from the EEPROM.

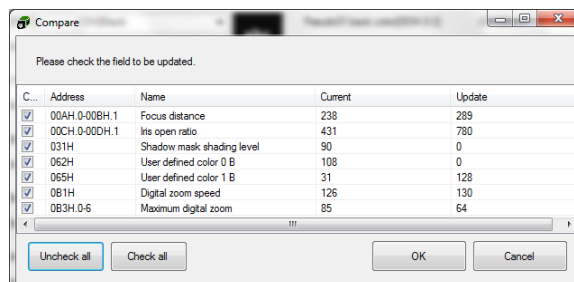


Figure 12

E. Creating an EEPROM Settings File

1. Select “Save As [DSP’s EEPROM]” under the “File” menu to save the DSP settings of the current color mode to a file. Enter the file name then select the “OK” button to create the file.
2. Select “Save As [uCOM’s EEPROM]” under “File” in the menu to save the microprocessor settings to a file. Enter the file name then select the “OK” button to create the file.
 - **NOTE:** If you have adjusted both a “DSP” and a “uCOM” value and want to retain and reload these values, you must save both a “DSP” and a “uCOM” profile.

F. Loading an EEPROM Settings File

1. Select “Open [DSP’s EEPROM]” under the “File” menu to load the DSP settings of current color mode from file to the EEPROM.
2. Select “Open [uCOM’s EEPROM]” under “File” in menu to load the microprocessor settings from file to the “EEPROM.”
 - **NOTE:** If you intend to use previously saved “DSP” and “uCOM” data, then you must load both settings files individually.
3. Select the file you wish to load and then select the “OK” button to load the file.
4. Verify the load settings in the following window (Figure 13):

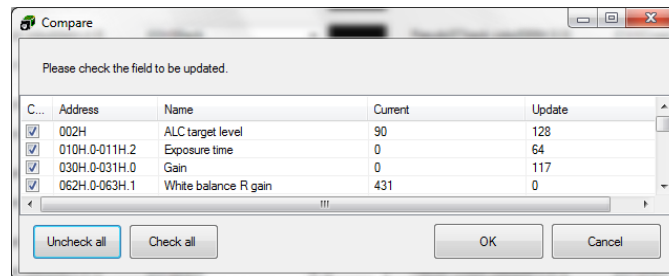


Figure 13

Uncheck the settings that are not to be loaded from the file to the EEPROM.
Then select the “OK” button to load the remaining (checked) settings from the file to the EEPROM.

G. Debug Mode

The command details between the camera and the PC can be verified with separate software (Debug View) by selecting “Debug Mode” in the menu. The separate Debug View software can be downloaded from the following link:

<http://technet.microsoft.com/en-us/sysinternals/bb896647.aspx>

1. Execute the AF133Ctrl software.
2. The following UART dialog window will open by selecting “Port Setting” under “Comm” in menu (Figure 14).

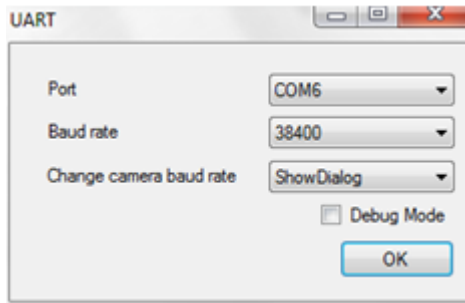


Figure 14

3. Select the “Debug Mode” checkbox and then select “OK” to close the UART communication window.
4. Execute the Debug View software.
5. The commands between the camera and the PC displays in debug view.

Command Display	Command Descriptions
Debug:\\.\COM2	COM2 was opened
Set 38400 bps	The baud rate of the PC is set to 38,400 bps
SND: XX, XX, XX	The PC sent the data XX, XX, XX (Hex) to the camera
RCV: XX, XX, XX	The PC received the data XX, XX, XX (Hex) from the camera
Close	The serial port was closed

- **NOTE:** In the Debug View, the read command of 000H address for the uCOM may display multiple times, this is caused by the baud rate adjusting between the PC and the camera.

III. How to USE Software

- **SOFTWARE FUNCTION NOTE:** All functionality with ‘Pre-set Value Buttons’, ‘Scroll Bars’, ‘Input Values’, ‘Drop Down List’ and ‘Check Boxes’ are consistent throughout the software. Once defined, they will operate within a consistent nomenclature.

A. Zoom, Focus, and Iris Control – uCOM: Standard tab

1. Master Zoom Control (3 options)

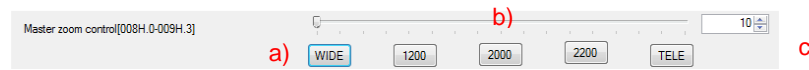


Figure 15

a) Pre-set Zoom Position Buttons

The optical zoom position can be selected with the following buttons:

WIDE: Zoom to “WIDE” position as position of “Optical zoom WIDE-end limiter”

1200:

2000:

2200:

TELE: Zoom to “TELE” position as position of “Optical zoom TELEPHOTO-end limiter”

NOTES:

- The full range of the optical zoom positions is from 10 to 2530.
- The optical zoom position can be changed to WIDE or TELE with the “1200”, “2000” or “2200” button if the zoom position value is out of the zoom position range. The zoom position range can be set with “Optical zoom WIDE-end limiter” and “Optical zoom TELEPHOTO-end limiter”.
- The optical zoom position does not change when the “1200”, “2000” or “2200” buttons are select if the zoom position value is out of the zoom position range. The zoom position range can be set with “Optical zoom WIDE-end limiter” and “Optical zoom TELEPHOTO-end limiter”.

b) Scroll Bar (2 ways to operate)

The optical zoom position can be changed by dragging and dropping the scroll bar cursor of the “Master zoom control”.

- **NOTE:** The optical zoom position does not change when the cursor is dropped in a position that is out of the zoom position range. The zoom position range can be set with “Optical zoom WIDE-end limiter” and “Optical zoom TELEPHOTO-end limiter”.

The optical zoom position can be changed by clicking a point on the scroll bar. The zoom position will change from WIDE to TELE (or from TELE to WIDE) with 10 clicks when the full optical zoom range is from 10 to 2530.

- **NOTE:** The optical zoom position is not changed when an area of the scroll bar that is out of the zoom position range is clicked. The zoom position range can be set with “Optical zoom WIDE-end limiter” and “Optical zoom TELEPHOTO-end limiter”.

c) Entering a Value

The optical zoom position can be changed by entering a value in the field adjacent to the scroll bar.

- **NOTE:** The optical zoom position does not change when the entered value is out of the zoom position range. The zoom position range can be set with “Optical zoom WIDE-end limiter” and “Optical zoom TELEPHOTO-end limiter”.

2. Zoom Settings

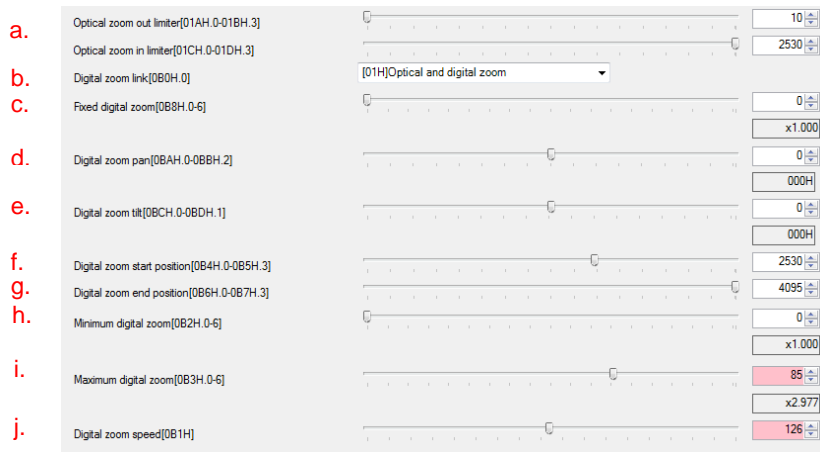


Figure 16

a) Optical Zoom Range

Set the optical zoom range with “Optical zoom out limiter” & “Optical zoom in limiter”. The full optical zoom range is covered when the values are set as the following:

Optical zoom out limiter: 10
Optical zoom in limiter: 2530

b) Digital Zoom Link

When choosing the type of zoom control, users have a choice of using optical zoom independently or combining the optical zoom with digital zoom.

Optical and Digital Zoom: Uses both optical and digital zoom.

Optical Zoom Only: Only uses optical zoom.

In this mode, the “Fixed digital zoom” can be used as the manual digital zoom.

Master Zoom control will not allow for Digital Zooming in this mode.

c) Fixed Digital Zoom: Gives the user *manual control* of the Digital Zoom.

d) Digital Zoom Pan: Allows the user to *pan the image from left to right* when Digital Zoom is active.

e) Digital Zoom Tilt: Allows the user to *tilt the image from top to bottom* when Digital Zoom is active.

f) Digital Zoom Start Position:

This allows the user to determine the *start position* of the Digital Zoom when “Optical and digital zoom” is selected under the “Digital Zoom Link”.

g) Digital Zoom End Position:

This allows the user to determine the *end position* of the Digital Zoom; when “Optical and digital zoom” is selected under the “Digital Zoom Link”.

h) Minimum Digital Zoom:

This allows the user to define the level of digital magnification for the “Digital zoom *start position*”.

i) Maximum Digital Zoom: This allows the user to define the level of digital magnification for the “Digital zoom *end position*”.

j) Digital Zoom speed: This allows the user to determine the speed at which the digital zoom operates.

3. Focus Settings

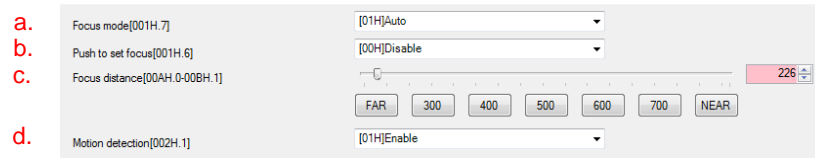


Figure 17

a) Focus Mode (2 options)

Auto Focus: In this mode, the camera will automatically adjust the focus. Select “Auto” in the “Auto Focus” drop down selection.

Manual Focus: The camera works with the manual focus when “Manual” is selected at “Focus mode”. In this mode, the focus position can be adjusted with the “Focus Distance” slide bar (Figure 17.c).

b) Push to Set Focus Control (2 options)

- **NOTE:** The focus mode has to be set to “Manual” before this function can be used as “Enabled”.

Disable: When “Disable” is selected, Push to Set Focus is inactive.

Enable: When “Enable” is selected, the camera will focus on the current target.

c) Focus Distance

This function gives the user the ability to change the focus distance when the camera is set “Manual” under Focus mode. There are 4 ways to adjust the focus distance.

- Slide Bar: The manual focus position can be changed by dragging the slide bar cursor.
- Clicking the Slide Bar: The manual focus position can be changed by clicking any point on the slide bar.
- Entered Value: The manual focus position can be changed by entering a value in the adjacent field.

- **NOTE:** The focus position does not change when the focus position value entered is out of the focus position range. The full range of the focus position is from 202 to 824.

iv. Focus Position preset Buttons

The manual focus position can be selected with the following 7 preset buttons:

- FAR: Focus to FAR (202)
- 300:
- 400:
- 500:
- 600:
- 700:
- NEAR: Focus to NEAR (824)

d) Motion Detection

- **NOTE:** “Auto” must be selected under the Focus Mode drop down menu.

Disable: When “Disable” is selected the Motion Detection algorithm is not active. In this mode, the camera will refocus when the object is moved.

Enable: When “Enable” is selected the Motion Detection algorithm is active. In this mode, the camera does not refocus while the object is moving. Instead, the camera will refocus when the object is still.

4. Iris Settings

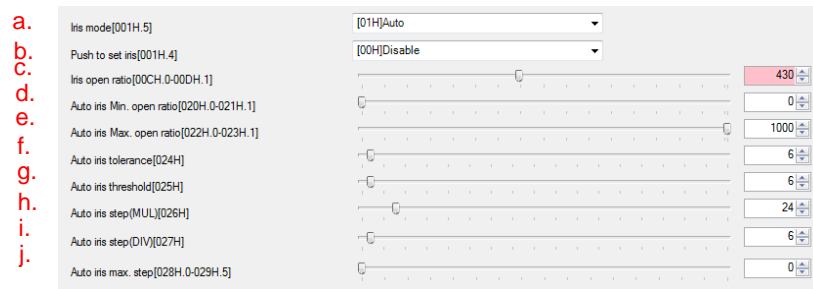


Figure 18

a) Iris Mode (2 options)

Manual: The iris opening ratio can be manually controlled and adjusted automatically when “Manual” is selected in “Iris mode”.

Auto: The iris opening ratio will automatically adjust when “Auto” is selected in “Iris mode.”

b) Push to set iris (2 options): This function allows the user to set a target iris opening ratio.

Disable: The camera works with the manual iris control when “Disable” is selected at “Push to set iris” function.

Enable: The camera adjusts the iris opening ratio once automatically when “Enable” is selected at “Push to set iris” function.

The auto iris opening ratio range can be set with “Auto iris Min. open ratio” and “Auto iris Max. open ratio”.

c) Iris open ratio

- **NOTE:** For “Iris open ratio” to function, the “Iris mode” must be set to “Manual”.

This allows the user to specify the position of the iris opening. The manual iris opening ratio range is from 0 (iris is completely closed) to 1000 (iris is completely open).

d) Auto iris Min. open ratio: This allows the user to set a minimum iris position when “Iris mode” is set to “Auto”.

e) Auto iris Max. open ratio: This allows the user to set a maximum iris position when “Iris mode” is set to “Auto”.

f) Auto iris tolerance: This allows the user to set a tolerance for the deviation from the target iris opening ratio.

The iris adjustment (open and close) stops when the difference of the target brightness and current brightness is less than this tolerance. The auto iris tolerance range is from 0 (All ways auto iris control) to 255 (No auto iris control).

g) Auto iris threshold: This allows users to set a threshold value at which the camera must adjust the iris opening ratio.

The iris adjustment (open and close) starts when the difference of the target brightness and current brightness is larger than the summation of the tolerance and this threshold. The auto iris threshold range is from 0 to 255.

h) Auto iris step (MUL): Set the value of the multiplier used to determine the speed at which the mechanical iris changes.

i) Auto iris step (DIV): Set the value of the divisor used to determine the speed at which the mechanical iris changes.

j) Auto iris max. step: Set the maximum value for the incremental step or change of the iris.

B. Push Button Control - “uCOM: Push Button” tab

- **NOTE:** The “uCOM Push Button” tab gives the user the ability to control the camera via an external hardware device. For connector information please refer to page 8 (Figure 7 ‘D’ connector). There are 9 assignable signals for the push buttons.

1. Push Button Settings: Select enable to activate “Push Button” functionality (Figure 19).

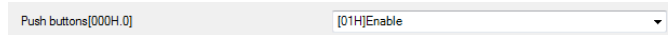


Figure 19

2. Push Button Initial Functions Settings: Set the initial operation mode for the push buttons and external push buttons.

The following are the selectable operation modes for the camera’s external push buttons (Figure 20):

Disabled	Zoom (TELE)	Zoom (WIDE)
Display Menu	Focus (FAR)	Push to set focus
Focus (NEAR)	AF ON	Push to set iris
AF OFF	Auto Iris ON	Iris (OPEN)
Auto Iris OFF	Picture Mode (+)	Picture Mode (-)
Iris (CLOSE)	Contrast (-)	Shadow mask shading level (+)
Contrast (+)	Shadow mask Top (+)	Shadow mask Top (-)
Shadow mask shading level (-)	Shadow mask Bottom (-)	Shadow mask Top/Bottom (+)
Shadow mask Bottom (+)	Shadow mask Left (+)	Shadow mask Left (-)
Shadow mask Top/Bottom (-)	Shadow mask Right (-)	H Line Marker Color (+)
Shadow mask Right (+)	H Line Marker Color Size (+)	H Line Marker Color Size (-)
H Line Marker Color (-)	H Line Marker Position (-)	V Line Marker Color (+)
H Line Marker Position (+)	V Line Marker Color Size (+)	V Line Marker Color Size (-)
V Line Marker Color (-)	V Line Marker Position (-)	Flip OFF
V Line Marker Position (+)	Vertical flip	Horizontal and Vertical Flip
Horizontal flip	Still image ON	IRC Filter OFF
Still image OFF	AWB OFF	AWB ON
IRC Filter ON	AF OFF/ON	Auto iris OFF/ON
Push to set WB	Flip OFF/Vertical flip	Flip OFF/Horizontal and Vertical Flip
Flip OFF/Horizontal flip	H Flip / H and V Flip	Vertical Flip/Horizontal and Vertical Flip
Horizontal Flip/Vertical Flip	IRC Filter ON/OFF	AWB OFF/ON
Still image OFF/ON		

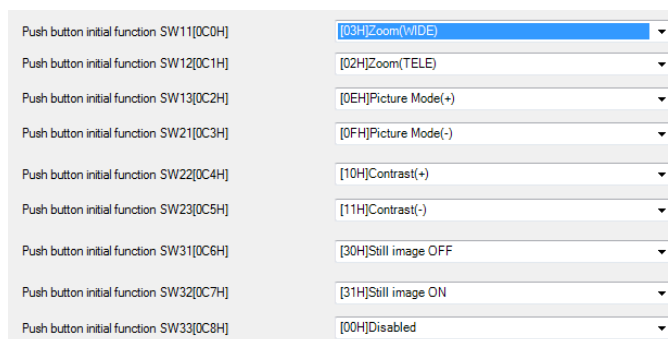


Figure 20

3. Push Button Polarity Settings: Choose the type of the individual push button functions.
 - a) Normal: The camera default setting. This is a momentary switch function.
 - b) Invert: This is a reverse or alternate switch function.

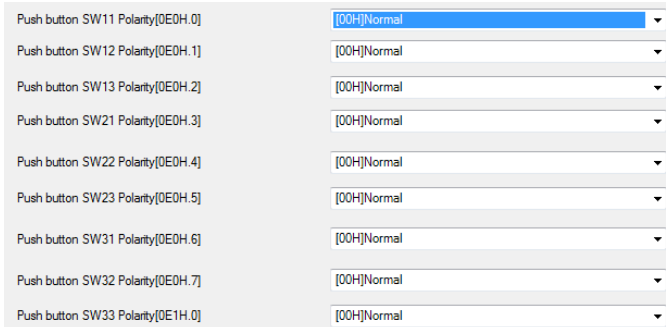


Figure 21

4. Number of Picture Mode Settings: Allows user to set the minimum and maximum *picture modes* for push buttons.

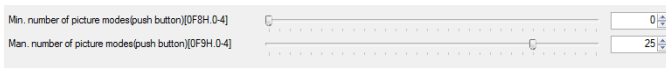


Figure 22

5. Contrast Limiter Settings: Allows user to set the minimum and maximum *position of contrast* for push buttons.

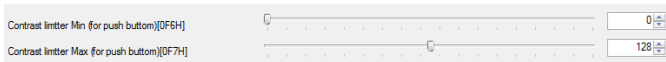


Figure 23

6. Shadow Mask Settings: Allows user to set the minimum and maximum *shadow masking* for push buttons.

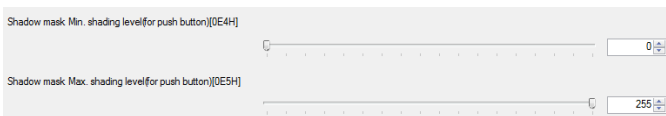


Figure 24

7. Marker Horizontal Position Settings: Allows user to set the minimum and maximum *marker horizontal position* for push buttons.

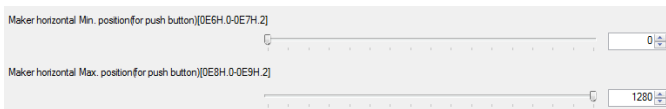


Figure 25

8. Marker Horizontal Size Settings: Allows user to set the minimum and maximum *marker horizontal size* for push buttons.

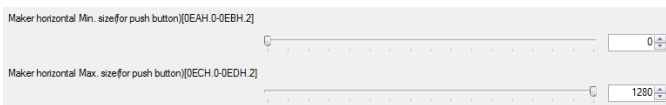


Figure 26

9. Marker Vertical Position Settings: Allows user to set the minimum and maximum *marker vertical position* for push buttons.

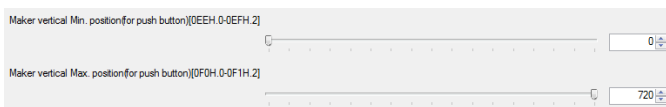


Figure 27

10. Marker Vertical Size Settings: Allows user to set the minimum and maximum *marker vertical size* for push buttons.

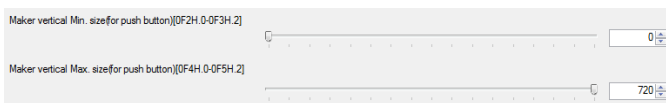


Figure 28

C. Picture Mode Control - “uCOM: Picture Mode” tab

- **NOTE:** There are 2 preset picture modes and 30 available pseudo modes. The pseudo modes are numbered 00 through 29.

1. Picture Mode Setting (Figure 29)

1. Picture: A normal picture image is output from the camera when “Picture” is selected at “Picture mode”.
2. Bright: The camera outputs an image with a high level of brightness when “Bright” is selected at “Picture mode”.
3. Pseudo: The pseudo mode image is output from the camera when “Pseudo (xx)” is selected at “Picture mode”.

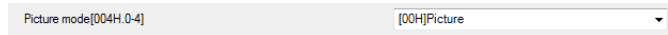


Figure 29

2. Pseudo Mode Color Combination Settings (Figure 30)

The user can define each of the individual pseudo colors. The text and background of the current pseudo colors are interchangeable (see section E for user defined colors).

3. Pseudo Threshold and Slope Settings (Figure 31)

- **NOTES:** These settings will affect all of the pseudo modes.
 - a) Pseudo color threshold setting
Set the threshold of the brightness for the text and background color.
The threshold range is from 0 to 255.
 - b) Pseudo color slope setting
Set the slope of the brightness for the text and background color.
The threshold range is from 0 to 255.



Figure 30

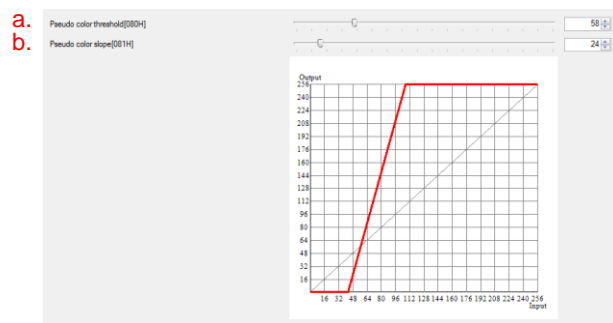


Figure 31

D. Shadow Mask & Line Marker Control - “uCOM: Marker” tab

1. Shadow Mask Shading Level Settings

This function sets the darkness of the shadow mask for the entire image. The darkness range is from 0 (lightest) to 255 (darkest). When 0 is selected, only a black line appears at the border of the shadow mask.

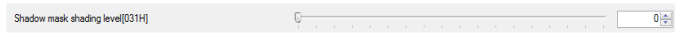


Figure 32

2. Horizontal Shadow Mask Position Settings (top or bottom)

This function set the horizontal shadow mask from the top and/or bottom of the screen. The horizontal shadow mask position range is 0 to 720.



Figure 33

3. Vertical Shadow Mask Position Settings (left or right)

This function sets the horizontal shadow mask from the right and/or of the screen. The horizontal shadow mask position range is 0 to 2047.

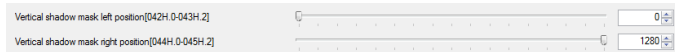


Figure 34

4. Horizontal Line Marker Settings

This function sets the horizontal line markers color, position and thickness. The horizontal line markers position range is 0 to 720.

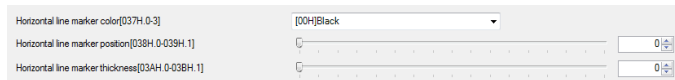


Figure 35

5. Vertical Line Marker Setting

This function sets the vertical line markers color, position and thickness. The vertical line markers position range is 0 to 2047.

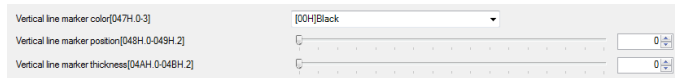


Figure 36

- NOTE:** A required color and thickness value is necessary to view the horizontal or vertical line markers. These markers can be shown in 16 available colors noted below.

Black	White	Red
Green	Blue	Cyan
Magenta	Yellow	User define color 0
User define color 1	User define color 2	User define color 3
User define color 4	User define color 5	User define color 6
User define color 7		

E. User Color Control - "uCOM: UserColor" tab

1. 8 User-Definable Colors Settings

a) The user can define 8 custom colors by adjusting the levels of red, green and blue.

- **NOTE:** User-defined colors can be used in the "uCOM:Picture Mode" (see section C) and "uCOM:Marker" (see section D) tabs wherever the user has the option of defining a color.

User defined color 0 R[060H]	0	<input type="text" value="255"/>
User defined color 0 G[061H]		<input type="text" value="128"/>
User defined color 0 B[062H]		<input type="text" value="0"/>
User defined color 1 R[063H]	1	<input type="text" value="255"/>
User defined color 1 G[064H]		<input type="text" value="0"/>
User defined color 1 B[065H]		<input type="text" value="128"/>
User defined color 2 R[066H]	2	<input type="text" value="128"/>
User defined color 2 G[067H]		<input type="text" value="255"/>
User defined color 2 B[068H]		<input type="text" value="0"/>
User defined color 3 R[069H]	3	<input type="text" value="0"/>
User defined color 3 G[06AH]		<input type="text" value="255"/>
User defined color 3 B[06BH]		<input type="text" value="128"/>
User defined color 4 R[06CH]	4	<input type="text" value="128"/>
User defined color 4 G[06DH]		<input type="text" value="0"/>
User defined color 4 B[06EH]		<input type="text" value="255"/>
User defined color 5 R[06FH]	5	<input type="text" value="0"/>
User defined color 5 G[070H]		<input type="text" value="128"/>
User defined color 5 B[071H]		<input type="text" value="255"/>
User defined color 6 R[072H]	6	<input type="text" value="128"/>
User defined color 6 G[073H]		<input type="text" value="128"/>
User defined color 6 B[074H]		<input type="text" value="128"/>
User defined color 7 R[075H]	7	<input type="text" value="255"/>
User defined color 7 G[076H]		<input type="text" value="207"/>
User defined color 7 B[077H]		<input type="text" value="0"/>

Figure 37

F. Software Communication Control- “uCOM: UART” tab

Figure 38

1. UART Baud Rate Setting

This function sets the UART communication baud rate.

9600, 19200 and 38400 bps are available for selection for the UART communication baud rate.

- **NOTE:** If a communication error occurs, please choose a slower baud rate.

2. UART Short Reply for Write Setting

- Disable (default): The reply data from the camera includes the written data.
- Enable: The reply data from the camera does NOT include the written data.

3. UART Check Sum Setting

- Enable (default): The camera DOES NOT accept or process the command if the check sum does not match.
- Disable: The camera accepts and processes the command without checking the sum.

G. Blemish Pixel Control - “uCOM: BlemishPixel” tab

1. Blemish Pixel Settings

Please do not adjust. This tab is for factory use only.

H. Other Control - “uCOM: Other” tab

1. OSD (On Screen Display) Settings

- OSD Character Size: Set the character size for on screen display (2 options).

Large (default)
Small

- OSD Horizontal Position: Set the horizontal position for the on screen display (Range 0 to 255).

- OSD Vertical Position: Set the vertical position for the on screen display (Range 0 to 255).

Figure 39

2. Still Image Settings: Set still image mode to On or Off (default).

Figure 40

3. 50/60Hz Selection Settings

- 60Hz (default): Sets the video output frame rate to 60Hz.
- 50Hz: Sets the video output frame rate to 50Hz.

Figure 41

4. Test Pattern (Grey Scale) Settings: Set test pattern gray scale display On or Off (default).

Figure 42

I. Shutter and Gain Control - “DSP: Shutter/Gain” tab

1. ALC (Automatic Light Compensation) Level and Weight Settings

- a) ALC Target Level: The user can adjust the ALC target brightness level for the application.
- b) Edge ALC Weight: This function sets the importance or weight of the “Edge” section (indicated below) of the image sensor during the ALC calculation.
- c) Center ALC Weight: This function sets the importance or weight of the “Center” section (indicated below) of the image sensor during the ALC calculation.
- d) ALC Peak: Set the importance of the “Peak” brightness value for the “ALC” function. The “ALC Peak” function has a range of 0 to 15. 0 will affect the ALC function the least when a bright object is introduced and 15 will affect it the most.

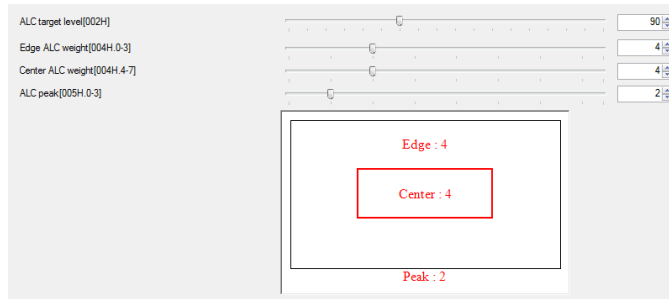


Figure 43

2. ALC Frame Settings

- a) ALC Average Integration Frames: Choose the number of frames to be used during the calculation of ALC. There are 16 preset frame values to choose from.
- b) ALC Single-Frame Quantity: Choose the number of frames used to calculate the ALC after power up. There are 16 preset frame values to choose from. If the value is 0, the ALC will use the “Auto Single-Frame Quantity” value.

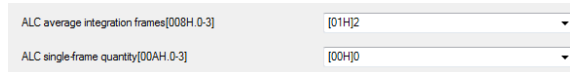


Figure 44

3. ALC Exposure Settings

- a) Exposure Control: Sets the exposure operating mode to “Fixed EE” or “Auto EE”.
- b) Exposure Time: Manually sets the “Fixed EE” exposure (26 preset buttons available).
- c) AEE Minimum Exposure Time: Set the level of priority for this value in the calculation of ALC.
- d) AEE Middle Exposure Time (Minimum Side): Set the level of priority for this value in the calculation of ALC.
- e) AEE Middle Exposure Time (Maximum Side): Set the level of priority for this value in the calculation of ALC.
- f) AEE Maximum Exposure Time: Set the level of priority for this value in the calculation of ALC.
- g) AEE Tolerance: This allows the user to set a tolerance for the deviation from the ALC target brightness level.
The AEE stops when the difference of the target brightness and current brightness is less than this tolerance. The AEE tolerance range is from 0 to 255.
- h) AEE Threshold: This allows the users to set a threshold value at which the camera must adjust the AEE.
The AEE stops when the difference of the target brightness and current brightness is less than this threshold. The AEE threshold range is from 0 to 255.
- i) AEE Speed: Set the value for the speed at which the AEE compensates for changes in light.

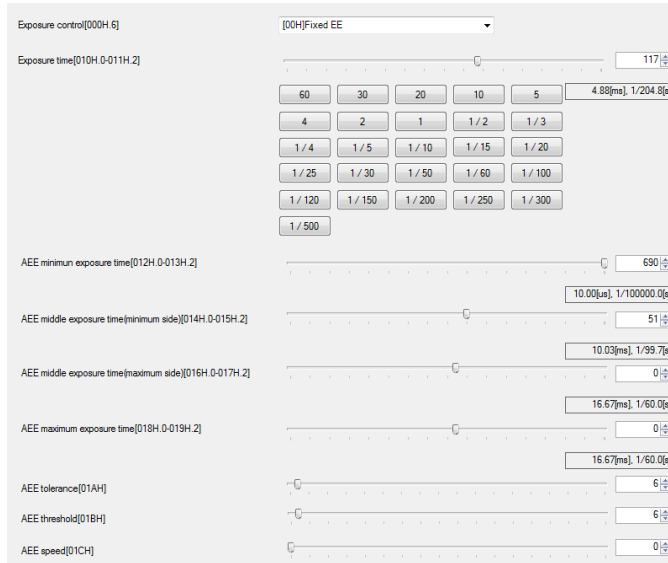


Figure 45

4. Gain Settings

- a) Gain Control: Select “Fixed” or “AGC (Automatic Gain Control)”
- b) Gain: Select a “Fixed” gain value from 0 to 511.
- c) AGC Minimum Gain: Set the level of priority for this value in the calculation of ALC.
- d) AEE Middle Gain: Set the level of priority for this value in the calculation of ALC.
- e) AGC Maximum Gain: Set the level of priority for this value in the calculation of ALC.
- f) AGC Tolerance: This allows the user to set a tolerance for the deviation from the ALC target brightness level. The AGC stops when the difference of the target brightness and current brightness is less than this tolerance. The AGC tolerance range is from 0 to 255.
- g) AGC Threshold: This allows the users to set a threshold value at which the camera must adjust the AEE. The AGC stops when the difference of the target brightness and current brightness is less than this threshold. The AGC threshold range is from 0 to 255.
- h) AGC Speed: Set the value of the speed at which AGC compensates for changes in light.
- i) Gain Value for Disabling Motion Detection: Set the Gain value to determine when the Motion Detection function should be disabled.

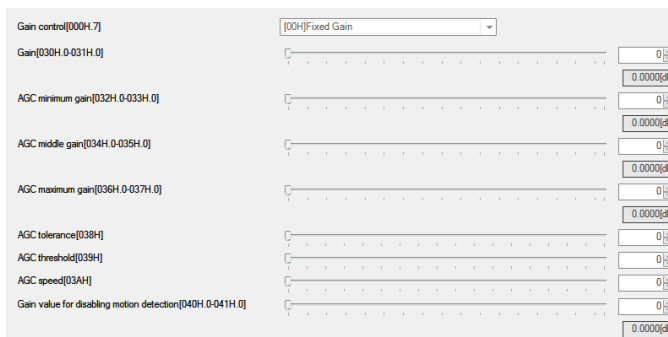


Figure 46

5. Digital Gain Settings: Select a digital “Fixed” gain value from 0 to 255.



Figure 47

6. IRC Filter Settings: The user can “Enable (default)” or “Disable” the Infrared Cut Filter.



Figure 48

J. White Balance Control - “DSP: WB” tab

1. White Balance Settings

- a) White Balance Mode: Set the White Balance to “Manual” (default) or “AWB” (Auto White Balance).
- b) Push-to-set White Balance: Set the White Balance to “OFF” (manual) or “ON”
 - **NOTE:** The camera adjusts the White Balance once automatically when “ON” is selected.

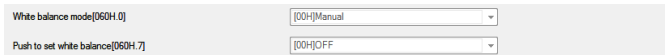


Figure 49

2. White Balance Red, Green, Blue Settings

- a) White Balance Red Gain: Set the Red pixel value for white balance the range is from 0 to 1023.
- b) White Balance Green Gain: Set the Green pixel value for white balance the range is from 0 to 1023.
- c) White Balance Blue Gain: Set the Blue pixel value for white balance the range is from 0 to 1023.



Figure 50

3. Auto White Balance Tolerance/Threshold

- a) Auto White Balance Tolerance: This allows the user to set a tolerance for deviation from the target white balance level.

The AWB stops when the difference of the target white balance and current white balance is less than this tolerance. The AWB tolerance range is from 0 to 255.

- b) Auto White Balance Threshold: This allows the users to set a threshold value at which the camera must adjust the white balance.

The AWB stops when the difference of the target white balance and current white balance is less than this threshold. The AWB threshold range is from 0 to 255.



Figure 51

4. Auto White Balance

- a) Auto White Balance Average Integration Frames: Choose the amount of frames to be used during the calculation of Auto White Balance. There are 16 preset frame values to choose from.
- b) Auto White Balance Single-Frame Process Quantity: Choose the number of frames used to calculate the auto white balance after power up. There are 16 preset frame values to choose from. If the value is 0, the AWB will use the “Auto white balance average integration frames” value.

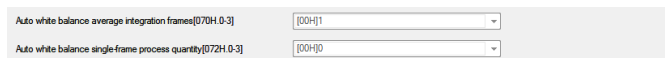


Figure 52

5. Auto White Balance R/B Change Limit

- a) Auto White Balance R Change Limit: Set the response speed of Red during the auto white balance calculation process. The Auto white balance R change limit range is 0 to 255.
- b) Auto White Balance B Change Limit: Set the response speed of Blue during the auto white balance calculation process. The Auto white balance B change limit range is 0 to 255.



Figure 53

K. Gamma Control - “DSP: Gamma” tab

- Gamma Mode Settings: Set the “Gamma mode” to “Manual” (default) or “Preset”



Figure 54

- Preset Gamma Settings: Set the gamma to 1 of 9 preset values. This function operates only when the “Preset” is chosen under “Gamma mode”.



Figure 55

- Manual Gamma Control Point Settings: Set the gamma control point for 1 or each of ten value locations.

- NOTE:** This adjustment can also be made by dragging the blue control points as seen in the figure below. Value ranges are from -256 to 511.

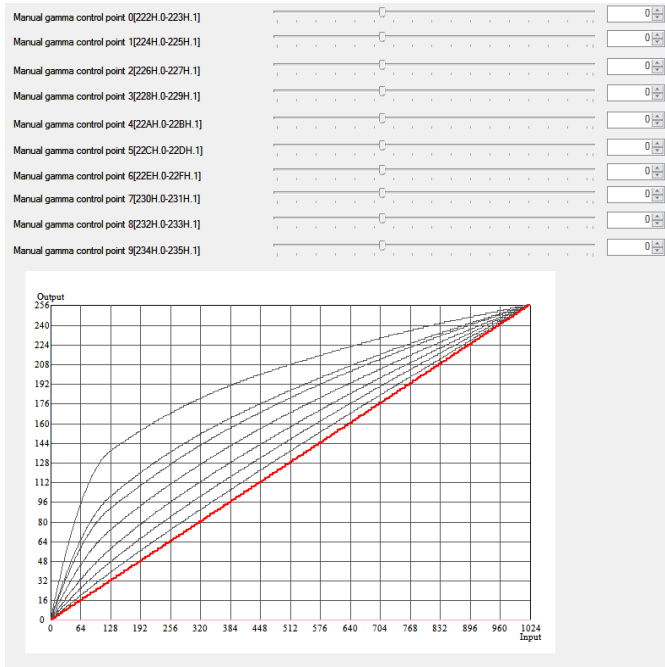


Figure 56

L. Chroma Control - “DSP: Chroma” tab

- YUV Blue Settings
 - B-Y Gain: Set the B-Y Gain value (0 to 127).
 - B-Y Hue: Set the B-Y Hue value (-128 to 127).
- YUV Red Settings
 - R-Y Gain: Set the R-Y Gain value (0 to 127).
 - R-Y Hue: Set the R-Y Hue value (-128 to 127).

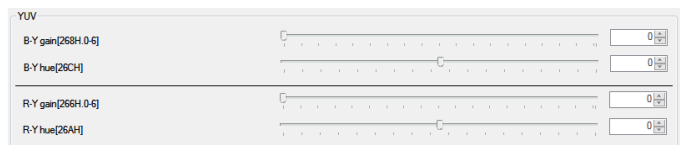


Figure 57

- High Luminance Chroma Suppress Settings

- NOTE:** This function controls chroma values in an image with high luminance values and reduces potential for chroma noise.
- High Luminance Chroma Suppress Threshold: Set the threshold value to which point the high luminance chroma suppress activates (0 to 255).
 - High Luminance Chroma Suppress Slope: Set the slope value to which the high luminance chroma suppress reacts (0 to 7).

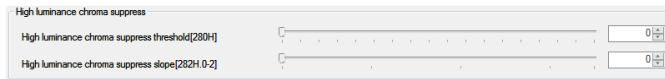


Figure 58

M. Aperture Control - “DSP: Aperture” tab

- **NOTE:** There are 2 stages provided to adjust aperture (Front Aperture and Back Aperture). When “Front Aperture Settings” are adjusted, the aperture correction is achieved on the video signal before digital zoom processing. When “Back Aperture Settings” are adjusted, the aperture correction is achieved on the video signal after digital zoom processing.
- **NOTE:** Aperture correction can increase the clarity and sharpness of an image. However, it can also create video artifacts. After applying digital zoom, these artifacts are magnified. User should consider and choose the proper stage for aperture adjustment.

1. Front Aperture Settings: Aperture correction of the RGB signal.
 - a) Front Aperture Control Horizontal Gain: Adjust the “Front” Aperture control for Horizontal pixels (0 to 15).
 - b) Front Aperture Control Vertical Gain: Adjust the “Front” Aperture control for Vertical pixels (0 to 15).
 - c) Front Aperture Control Coring: Adjust the detection range of sharpness enhancement for “Front Aperture control” (0 to 63).



Figure 59

2. Back Aperture Settings: Aperture correction of the Y signal.
 - a) Back Aperture Horizontal Gain: Adjust the “Back” Aperture control for Horizontal pixels (0 to 15).
 - b) Back Aperture Vertical Gain: Adjust the “Back” Aperture control for Vertical pixels (0 to 15).
 - c) Back Aperture Coring: Adjust the detection range of sharpness enhancement for “Back Aperture control” (0 to 63).

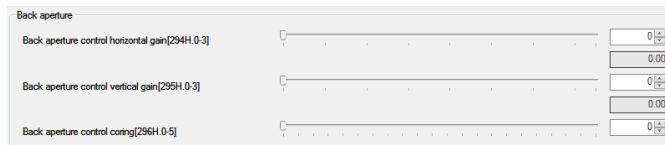


Figure 60

N. Flip and Contrast Control - “DSP: Other” tab

1. Horizontal / Vertical Flip Settings:
 - a) Horizontal Flip: Activate or turn off the Horizontal Flip of the image.
 - b) Vertical Flip: Activate or turn off the Vertical Flip of the image.

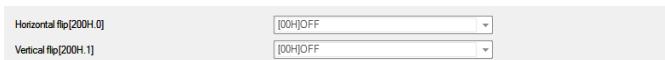


Figure 61

2. Contrast Settings:
 - a) Contrast: Set the “Contrast” level for the video signal (0 to 255).
 - b) RGB Offset: Set the “RGB offset” level for the color (0 to 127).



Figure 62

O. OSD Control – “OSD: Command Test” tab

The OSD functionality can be evaluated in the “OSD: Command Test” tab.

Select the “Send OSD Command” button to send the OSD command. When you activate the “OSD: Command Test” function the default OSD (“Sensor Technology STC-AF133”) will be displayed.

The screenshot shows a control interface for the OSD. It consists of several rows of controls, each with a button on the left and one or more dropdown menus on the right. The controls are as follows:

- Display Control Command:** [00H]Display OFF, [00H]Blinking OFF / Character left to right reverse OFF
- Initial Status Setting Command:** [00H]Character blinks, [00H]Vertical display start position setting unit = 3 rows
- 3-Channel Background Control Command:** [00H]No background, [01H]Framing ON
- Character Display Position Control Command:** [00H]2H / 2H, [00H]22/fosc[us]
- Video RAM Batch Clear Command:** (No dropdowns)
- Character Size Control Command:** [00H]Row 0, [00H]1H, [00H]1t dots
- Write Address Control Command:** [00H]Row 0, [00H]Column 0
- Character Address Bank Select Command:** [00H]Low-order bank
- Display Character Control Command:** [00H]Character does not blink / Left and right reverse character specification OFF, [00H]D /
- Send OSD Command(Maximum 32Bytes):** 7E.C0.1C.0E.17.1C.18.1B.FD.1D.0E.0C.11.17.18.15.18.10.22.FD.1C.1D.0C.69.0A.0F.01.03.03.FD

Figure 63

1. Display Control Command (2 Controls)
 - a) Display OFF (default) or Display ON
 - b) Blinking OFF / Character left or right reverse OFF (default)
 Blinking Frequency Approx. 2Hz / Character left or right reverse ON
 Blinking Frequency Approx. 1Hz / Character left or right reverse OFF
 Blinking Frequency Approx. 0.5Hz / Character left or right reverse ON
2. Initial Status Setting Command (2 Controls)
 - a) Character blinks (default) or Character left to right reverse
 - b) Vertical display start position setting unit = 3 rows (default) or = 9 rows
3. Channell Background Control Command (2 Controls)
 - a) No background (default)
 Blank background
 Must not be specified
 Filled background
 - b) Frame ON (default) or Frame OFF
4. Character Display Position Control Command (2 Controls)
 - a) 2H / 2H (default) or (5H / 11H ~ 95H/281)
 - b) 22/fosc[us] (default) or (25/fosc[us] ~ 115/fosc[us])
5. Video RAM Batch Clear Command
6. Character Size Control Command (3 Controls)
 - a) Row 0 (default) ~ Row 11; Prohibited (4)
 - b) H1 (default) ~ H4
 - c) 1t dots (default) ~ 4t dost
7. White Address Control Command (2 Controls)
 - a) Row 0 (default) ~ Row 11
 - b) Column 0 (default) ~ Column 27

8. Character Address Band Select Command (1 Control)
 - a) Low-order bank (default) or high-order bank
9. Display Character Control Command (2 Controls)
 - a) Character does not blink / Left and right reverse character specification OFF
Character blinks / Left and right reverse character specification ON
 - b) 0/ (default) ~ extended list
10. Send OSD Command (Maximum 32bits)

P. Display and Change DSP and uCOM Value Controls – “Field Table” tab

- **NOTE:** This tab allows the user to view and change all available parameters.
1. Drop Down Menu: The drop down menu allows the user to choose a filter by menu tab name.
 2. Filter option check boxes
 - a) Selecting the “Tab Page Filter” check box will remove all control functions from view with the exception of the tab chosen drop down menu filter.
 - b) Selecting the “Different Filter” check box will remove all control functions from view with the exception of functions with changes.
 3. Parameter list window: This window allows the user to view and make changes to all available parameters. To make a parameter change, click the value under “Register” column.

Device	TabPage	Address	Name	EEPROM	Register
DSP	ShutterGain	000H.6	Exposure control	[00H]Fixed EE	[00H]Fixed EE
DSP	ShutterGain	000H.7	Gain control	[00H]Fixed Gain	[00H]Fixed Gain
DSP	ShutterGain	001H.7	IRC filter	[00H]Enable	[00H]Enable
DSP	ShutterGain	002H	ALC target level	0	0
DSP	ShutterGain	004H.0-3	Edge ALC weight	0	0
DSP	ShutterGain	004H.4-7	Center ALC weight	0	0
DSP	ShutterGain	005H.0-3	ALC peak	0	0
DSP	ShutterGain	008H.0-3	ALC average integration frames	[00H]1	[00H]1
DSP	ShutterGain	00AH.0-3	ALC single-frame quantity	[00H]0	[00H]0
DSP	ShutterGain	010H.0-011H.2	Exposure time	0	0
DSP	ShutterGain	012H.0-013H.2	AEE minimum exposure time	0	0
DSP	ShutterGain	014H.0-015H.2	AEE middle exposure time(minimum side)	0	0
DSP	ShutterGain	016H.0-017H.2	AEE middle exposure time(maximum side)	0	0
DSP	ShutterGain	018H.0-019H.2	AEE maximum exposure time	0	0
DSP	ShutterGain	01AH	AEE tolerance	0	0
DSP	ShutterGain	01BH	AEE threshold	0	0
DSP	ShutterGain	01CH	AEE speed	0	0
DSP	ShutterGain	030H.0-031H.0	Gain	0	0

Figure 64

Revision

Rev	Date	Changes	Notes
1.0	2009/12/3	New Document	
1.01	2010/06/16	Updated document	
1.02	2010/09/13	Complete update of document based on revised software 2.0.02.	STA Revision

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