

## 1 Introduction

The alea technologies team thanks you for your decision to use the IG-30 system and wishes you a successful gaze interaction experience.

The system will allow the user to control specialized, e.g. AAC applications as well as many standard Windows applications through eye-movements. This Quickstart-Guide will guide you through the first steps and list configuration option, where appropriate.

### 1.1 IntelliGaze™ [IG] v.1.2

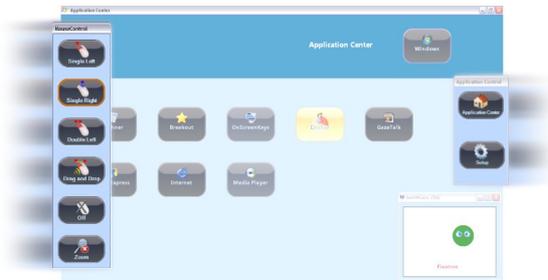
IntelliGaze™ can be seen as a mouse replacement software application. It uses a camera system to acquire images of the user and calculates the actual gaze from the eye images. The gaze location is then flexibly mapped into a cursor position and configurable mouse control.



A new user needs to be calibrated to the system, before the gaze control can be used. The gaze tracking and 'click' control can be adopted to the user requirements and the target application.

### 1.2 Application Center [AC]

The Application Center acts as a configurable Home-Page to the gaze controlled PC. It provides one-look start-up of applications and Windows desktop access. The AC also provides off-screen accessible areas, which control the mouse behavior and allow the run-time adjustment of several system parameters.

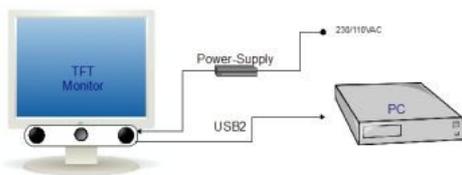


## 2 System Setup

### 2.1 Hardware

The system should have been pre-configured by your supplier. The camera mounting has been matched with the monitor type and size and has been pre-adjusted properly.

1. Attach the monitor to the desktop stand or monitor arm provided.
  -  Please pay attention to the mechanical robustness so that the setup can not tip over or harm the user.
2. Attach the camera unit to the special adapter provided with your system.
  -  The camera lens has been calibrated and locked during production. Do not try and change the lens settings at any time.
3. Connect the camera cable to a USB2 port on the computer, attach the power-supply and connect it to the net.
4. Turn on the computer.



 The LED on the back-side of the camera unit indicates proper power-supply of the illumination (green). In case of problems, the LED will change to orange, in which case you should turn the device off and contact service.

 If the camera has been connected to a different USB2 port than before, the driver installation dialog might pop up, but should simply be accepted.

 If the physical camera-monitor configuration has been changed, the settings in the **Monitor Calibration** have to be adapted accordingly!

### 2.2 Monitor Calibration

These measurements only have to be performed, if the camera mounting geometry has been changed. A failure can in particular cause inaccuracies under head-movements.



1. Open the external program: All Programs\alea technologies\IntelliGaze\Monitor Calibration
2. Enter the values for the monitor resolution.
3. Use a metric ruler to measure the physical monitor size and the camera-monitor distances.
4. Close the program and restart IntelliGaze.

### 2.3 Software

The IntelliGaze™ background operation should be started with your login if the entry has been put into the 'Autostart' list correctly, and show up in the system-tray, where a right-click on the icon shows the options.



If a manual start is desired, double click on the IntelliGaze icon  on the desktop.

## 3 First Start

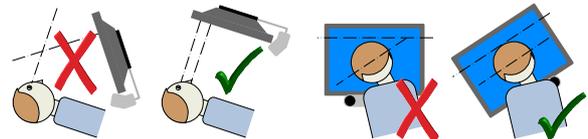
The following paragraphs will provide a step-by-step guide through a successful operation of the system

 It is highly recommended to limit the complexity of the 1<sup>st</sup> gaze controlled application, and test the setup with an experienced user like the operator himself, in advance.

 As simplification the first steps are assumed to be carried out with a Dwell click. Alternatives are Blinks or Switches (see 4.2)

### 3.1 Subject Orientation

The monitor should be aligned with the subjects head, in about 60cm distance. The top of the monitor should be only slightly below the top of the subjects head. If the subject's head is rotate, i.e. lying on the side, the monitor should be rotated as well.



Once a correct position is achieved, the tracking will start fully automatically. The Tracking Status Monitor will help, adjusting the subject or monitor. As a result, the head position should be indicated as good (green) and both eye icons should be present while looking at the corners of the screen.

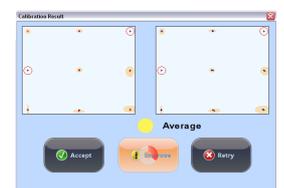


If a subject wearing glasses turns out to be problematic to track stably, changing the head angle or tilting the glasses slightly will improve results in most cases. Halogen spot lights or direct sunlight can cause problems as well and are to be avoided.

### 3.2 Calibration

Start the calibration by either looking into the camera or pressing **Ctrl-F5**. Follow the calibration target on the screen. After the sequence finishes, the calibration result will be displayed. The colored dot's size will represent the selected target accuracy for the calibration and the color, as well as the text label, will indicated the achieved result.

The calibration can be accepted by looking (pressing) at the accept button. If problematic data has been collected for some points, these will be labeled and the option 'Improve' will be displayed. Depending on the desired accuracy and the subjects capabilities the





calibration can either be accepted anyway, an improvement run can be started or a completely new calibration can be initiated. The calibration results will be used until another calibration will be performed even over system restarts. After accepting a calibration, the Application Center will be started automatically.

*The application center might appear differently from the above, depending on the installed and pre-configured applications.*



### 3.3 Start an Application

An application can be easily started by fixating ('clicking') on one of the application buttons.

*For training or adjustment purposes the cursor control can be toggled between 'gaze' and 'mouse' input by pressing PAUSE key or moving the mouse at any time.*

### 3.4 Return to the Application Center

To close the application you are using and return to the Application Center, fixate slightly right off the screen. This will bring up the panel showing an Application Center button. Activate the button, your application will be closed and the Application Center will come up. The application center can be accessed at any time by pressing **Ctrl-A**.

## 4 Configuration Options

### 4.1 IntelliGaze™

#### 4.1.1 Calibration [Setup | Calibration]

The calibration can be adjusted to the users capabilities. Most important parameters, default value underlined:

- **No. of Points:** 1 – 5 – 9 – 16

Higher number of points can increase the accuracy, while less points are easier to calibrate.

*The 16-point calibration is a special high accuracy calibration which slightly reduces head movement tolerance for higher accuracy. Use this calibration if you want maximum accuracy and the subject is not moving very much.*

- **Target Accuracy:** 10 – 20 – 30 – 40 mm (screen)

Determines the desired gaze accuracy after calibration, that is achievable for the individual user. Used only as reference quality for feed-back after calibration.

- **Automatic Calibration / Skip bad point**

The calibration will proceed automatically, waiting for valid data at each point, unless the 'skip' option is selected. In non-automatic mode, the operator has to press **[SPACE]** to accept each point.

- **Position Calibration Area:** Full – Center - Bottom

- **Choose which eye to calibrate:** Both - Right – Left

While by default the system combines gaze data from both eyes into a most robust gaze-location, some subjects with vision problems might only be able to calibrate on one eye.

The additional option to Ignore the other eye completely allows stable tracking, even if the other eye is not visible at all. Under this condition the second eye must never be visible to the camera, else the tracking might become unstable.

- **Slow Mode:** off / on

Reduces the speed of the calibration process and enlarges the calibration targets to help tired users.

### 4.2 Application Center [AC]

#### 4.2.1 Application Behavior [Setup | Appl. Ctr. ]

Each application, that has been configured to start from the AC possesses a set of start-up parameters, especially controlling mouse emulation. These parameters override the standard settings during the run-time of the particular application.

- **Application Options**

Enter name, icon, start-up arguments, etc. here.

### • Mouse Options

A special case is the direct control via API. This requires an adapted application, which handles the communication with an internal interface. The mouse is hereby no longer controlled by IntelliGaze. All interaction is done by the respective application.

**Mouse Trigger** - beside by several hardware switches, the mouse click can be triggered by adjustable dwell-time or blink.

**Mouse Cursor Shape** - The cursor display should set according to the trigger type, i.e. dwell works best with the animated circle which acts as a progress indicator, and the application.

*Obrusive cursors can distract the user and therefore reduce the accuracy. Several AAC applications can generate their own cursor and dwell indicator.*

**Mouse Cursor Output** - The cursor can be controlled by fixation-filtered or raw gaze data. Unless delay (e.g. in games) is an issue, it is recommended to use 'fixation' setting.

**Blickfang™** - Corrects gaze input according to user interface element positions. There is a growing number of application that are supported by Blickfang™, i.e. Mind Express, The Grid, OnScreen-Keys, Viking Communicator, Words+.

## 5 Hotkeys

Hotkey	Function	Comment
<b>Ctrl- A</b>	Show Application Center	
<b>Ctrl- F5</b>	Start Calibration	<b>ESC</b> will cancel
<b>SPACE</b>	Accept point during manual calibration	Will use next valid fixation.
<b>PAUSE</b>	Dis-/Enable mouse cursor control by gaze input	Toggles Gaze<->Mouse. Gaze input is automatically disabled at mouse input
<b>Ctrl- S</b>	Toggle standard mouse cursor (display) on/off	
<b>Ctrl- D</b>	Desktop video recording	With gaze cursor overlay
<b>Ctrl- F1</b>	Show Status Monitor	<b>Ctrl Cursor-↕</b> resizes <b>Ctrl Cursor-↔</b> positions
<b>Ctrl- F11</b>	Enter Setup	Equiv. to Tray-Icon
<b>Ctrl - G</b>	Open the eye gesture trainer	Only when an eye gesture alphabet is loaded
<b>R-Click tray icon</b>	Enter Setup	

## 6 Safety Considerations

All initial setup and configuration shall only be conducted by trained personal. The system must not be used with any other power-supply than the originally provided unit! The camera system contains no serviceable parts. Do not open the camera system!

Dis-/Connect cables only, when the power-supply and PC are turned off!

The IG-30 system is compliant with CE regulations for EMC and the EN 60825-1 standard for LaserSafety.

## 7 List of Components

All components should have been set up and pre-configured by your local distributor.

1. CAM30 camera-illumination unit, incl. license
2. Power-Supply (230/110V), Installation CD
3. VESA-Mount
4. Quickstart-Guide

## 8 Support

Distributor	Name / Contact