

VC Smart Camera Demo Users' Guide

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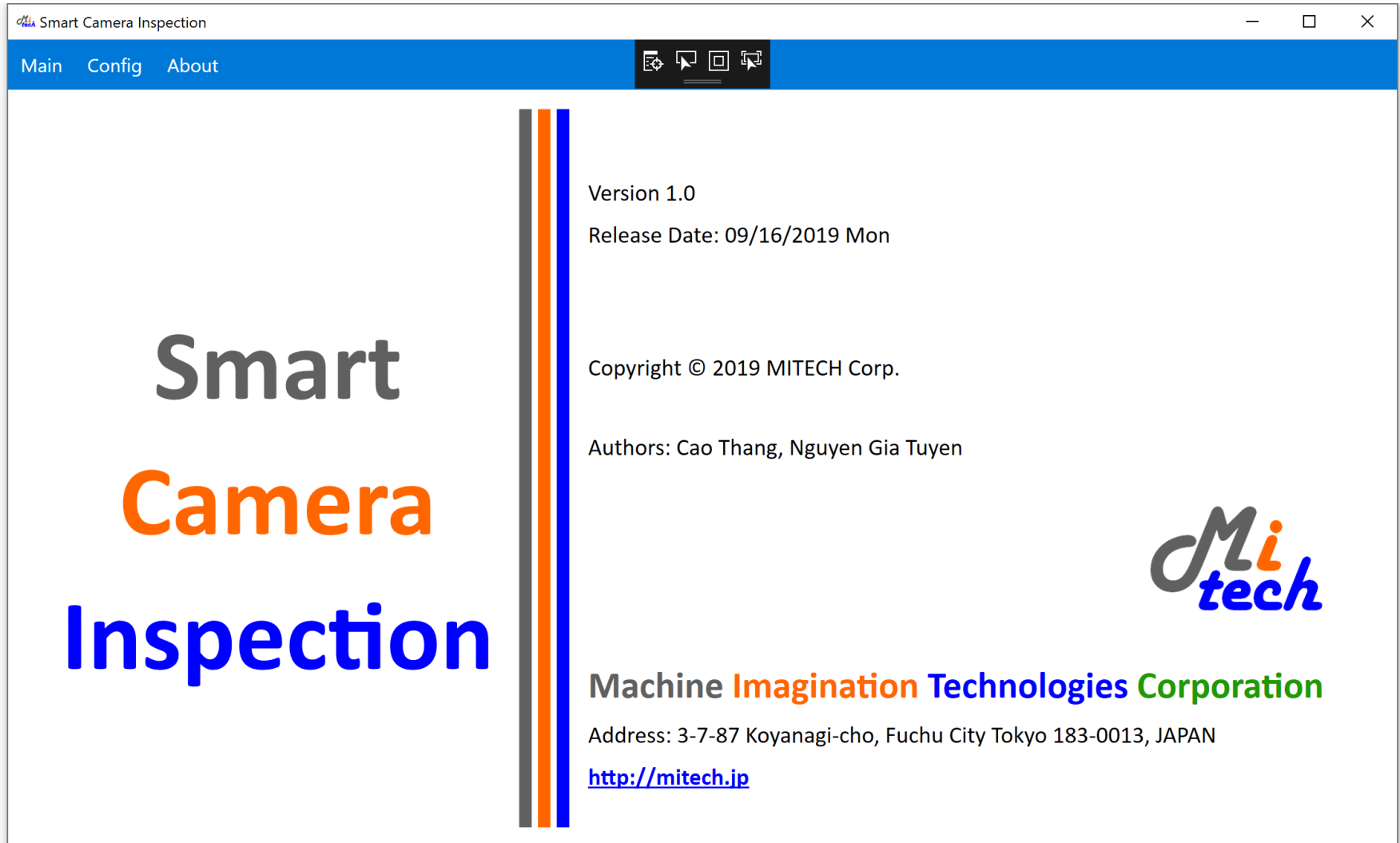
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VC Smart Camera Demo



About This Software

- This is Smart Camera Demo, written by MITECH Corp., for evaluating VC NanoZ Smart Camera and VC Nano 3D Camera
- Depending on version, this user guide may be a little different from your software
- For more information and for developing smart camera software in practical application, please feel free to contact us at <http://mitech.jp/>
- Thank you for using this software

1. Copy Program to Camera and PC

- Camera Side

- Copy *01A_DemoLinux* to a folder, for example `/home/user/mitech/`
- Set program as executable
`chmod +x 01A_DemoLinux`
- Run the program
`cd /home/user/mitech/`
`./01A_DemoLinux`

```
22:15:42[root@VC-Z] ~  
#cd /home/user/mitech  
  
22:15:56[root@VC-Z] /home/user/mitech  
#./01A_DemoLinux
```

- Windows Side

- Copy *01B_DemoWindows* to a folder, for example `C:\¥mitech`
- Run the program
- Set suitable parameters such as image size, shutter, gain, ...
- Enjoy testing your camera with this program



2. PC Client Application: Interface (Main Page for Area Camera)

Start, stop process to get live data in camera

Camera status

Camera setting params

Smart Camera Inspection

Main Config About

LIVE START LIVE STOP

INSPECTION START

INSPECTION STOP

REQUEST STATUS

STATUS

Snap

Process

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This area will show image capture of Camera

Smart Camera Inspection User Interface

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Settings: Area Camera

X0	0	Y0	0
Width	2048	Height	1536
Threshold	100	Shutter	1000
Gain	200	FlashID	1
Current Flash (mA)	1500		
Max Flash (mA)	10000		
Trigger Source	TRGSRC_IMM		
Trigger Mode	TRGMODE_EDGE		

Click to save and send setting params to Camera

Click to save captured image

SAVE IMAGE SEND SETTING SAVE SETTING

Start Signal

IMMEDIATE START
IMMEDIATE START
PLC_IN START

Start Signal

IMMEDIATE START

PLC In/Out Signals

☒ ☒ ☒ ☒ ☒

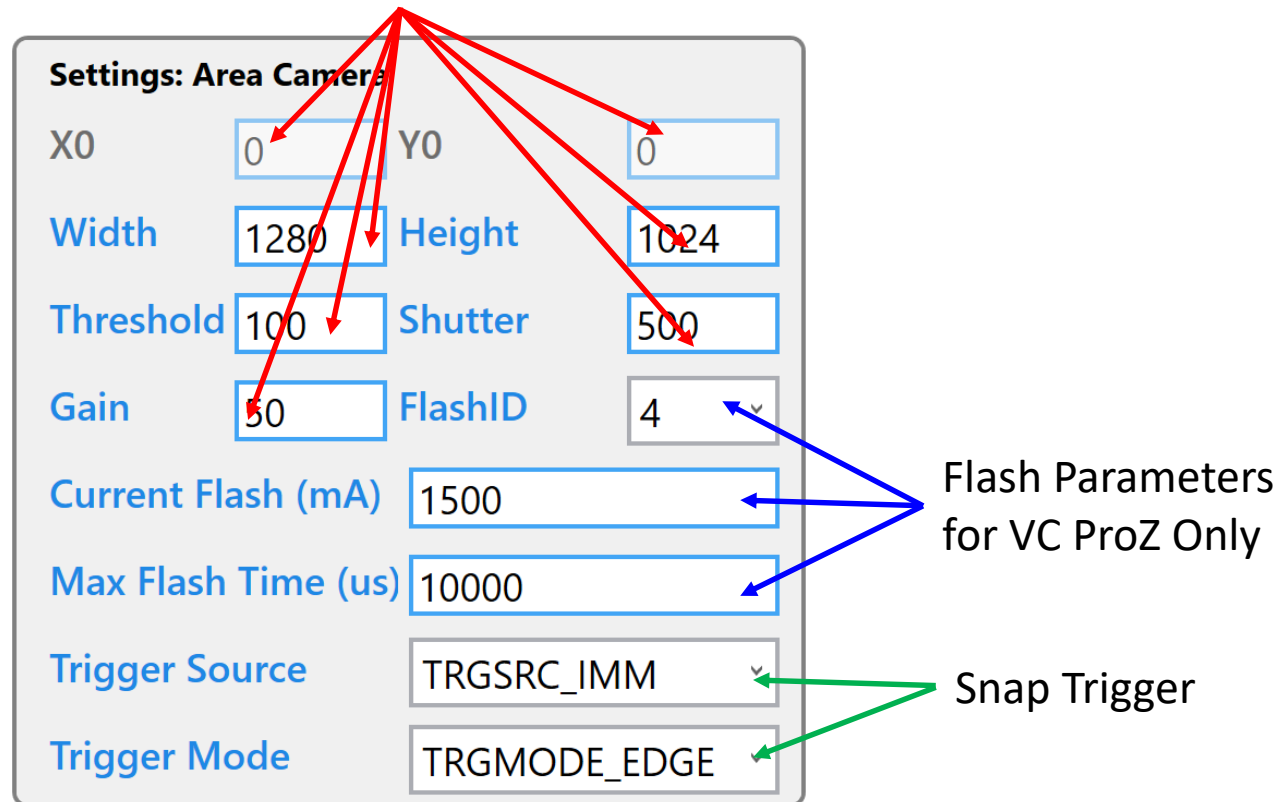
Select Start Signal

- Start Signal is PLC In signal for starting an inspection
 - IMMEDIATE START: Start without PLC In
 - PLC_IN START: Start with "INP 0" Signal (for both VC NanoZ and VC NanoZ 3D)

2. PC Client Application: Interface (Main Page for Area Camera)

- Snap Parameters

Snap Parameters for both
laser and area cameras



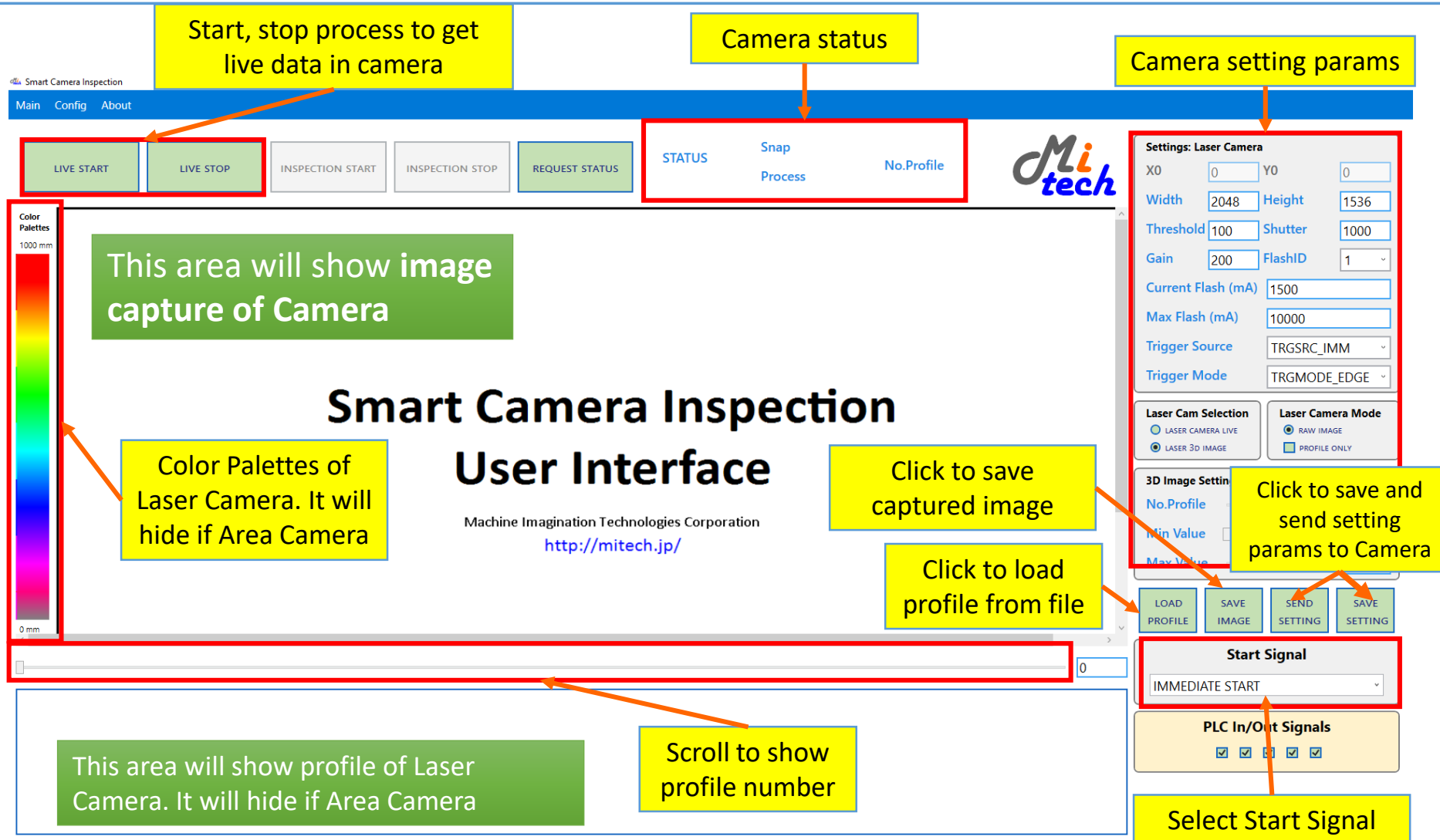
Settings: Area Camera

X0	0	Y0	0
Width	1280	Height	1024
Threshold	100	Shutter	500
Gain	50	FlashID	4
Current Flash (mA)	1500		
Max Flash Time (us)	10000		
Trigger Source	TRGSRG_IMM		
Trigger Mode	TRGMODE_EDGE		

Flash Parameters for VC ProZ Only

Snap Trigger

2. PC Client Application: Interface (Main Page for Laser Camera)



The screenshot displays the 'Smart Camera Inspection User Interface' for a laser camera. The interface includes a top navigation bar with 'Main', 'Config', and 'About' tabs. A central area shows a live camera feed with a color palette on the left. To the right, there are settings for the laser camera, including X0, Y0, Width, Height, Threshold, Shutter, Gain, FlashID, Current Flash (mA), Max Flash (mA), Trigger Source, and Trigger Mode. Below the settings are buttons for 'LOAD PROFILE', 'SAVE IMAGE', 'SEND SETTING', and 'SAVE SETTING'. At the bottom, there are sections for 'Start Signal' and 'PLC In/Out Signals'. Annotations with arrows point to various elements: 'Start, stop process to get live data in camera' points to the 'LIVE START' and 'LIVE STOP' buttons; 'Camera status' points to the 'STATUS' button; 'Camera setting params' points to the 'Settings: Laser Camera' panel; 'This area will show image capture of Camera' points to the central live feed area; 'Color Palettes of Laser Camera. It will hide if Area Camera' points to the color palette; 'Click to save captured image' points to the 'SAVE IMAGE' button; 'Click to load profile from file' points to the 'LOAD PROFILE' button; 'Click to save and send setting params to Camera' points to the 'SEND SETTING' button; 'This area will show profile of Laser Camera. It will hide if Area Camera' points to the bottom profile area; 'Scroll to show profile number' points to a scroll bar; and 'Select Start Signal' points to the 'Start Signal' dropdown menu.

Start, stop process to get live data in camera

Camera status

Camera setting params

Smart Camera Inspection User Interface

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Color Palettes of Laser Camera. It will hide if Area Camera

Click to save captured image

Click to load profile from file

Click to save and send setting params to Camera

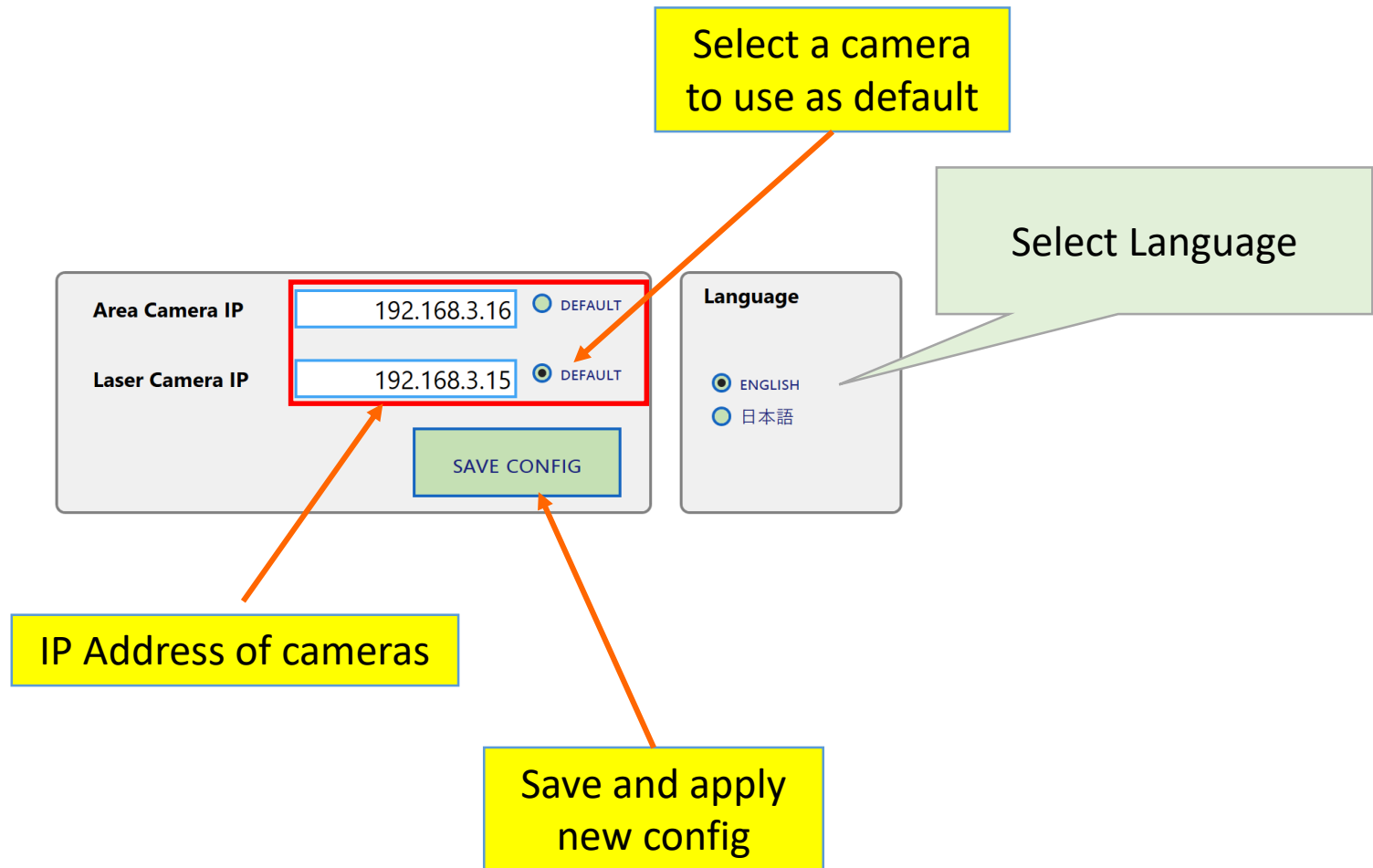
This area will show image capture of Camera

This area will show profile of Laser Camera. It will hide if Area Camera

Scroll to show profile number

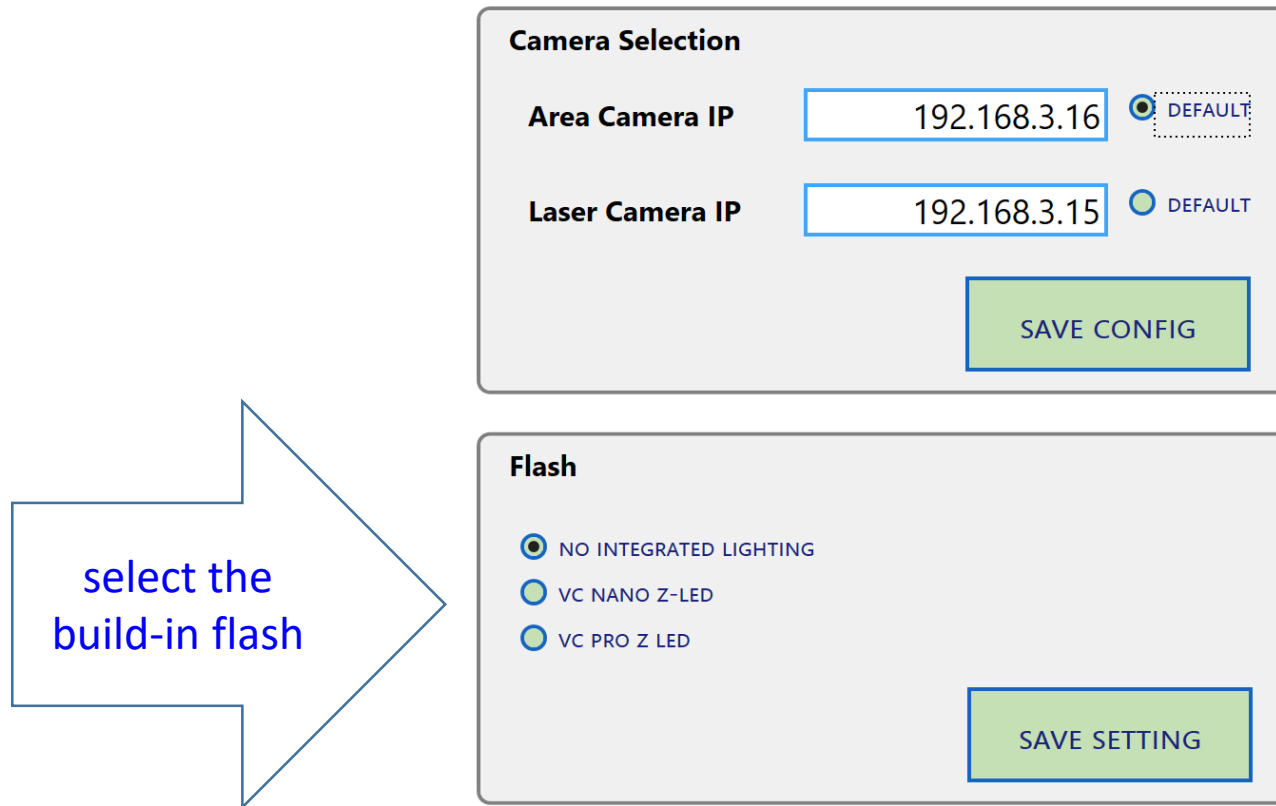
Select Start Signal

2. PC Client Application: Interface (Configuration Page)



2. PC Client Application: Interface (Configuration Page)

- If choosing Area Camera, you can select the build-in flash



Camera Selection

Area Camera IP ☒ DEFAULT

Laser Camera IP ☐ DEFAULT

SAVE CONFIG

Flash

☒ NO INTEGRATED LIGHTING

☐ VC NANO Z-LED

☐ VC PRO Z LED

SAVE SETTING

2. PC Client Application: Interface (Configuration Page)

- Parameters for Flash of the VC-ProZ is in the Main Page

Flash

☐ NO INTEGRATED LIGHTING
 ☐ VC NANO Z-LED
 ☒ VC PRO Z LED

SAVE SETTING

Settings: Area Camera

X0 Y0

Width Height

Threshold Shutter

Gain FlashID

Current Flash (mA)

Max Flash Time (us)

Trigger Source

Trigger Mode

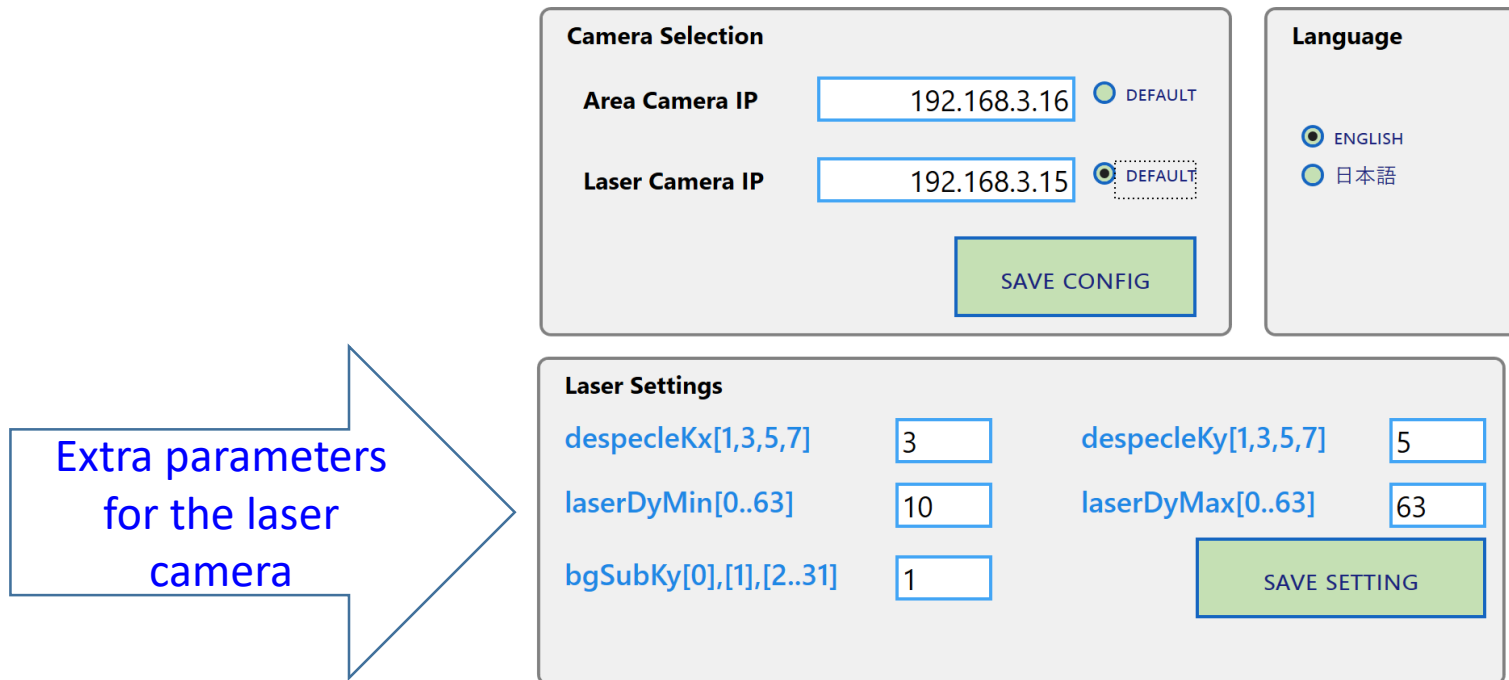
Flash ID	Camera Flash
0	FLASH ₀ /TrigOut
1	FLASH ₁
2	FLASH ₂
3	FLASH ₃
4	FLASH ₂ & FLASH ₃



For FlashID, Current Flash (mA), Max Flash (time in μ s), please refer https://www.vision-components.com/fileadmin/external/documentation/hardware/VC_pro_Z/index.html#gpios

2. PC Client Application: Interface (Configuration Page)

- If choosing Laser Camera, you can select some extra parameters for the laser camera



The screenshot displays the configuration interface for the PC Client Application. It is divided into three main sections:

- Camera Selection:** Contains two IP address input fields. The 'Area Camera IP' is set to 192.168.3.16 with a 'DEFAULT' radio button. The 'Laser Camera IP' is set to 192.168.3.15 with a 'DEFAULT' radio button. A green 'SAVE CONFIG' button is located below these fields.
- Language:** Contains two radio buttons for 'ENGLISH' (selected) and '日本語'.
- Laser Settings:** Contains three input fields for 'despecleKx[1,3,5,7]' (value 3), 'despecleKy[1,3,5,7]' (value 5), 'laserDyMin[0..63]' (value 10), 'laserDyMax[0..63]' (value 63), and 'bgSubKy[0],[1],[2..31]' (value 1). A green 'SAVE SETTING' button is located to the right of these fields.

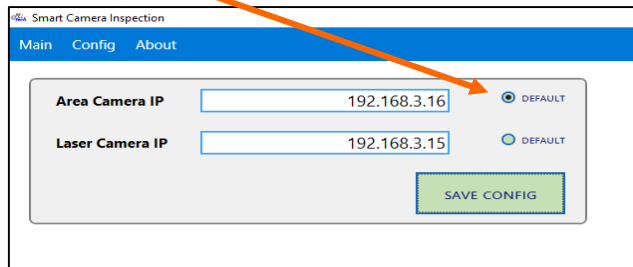
A blue arrow points from the text 'Extra parameters for the laser camera' to the 'Laser Settings' section.

For the extra parameters for the laser, please refer <https://www.vision-components.com/fileadmin/external/documentation/software/lib/libvclinux/latest/html/a00009.html>

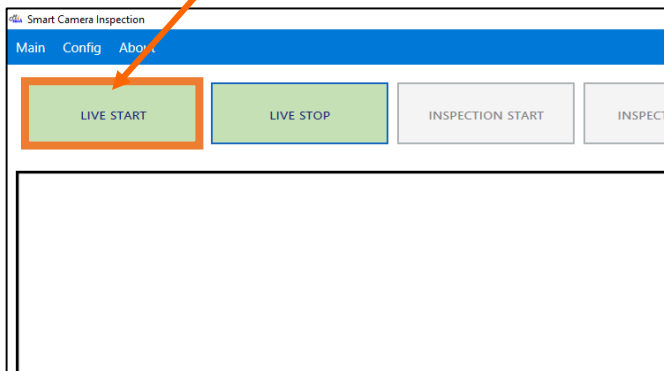
3. Area Camera Flow

PC Client

1. Enter IP and select Default on Area Camera then Click "SAVE CONFIG"



3. Click "LIVE START" to get the image on Area camera



Area Camera

2. Start camera program
\$./01A_DemoLinux

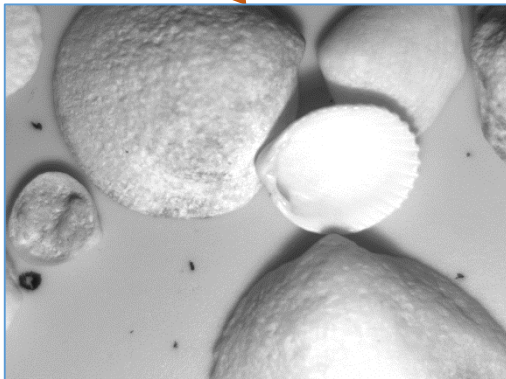


3. Area Camera Setting

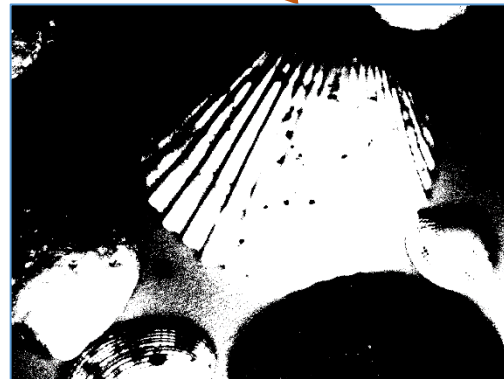
- Area Camera is **VC_nanoZxx**
 - Width and height should be set correctly
 - Other parameters also should be set correctly
- Mode of Area Camera
 - **Raw image**: get a raw image of the camera and display
 - **Binary image**: get a binary image of the camera and display
 - **Blob image**: get blobs of image, image data of camera and display
- Image results

Settings: Area Camera			
X0	<input type="text" value="0"/>	Y0	<input type="text" value="0"/>
Width	<input type="text" value="1280"/>	Height	<input type="text" value="1024"/>
Threshold	<input type="text" value="120"/>	Shutter	<input type="text" value="120"/>
Gain	<input type="text" value="200"/>	FlashID	<input type="text" value="1"/>
Current Flash (mA)	<input type="text" value="1500"/>		
Max Flash (mA)	<input type="text" value="9000"/>		
Trigger Source	<input type="text" value="TRGSRG_IMM"/>		
Trigger Mode	<input type="text" value="TRGMODE_EDGE"/>		

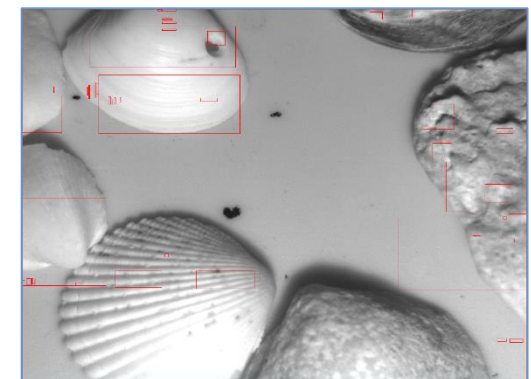
Area Cam Selection	Area Camera Mode
<input checked="" type="radio"/> AREA CAMERA	<input checked="" type="radio"/> RAW IMAGE
	<input type="radio"/> BINARY IMAGE
	<input type="radio"/> BLOB IMAGE



Raw image



Binary image

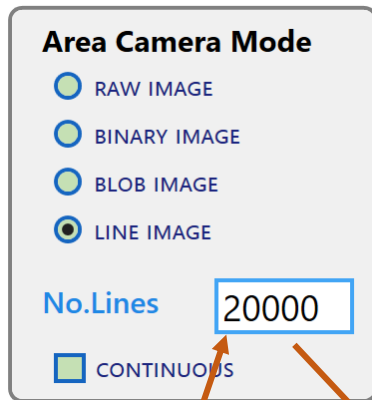


Blob image

3. Area Camera

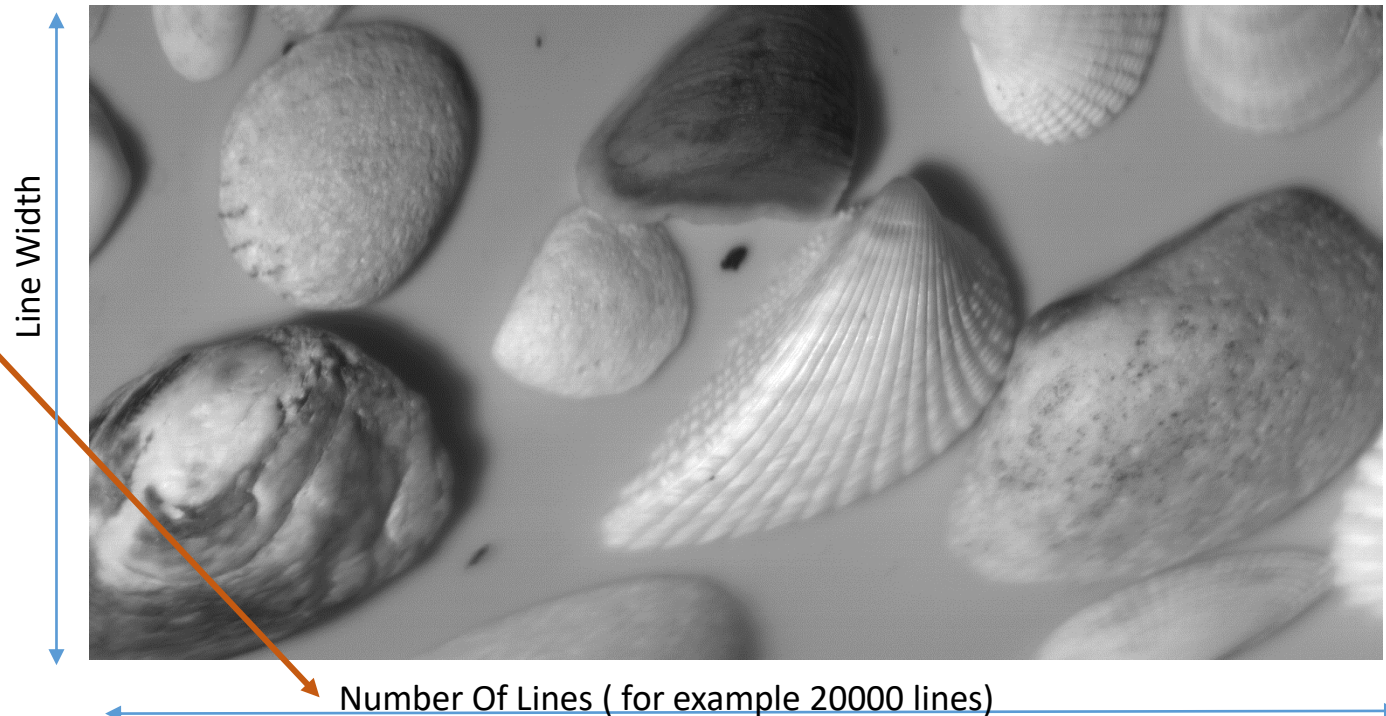
Snap Single Line as a Line Camera

- Using camera, you can snap a single line similar to a line camera
- The Line Width is camera image width
- You can specify Number of Lines (for example 20000 lines), not that this number is limited due to buffer space



Select "LINE IMAGE" and number of desired lines

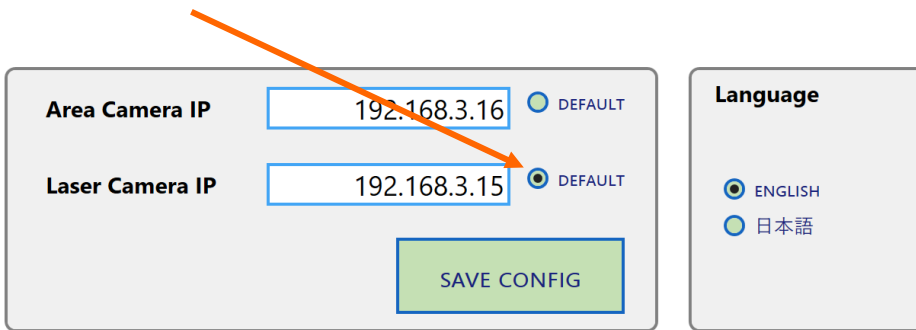
LINE IMAGE will look like this



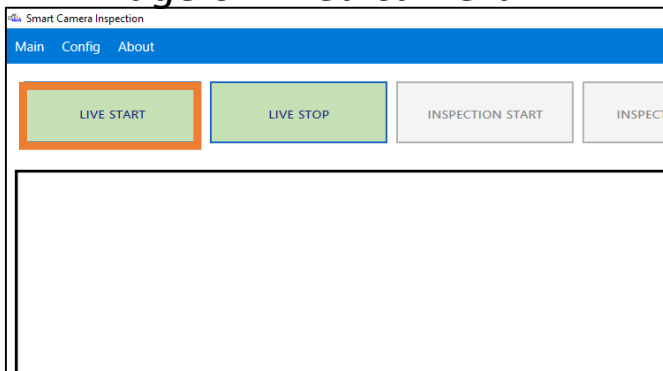
4. Laser Camera flow

PC Client

1. Enter IP and select Default on Laser Camera then Click "SAVE CONFIG"



3. Click "LIVE START" to get the image on Area camera



Laser Camera

2. Start camera program
\$./01A_DemoLinux



4. Laser Camera Setting

- Laser Camera is **VC_nano_3D_Z**
 - Width and height should be set correctly
 - Other parameters also should be set correctly
- 3D Image Settings
 - It only show if you select “Laser 3D Image” in Laser Camera Selection
 - Max, min value are max, min value of Color Palettes panel

Settings: Laser Camera

X0	<input type="text" value="0"/>	Y0	<input type="text" value="0"/>
Width	<input type="text" value="1408"/>	Height	<input type="text" value="1080"/>
Threshold	<input type="text" value="100"/>	Shutter	<input type="text" value="300"/>
Gain	<input type="text" value="200"/>	FlashID	<input type="text" value="1"/>
Current Flash (mA)		<input type="text" value="1500"/>	
Max Flash (mA)		<input type="text" value="10000"/>	
Trigger Source		<input type="text" value="TRGSRC_IMM"/>	
Trigger Mode		<input type="text" value="TRGMODE_EDGE"/>	

Laser Cam Selection

☐ LASER CAMERA LIVE

☒ LASER 3D IMAGE

Laser Camera Mode

☒ RAW IMAGE

☒ PROFILE ONLY

☐ CONTINUOUS

3D Image Settings

 No.Profile

 Min Value

 Max Value



CONTINUOUS: live will run continuously until users press “LIVE STOP button”

4. Laser Camera Setting (Continue)

Some of Laser Camera Settings, for suitable value, please refer to

<https://www.vision-components.com/fileadmin/external/documentation/software/lib/libvclinux/latest/html/a00009.html>

Settings: Laser Camera

X0	<input type="text" value="0"/>	Y0	<input type="text" value="0"/>
Width	<input type="text" value="2048"/>	Height	<input type="text" value="1536"/>
Threshold	<input type="text" value="100"/>	Shutter	<input type="text" value="1000"/>
Gain	<input type="text" value="200"/>	FlashID	<input type="text" value="1"/>
Current Flash (mA)	<input type="text" value="1500"/>		
Max Flash (mA)	<input type="text" value="10000"/>		
Trigger Source	<input type="text" value="TRGSRC_IMM"/>		
Trigger Mode	<input type="text" value="TRGMODE_EDGE"/>		

Laser Settings

despeckleKx[1,3,5,7]	<input type="text" value="3"/>	despeckleKy[1,3,5,7]	<input type="text" value="3"/>
laserDyMin[0..63]	<input type="text" value="3"/>	laserDyMax[0..63]	<input type="text" value="32"/>
bgSubKy[0],[1],[2..31]	<input type="text" value="0"/>	<input type="button" value="SAVE SETTING"/>	

Default when start camera
despeckleKx : 1
despeckleKy : 1
laserDyMin : 10
laserDyMax : 63
bgSubKy : 0

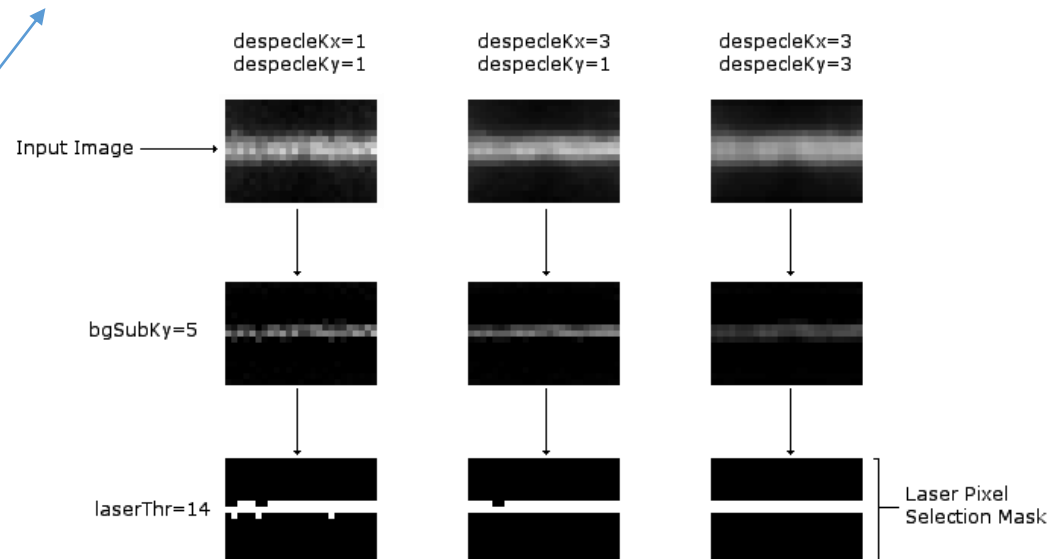
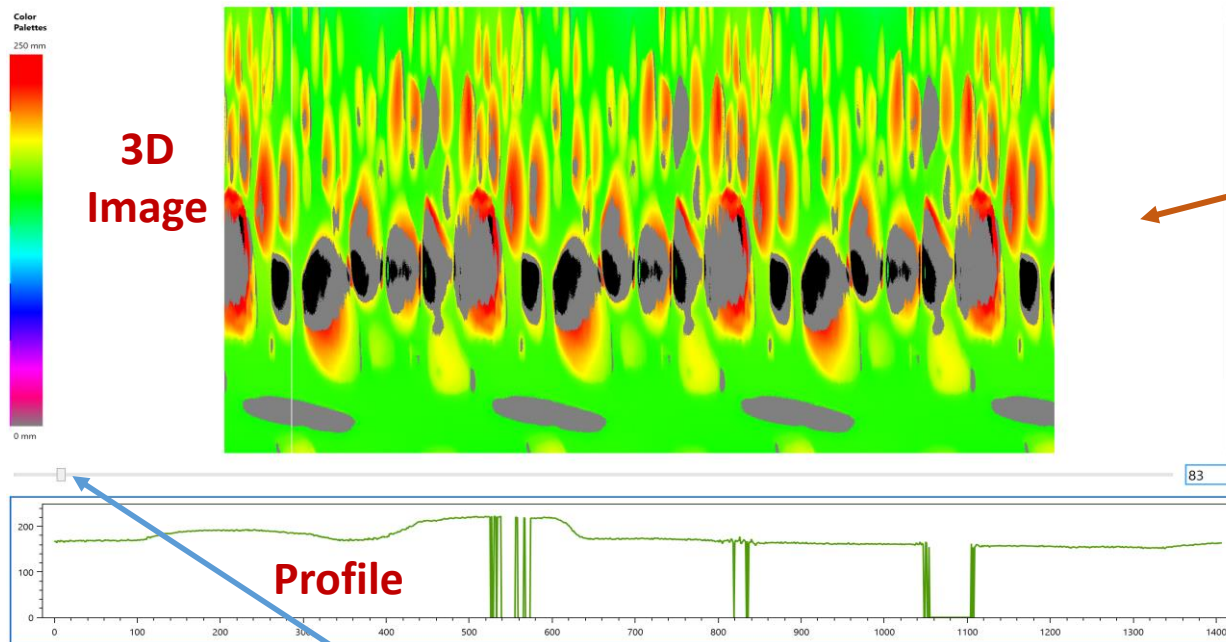


Image Source: www.vision-components.com

4. Laser Camera Setting (Continue)

- Selection of Laser Camera

- **Laser Camera Live:** PC get image and profile of camera then display into interface
- **Laser 3D Image:** Same as “Laser Camera Live”, but PC receives enough number of profile, it will calculate 3D images and show it into interface



Settings: Laser Camera

X0	0	Y0	0
Width	1408	Height	1080
Threshold	100	Shutter	300
Gain	200	FlashID	1
Current Flash (mA)	1500		
Max Flash (mA)	10000		
Trigger Source	TRGSRC_IMM		
Trigger Mode	TRGMODE_EDGE		

Laser Cam Selection

☐ LASER CAMERA LIVE
☒ LASER 3D IMAGE

Laser Camera Mode

☒ RAW IMAGE
☒ PROFILE ONLY
☐ CONTINUOUS

3D Image Settings

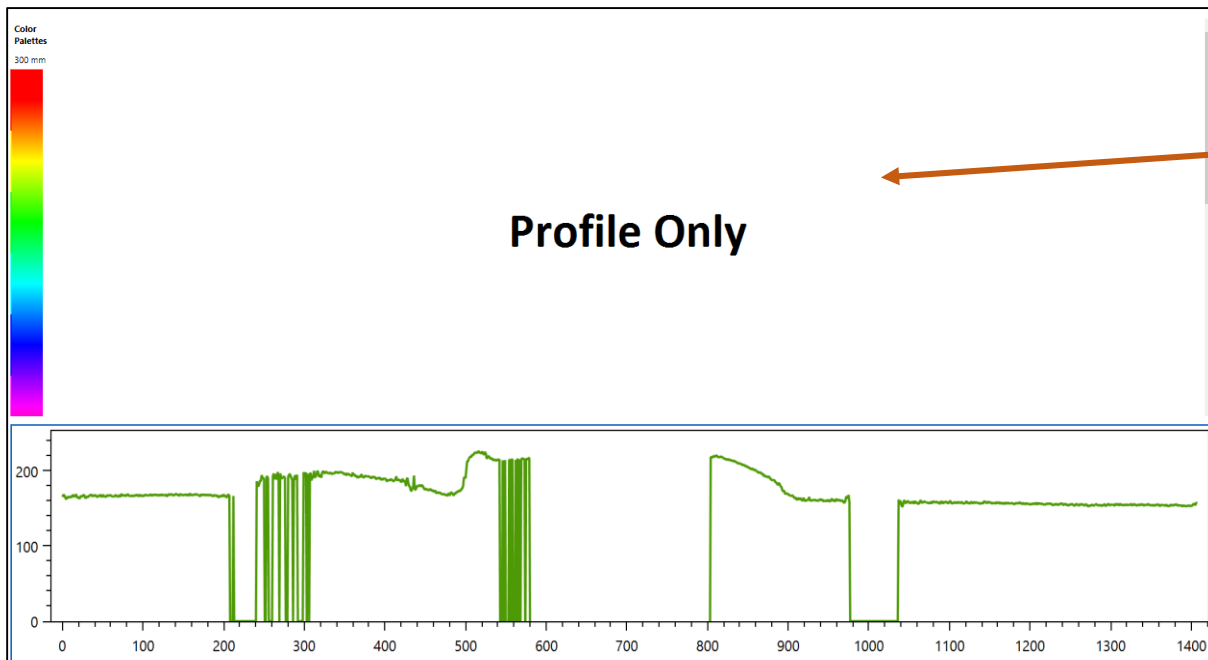
No.Profile	<input type="range"/>	200
Min Value	<input type="range"/>	0
Max Value	<input type="range"/>	300

CONTINUOUS: live will run continuously until users press “LIVE STOP button”

4. Laser Camera Setting (Continue)

- Mode of Laser Camera

- **Raw image:** Show both image and profile
- **Profile Only:** Show profile only
- **Continuous:** used when select “Laser 3D Image” and check “profile only”. Application will continuously run and make new 3D image for each “number of profile”



Settings: Laser Camera

X0 Y0

Width Height

Threshold Shutter

Gain FlashID

Current Flash (mA)

Max Flash (mA)

Trigger Source

Trigger Mode

Laser Cam Selection

☐ LASER CAMERA LIVE

☒ LASER 3D IMAGE

Laser Camera Mode

☒ RAW IMAGE

☒ PROFILE ONLY

☐ CONTINUOUS

3D Image Settings

No.Profile

Min Value

Max Value

PLC_IN Start Signal

- For start signal, you can choose
 - IMMEDIATE START**: this is no trigger mode
 - PLC_IN START**: this is trigger mode, using GPIO Nr. 10 as PLC_IN signal

Start Signal

IMMEDIATE START
IMMEDIATE START
PLC_IN START

☒
☒
☒
☒
☒

- Please note that PLC_IN is different from Trigger Source. Trigger Source here is snap trigger

Max Flash Time (us) 10000
Trigger Source TRGSRC_IMM
Trigger Mode TRGMODE_EDGE

NOTE: Incorrect VC Lib

- Your camera may have different VC LIB with us, in this case, there are some message similar this

```
error while loading shared libraries: libvcimgnet.so.1:  
cannot open shared object file: No such file or directory
```

- In this case, please copy the missing files from 01A_DemoLinux/vclib to /usr/lib

Thank You For Using This Software



- For more information and for developing smart camera software in practical application, please feel free to contact us at <http://mitech.jp/>



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