



ICG - Ionos Configuration GUI Manual

Version 0.39.x Beta



Revision 20140812v02s09

Preliminary

Contents

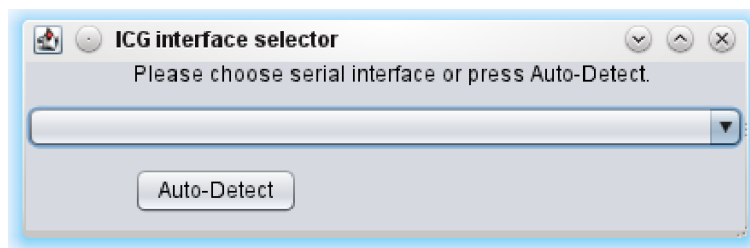
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Chapter 1

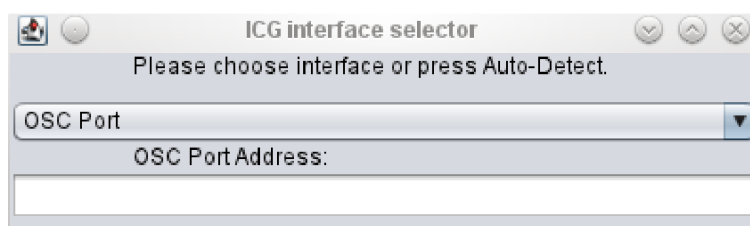
Functional Description

1.1 Startup

After ICG start, the interface selection window is shown.



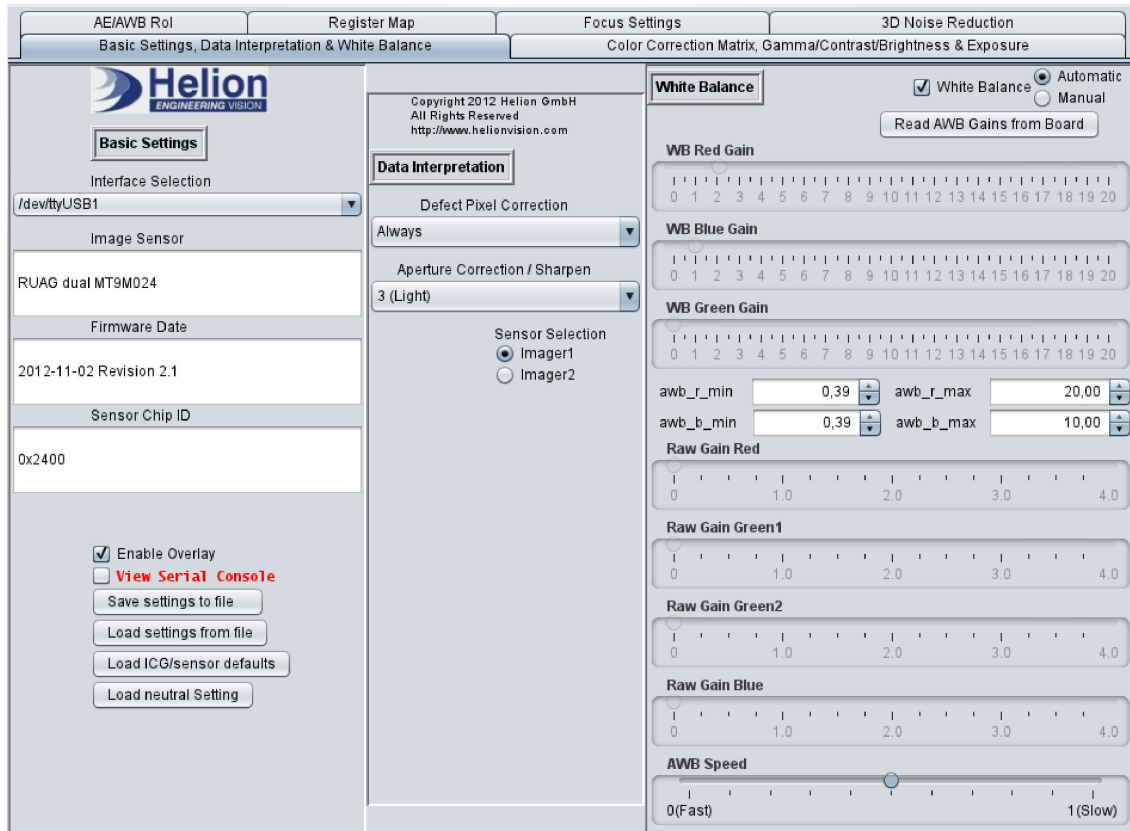
If you have no other devices with active serial interface you can click the "Auto Detect"-button. When other active serial devices are present, it is recommended to select the interface the HDR60 Board is connected to manually.



When the OSC Port is selected the IP-address textfield will appear. Enter the target-PCs IP-address followed by the port number. Example: 192.168.1.99:9000

Please Configure the control script on the target PC accordingly.

1.2 Basic Settings, Data Interpretation & White Balance



1.2.1 Basic Settings

Interface Selection

This Combo-Box allows to set the interface (Windows: COM1 or higher, Linux: /dev/ttyUSB0 or higher) to which the HDR-60 board is connected. When a Interface is selected, ICG tries to connect to the HDR-60 Board and runs the initialization-routine, which may take some seconds.

Image Sensor

This text-field displays which image sensor is currently used, if this feature is supported by the Mico32 firmware of the HDR-60 Board.

Firmware Date

The date of the firmware/bitstream, that is currently running on the HDR-60. For the latest firmware for the used image sensor visit <https://download.helionvision.com/ICG-GUI>.

Sensor Chip ID

The ID of the connected image sensor. This ID correspond to the ID, the image sensor vendor released for that image sensor, see also the datasheet of the image sensor.

Enable Overlay

This Check-box sets the visibility of the Overlay.

View Serial Console

Activating this Check-box opens the Serial Console window which can be used to monitor all input/output messages on the serial interface and to send commands to the Mico32 on the HDR-60 Board manually.

Save settings to file

By clicking this button, you can save the contents of the `uart_register_map` registers into a file. The filename will be `uart_register_map.txt` and the file will be located directly in the ICG folder.

Load settings from file

Clicking on this button will write the contents of the `uart_register_map.txt` file into the registers of the Mico32 program on the HDR-60-Board.

Load ICG/sensor defaults

This will load sensor-specific ICG defaults from the file `<sensorname>_defaults.txt`.

Write current Registermap to SPI-Flash

Clicking on this button will write the current registermap into the SPI-flash.

Read SPI-Flash into Registermap

Clicking on this button will read the SPI-flash and write these data into the registermap.

1.2.2 Data Interpretation

Defect Pixel Correction

Use this Combo-Box to set the defect pixel correction mode. For most cases "Adaptive" gives the best results.

Aperture Correction

This Combo-Box sets the Aperture Correction. The Effect can be seen on the sharpness of small details in the picture.

Subtract true Black Offset*

The black offset subtraction can be activated, deactivated or set to automatic mode. When set to "On" the black offset value from the "Level" Text-field is used. In automatic mode, the value from this Text-field has no influence. Clicking on the Radio-Button "Off" deactivates the black offset correction.

*) **Note:** This feature is not always available (depending on image sensor).

Level*

This text-field sets the black offset level. This value is only used when the black offset correction is on and not in automatic mode.

Note: When entering values into any text-field, make sure to press "Enter" afterwards to make ICG notice the change.

*) **Note:** This feature is not always available (depending on image sensor).

Tonemapping Split Position*

This slider sets the vertical border for the split screen feature. On the split screen the normal image is on the left, the tonemapped HDR image is on the right side. The position 0 of the slider results in a full HDR image, position 100 results in a non HDR image.

*) **Note:** This feature is not always available (depending on image sensor).

Orientation*

Use this Combo-Box to select the image orientation. The following modes are available: Normal, Mirrored, Flipped and Mirrored+Flipped.

*) **Note:** This feature is not always available (depending on image sensor).

Freeze Frame*

When this checkbox is selected, the current image is frozen.

*) **Note:** This function is only available for bitstreams with integrated framebuffer.

Sensor Selection

These Radiobuttons allow to switch between the two image sensors.

*) **Note:** This feature is only available in dual-head Systems.

1.2.3 White Balance

White Balance & Color Correction

This check-box activates/deactivates the White Balance and Color Correction settings. By default, this check-box is activated. When deactivated, all further changes in White Balance and Color Correction will be ignored.

White Balance Automatic/Manual

When set to "Automatic" the automatic white balance algorithm on the HDR-60 pipeline is used. Clicking on the Radio-Button "Manual" enables setting the relative red and blue WB gain factors manually with the sliders below.

Read relative Red & Blue from Board

When this button is clicked, the current WB relative blue and red factors are read from the board and the sliders "Relative Red" and "Relative Blue" are set. This feature is useful to show the WB red and blue factors when the board is in automatic WB mode.

Relative Red / Relative Blue

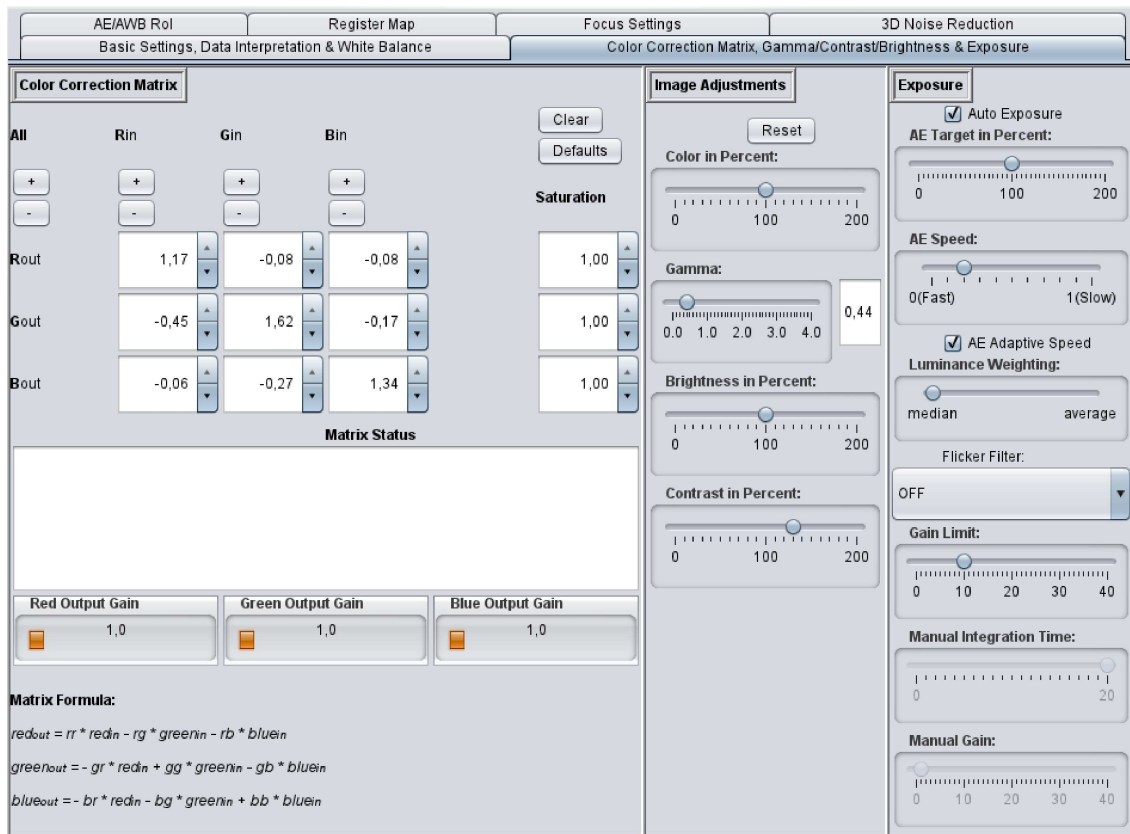
These sliders can be used to set the red and blue WB gain factors, when the check-box "Adjust relative Gain" is enabled and the WB mode is set to "Manual". When the Button "Read relative Red & Blue from Board" is clicked, these sliders are set to the current WB red and blue factors.

awb_r_min, awb_r_max, awb_b_min, awb_b_max

These fields set the minimum and maximum limits for the automatic white balance algorithm. When the relative red or blue values are outside of these limits, the algorithm will not touch these values.

Note: When entering values into any text-field, make sure to press "Enter" afterwards to make ICG notice the change.

1.3 Color Correction Matrix, Gamma/Contrast/Brightness & Auto Exposure



1.3.1 Color Correction Matrix

Clear

This button sets the CCM to a identity matrix.

Defaults

This button sets the CCM back to the values it had at ICG start time.

RR, RG, RB, GR, GG, GB, BR, BG, BB These fields set the CCM values. You can enter numbers directly into the field or click the up/down arrows on the side for small increments/decrements.

Note: When entering values into any text-field, make sure to press "Enter" afterwards to make ICG notice the change.

Saturation

These fields set the color saturation for red, green, and blue. Changing the saturation factors causes a recalculation of the entire matrix. Sending all matrix values over the serial interface may take a few seconds.

Note: When entering values into any text-field, make sure to press "Enter" afterwards to make ICG notice the change.

Matrix valid indicator field

The indicator field indicates if all Matrix values have the correct sign. RR, GG, BB must be positive, all other

fields must be negative. When a matrix value has the wrong sign, the sign will be ignored when sending the value to the board. The indicator field then turns red to show that the CCM in ICG and on the board are not consistent. If this occurs, just check the signs of the CCM values and change them where necessary.

Red, Green, Blue Output Gain

These gain bars show the current gain factor for each color, calculated from the CCM.

1.3.2 Gamma/Contrast/Brightness

Reset

This button sets all sliders in this section to 100% or 1.0 .

Color

This slider sets the color saturation. Set to 0 for gray-scale.

Gamma

This slider sets the gamma value.

Brightness

This slider sets the image brightness.

Contrast

This slider sets the image contrast.

Note: Some of these values need calculation after changing. When the Mico32 is calculating the new values, a little green square overlay is displayed in the bottom right corner of the output image to indicate that the Mico32 is busy.

1.3.3 Auto Exposure

Auto Exposure

This check-box activates/deactivates the Auto Exposure function.

When Auto Exposure is deactivated, the Flicker Filter is deactivated too.

Target

This slider sets the Auto Exposure target luminance.

Stability

This slider determines how fast the Auto Exposure function reacts to changes. When this slider is set to 0.0, the AE algorithm reacts as fast as possible to changes in brightness, when the slider is set to 1.0 the AE becomes static and will not react when brightness changes.

IIR Filter fast switch

The IIR Filter fast switch allows to override the AE Stability setting for great brightness changes in the picture, so that the AE can react fast to fundamental changes in exposure.

Gain Limit

This slider sets the maximum gain factor for the AE.

Manual Integration Time

When the Auto Exposure function is off, the integration time in milliseconds can be set manually with this slider.

Manual Coarse Integration Time

When the Auto Exposure function is off, the coarse integration time in frames can be set with this slider.

Note: This setting works only if the camera has an integrated framebuffer.

Manual Gain

When the Auto Exposure function is off, the gain can be set manually with this slider.

Luminance Weighting

This slider adjusts the weighting of the type of AE algorithm. The weighting is adjustable between median-based AE of the entire image and average-based AE of the selected region of interest (RoI), see *AE RoI settings*.

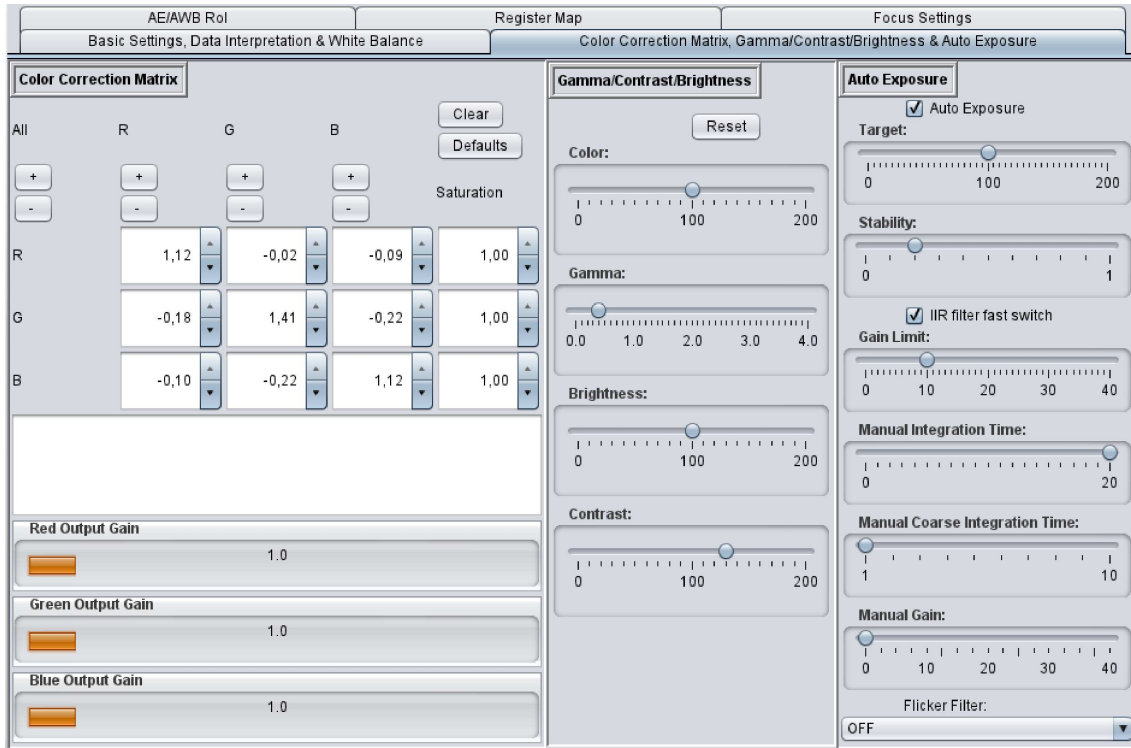
Flicker Filter

The Flicker Filter corrects image flickering when working under electrical lightning conditions. Set to the mains frequency of your area for best results.

The Flicker Filter will only work if Auto Exposure is activated.

Note: While using HDR with multiple exposure times the results of the flicker filter will be insufficient.

1.4 ROI Settings



1.4.1 AWB Rol settings

Show AWB Rol

When this check-box is activated, an overlay shows the exact size and position of the current AWB Region of Interest.

AWB Rol Box, StartX, StartY, DimX, DimY

The black rectangular box stands for the entire visible area. The red rectangular frame shows the Rol. To adjust the Rol draw a frame with the mouse. Therefore press and hold the left mouse-button on the left-top corner of the Rol and then move to the right-bottom corner and release the mouse-button. The dimensions are shown in the four text-fields (StartX, StartY, DimX, DimY) under this area.

As an alternative it is possible to enter the Rol directly in these fields.

Note: When entering values into any text-field, make sure to press "Enter" afterwards to make ICG notice the change.

1.4.2 AE Rol settings

Show AE Rol

When this check-box is activated, an overlay shows the exact size and position of the current AE Region of Interest (only for the AE algorithm "average luminance", see *Luminance Weighting*).

AE Rol Box, StartX, StartY, DimX, DimY

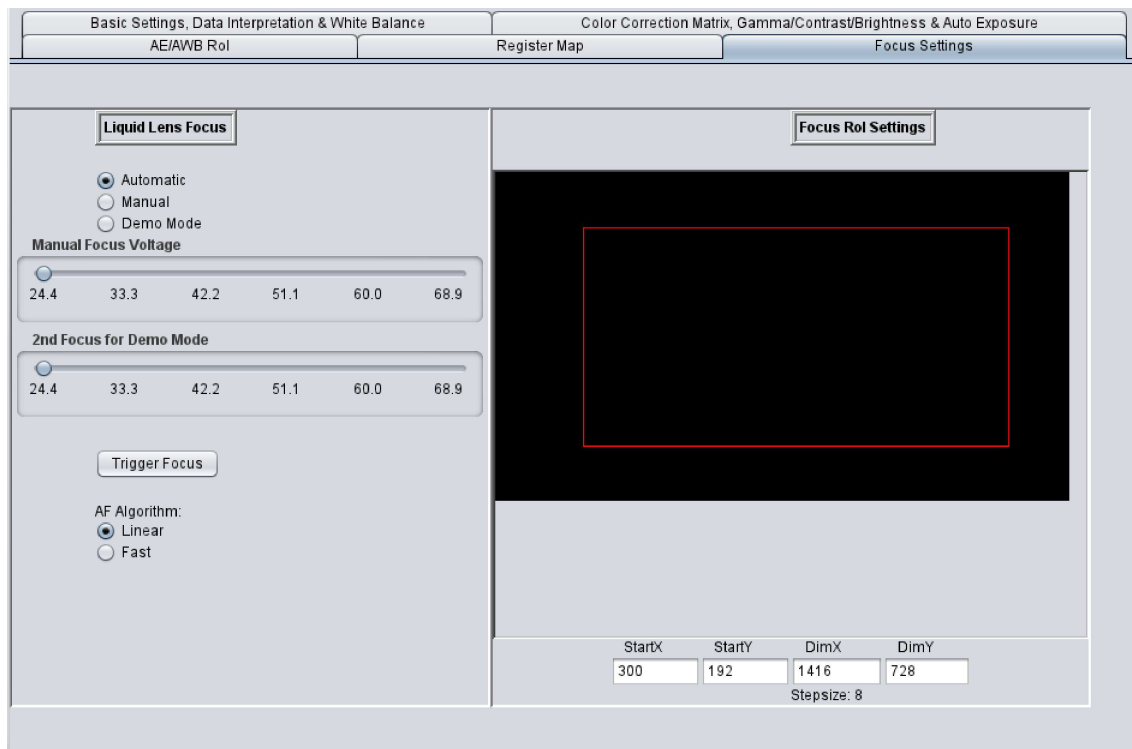
The black rectangular box stands for the entire visible area. The red rectangular frame shows the Rol. To adjust the Rol draw a frame with the mouse. Therefore press and hold the left mouse-button on the

left-top corner of the RoI and then move the mouse to the right-bottom corner of the RoI and release the mouse-button. The dimensions of the RoI are shown in the four text-fields (StartX, StartY, DimX, DimY) under this area.

As an alternative it is possible to enter the RoI directly in these fields.

Note: When entering values into any text-field, make sure to press "Enter" afterwards to make ICG notice the change.

1.5 Focus Settings



Liquid Lens Focus

There are three focus modes for the liquid lens: the automatic focus mode, the manual focus mode and the demo focus mode. To use one of the modes first select the corresponding radiobutton and then use the slider or the RoI setting.

- Automatic mode: In this mode, the sharpness of the image is measured and optimised. To set the RoI for the sharpness measurement, use the RoI setter to the right.
- Manual mode: Use the slider below to set the focus of the liquid lens manually
- Demo Mode: To use the demo mode, first set the focus mode to "Manual", then use the two sliders below to set two different focus values. Now set the focus mode to "Demo Mode". The focus of the lens will now jump forth and back between both focus values.

Focus Trigger

Pressing this button triggers the autofocus.

AF Algorithm

With these two radiobuttons you can switch between the different autofocus algorithms.

Focus RoI Box, StartX, StartY, DimX, DimY

The black rectangular box stands for the entire visible area. The red rectangular frame shows the RoI.

To adjust the RoI draw a frame with the mouse. Therefore press and hold the left mouse-button on the left-top corner of the RoI and then move the mouse to the right-bottom corner of the RoI and release the mouse-button. The dimensions of the RoI are shown in the four text-fields (StartX, StartY, DimX, DimY) under this area.

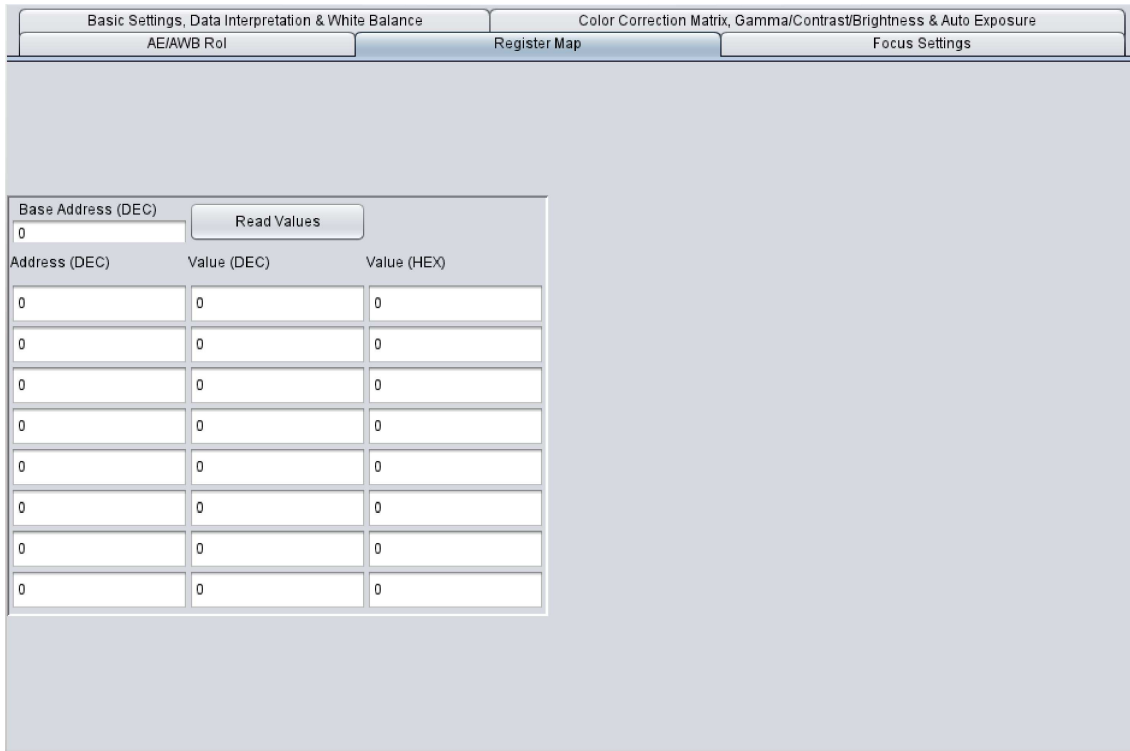
As an alternative it is possible to enter the RoI directly in these fields.

Note: When entering values into any text-field, make sure to press "Enter" afterwards to make ICG notice the change.

Note: The Autofocus function is not available in all bitstreams.

Note: The "Focus Settings" tab is only shown when a compatible bitstream is detected on the HDR60-Board.

1.6 Register Map



Address (DEC)	Value (DEC)	Value (HEX)
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Base Address

When an address is entered in this field, the eight address fields below are calculated from this base address. The register map address range is 0 to 255.

Note: When entering values into any text-field, make sure to press "Enter" afterwards to make ICG notice the change.

Read Values

When this button is clicked, the registers with the given addresses are read and the values are displayed in the "Value" fields.

Address fields

These address fields set the addresses from which the register values are read.

Note: When entering values into any text-field, make sure to press "Enter" afterwards to make ICG notice the change.

Value (DEC)

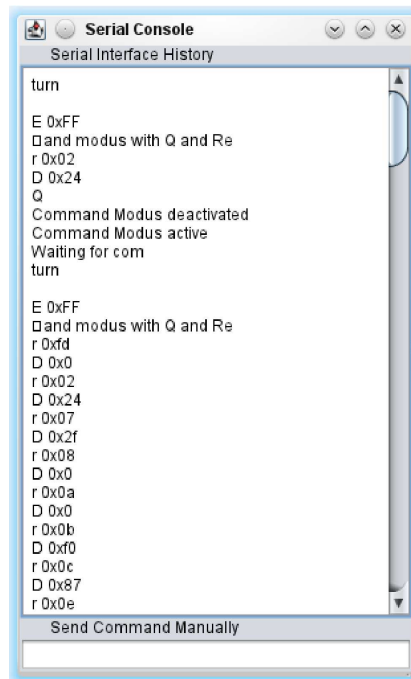
These fields display the value of the register at the given address in decimal form. When a value is entered in one of these fields, it is written to the corresponding register on the Mico32.

Note: When entering values into any text-field, make sure to press "Enter" afterwards to make ICG notice the change.

Value (HEX)

These fields display the value of the register at the given address in hexadecimal form.

1.7 Serial Console



Serial Interface History

This text-field displays the last 256 messages on the serial interface.

Send Command Manually

This text-field can be used to send commands to the board.

Note: When entering values into any text-field, make sure to press "Enter" afterwards to make ICG notice the change.

1.8 Annotations

- Depending on the used Ionos-ISP IP cores and the mounted image sensor not all options shown in this manual may be available.
- When entering values into any text-field make sure to press "Enter" afterwards, otherwise the changes will be ignored.
- ICG works only if the connected HDR-60 board
 - has mounted a supported image sensor
(for details see <https://download.helionvision.com/ICG-GUI>)
 - is programmed with a bit-stream, that supports
 - * the ICG-interface *and*
 - * the mounted image sensor *and*
 - * the Ionos-ISP IP cores
 (for details see <https://download.helionvision.com/ICG-GUI>)

Appendix A

Revision History

Table A.1: Revision History ICG Manual

Date	Version	Section	Change Summary
2012-03-19	v01s00m01	-	Initial Release
2012-03-21	v01s01m01	-	Update Binary
2012-09-01	v02s01m01	-	Update for ICG-Version 0.33, correction of typos
2012-09-03	v02s01m02	-	Update for ICG-Version 0.34
2012-10-17	v02s02m01	-	Update for ICG-Version 0.34.3
2012-11-22	v02s03m00	Functional Description	Update for ICG-Version 0.36
2013-05-02	v02s04m00	Functional Description	Update for ICG-Version 0.37.1
2013-05-07	v02s05m00	Functional Description	Update for ICG-Version 0.37.2
2013-07-11	v02s06m00	Functional Description	Update for ICG-Version 0.38
2013-08-06	v02s07m00	Functional Description	Update for ICG-Version 0.38.2
2013-10-15	v02s08m00	Functional Description	Fixed Focus Settings Screenshot
2014-08-12	v02s09m00	Functional Description	Update for ICG-Version 0.39.x

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