« Dear User,

In the below, you will find technical information about one of our products for 3D Virtual and Augmented Reality visualization: the **AR-vision-3D**.

This device is currently available for purchase.

Trivisio allows all its customers to make customizations of any product it offers.

Prototyping and customization is Trivisio's original focus, and with its contineous re-investment always more production services are available.

Trivisio's mission is to develop state-of-the-art optoelectronic equipment to serve numerous verticals. With its advanced knowledge and skills about opto-electronic technology, Trivisio is a reliable catalyzer to bring solutions of tomorrow available today. Each customer has a new challenge for which Trivisio is more than a supplier, it is a great partner and asset.

All our team members work to satify you. »

The marketing team

AR-vision-3D

designed for augmented reality

TECHNICAL CHARACTERISTICS

INTRODUCTION

The **AR-vision-3D** is a "head mounted display" (HMD). An HMD is an opto-electronic device that projects an image or a streaming video in the eyes from a near-the-eye micro-display source. The device is placed in front of the eyes and is supported by a head mounting mechanism. Trivisio delivers the lightest in weight solutions for HMD. The head mounted mechanism comes in three variants:

Goggle style: the nose and the ears support the weight of the device, alike reading glasses

Front fixation style: the forehead supports the weight of the device

Oaktree style: this variant is a full head fixation

Trivisio strongly advises users to have applications that allows full head fixation for the support of the opto-electronic device.

The **AR-vision-3D** is a specialized product designed for Augmented Reality applications.

Augmented Reality is a technology derived from Virtual Reality. While virtual reality is the experience of exclusively virtual worlds and objects, augmented reality is the experience of both the real world with virtual objects in the viewer's field of view. When a viewer sees the real world with additional computer generated content and data we can talk about augmented reality. Everybody experiences augmented reality just by watching TV, as the viewers watch the real world with additional virtual objects displaying textual and graphical information (name of the TV program & station, the time, the logo of the program). Our product will allow such an experience but with the feeling of full immersion and with the option to see 3-dimensional virtual objects.

Video-Tracking is another application of the video-see-through HMDs. The ARvision3D has several modes of function, one of these modes is the simple capture and restitution of the capture in the micro-displays. This simple mode can be used to track the field of view of the user.

a. DISPLAY

The device is stereoscopic (3D), and the technology used is Passive ***Stereoscopy*** which stands for not loosing any resolution during the stereoscopic experience, and requires two cables for the input.
The video cards required for having an optimal and functional stereoscopic experience are for instance dual input/output video cards (NVIDIA offers such cards).

The displays used are ***micro-displays*** with the following characteristics:

- 800*600 resolution; 480,000 pixels and 18-bit display colors each. With both micro-displays the pixels equal to 1.4 million.
- Displays are Liquid Crystal On Silicon (***LCOS***), one of the best quality of image. The image has an excellent sharpness, brightness, and contrast which allow a comfortable reading visibility without getting your eyes tired.
- Brightness and contrast are adjusted with the control unit (please see "power unit" section below for info about the control unit).

The rate (speed) of appearance of the images in the display is 120Hz per color (Yellow, Red, Blue), which accounts for a rate of 360Hz with all colors. We call this feature the ***refresh rate***. The display and appearance is without flickering; flickering being a sort of shaking of the images.

The **AR-vision-3D** gives the viewer a maximum ***Real Field of View*** of 40 degrees diagonally. The field of view can be characterizes by the size of an image at a certain display. A 40 degree field of view of an HMD is like watch a screen of 57 inches at 2 meters distance.

The ***eye relief*** of this binocular is 18 millimeters.

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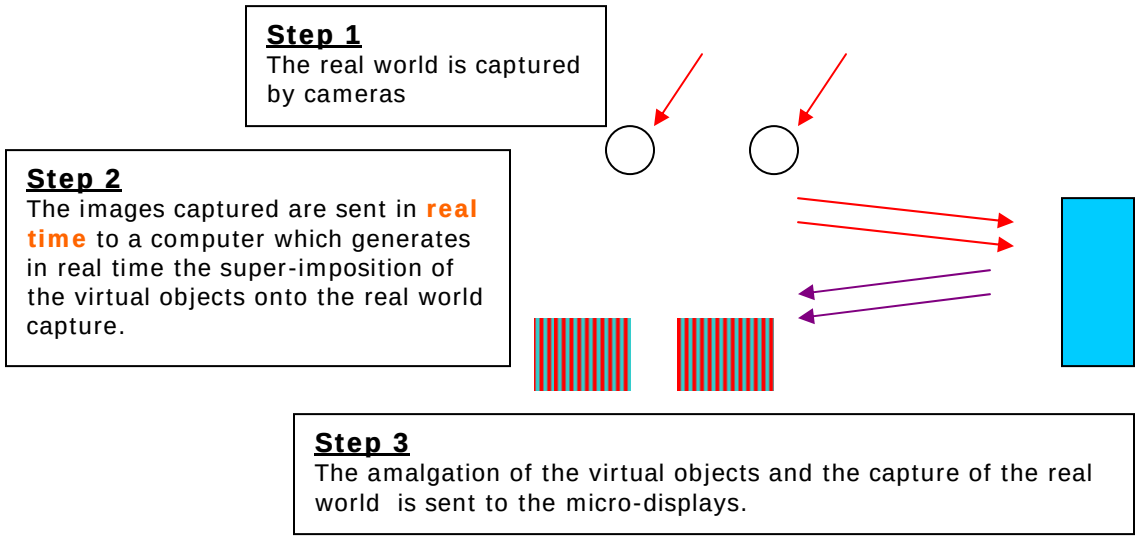
b. CAMERAS



How the augmented reality (AR) with an ARvision-3D works?

LEGEND

cameras

micro-display with the augmented image

→ capture of the real world

→ augmented image

flow of data

computer equipped with dual input and ouput graphic card

As you can notice from the scheme above the real world is captured with two cameras. We call such a capturing system a dual angle capture. The dual angle capture is important for Augmented Reality applications in order to make a perfect positionning of the virtual objects onto the real world captures. Our other Augmented Reality devices use a single angle of capture with one camera. Tracking devices are compatible with Trivisio products in order to make augmentations and positioning.

The cameras we offer for the Augmented Reality range of products are:
USB 2.0
PAL
NTSC

These mini-cameras have :

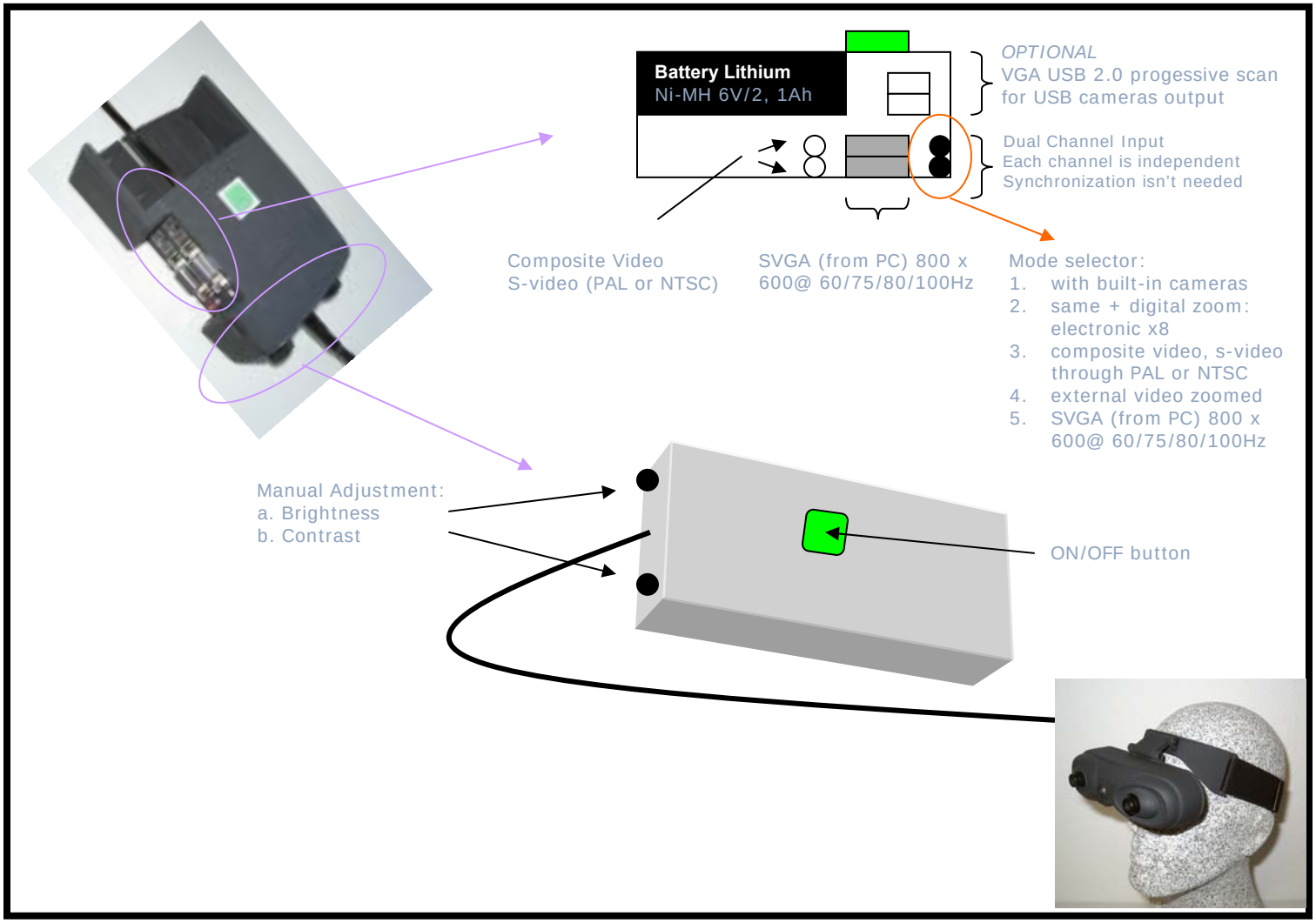
- 480*640 resolution, there is the option to have a VGA progressive scan.
- High 48 frames per second capturing rate
- 6mm lens (x0.9 vision), the lens is changeable by the user.
- Manually adjustable focus
- Manually adjustable convergence of the cameras

c. POWER UNIT: Connectivity

The ARvision-3D is equipped with a power unit which is used as controller for:

* manual display adjustments (brightness and contrast), of course you can control the image from the computer as well since the computer is the image feeder in Augmented Reality mode.
* connecting the input/output cables
* choosing the function mode

The power unit is equipped with a Ni-MH rechargeable and removable battery. The power unit can also be plugged.



SIZE (W/H/D): 105mm * 155 mm * 43 mm
WEIGHT: ~ 480 grams, including the battery
BATTERY Ni-MH 6V/2, 1Ah: Charges in 50 minutes with the provided battery plug adapter; allows 2 hours of operating time with these standard batteries.

☝ USB plugs: the USB cameras output can be through double (or splitted) USB plugs or a single USB. The splitted option allows you to control independently each cameras' output whereas the single USB output option doesn't allow a separately independent output per camera. The option you choose has to be mentioned at the order.

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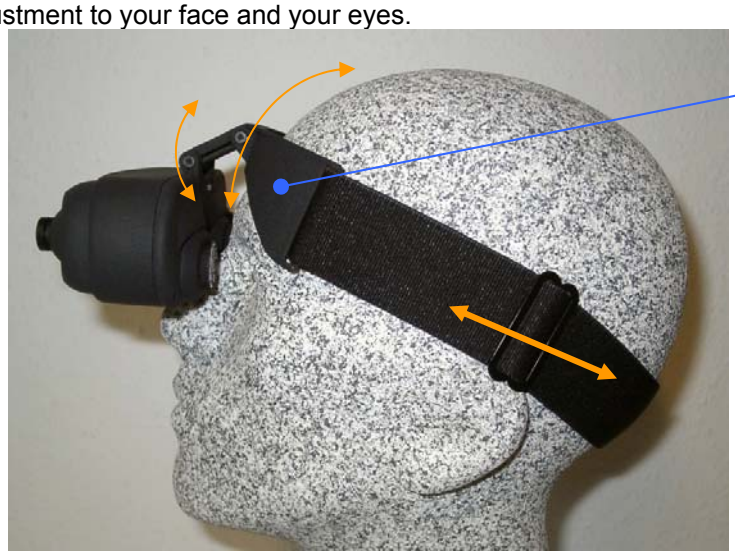
d. Attachment and Mechanical Adjustment of the HMD.

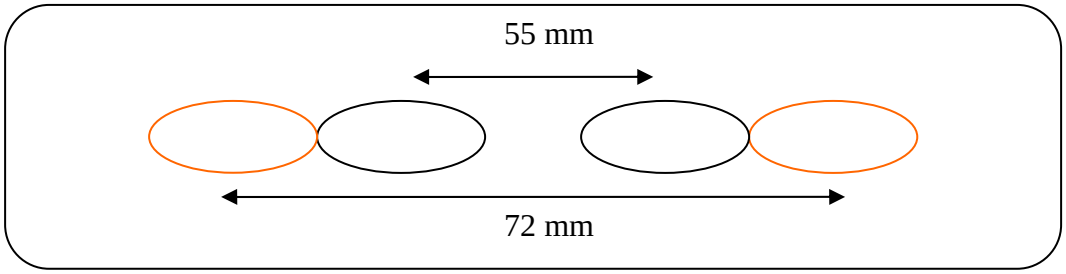
- Adjustment to the eye in two steps

1. The HMD adjustment to your face and your eyes.



2. The adjustment of distance between the oculars comes in two versions in order to match each individual's ***interpupillary distance*** (IPD).

Standard IPD adjustment: 60-75 mm
Option extended IPD adjustment: 55-72 mm



e. The HMD

The HMD comes with a basic cable length of 1.2 meters, but can be extended upon request.

The weight on the head from the device is 230 grams.

The rectangular size (W/H/D) of the HMD is 158m * 50mm * 65mm

The operating temperature of the device is from -10 degree Celsius up to +40 degrees Celsius