

Technical Note

Tobii Pro Eye trackers and The Observer XT

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1 Introduction

AIM OF THIS TECHNICAL NOTE

This document describes how to start and stop Tobii Pro eye trackers in The Observer XT and how to import the eye tracking data into the observation. This document describes the use of the Tobii Pro X2 Eye Trackers. These are stationary eye trackers that are positioned below a computer monitor. They are controlled with the analysis software Tobii Pro Lab or Tobii Pro Studio.

This technical note describes both Tobii Pro Lab and Tobii Pro Studio. When instructions are identical, both applications are referred to as Tobii Pro software. Where needed, separate instructions for the two applications are given.

SYSTEM USED

Computer

All software was tested on our standard test platform, which is a Dell Precision T5810 desktop computer.

- Processor: Intel Xeon E5-1620 v3, at 3.50 GHz.
- RAM Memory: 8 GB.
- Operating system: Windows 10 64 bit.

The Observer XT and the Tobii Pro software were installed on two separate computers.

SOFTWARE

On the The Observer XT computer

- The Observer XT 14.2.

- **N-Linx Server** version 1.0, for communication between The Observer XT and other applications.

NOTE The N-Linx Server can also be installed on a third computer, connected with The Observer XT computer and the computer with Tobii Pro software.

On the computer with Tobii Pro software

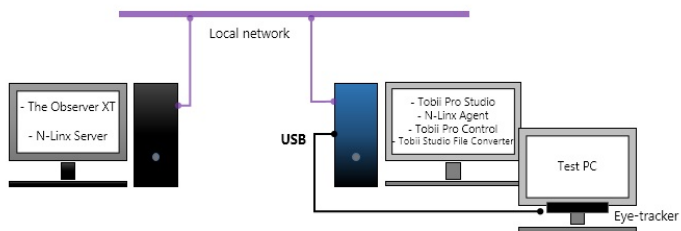
- We tested:
 - Tobii Pro X2-30 Eye tracker with Tobii Pro Lab 1.98.15089.
 - Tobii Pro X2-60 Eye tracker with Tobii Pro Studio 3.4.7.

NOTE If you have another eye tracker than the ones tested by Noldus IT, check thoroughly that the solution described in this note works.

- **N-Linx Agent** version 1.2, for communication between The Observer XT and Tobii Pro Studio or Tobii Pro Lab.
- **Tobii Pro Studio and Lab** plugin installed on the computer with Tobii Pro Studio or Tobii Pro Lab.

NOTE You can install this component when you install N-Linx Agent.

- **Noldus Tobii Studio File Converter 3**, to convert Areas of Interest (AOI) data from the Tobii Pro software. For other data types you do not need a file converter.



Notes

- The communication system N-Linx Server + N-Linx Agent + Tobii Pro Studio and Lab plugin takes care of automatic start and stop of data co-acquisition with Tobii Pro software when you operate The Observer XT. It does not transfer the data from Tobii Pro software to The Observer XT, or synchronize the data with the event log. For this, you must export the data files from the Tobii Pro software, import them into The Observer XT, and synchronize manually with the event log.
- The N-Linx Server adds the possibility to extend the solution with other N-Linx enabled software and custom development (N-Linx SDK). Contact Noldus for details.

IMPORT PROFILES

Import profiles for data from Tobii Pro Lab

To import data from Tobii Pro Lab into The Observer XT, import profiles are available. These can be downloaded from <https://www.noldus.com/restricted/observer-xt-14-other-downloads>.

Download the zip-file and extract it to a temporary folder. Copy the profile to C:\ProgramData\Noldus\Common\Profiles on your computer with The Observer XT. Copy both the folder and the file.

Import profiles for data from Tobii Pro Studio

To import Tobii Pro Studio data, a number of import profiles are available. These are installed automatically when you install The Observer XT. For the import procedures, see page 26 and page 37 for non-AOI data and AOI data, respectively.

FOR MORE INFORMATION

About The Observer XT

- The Observer XT Help.

- For visualizing data: see **Visualize Data**.
- For calculating statistics: see **Calculate Statistics**.
- Quick Start Guide - The Observer XT.
- The Observer XT sample project, which you can find on the installation USB stick, in the folder **Sample Projects/Human sample project**. Other sample projects can be downloaded from <https://www.noldus.com/downloads>. To access this page you need to register and login first.
- The Noldus Customer support center <https://www.noldus.com/support-center>. The web page of the Noldus Customer support center also contains the customer support database with questions asked by The Observer XT users and answers from the help desk.

About N-Linx

- The Reference Manual - N-Linx, which you can find on The Observer XT installation USB stick.

About Tobii Pro Software

- The Tobii Pro Lab or Tobii Pro Studio User Manual.

2 Computer configuration

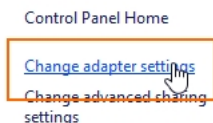
MAIN STEPS

- The Observer XT computer and the computer with Tobii Pro software must be connected to a local network, and both must have a fixed IP address that fall in the same range. For example 191.168.0.50 and 191.168.0.51. See **SET IP ADDRESS** below.
- Install **N-Linx Server** on computer with The Observer XT, or on a third computer that is connected to both The Observer XT and the Tobii Pro computer. See page 12.
- Install **N-Linx Agent** together with the plugin **Tobii Pro Studio and Lab** on the computer with Tobii Pro software. See page 13.
- It can be useful to create a shared folder on the Tobii Pro software computer where gaze replay videos and exported data are stored. This way you have always quick access to the eye tracking video and data from The Observer XT computer. See page 14.

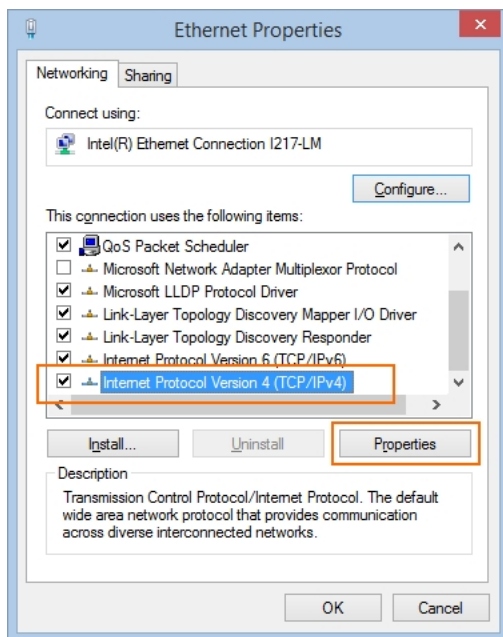
SET IP ADDRESS

Connect both computers with an Ethernet cable. Then give both computers a fixed IP address that falls in the same range. To do so, follow the procedure below for both computers:

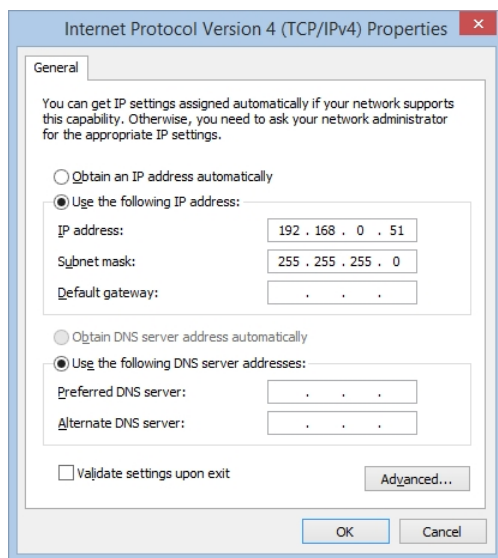
1. Open the Control Panel and select **Network and Sharing Center**.
2. Click **Change adapter settings** on the left side of your window.



3. Right-click the Local Area Connection and click **Properties**. If your computer has more than one Local Area Connection, choose the one with which the computer is connected to the other one. To check which one this is, remove the cable. The LAN connection that gets the *disconnected* symbol is the correct one.
4. Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.



5. Click **Use the following IP address**.
6. In the **IP address** field, enter the same first three numbers for both computers and a fourth number that differs on both computers.
7. Enter the number 255.255.255.0 in the **Subnet mask** field on both computers. Leave the other fields empty.



8. Click **OK** and close the Control Panel.

INSTALL N-LINX SERVER

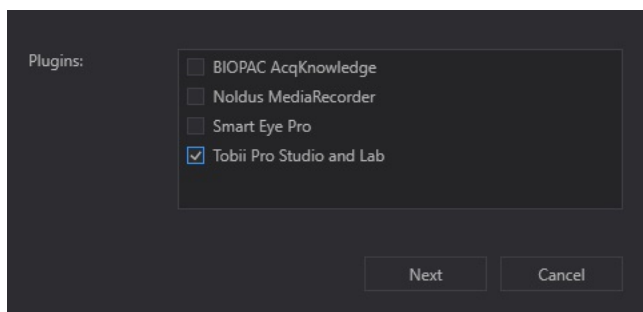
IMPORTANT Install this piece of software on the The Observer XT computer, or on a computer connected with both the computer with The Observer XT and the one with Tobii pro Software.

1. Insert The Observer XT installation USB stick in one of the PC's USB ports.
2. Browse to **Drivers and Tools\N-Linx Server**.
3. Double-click **N-Linx Server Setup.exe**.
4. Next to **Installation type** choose **Standard**, unless you want to change the program location.
5. Follow the instructions on your screen.

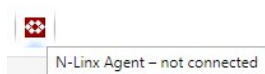
INSTALL N-LINUX AGENT

IMPORTANT Install this piece of software on the computer with Tobii Pro software.

1. Insert The Observer XT installation USB stick in one of the USB ports of the computer on which the Tobii Pro software is installed. Browse to **Drivers and Tools\N-Linx Agent**.
2. Double-click **N-Linx Agent Setup.exe**.
3. Next to **Installation type** choose **Standard**, unless you want to change the program location (C:\Program Files\Noldus\N-Linx Agent 1).
4. In the **Plugins** field, select **Tobii Pro Studio and Lab**, and click **Next**.



5. Accept the End-User License Agreement, click **Install** and follow the instructions on your screen.
6. If the N-Linx Agent user interface does not open after installation, at the bottom-left corner of the screen, on the system tray, click the arrow icon and double-click the **N-Linx Agent** icon.



7. In the N-Linx Agent user interface, next to **N-Linx Server Address**, enter the IP address of the computer where N-Linx Server is installed. This IP address must be *fixed*.

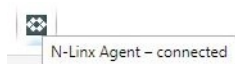
If The Observer XT and N-Linx Server are installed on the same computer, enter *localhost*.

TIP You can also enter the **Computer name** instead of the IP address. To find the **Computer name** of the computer where N-Linx Server is installed, on that computer open the Control Panel and choose **System**. Locate **Computer name**.

8. Click **Connect**. If connection is established, the message at the bottom of the N-Linx window says **Connected**.

Notes

If N-Linx Agent is already connected, the icon in the taskbar looks like this:

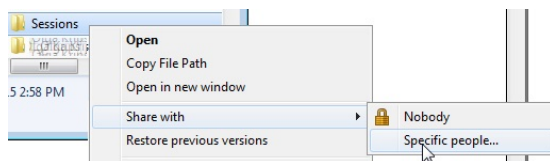


CREATE A SHARED FOLDER

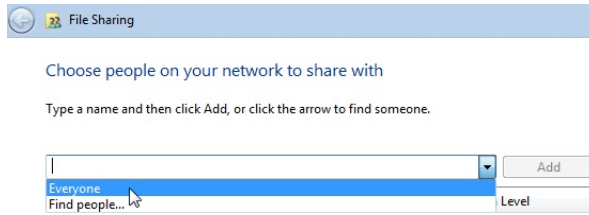
Share the folder with eye tracking data and videos, so that it can be accessed from the computer with The Observer XT. This is useful when you import eye tracking data and videos into The Observer XT.

On the computer with Tobii Pro software

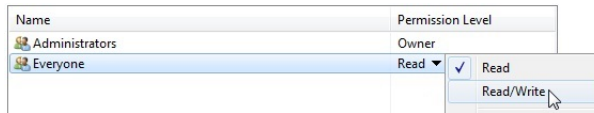
1. Right-click the folder where the Tobii Pro exported data and videos are going to be stored, and select **Share with** and then **Specific People**.



2. Click the arrow next to **Add** and select **Everyone** and then click **Add**.



3. Select **Read/Write** as **Permission level** and click **Share**.



On both computers

1. Open File Explorer and then **This PC**.
2. Click the **Map network drive** icon.
3. Choose a name for the drive and browse to the shared folder. Choose the same name on both computers. Then click **Finish**.

3 Workflow

MAIN STEPS

1. Prepare The Observer XT (page 17) to make sure that the data collected can be started and stopped with The Observer XT.
2. Record data with Tobii Pro Lab (page 20) or Tobii Pro Studio (page 23).
3. Export eye tracking data like fixations and saccades from Tobii Pro Lab (page 26) or Tobii Pro Studio (page 27).
4. Import Tobii Pro data in The Observer XT (page 29).
5. Import the Gaze replay video in The Observer XT (page 36).
6. Optionally, export Area of Interest data (AOI) from Tobii Pro Lab (page 37) or Tobii Pro Studio (page 38). Next, use the Noldus Tobii Studio File Converter 3.0 to make the data files compatible with The Observer XT (page 39) and import those files into The Observer XT (page 43).

IMPORTANT TERMS

You define a *project* both in The Observer XT and the Tobii Pro software, however this term represents different things in the two programs.

- In Tobii Pro Lab, a *project* can contain one or more recordings.
- In Tobii Pro Studio, a *project* can contain different tests, each of them containing one or more recordings.
- In The Observer XT, a *project* contains *observations*, which are the equivalent of the recordings in the Tobii Pro software.

However, you can import data from one test/study, or multiple tests/studies into one project of The Observer XT.

4 Prepare The Observer XT

AIM

To set The Observer XT to start and stop eye tracking with the Tobii Pro software.

If you ordered a set-up from Noldus IT, these settings have already been made. Then, continue with:

- **Record with Tobii Pro Lab** on page 20 or
- **Record with Tobii Pro Studio** on page 23.

PREREQUISITES

- N-Linx Agent and the plugin Tobii Pro Studio and Lab are installed on the computer with Tobii Pro software.
- N-Linx Server is installed on the The Observer XT computer or on a third computer connected to the The Observer XT computer and the computer with Tobii Pro software computer.
- The Observer XT is opened and you have created a project.

PROCEDURE

Connect The Observer XT to N-Linx Server

Follow this procedure just once. The settings are also valid for any new The Observer XT project that you create.

1. In The Observer XT, choose **File > Preferences**.
2. Click **N-Linx Settings** on the left.
3. Select **Use N-Linx Server to connect with other applications**.

4. Next to **N-Linx Server address**, enter the computer name of the computer with N-Linx Server. Leave the default entry *localhost* if The Observer XT and N-Linx Server are installed on the same computer.

TIP To find the **Computer name** of the computer with N-Linx Server, open the Control Panel and choose **System**. Locate **Computer name** (not Full Computer name).

5. Make sure the **N-Linx Server port** is **5672**.

Ask your system administrator for assistance with choosing another port if port 5672 is used by another program.

6. Click **Test connection**, and check that the **Status** changes to *Connected*.

If connection fails, review all the settings under **Computer configuration** (page 10).

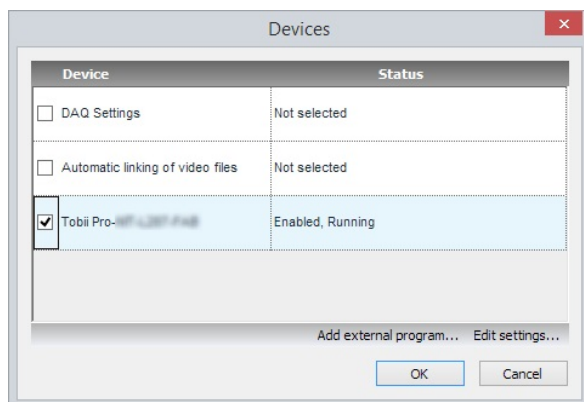
Project Setup

Follow these steps for each new The Observer XT project you create to work together with the Tobii Pro system.

1. Choose **Setup > Project Setup**.
2. Under **Observation Source** select **Live Observation**.

In the next steps you specify that The Observer XT communicates with the Tobii Pro Studio and Lab plugin, which should be installed together with N-Linx Agent on the computer with Tobii Pro software.

3. In the **Devices** window, check that **Tobii Pro** [computer name] is selected.



If you do not see this item, it is likely that N-Linx Agent is not installed, or that the plugin Tobii Pro Studio and Lab was not selected when you installed N-Linx Agent. Re-run the N-Linx Agent installer file, and select **Modify** and choose **Tobii Pro Studio and Lab**. See page 13.

4. Click **OK**.

Coding Scheme

To annotate your test participant's behavior, create a Coding Scheme. See The Observer XT Help for more information.

5 Record with Tobii Pro Lab

AIM

To design a test in Tobii Pro Lab and start and stop eye tracking acquisition with The Observer XT.

PREREQUISITE

You set up The Observer XT, following the procedure on page 17.

PROCEDURE

In Tobii Pro Lab

1. Create a new Tobii Pro Lab project, or open an existing one. In case of a new project, choose **Screen** as **Project type**.
2. Open the **Design** tab.
3. Press the **Add stimulus** button on toolbar on the top and browse to the stimulus to display. Set its properties, for example the display duration, in the **Properties** pane on the right. Add more stimuli, if needed.
4. You are now ready to start your observation in The Observer XT.

In The Observer XT

5. Create a new observation. To do so, click **Observations** in the Project Explorer, then **Create a new observation**.
6. Name the observation, then click **OK**.

In Tobii Pro Lab

7. Let the participant take place behind the monitor with the eye tracker.

8. Open the **Record** tab.

IMPORTANT Do not click the **Start Recording** button. Start the recording by starting an observation in The Observer XT (see below).

In The Observer XT

9. To start the test, click the **Start observation** button.



If the **Enter Independent Variable Values** window opens on the screen of The Observer XT, enter the independent variable values for that observation and click **OK**.

In Tobii Pro Lab

10. The calibration starts. Check that the test participant's eyes are visible as two white circles in the center box of the drawing that appears on your screen. If not, change his/her position relative to the monitor (lower or raise the chair or let the test participant sit closer or further away from the monitor).
11. Click **Start calibration** to start the calibration and let the test participant follow the symbol moving on the screen. When the calibration is ready, a plot with the calibration results appears on the test leader monitor.
12. Check whether the calibration is good, that is, whether the distance between the gaze points and the positions of the calibration symbol is acceptable. If so, click **Accept**.
13. The stimuli are now presented. Let the participant carry out the tasks assigned.

In The Observer XT

14. Optionally, score the behaviors with keys on your keyboard.
15. To stop the test, click the **Stop observation** button in The Observer XT.



Eye tracking now stops automatically.

NOTES

- Eye tracking also stops when the test you designed in Tobii Pro Studio ends before you pressed the **Stop observation** button in The Observer XT.
- If the computer with the Tobii Pro software is restarted, you must restart The Observer XT as well. Otherwise starting acquisition with the Tobii Pro software will not work.
- If the computers with The Observer XT and the Tobii Pro software are restarted, it may take some time before the Tobii Pro plugin starts when you create the first observation. If you start an observation in The Observer XT before the plugin is fully running, acquisition with the Tobii Pro software does not start. If you notice this, create and start a second observation. Acquisition with the Tobii Pro software will now start.

MORE INFORMATION

For more information on how to design a test in Tobii Pro Lab, see the Tobii Pro Lab user manual.

6 Record with Tobii Pro Studio

AIM

To design a test in Tobii Pro Studio and control recording with The Observer XT.

PREREQUISITE

You set up The Observer XT, following the procedure on page 17.

PROCEDURE

In Tobii Pro Studio

1. Create a new project, or open an existing one.
2. Create a new test.
3. From the toolbar on the top, choose the stimulus to test and set its properties, for example how long it should be displayed on the test screen. Add more stimuli, if needed.
4. You are now ready to start your observation in The Observer XT.

In The Observer XT

5. Create a new observation. To do so, click **Observations** in the Project Explorer, then **Create a new observation**.
6. Name the observation, then click **OK**.

In Tobii Pro Studio

7. Let the participant take place behind the monitor with the eye tracker.
8. Click **Start Recording**.

9. **OPTIONAL** Enter the name of the test participant, and click **Continue**.
10. The **Calibration** screen opens. Check that the test participant's eyes are visible as two white oval shapes in the Calibration screen. If not, change his/her position relative to the monitor (lower or raise the chair or let the test participant sit closer or further away from the monitor).
11. Click **Start** to start the calibration and let the test participant follow the symbol moving on the screen. When the calibration is ready, the **Calibration** window appears. This window shows at what points on the screen the test participant looked and the positions of the calibration symbol.
12. Check whether the calibration is good, that is, whether the distance between the gaze points and the positions of the calibration symbol is acceptable. If so, click **Accept**. A new screen appears. Fill in the name of the recording.

IMPORTANT At this stage, do **not** click the **Start Recording** button in Tobii Pro Studio. The system is configured to start recording automatically from The Observer XT.

In The Observer XT

13. To start the test, click the **Start observation** button in The Observer XT.



If the **Enter Independent Variable Values** window opens on the screen of The Observer XT, enter the independent variable values for that observation and click **OK**.

Eye tracking now starts automatically.

14. Let the participant carry out the tasks assigned.
15. Optionally, score the behaviors with keys on your keyboard.
16. To stop the test, click the **Stop observation** button in The Observer XT.



Eye tracking now stops automatically.

NOTES

- Eye tracking also stops when the test you designed in Tobii Pro Studio ends before you pressed the **Stop observation** button in The Observer XT.
- If the computer with the Tobii Pro software is restarted, you must restart The Observer XT as well. Otherwise starting acquisition with the Tobii Pro software will not work.
- If the computers with The Observer XT and the Tobii Pro software are restarted, it may take some time before the Tobii Pro plugin starts when you create the first observation. If you start an observation in The Observer XT before the plugin is fully running, acquisition with the Tobii Pro software does not start. If you notice this, create and start a second observation. Acquisition with the Tobii Pro software will now start.

MORE INFORMATION

For more information on how to design a test in Tobii Pro Studio, see the Tobii Pro Studio user manual.

7 Import Non-AOI data into The Observer XT

AIM

To import the following data into The Observer XT:

- Fixation data.
- Stimulus data.
- Mouse click data.
- Key press data.
- Recording type data (for Tobii Pro Lab only).

PREREQUISITE

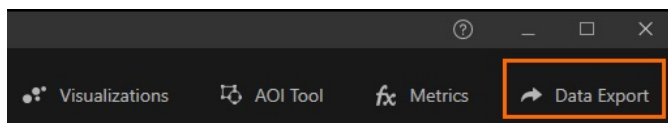
You carried out an observation in The Observer XT and simultaneously acquired eye tracking data with the Tobii Pro software.

PROCEDURE

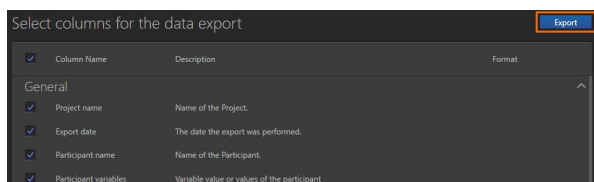
1. Export the data from Tobii Pro Lab (page 26) or Tobii Pro Studio (page 27).
2. Import the data into The Observer XT (page 29).

EXPORT THE DATA FROM TOBII PRO LAB

1. Open the project and click on **Data export** on the toolbar.

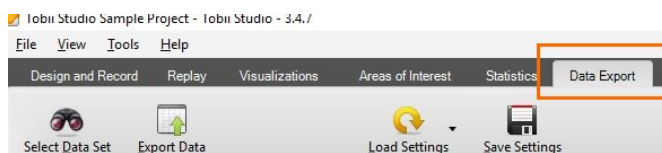


2. In the **Settings** pane on the right, select the recording to export.
IMPORTANT Select a single recording. Export each recording individually. Give each file a different name so that it does not overwrite the previously exported one.
3. Under **Select columns for the data export**, select all columns.
IMPORTANT Always select all columns. Otherwise the import profile won't recognize the columns to import.
4. Click on **Export**.

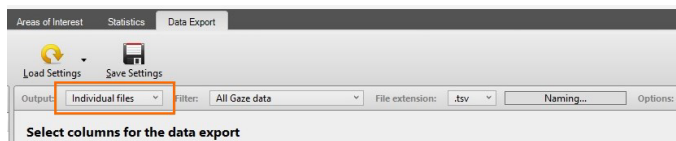


EXPORT DATA FROM TOBII PRO STUDIO

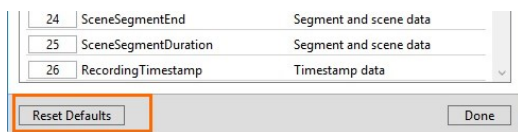
1. In Tobii Pro Studio, click the **Data Export** tab.



2. Click **Select Data Set** and choose the recordings to export.
3. From the **Output** list on the toolbar select **Individual files**.



4. Click the **Column Order** button and then the **Reset Defaults** button. Next, click **OK**. This ensures that the import profile matches the columns of the exported data file.

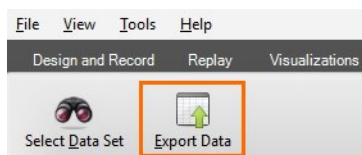


5. In the **Data Export** tab, select all columns for the data export, from **General data to Eye tracking data and validity codes**.

IMPORTANT Always select all columns, except **[Variable Name] Value**. Otherwise the import profile won't recognize the columns to import.

<input checked="" type="checkbox"/>	ParticipantName	Name of the Participant associated with the T
<input type="checkbox"/>	[VariableName]Value	Displays the independent variable values asso
<input checked="" type="checkbox"/>	RecordingName	Name of the Recording.

6. Click the **Export data** button and choose where to save the export files.



7. Proceed with importing the data into The Observer XT (next page).

IMPORT NON-AOI DATA INTO THE OBSERVER XT

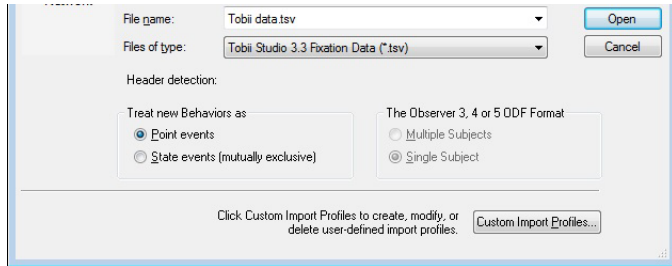
You must use a specific *import profile*. You do not need to convert the non-AOI export data before import in The Observer XT.

1. Copy the export files from the Tobii Pro software to The Observer XT computer.
2. In The Observer XT, open the observation in which you want to import the eye tracking data. Click the **Import data** button on the toolbar.



Select **Import observational data**. The **Import Observational Data** window opens.

3. From the **Files of type** list, select the import profile you require.
 - For Tobii Pro Lab fixation data: **Tobii Pro Lab 1.98 Fixation Data (*.tsv)**.
 - For Tobii Pro Lab stimulus data: **Tobii Pro Lab 1.98 Stimulus Data (*.tsv)**.
 - For Tobii Pro Lab key presses and mouse clicks: **Tobii Pro Lab 1.98 Keyboard and Mouse event Data (*.tsv)**.
 - To exclude calibration from the observation (Tobii Pro Lab only): **Tobii Pro Lab 1.98 Recording type (*.tsv)**.
See **To exclude the calibration from Tobii Pro Lab data** on page 30 for more information.
 - For Tobii Pro Studio fixation data: **Tobii Studio 3.3-3.4 Fixation Data (*.tsv)**.
 - For Tobii Pro Studio stimulus data: **Tobii Studio 3.3-3.4 Stimulus Data (*.tsv)**.
 - For Tobii Pro Studio mouse clicks: **Tobii Studio 3.3-3.4 Mouse Click Data (*.tsv)**.
 - For Tobii Pro Studio key presses: **Tobii Studio 3.3-3.4 Key Press Data (*.tsv)**.
4. Under **Treat new Behaviors as**, select **Point events**.
5. Browse to the location on your computer where you stored the data file. Select the appropriate file and click **Open**.



6. If this is the first file you import into the project, you will be asked whether you want to import new coding scheme elements. Click **Yes**.
7. The data are imported into The Observer XT as a new event log in the current observation.

To exclude the calibration from Tobii Pro Lab data

Tobii Pro Lab, by default, adds a calibration to the Timeline. This calibration is included in the export file. For further analysis of the eye tracking data, you may want to exclude the calibration. To do so:

1. Import the Tobii data, following the procedure above. In step 3 choose **Tobii Pro Lab Recording Events (*.tsv)** from the **Files of type** list.
2. Choose Analyze > Select Data > New Data Profile. Give the profile a name and click OK.
3. Under Select intervals click on the box next to By Manual Selection.
4. Under Interval Start Criteria choose Observational Data.
5. From the Behaviors list, choose **Eye tracker calibration end**. Leave the rest of the fields at their default values. The window now looks like this:

Select Intervals (Manually)

Interval Start Criteria

☐ Observation time

☒ Observational data

Start interval at:

00:00,00 mm:ss,ff

after start of

<Any Subject>

Eye tracker Calibration end

Interval Stop Criteria

☒ Observation time

☐ Observational data

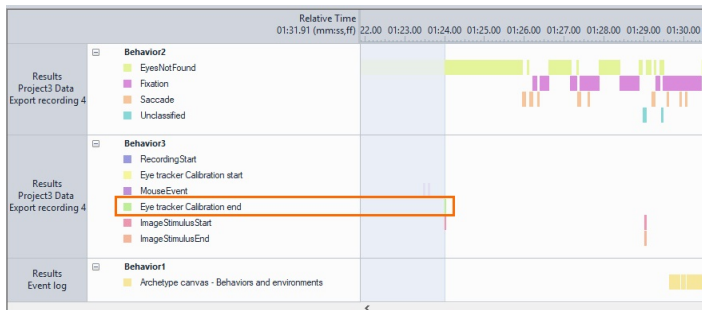
Stop interval before:

00:00,00 mm:ss,ff

before end of observation

OK Cancel

You now created an interval from the end of the calibration till the end of the recording. When you select this data profile, the data during calibration are excluded from visualization and analysis.



NOTES

- For the first file you import into the project, you will be asked whether you want to import new coding scheme elements. Click **Yes**.
- Data from each import profile are imported as point events in a separate behavior group of type “Start-Stop”.
- Note that fixations and saccades are imported as *point events*, that is, events with no duration. If you are interested in calculating fixation duration, follow the same procedure as in **Import AOI data into The Observer XT** on page 37.
- If you want to analyze the behavior of the subject while a specific stimulus was presented, in the Data profile choose **Select interval - By manual selection**. For both **Interval Start Criteria** and **Interval Stop Criteria**, choose **Observational data** and then select the same stimulus element from the behavior list.

Select Intervals (Manually)

Interval Start Criteria

☐ Observation time

☒ Observational data

Start interval at:

00:00.00 mm:ss.ff

after start of

<Any Subject>

Emotional Face.jpg

Interval Stop Criteria

☐ Observation time

☒ Observational data

Stop interval before:

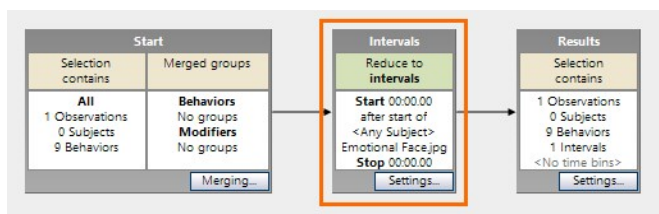
00:00.00 mm:ss.ff

before end of

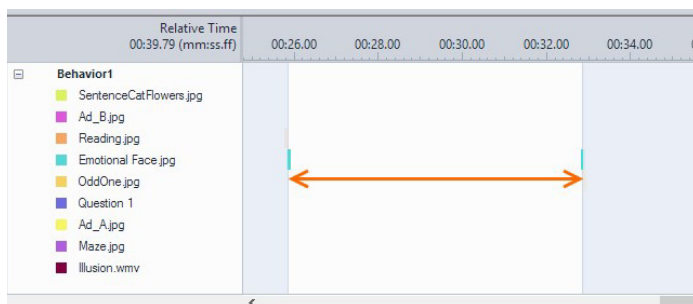
<Any Subject>

Emotional Face.jpg

Next, insert the Intervals box in the Data profile.



Check in the Visualization that the interval is selected for analysis that corresponds to the time between the start of the stimulus and the end of the stimulus (white area):



When you have two or more instances of the same stimulus, under **Interval Stop Criteria** select the following:

Stop interval before:

00:00.001 mm:ss.fff

before start of

<Any Subject>

Emotional Face.jpg

Various intervals will be defined:

- From start of first stimulus to end of first stimulus.
- From end of first stimulus to start of second stimulus. Ignore this result in the statistics table.
- From start of second stimulus to end of second stimulus.
- etc.

8 Import gaze replay video into The Observer XT

AIM

To import the video with the gaze overlay into The Observer XT.

TIP If you have MediaRecorder and Tobii Pro Studio, you can record the screen of the Tobii Pro Studio computer (set Tobii Pro Studio to **Remote Live Viewing**) and import it automatically in the observation. This way you do not need to import video manually. In the Observer PC, add an exception to Windows Firewall to the application **Tobii Studio Remote Viewer**.

PREREQUISITE

You carried out an observation in The Observer XT and simultaneously acquired eye tracking data with Tobii Pro software.

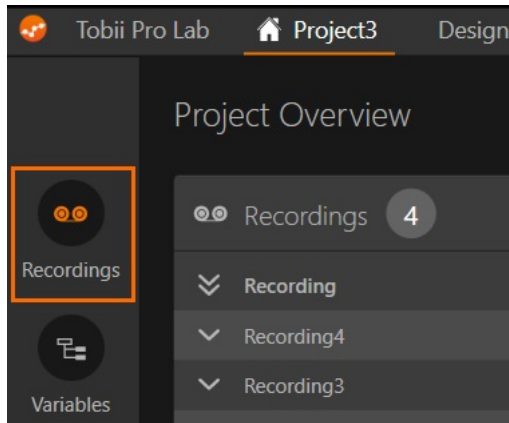
PROCEDURE

Carry out the following steps:

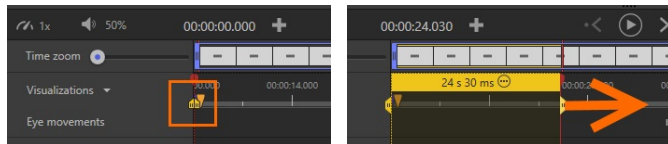
1. Export the gaze replay video from Tobii Pro Lab (page 34) or Tobii Pro Studio (page 36).
2. Import the gaze replay video into The Observer XT, see page 36.

EXPORT GAZE REPLAY VIDEO FROM TOBII PRO LAB

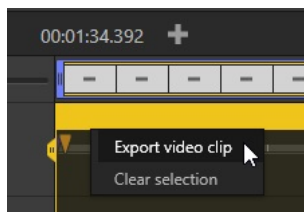
1. Open the project and click on the **Recordings** button on the toolbar on the left.



2. Double-click the recording from which you want to export the gaze replay video.
3. On the left-hand side of the timeline you find two small yellow markers. Click-and-hold the right-hand one and drag it to the end of the video. This way the entire gaze replay video is selected for export.

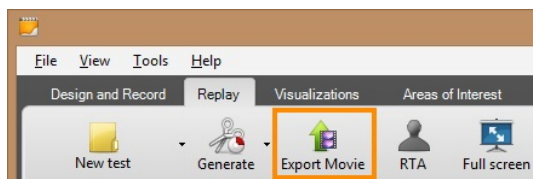


4. Right-click the yellow bar and choose **Export video clip**.
5. Browse to the location to store the video file, name the file and click **Save**.



EXPORT GAZE REPLAY VIDEO FROM TOBII PRO STUDIO

1. Click the **Replay** tab, then click the **Export Movie** button.



2. In the window that appears, choose the options you require.
OPTIONAL As **Output folder**, choose the folder shared with The Observer XT computer.
3. Click **OK**.

IMPORT THE GAZE REPLAY VIDEO INTO THE OBSERVER XT

1. In the Observer XT, open the observation you want to import the video to.
2. Choose **Observe > Video > Open in Current Observation**, or click the import video button on the toolbar.



3. Choose the video file exported from the Tobii Pro software and click **Open**.

9 Import AOI data into The Observer XT

AIM

To import Area of Interest data into The Observer XT.

PREREQUISITES

- You defined Areas of Interest in the Tobii Pro software.
- You have Tobii Pro Lab 1.98 or Tobii Pro Studio 3.4. Contact the Noldus help desk if you have another version of Tobii Pro software.
- You have the file **Tobii Studio File Converter 3.0 Setup.exe** provided by Noldus Information Technology.

PROCEDURE

Carry out the following steps.

1. Export the eye tracking data from Tobii Pro Lab (page 26) or Tobii Pro Studio (page 36). For AOI data, it is not needed to export all columns, as long as all columns described in **variables to export - tobii pro studio** on page 38 are exported.
2. Convert the export file, see page 39.
3. Import the converted file into The Observer XT, see page 43.

VARIABLES TO EXPORT - TOBII PRO LAB

Under General

- **Project name:** The name of the project in Tobii Pro Lab.
- **Recording name:** The ID of the recording.

- **Recording Date:** The start date of the recording.
- **Recording Start time.** The start time of the recording.
- **Recording Timestamp:** The time stamp of a sample point from the start of the recording (set to zero).

Under **Gaze events:**

- **Gaze Event Duration:** The duration of a fixation.
- **AOI hit:** The name of the Area of Interest.

VARIABLES TO EXPORT - TOBII PRO STUDIO

Under **General data:**

- **StudioProjectName:** The name of the project in Tobii Pro Studio.
- **RecordingName:** The ID of the recording.
- **RecordingDate:** The start date of the recording.

Under **Timestamp data:**

- **RecordingTimestamp:** The time stamp of a sample point from the start of the recording (set to zero).
- **LocalTimeStamp:** The local time stamp of a sample point.

Under **Gaze event data and AOI activity information:**

- **GazeEventDuration:** The duration of a fixation.
- **AOI[Name of AOI]Hit:** The name of the Area of Interest.

Tips

- In Tobii Pro Studio, it is possible to save the current selection of variables as “AOI data”, so you can quickly open the same selection when necessary (**Load Settings**). To do so, click the **Save Settings** button.



- To use the same data file also to import non-AOI data, for Tobii Pro Lab select all variables, or for Tobii Pro Studio select all variables except **[Variable Name]Value**. You can use that file in the procedures on page 26.

Structure of the export file

In the export file, each area of interest is represented by a column (see the last column in the example below). For each sample point, the cell contains 1 (fixation in that AOI) or 0 (no fixation).

RecordingName	RecordingDate	MediaName	RecordingTimestamp	LocalTimeStamp	GazeEventDuration	AOI[Big logo]Hit
Rec 17	2/22/2016	With Logo.jpg	136746	26:23.7	333	1
Rec 17	2/22/2016	With Logo.jpg	136763	26:23.7	333	1
Rec 17	2/22/2016	With Logo.jpg	136780	26:23.8	333	1
Rec 17	2/22/2016	With Logo.jpg	136796	26:23.8	333	1
Rec 17	2/22/2016	With Logo.jpg	136813	26:23.8	333	1
Rec 17	2/22/2016	With Logo.jpg	136830	26:23.8	333	1
Rec 17	2/22/2016	With Logo.jpg	136846	26:23.8	333	1
Rec 17	2/22/2016	With Logo.jpg	136863	26:23.8	333	1
Rec 17	2/22/2016	With Logo.jpg	136880	26:23.9	333	1
Rec 17	2/22/2016	With Logo.jpg	136896	26:23.9	333	1
Rec 17	2/22/2016	With Logo.jpg	136913	26:23.9	333	1
Rec 17	2/22/2016	With Logo.jpg	136930	26:23.9	333	1
Rec 17	2/22/2016	With Logo.jpg	136946	26:23.9	333	1
Rec 17	2/22/2016	With Logo.jpg	136963	26:23.9	333	1
Rec 17	2/22/2016	With Logo.jpg	136980	26:24.0	33	0
Rec 17	2/22/2016	With Logo.jpg	136996	26:24.0	33	0
Rec 17	2/22/2016	With Logo.jpg	137013	26:24.0	267	0
Rec 17	2/22/2016	With Logo.jpg	137030	26:24.0	267	0
Rec 17	2/22/2016	With Logo.jpg	137046	26:24.0	267	0
Rec 17	2/22/2016	With Logo.jpg	137063	26:24.0	267	0
Rec 17	2/22/2016	With Logo.jpg	137080	26:24.1	267	0

CONVERT THE AOI DATA

Why convert AOI data?

To be able to import the AIO data into The Observer XT, the export file must be converted into a format that can be read by The Observer XT.

NOTE

To import non-AOI data, such as fixations, mouse clicks, key presses and stimulus data, see page 26.

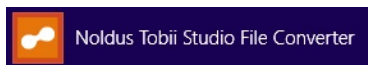
Install Noldus Tobii Studio File Converter

1. Close Tobii Pro Lab or Tobii Pro Studio.
2. Copy the file **Tobii Studio File Converter 3.0 Setup.exe** to the PC where you have stored the Tobii Pro export files.
3. Double-click **Tobii Studio File Converter 3.0 Setup.exe** and follow the instructions on the screen.
4. When installation is completed, click **Close**.

By default, the Tobii Studio File Converter is installed on C:\Program Files (x86)\Noldus\Noldus Tobii Studio File Converter.

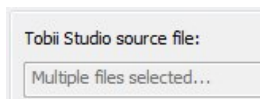
Convert AOI data into The Observer XT format

1. In the Apps screen, under **Noldus** click **Noldus Tobii Studio File Converter**.

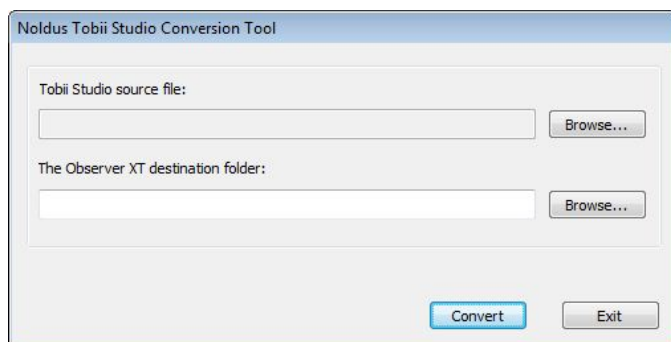


2. Next to **Tobii Studio source file**, click **Browse**, select one or more files exported from the Tobii Pro software and click **Open**.

To select multiple TSV files, click **Browse**, click the TSV file names while holding the **Ctrl** key down, and click **Open**. A message confirms that multiple files are selected.



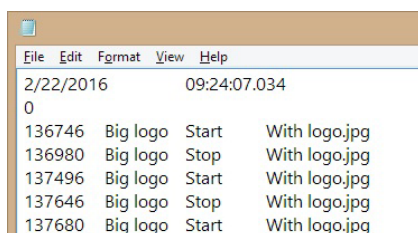
3. Next to **The Observer XT destination folder**, click **Browse** and select the folder where you want to store your converted files.



4. Click **Convert**.
5. A message appears in the window “Conversion is ready”. Click **Exit** to close the window.

The converted export file

To check the contents of the converted export file (*.txt), right-click it and select **Open with Notepad**. Do not open it in a word processor such as Microsoft Word. The file should look like this.



The first line contains the value of the variable **RecordingDate** and the first value of **Recording Start time** (Tobii Pro Lab) or **LocalTimeStamp** (Tobii Pro Studio) in the recording. If the variables are not in the original export file, they do not appear in this line. The second line contains **0** (zero). This line is added automatically by Noldus Tobii Studio File Converter.

The columns contain the following information:

- Time from the recording start time (in ms).

- Name of the area of interest.
- Event type (start/stop).
- File name of the stimulus (optional).

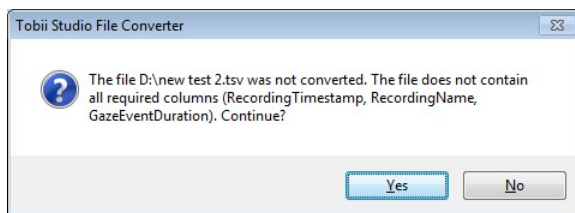
To import the file into The Observer XT, see page 43.

Notes

- The name of the converted file is Observer-[StudioProjectName] [RecordingDate] [RecordingName].txt.

If **Studio Project Name** and **Recording Date** are not exported from the Tobii Pro software, the converted file name is Observer-[Recording Name].txt.

- If the Tobii Pro export file contains more recordings, each recording is converted to a separate text file.
- If the Tobii export file does not contain one of the required columns, when trying to convert this file the message appears:



Click **Yes** to continue converting (if you have selected multiple files), otherwise click **No**. Re-export the file with the correct columns and convert it again.

- The Tobii export files may also contain other columns like **ParticipantName** or **GazeEventType**, but they will not be converted.
- The converted file ends when the last AOI hit ends. The length of the converted file may therefore be shorter than the original recording.

IMPORT AOI DATA INTO THE OBSERVER XT

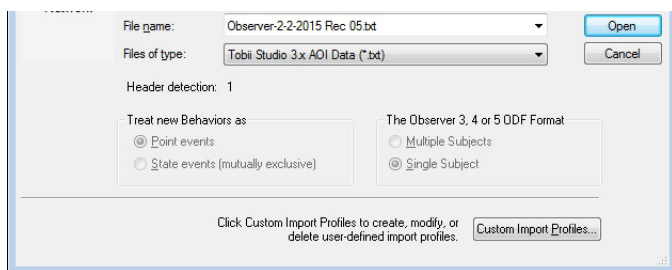
IMPORTANT Make sure that you have converted the export files with Noldus Tobii Studio File Converter (page 39).

To import the data into The Observer XT

1. In The Observer XT, in the Project Explorer, open the observation in which you want to import the eye tracking data. Click the **Import data** button on the toolbar.



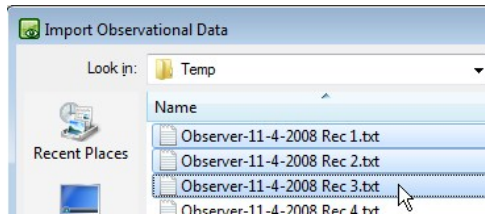
2. Select **Import observational data**.
3. In the **Import Observational Data** window, from the **Files of type** list, select **Tobii 3.x AOI Data (*.txt)**.



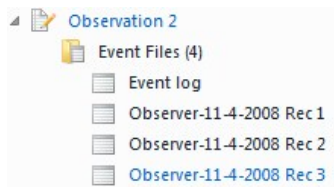
4. Browse to the location where you stored the converted files. Select the appropriate file and click **Open**.

Notes

- To import multiple recording files in the same observation, click each converted file name while holding the **Ctrl** key down.



- The files are imported as separate event logs in the same observation.



- When visualizing multiple recordings, they appear in separate charts, one for each recording.



- If this is the first file you import into the project, you will be asked whether you want to import new coding scheme elements. Click **Yes**.

10 Synchronization

HOW TO DETERMINE THE DELAY BETWEEN THE OBSERVER XT AND TOBII PRO SOFTWARE

Data synchronization

The system described in this note makes it possible to start recording in Tobii Pro software the moment you start an observation in The Observer XT. The eye tracking data are aligned with the observational data scored manually. However, there may be a delay between the start of the observation and the start of recording in the Tobii Pro software. The delay may be caused, among other things, by delays in the network communication. As a result, there may be a mismatch between eye tracking data and observational data.

To measure the delay

1. Define in your coding scheme a Point event labeled, for example, *sync*.
2. Start an observation as usual.
3. Ask the test participant to perform an action that could be seen on the screen (for example, typing in a letter in a web field or the Windows Notepad).
4. The very moment he/she performs that action, score the *sync* event.
5. Import the video made by the Tobii Pro software into The Observer XT, and look when the letter appears on the screen. The difference in timing between that time and the time that you scored *sync* gives you the value of the delay.

This method is less precise than the previous as it relies on the coder's reaction time.

To compensate for a delay

1. Take note of the value you measured with one of the two methods above.

2. Open the observation and click the **Offset** button.
3. Click **Numerical** offset.
4. Next to the name of the event log containing the eye tracking data, enter this delay. For example, if the delay was 0.5 s, then enter 00:00.500.

For more information, in The Observer XT Help see **External Data > Import External Data > Manual Synchronization**.

11 Firewall settings

AIM

When N-Linx Agent is installed, it enables the necessary communication ports. Follow this section in case communication is for some reason blocked by Windows Firewall.

PREREQUISITES

- The Tobii Pro software and The Observer XT run on different computers, or N-Linx Server runs on a third computer other than The Observer XT computer and the computer with Tobii Pro software. If that is not the case, skip this section.
- The computers must be in the same network.

PROCEDURE

IMPORTANT Do the following in all computers: the computer with Tobii Pro Studio software, the Observer XT computer, and the computer where N-Linx Server is installed (if this is different from the computers where The Observer XT and the Tobii Pro software are installed).

1. Open the Windows Control Panel and choose **Windows Firewall**.
2. On the left side of the window, click **Advanced Settings**.
3. In the pane on the left, click **Inbound Rules** and then in the Actions pane on the right click **New Rule**.
4. In the window that opens, select **Port** and click **Next**.
5. Select **TCP** and **Specific local ports**. Next to that option enter **5672**, then click **Next**.
6. Select **Allow the connection** and click **Next**.
7. Select to which network the rule applies and click **Next**.

8. Give the rule a name, for example *N-Linx connection* and click **Finish**.
9. Check in the Inbound Rules list that this rule is set to **Enabled**.
10. Click **Outbound Rules** and click **New Rule** in the Actions pane. Repeat steps 4 to 9 for the outbound rule.
11. Close all Control panel windows.

CHECK CONNECTION IN N-LINX AGENT

1. At the bottom-right corner of the screen of the computer with Tobii Pro software, click the arrow icon and in the system tray double-click the **N-Linx Agent** icon.



2. Next to **N-Linx Server Address** make sure that the IP address of the Observer XT computer is specified. This IP address must be *fixed*.

NOTE If The Observer XT and N-Linx Server are installed on the same computer, enter *localhost*.

TIP You can also enter the **Computer name** of the computer where N-Linx Server is installed, instead of its IP address. On the computer where N-Linx Server is installed, open the Control Panel and choose **System**. Locate **Computer name** (not Full Computer name).

3. Click **Connect**. If connection is established, the message at the bottom of the N-Linx Agent window says **Connected**.
4. Click the **Close** button to close the N-Linx Agent window.



12 General notes

THE OBSERVER XT

Independent Variables

If the Independent Variables list appears when you press the **Start Observation** button, the actual observation (and therefore eye tracking by Tobii Pro Studio) starts when you click **OK** in the Enter Independent Variables window.

You can choose when the Enter Independent Variables window appears. For details, see **Set up your Project > Project Settings** in The Observer XT Help.

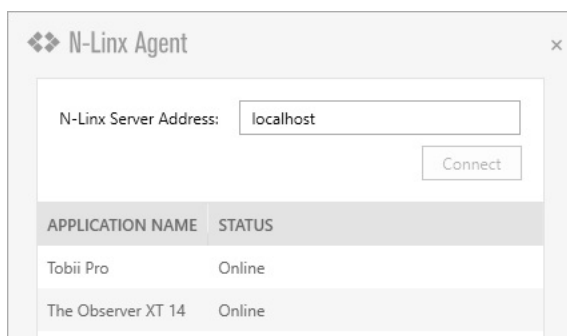
For more information on recording data in The Observer XT, see **Carry out an Observation** in The Observer XT Help.

N-LINX AGENT

On the Tobii Pro Studio computer, you can check the status of N-Linx Agent. Click the arrow icon on the system tray, then double-click the **N-Linx Agent** icon.



The N-Linx Agent window shows the status of **Tobii Pro** and **The Observer XT**.



- **The Observer XT** is visible and **Online** when the program is open.
- **Tobii Pro** is **Offline** when it is installed, but not active. This is the case immediately after installation of N-Linx Agent and after the computer is restarted.
- After creating an observation in The Observer XT, the status of **Tobii Pro** becomes **Online**.
- **Online** means that the Tobii Pro plugin is started and therefore available for communication. Once the Tobii Pro plugin is started, it remains running until the PC is shut down.

EYE TRACKING

To carry out a new recording with the same participant

Tobii Pro Studio: Start a new recording on the Tobii Pro Studio computer. Open the tab **Use Existing Participant**. Select the participant and click **Continue**. Then repeat the procedure from step 13 on page 24.

Tobii Pro Lab: Open the **Record** tab and select the participant in the **Participant** pane at the bottom. Then repeat the procedure from step 9 on page 21.

To repeat calibration

Select the points to recalibrate and click **Recalibrate (n. points)**.

If the calibration continues to be unsatisfactory, Tobii Pro Studio has the option to look into the calibration in more detail. To do so, click **Check Calibration**. Nine points appear on the screen of the test participant, with the gaze represented as a circle. Move the chair up and down or backwards and forwards until the circle is around the dot the participant looks at. Make sure the gaze is detected in the correct position for each calibration point. When done, let the participant press the **Esc** key. Tobii Pro Lab does not have this functionality.

To view the fixations live

Do one of the following:

- Connect the Tobii Pro system to two monitors. Place one of the two monitors in the observation room. In Tobii Pro Studio, click the **Setup** icon and choose **Show Live Viewer**, and select that monitor.
- If you have the Enterprise version of Tobii Pro Studio, this version includes a remote viewer application. Install this on the Observer computer to view the fixations live. You can also use this program to control Tobii Pro Studio, for example start a new recording, and do the calibration.

TEST LEADER DISPLAY

Windows font size

- To make sure that the gaze points are correctly positioned when reviewing the test, set the Windows font size on the stimulus monitor to 100%. In the **Search** field of the start screen, type “display” and click **Change display settings**. Under Scale and layout, choose **100%** from the list **Make text and other items larger or smaller**.

Display

Brightness and color

Change brightness



Night light



Off

[Night light settings](#)

Scale and layout

Change the size of text, apps, and other items



Multiple monitors

When using a dual screen setup, set the same resolution on both screens.