



# EyeLink 1000 eye tracker in MEG Core

This manual is to provide information to work with the SR Research EyeLink 1000 eye tracking system in MEG Core. Further helpful information can be found from the EyeLink1000 User manual and from the SR Research Support Sites (you have to register!). There you can also find a forum, example experiments and download the documents and software packages. <https://www.sr-support.com/>

## 1 System setup

Eye Link 1000 consists of the following components.

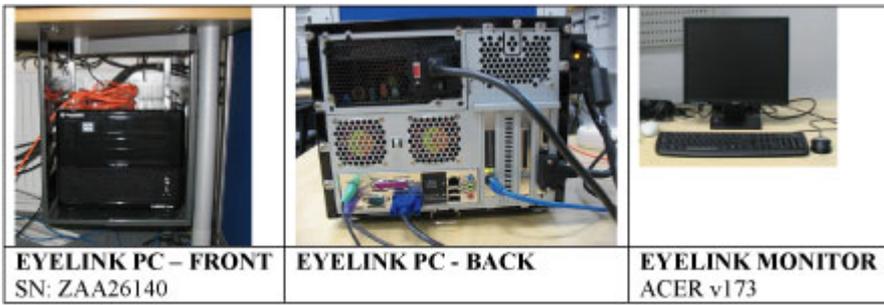


Figure 1: Eye Link PC, SN: ZAA26140



Figure 2: MEG control room components

		
<b>DESKTOP MOUNT WITH THE BAR</b>	<b>CAMERA HEAD</b> EyeLink CL-OC ZAA 26	<b>EYELINK IR-PANEL</b> FL-890 SN:0023
		
<b>EYE TRACKER ON DESKTOP MOUNT</b>	<b>EYE TRACKER ON TRIPOD</b>	<b>EYELINK DESKTOP MOUNT</b> FLM, Centerball 24F
		
<b>TRIPOD MOUNT ADAPTER</b>	<b>DESKTOP MOUNT PLANE</b>	

Figure 3: Eye Tracker components

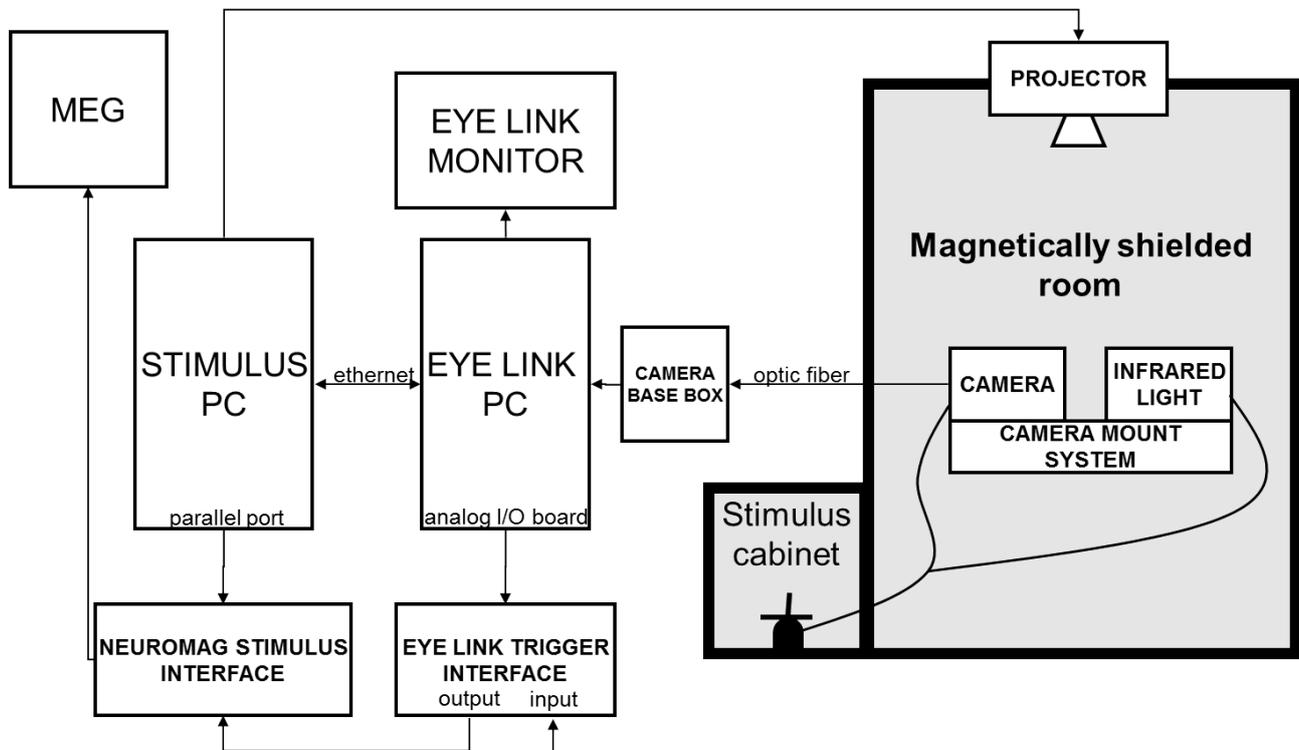
		
<b>STIMULUS PC</b>	<b>NEUROMAG TRIGGER INTERFACE</b>	<b>STIMULUS CABIN</b>

Figure 4: EyeLink Interface components

### 1.1) Wiring of the Eye Link system

The Eye Tracker is installed in the MEG. This means that the Eye tracking Host PC and all eye tracking components in the control room are installed and fixed to their place. Still one should make sure before experiment that everything is connected and the proper settings are set.

## EYE LINK 1000 WIRING IN MEG



The following connections are connected when the system is normally set. If something doesn't work, check the following first:

1. Eye Link cable should be connected between camera base box and Eye Link Pc
2. All power cables should be plugged in:
  - a. Eye Link Pc
  - b. Eye Link Monitor
  - c. Eye Link Camera Base Box
3. Optic fiber should be connected to the camera base box
4. Cross wired Ethernet cable: other end to the Eye Link Pc and the other to the PCI-Ethernet card on the stimulus pc.

When using the eye tracker, do also "(See the chapter 3.2 Starting and running the experiment)"

5. Inside the magnetically shielded room, connect an optic fiber to the eye link camera
6. Inside the magnetically shielded room, connect two power cables with the camera power and IR-light power.
7. Connect the Eye Link Power to an outlet inside the stimulus cabin.

### 1.2) Software setup

Check out the system settings. The detailed system settings are defined the INI-files, which can be found under the c:\elcl\exe directory on Eye Link Host Pc. Here we go through the most used ini-files: physical.ini, button.ini, analog.ini and final.ini.

NOTICE: You can also set some parameters of INI-files remotely from stimulus PC. Advantage of this: Parameters which are altered remotely won't change the INI-files permanently.

### PHYSICAL.INI

The file contains the physical characteristics of the setup. Measure the current parameters of your setup and fill the details. The physical measures refer to the screen sizes of the back projection screen. These dimensions should be measured when the screen is on its place.

**NOTICE:** The default settings below are measured just from a single setup. It's crucial to measure the physical dimensions before experiment, and make sure that the parameters below are properly set. Instead deleting the old settings permanently, you can start the line with comment marks ";;".

The default settings:

```
screen_phys_coords = -350.0, 260.0, 350.0, -260.0
;;millimeters from the center of the screen(left, top, right, bottom)

screen_pixel_coords = 0.0, 0.0, 1400.0, 1050.0
;;pixel coordinates on the edge of the screen (left, top, right, bottom).
;;If you are using a different resolution in your presentation than
;;the native resolution of the stimulus PC monitor, you need to change
;;these values accordingly.

screen_distance = 1260 1305
;;(distance from the eye to the top
;;distance from the eye to the top and to the bottom of the screen
;;in millimeters.
```

It's important that these parameters are properly set, though they'll effect on fixation and saccade detection.

For more details, see *EL1000\_InstallationGuide, 8.4 Customizing Your PHYSICAL.INI Settings'*

### BUTTON.INI

This file defines the external buttons been used.

Functional buttons can be set for the game controller via USB port, or external devices via digital input interface.

For USB device, write:

```
create_usb_button 1 307;; (y-button, HID coding)
```

For digital input port:

```
create_button 7 2 0x01 1; uses channel "digital in 1" on EyeLink interface box  
;; last digit is <inverted>-signal, 1 if active-low, 0 if active-high
```

where 7 = number of the button, number 2 = input port address and 0x01 the received trigger, here we get a trigger from channel 1.

After defining the button, you can use this as a button device in Experiment Builder, by referring to "button 7".

### **ANALOG.INI**

Analog.ini-file defines how the analog channels are been used; voltage range and coordinates levels are set.

For example:

```
analog_dac_range -5, +5;;  
set the voltage rate between -5v to +5v. The system limits are ±10v.
```

Gaze coordinates on the visual stimulus can be calculated from the voltage levels with the following equations:

```
R = (voltage - min voltage) / (max voltage - min voltage)    (1)  
S = R*(max range - min range) + min range                    (2)  
gazex = screenleft + S*(screenright - screenleft + 1)        (3)  
gazey = screenbottom + S*(screentop - screenbottom + 1)      (4)
```

### **FINAL.INI**

Final.ini file overrides the parameters wrote in other ini-files. It's recommended to make the changes to this final.ini files, not to the default one.

Parallel port is set in the host PC on default, so the parallel interface works automatically. If you want to use parallel triggers, check that the following lines are in the final.ini file.

```
write_ioport 0x37A 0x20 ;; enables the bidirectional function for  
                        ;; the current parallel port  
input_data_ports 0x378 ;; set the input ports to the data register
```

## 1.3) External devices

### 1.3.1 Stimulus PC

Stimulus PC is connected to the Eye Link PC via Ethernet cable.

Ethernet cable should be connected (blue cross wired cable) between the computers and the following settings set for the Ethernet card of the stimulus PC settings. Name of the connection is "EyeTracking":

```
EyeTracking  
IP - 100.1.1.2  
Subnet mask 255.255.255.0
```

You can control the the Eye Link Host PC remotely from the stimulus PC. For that you need a presentation software, which can control the stimulus presentation, but can also send needed markers and triggers to Eye Link Host PC. See more info from "Stimulus Software" about how to control the eye tracker remotely.

Stimulus PC has a parallel output (printer port) which is directed to the neuromag trigger interface - box, using channels 1-8. These channels can be used for controlling the actions related to stimulus presentation to MEG.

### 1.3.2 Eye Link interface

Eye Link PC includes PCI analog card and an output board (ST 334), which consist of analog out and digital input/output channels. The trigger interface provides sending and receiving TTL pulses, and sending of the analog signal.

The output channels from the EyeLink interface box can be connected to input channels 9-16 of the "neuromag trigger interface" (Figure 2) via coaxial cables.

Analog DAC card (DT334) is connected to "EyeLink interface" via cable with an AMP connector.

## DIGITAL OUTPUT

To trigger the digital output signals, you need to send a "write\_ioport" -command to the Eye Link PC. This can be done from the stimulus PC, or by defining a button, which executes a write\_ioport -command.

```
button_function 7 "command_press" "command_release"
```

The command consists of two parameters: port address and the sent data.

Examples of using the "write\_ioport" commands.

```
write_ioport 4 0x01 ;; sends a trigger to the channel 1 on port address 4 (digital out)
write_ioport 4 0x00 ;; clears all signals on port 4 (digital out)
write_ioport 4 0xFF ;; send trigger to all 8 channels on port address 4 (digital out)
```

Triggers are sent as hexadecimal numbers. See the correct code for each channel from the table below.

Channel	1	2	3	4	5	6	7	8	Clear
Code	0x01	0x02	0x04	0x08	0x10	0x20	0x40	0x80	0x00

Normally you should clear each signal after the trigger has been sent (the length of the minimum pulse should be around 10ms). Notice that you can use 8 different output channels but you can't trigger them separately at the same time by using two different write\_ioport commands. To trigger two or several triggers at the same moment, you need to send such hexadecimal message which turns them on at the same time. For example "write\_ioport 4 0x05" command triggers channels 1 and 3 simultaneously.

See more information about how to send the triggers in practice with the presentation software from the each presentation software chapter later on.

## DIGITAL INPUT

Digital input port can be used for controlling the Eye Link Host PC. For example tactile triggers can be used for controlling the experiment

New buttons can be added in "button.ini" -file (check the predefined buttons). See more details how to define the input buttons from the chapter "button.ini".

## 2 Experiment

### 2.1) Preparations

#### 2.1.1 Subject

When recording single eye only, the eye movements should be measured from the subject's dominant eye. The dominant eye can be measured:

- With a two fingers method: Place your both index fingers in line onto front you. Look at the fingers and close your eyes in turns. If the view doesn't change (you still see the fingers in same angle) while closing your eye, the current open eye is the dominant one.
- With two hands, make a small hole with your thumbs and index fingers and raise them at your eye sight level, while keeping your hands extended. Now focus on certain small object (egde, pin or such..) through this hole. Next bring the arm closer to your eyes while still

looking at the object through your fingers. Finally your hands will follow to your dominant eye.

### 2.1.2 Mascara

Eye lashes will get very dark when having mascara, which can effect negatively on the pupil detection.

### 2.1.3 Eye Glasses

Normal eye glasses can't be used in MEG, but special goggles are used instead. When using glasses with the eye tracker, the lenses may reflect infra-red light, which can disturb the eye tracking. Eye tracker may work with glasses, but it needs to be adjusted very carefully. Notice that the successful rate is lower with the glasses than without.

### 2.1.4 Contact Lenses

There are basically two types of contact lenses: hard and soft.

#### 2.1.4.1 Soft lenses:

Soft contact lenses works normally quite well. The edge of lens can be seen from the eye image as a pale ring, but it usually doesn't effect on the eye tracking. On the other hand, lenses can create an extra reflection point, which is very close to 1st Purkinje image, but is normally visible only on certain angles.

If the lenses don't fit in the eye perfectly, they can slide a little bit on top of the eye. This makes the tracking less precise, especially in the extreme corners.

#### 2.1.4.2 Hard lenses:

Hard lenses don't usually work with the eye trackers. They tend to be less stable than soft lenses and can slide partly off the center of the eye. This will produce an eye image, where the pupil is cut off partly.

### 2.1.5 Device setup

Set the following things before bringing the subject inside the MSR.

1. Bring the camera system inside the magnetically shielded room. Place the mount on the desktop mount. Place the mount on the fixed distance. Look at the tape marks on the floor.
2. Connect the cables (power cords of the IR-light source, the camera, and the optic fiber) inside the MSR. Check that the power plugs are connected inside stimulus cabinet.
3. Turn on the Eye Link PC. Choose option "Eye Link" from the startup menu and press enter.
4. Turn on the Stimulus PC (Windows).
5. Turn on the projector.
6. Set the back projection screen on the certain distance and adjust the screen to a certain size (look at the markers on the back projection's screen holders). Same settings should be fixed in the physicals.ini -file on the Eye Link Host PC.

7. Show the "eye view"-image on the back projection screen. You can do this with your presentation software, or you can run the track.exe –file on Stimulus PC, which shows the eye image on the screen.

## 2.2) Setting the camera system

1. Bring the subject inside MSR and place on the MEG-chair. Lift the chair to the measurement position.
2. The camera and the infrared light source are attached to its mount. Their positions are calibrated and directed to a single point, and normally you shouldn't touch their positions on the bar. Take the lens cover off.
3. Uncheck the threshold coloring from Host PC.
4. Show the eye image (the overview scene image) on the back projection screen (For Example run the track.exe-file on Stimulus PC and click the "enter" twice to see the eye image on Stimulus PC and on the back projection screen).
5. Adjust the camera position, so that eye will be shown in the middle of the "eye view image".
6. When the eye is visible in the image, click the eye with the mouse cursor on Host PC and switch the camera view for the closer eye image.
7. Focus the camera lens, so that the image is sharp. The easiest way to see this is when the cornea reflection is as small as possible.
8. Check the threshold coloring from Host PC.
9. Change the pupil and CR threshold levels if needed. See Eye Link 1000 Installation guide, chapter 7.5 Long range mount camera setup
  - a. Pupil threshold: Idea is to fill the dark pupil with blue color. If there isn't enough blue color inside the pupil, adjust the pupil threshold level up. If there is too much blue color around the pupil, change the threshold level down.
  - b. Cornea reflections: Idea is to have as small CR as possible. If there is a white halo around the turquoise reflections, adjust the CR-threshold level down to vanish it.
10. Calibrate (see Calibration)
11. Validate and check if the calibration is good enough.

## 2.3) Calibration

Few things which need to be noticed when doing the calibration:

- Choose the eye to track.
- The background's brightness of the calibration shouldn't differ much from the brightness used in the actual experiment. If there are dramatic changes in pupil size, it may effect on tracking abilities. This is due to the pupil reactions to the brightness. Black background in the calibration enlarges the pupil and if the experiment itself is very bright: the pupil will shrink to small. The different sizes of the pupil may cause inaccuracy to the tracking.
- When calibrating, it's crucial to ask the subject to focus on the center of the calibration ring, not just to the "ring" itself. This way you get much more accurate calibration, and the "calibration grid" will appear straight.
- Automatic vs. Manual calibration. The guideline is to use manual calibration when possible. In the manual calibration, with training, the operator learns to see when then gaze has positioned to its place and when to clarify the point. As opposite, the automatic calibration calculates the first steady state, even though the gaze isn't centered to the calibration point yet. In manual calibration: operator checks the calibration point manually by pressing the space bar when the eye focuses on the point.

## 2.4) Pupil Calibration

EyeLink system records either pupil "diameter" or "area". This can be set in the setup window of EyeLink. The units will vary between different subjects, so the pupil size needs to be calibrated. Otherwise the output unit is "arbitrary".

There exists no calibration procedure in EyeLink, but each user has to calibrate on their own. When subject is on the chair, put "a fake eye" on top of the subject's eye. Now track the fake eye. Change the tracking mode to "pupil" and record few seconds of data. After that, you should change to "pupil-CR" -mode again.

When you know the size of your fake eye, you can calculate the conversion factor between mm:s and eyelink-units.

### 2.4.1 Calibration with PresLink

Calibration can be run remotely by using PresLink extension. In this way you also can set your custom settings for the calibration. Example of the sce/pcl code:

```
begin;
picture {
  text { caption = "[C]alibrate"; font_size = 45; transparent_color=128,128,128;}; x = 0; y = 0;
}et_calibration;

begin_pcl;

eye_tracker tracker = new eye_tracker( "PresLink" ); # initialize PresLink.
tracker.start_tracking() ;#connect to Eyelink tracker.

tracker.send_command("screen_pixel_coords = 0, 0, 1920, 1080"); #send resolution to eye tracker host.
tracker.send_command("screen_phys_coords = -265, 150, 265, -150");#send resolution to eye tracker host.

tracker.send_command("screen_distance = 600");      # send screen distance to eye tracker host.
tracker.send_command("calibration_type = HV9");     # enable 9 point calibration
string target_fname = stimulus_directory +"target.bmp";
tracker.set_parameter("target_file",target_fname);

et_calibration.set_background_color(128,128,128);
et_calibration.clear();
et_calibration.present();

tracker.calibrate(et_calibrate_default, 1.0, 0.0, 0.0); # start calibration routine;
```

Calibration uses a picture et\_calibration by default. So if you want to use a custom point, name your picture as et\_calibration. Notice that you can use bmp-files only.

### 3 Stimulus Software

A separate stimulus software is needed for the stimulus presentation with the EyeLink PC. The stimulus PC is used for showing the eye image, the calibration and the stimuli presentation, whereas Eye Link Host PC controls the eye tracking.

There are few software which are already installed in the MEG stimulus PC:

#### 3.1) Experiment Builder

The Experiment Builder is a visual experiment creation tool for usage with the EyeLink eye tracker.

While a primary goal of the Experiment Builder has been to create a tool that allows to easily creating EyeLink experiments; the Experiment Builder can also be used to create non EyeLink experiments that do not need eye tracking functionality.

The SR Research Experiment Builder can be downloaded and used in a fully functional evaluation mode for 30 days without a license from the [<http://www.sr-research.com/> SR Research home page]. To use the software in a non-evaluation mode after the 30 day trial period, a USB key that has been programmed with an Experiment Builder license code is required. The key locates on the wall behind Stimulus PC in the MEG control room. You can borrow this usb-dongle by writing your name on the notebook (locates on the shelf, next to the dongle).

##### 3.1.1 Input Triggers

When receiving a TTL trigger, you need to choose which ports to use. Basically you have to option. Either parallel port of the Stimulus PC or to create a button from I/O port signals on Host PC.

##### Parallel port of Stimulus PC

To enable TTL signals in Experiment Builder, you need to set the parallel port in Properties window (Devices->TTL). Address for parallel port = 0x378.

Add TTL-input object from the trigger toolbar to the workspace. Choose the Parallelport\_1 for "Device". There are two ways to set which pins to listen, either you can define the wanted inputs by hexadecimal (Mode = WORD) or define each pin separately (Mode = PIN).

##### Create a button from I/O port signals

Add EyeLink Button object on the workspace. Define which buttons are listened. Define these button in button.ini file on Host PC. For example

```
create_button 7 2 0x01 0;
```

this defines a button 7, which is triggered when the channel 1 in EyeLink Interface is triggered.

Then choose [7] for the Buttons, in the properties menu of the EyeLinkButton object.

### 3.1.2 Output Triggers

STIMULUS PC. To enable TTL output signal in Experiment Builder, you need to set the parallel port in Properties window (Devices->TTL). Address for parallel port = 0x378.

Add SetTTL object from the Action toolbar to the workspace. Choose the Parallelport\_1 for "Device". There are two ways to set which pins to trigger, either you can define the wanted outputs by hexadecimal (Mode = WORD) or define each pin separately (Mode = PIN).

### 3.2) Presentation software

Presentation software is installed on stimulus PC and is often used for stimulus presentation in MEG measurements.

- PCL code with PresLink using Ethernet connection
- TTL- triggers using parallel port

You can combine these two methods to get the benefits from each. If you like to have a flexible remote connection to Host PC and still very accurate triggering, you can use PresLink interface for calibration, start tracking and such. As an addition; use the port\_code triggers for precise synchronization.

#### 3.2.1 PCL code with PresLink using Ethernet connection

##### PresLink -extension

For controlling the Eye Link Host PC remotely from the Presentation software on Stimulus PC, there exists a Presentation extension called PresLink. PresLink extension enables the "eye\_tracker" -library, which commands can be used from the PCL-file. The connection works through Ethernet cable.

Presentation Help : Help Guide : References : PCL Reference : Eye Tracking Types  
<http://www.neurobs.com/presentation/docs/index.html>

When using the PresLink commands, all needed procedures are available through the Presentation extension, including calibration, recording, marker sending, data saving, etc.

##### Presentation-script

In the Presentation, define the trials inside the SCE-file and the executive commands in the PCL-file. Also include the eye tracking commands into PCL. In the example code below, we create an eye\_tracker object "tracker", which is afterwards called with "eye\_tracker" library commands. The synchronization is achieved by using the send\_messages()-commands before "present()" commands.

*Examples of the code:*

sce-file:

```
trial {
  picture {
    box { height = 10; width = 10; color = 0,0,0; };
    x = 0; y = 0;
  } pic1;
}trial1;

trial {
  picture {
    box { height = 10; width = 10; color = 255,0,0; };
    x = 0; y = 0;
  } pic1;
}trial2;

begin_pcl;

eye_tracker tracker = new eye_tracker( "PresLink" ); # initialize PresLink.
tracker.start_tracking() ;#connect to Eyelink tracker.

#open edf file on the tracker.
string edf_name = "track.edf"; #8 letters maxixum without ".edf"
tracker.set_parameter("open_edf_file",edf_name);
tracker.set_recording(true); #start recording.

trial1.present(); #present the stimulus

tracker.send_message("SYNCTIME");#mark the time we presented the stimulus

trial2.present();#present the other stimulus

tracker.set_recording(false); #stop recording.

#transfer the edf file. Note Presentation places files specified
#without a path in the user's home directory.
#in this example track.edf will be placed in your home directory.
#(eg. in xp #C:\documents and settings\
```

PresLink manual can be found from the Stimulus PC: (Program Folder)\SR-Research\EyeLink\Docs\PresLink.chm

## Usage with DataViewer

When analyzing data with DataViewer made by SR-Research, to automatize the procedure, you should set certain parameters on the code. Then the data viewer can sparse the data, according to those parameters.

*Example:*

```
string msg= "TRIALID ";
msg.append(string(i));
tracker.send_message(msg);

# put tracker into idle mode
# tracker.set_parameter("set_idle_mode");
# send TRIAL ID message
tracker.send_message("TRIALID");

msg= "!V TRIAL_VAR trial ";
msg.append(string(i+2));
tracker.send_message(msg);

msg = "!V TRIAL_VAR TRIAL_IMAGE ";
msg.append(graphics[i].filename());
tracker.send_message(msg);

msg = "!V IMGLOAD FILL ";
msg.append(graphics[i].filename());
tracker.send_message(msg);

# start recording
tracker.set_recording(true);

tracker.send_message("SYNCTIME");
image_trials[i].present(); # present the trials

tracker.set_recording(false); #stop recording.

msg= "TRIAL_RESULT ";
msg.append(string(0));
tracker.send_message(msg);
```

### 3.2.2 TTL- triggers using parallel port

#### 3.2.2.1 Inputs

#### Wiring (+settings)

Stimulus PC can trigger TTL pulses, which go to the “neuromag trigger interface” box line 1-8. These channels can be connected with coaxial cables to “EyeLink interface” box (input lines 1-8).

The signal will eventually go to I/O card of the EyeLink Host PC.

TTL-pulses can be automatically stored into the Eye tracking Data File (EDF) in Host PC (if you allow INPUT info, see file\_sample\_data), or you can create a button, which sends a message to a data file. How to define the button, see “button.ini”.

If the PresLink interface is not used at all, the controlling of the EyeTracker must be done from the Host PC manually, including calibration, recording, saving, etc.. Only the markers are shown in data are sent from the Stimulus PC.

### Presentation script for parallel port triggers

In the "settings" menu, create new output port in “Output port”-> Add-> new port (1). Choose the port LPT1. You can also set the length of pulse.

In the SCE-file, use port-triggers inside the trial as following:

```
port = "1" # if you have defined only one output port, then this is optional.  
          # Otherwise you need to define which port to use.  
  
port_code = 2;# Defines what is send to the port. You can send numbers  
             # between 0-255. Triggers will show as INPUT data  
             # in the edf-file. In the data file, two events can be seen,  
             # the trigger onset and off-set.
```

```
trial {  
  picture {  
    box { height = 10; width = 10; color = 0,0,0; };  
    x = 0; y = 0;  
  } pic1;  
  port_code = 2; #this code is send at the time “trial1” is presented  
}trial1;
```

Output data file will include the following lines

```
INPUT 155462 2 ## this is the same as number in the “port_code”  
INPUT 155472 0 ## indicates the trigger off-set. Occurs 10ms later  
          ## as the pulse length is set to 10ms
```

### 3.2.2.2 Output

Digital I/O in interface can also be used as output channels. You can send write\_ioport command from PCL-file to eye tracker to output channels of the EyeLink Interface:

```
tracker.send_message("write_ioport 4 0x01")
```

which sends a trigger to the channel 1 on port address 4.

See **DIGITAL OUTPUT** for more info.

## 4 Mouse stimulation mode

Mouse simulation mode can be used instead of real subject when testing the system. Mouse simulation mode is identical to the camera mode, but instead of eye coordinates, the system records mouse coordinates. Mouse simulation mode can be switched on from "setup-> simulation mode -> mouse simulation.

Notice that the camera needs to be on when starting the computer, even though you are using just the "mouse simulation" -mode. The reason is that the EyeLink - software won't start unless the camera is connected and powered.

Work around: start the Eye Link software from DOS command line with command "t -x". Notice that if you start the EyeLink software this way, you need to restart the software before you can work in camera mode.

## 5 Data analysis

Eye link system creates an EDF-file which consist the recorded data. To be able to read the file, some converter is needed. The most common options are:

- EDF2ASC – converter
- DataViewer – software
- Matlab - EDF-reader

Eye movement data can be transferred to analog out signals and further to MISC channels where the data can be seen as voltage levels (see the equations for x- and y-coordinates under "analog.ini")

### 5.1) EDF2ASC – Converter

EDF-files can be converted to ASCII format with EDF2ASC-converter. This ASCII file can be then exported to analysis software.

## 5.2) Data Viewer

The EyeLink Data Viewer is intended for reading, viewing, filtering, and outputting EyeLink 1000 data. The Data Viewer supports EDF files recorded by EyeLink 1000. Detailed information can be found in the *Data Viewer manual*

Dataviewer software can be downloaded from the forum of SR-research (notice that the dongle is needed for usage)

<https://www.sr-support.com/forums/showthread.php?t=10>

A USB key licensed for the software is required to run the software in full mode. The key hangs on the wall behind the computer screens in the MEG control room.

## 5.3) Matlab

Edf-files can be read directly to Matlab with an EDF\_API (can be difficult to get it work).

<https://www.sr-support.com/forums/showthread.php?t=255&page=4>

&page=4