

EyeLink Setup Instructions

1. Switch on the **multi-plug connector** (next to buc01), it's always on. Then **turn on the switch** (inside the cupboard on the right hand side, in scanner room) **to the EyeLink position**. Switch on the **Host-PC** (button on the back side and then power button on the front). Select the default "**EyeLink**" partition from the "Windows Boot Manager" interface.

Another way to start the host application is to go to the directory where it is stored and call it by typing the following lines at the command prompt:

e.g. **CD C:\ELCL\EXE [ENTER]**
ELCL.EXE [ENTER]

If you're using **rear projector**, use the following lines to start the application:

CD C:\RearProjector\EXE [ENTER]
ELCL.EXE [ENTER]

2. Select the appropriate **EyeLink Configuration (Long Range Mount)** from the 'Set Options' screen.
3. Select **Button1** on the **Extron** box. This allows projecting the entire desktop display of the EyeLink computer into the projector.
4. **Camera head and Illuminator Separation:** Adjust the camera and illuminator clip positions on the mounting bar so that the **inner edge** align with **the eye-to-camera distance measured in cm**.
5. **Align the camera:** Once the subject is positioned in the bore, the mirror might have to be slid forwards or backwards (for front projector, adjust the little mirror attached on the head coil mirror) so that the eye is clearly visible from behind the scanner. Point the camera at the eye to be tracked so that the eye appears in the centre of the **global view** (top image window on the 'Camera Setup' screen). **Focus the camera image** if it looks blurred (by turning the lens wheel, ring with the metal screw on it), a good guidance is to check the eye lashes are in focus; when they are sharp the image is usually good enough. The **eye holes** (32 channel coil) limit your field of view and increase the chance of shadows. Decide which eye you are tracking in advance and try to position that eye centrally within the **eye hole** of the head coil.
6. Turn off **threshold colouring** from the 'Camera Setup' screen and click on the pupil position on the global view of the camera image to acquire the pupil position.
7. Move the **illuminator** up/down and left/right so that the patch of the light is aligned with the field of view of the camera. For **focusing the illuminator**, loosen the 2 screws on the underside of the illuminator and then adjust the cover so that its edge aligns with the marking that approximates the eye-to-camera distance and then tighten the screws.
8. Turn the **threshold colouring** back on and press the 'auto threshold' button to set the pupil and CR threshold. If the threshold is too low or high, use the **pupil**

threshold buttons (or ‘UP’ and ‘DOWN’ keys) to manually adjust the pupil threshold, and **CR threshold** can be adjusted by using the **CR threshold buttons (or the + and – keys)**. Check that there are no large shadows within the threshold (i.e. big blue patches that are not the pupil). If there are you can move the bounding box (search limits) as best you can in order to include the eye but not the nearby shadows). N.B. round shadows are especially bad, if these are within the search limits eyelink might start to track them when your subject blinks or gets sleepy. **It is a good idea is to make the subject look along the edges of the display and ensure that the corneal reflection does not get lost.**

9. Default settings for the display resolution of Eyelink is set to **1024x768** in the PHYSICAL.INI-file that specifies the settings (screen_pixel_coords = 0.0, 0.0, 1024.0, 768.0). It’s important that it is matched with the actual display resolution you use. If you use a different display resolution, you can change the settings, but don’t do this in the PHYSICAL.INI file. Rather, copy the command line to the **FINAL.INI** file and change the setting there (this will override the settings in the PHYSICAL.INI-file). All setup files (.ini files) are stored in ‘C:\ELCL\EXE’ directory. **Remember to reset it to the default settings after you finished your experiment!** The best way to set the display resolution is to have your script send a command to the Host PC to update this parameter based on the resolution you are using.

e.g. `EyelinK('Command', 'screen_pixel_coords = 0 0 1920 1080');`

We got a separate setup for rear projector and the modified .ini files are copied into ‘C:\RearProjector\EXE’ directory. So for rear projection, load the Eyelink application as said in step1.

10. Before starting the calibration, select **button 3** (Cogent PC) on the **Extron box**.
11. Start **TRACK.EXE** (‘Programs - SR Research – EyeLink - Track ’) from the Cogent PC. To open track on the secondary monitor (dual view mode), call **open_track(1)** from the Matlab command prompt.
12. Begin **calibration** by pressing the ‘**Calibrate**’ button from the **Camera Setup** screen. When the pupil appears stable, press ‘**Accept Fixation**’ (or ‘**ENTER**’) button to accept the **first fixation**, then let sequence run by itself. If the calibration was successful, press the ‘**Accept**’ (or ‘**ENTER**’) button to accept the result, ‘Restart’ (or ‘ESC’) button to repeat the calibration.
13. Select ‘**Validate**’ (or ‘**V**’) button to start **validation**. Once the cursor appears stable and close to the target, press ‘**ENTER**’ to accept the first fixation, then let sequence run by itself. Press ‘**ENTER**’ when finished.
14. Repeat calibration if validation is poor.
15. **Close ‘Track’** if the validation is good.
16. **Start your experiment**. Make sure that the **filename** to store your data **does not exceed 8 characters** otherwise it may not properly transfer your data at the end of the experiment.
17. When the experiment finished, Press ‘**CTRL+ALT+Q**’ to exit the EyeLink 1000 Host PC application.

18. **At the end of your experiment please turn off the Host PC and then turn the switch (inside the cupboard on the right hand side, in scanner room) to OFF position.**