



Lifelines iEEG Acquire

Acquisition Systems

User Manual

Revision 7.00

Software Version 2.3

Regulatory Compliance

K143487: FDA 510(k) Clearance for class II medical device. Product: Lifelines iEEG

The Lifelines iEEG software and systems, the Trackit Mk3 and R40 amplifiers, and the Lifelines Photoc stimulator bear a CE mark issued by BSI (CE0086).

Copyright

All rights reserved. This manual contains proprietary information which is protected by copyright and may not be copied in whole or in part except with the prior written permission of Kvikna and Kvikna Medical. The copyright and the foregoing restrictions on the copyright use extend to all media in which this information may be preserved.

This copy of the Lifelines iEEG User Manual shall be used only in accordance with the condition of sale of Kvikna and Kvikna Medical or their distributors.

Kvikna and Kvikna Medical make no representations or warranties of any kind whatsoever with respect to this document. Kvikna and Kvikna Medical disclaim all liabilities for loss or damage arising out of the possession, sale or use of this document.

Kvikna® is a registered trademark of Kvikna ehf.

Lifelines iEEG® is a registered trademark of Kvikna ehf.

Lifelines® is a registered trademark of Lifelines Ltd.

Microsoft Word®, Windows®, and Office® are registered trademarks of Microsoft Corporation.

All other trademarks and product names are the property of their relevant owners.

Kvikna and Kvikna Medical
Stórhöfði 21
110 Reykjavík
Iceland
Tel: +354 578 8400
Email: kvikna@kvikna.com
www.kvikna.com

Report suggestions or complaints by email: support@kvikna.com

Intro	6
Intended Use.....	6
Disclaimers and Warranties.....	6
Compliance.....	8
Safety and Warning Notices	9
Device Description.....	15
Essential Performance	16
Connecting the System.....	17
Explanation of Symbols	18
Compatible File Formats	19
Accompanying Documentation.....	19
This Manual.....	19
Concepts.....	19
Centrum.....	21
Login	21
The User Interface.....	22
Patient List	22
Patient Admission.....	38
Upload.....	39
Processing.....	43
My Settings.....	43
The Admin View.....	45
Acquire Touch.....	55
Intro.....	55
Launching Acquire.....	55
Patient	56
Setup.....	57
Impedance	61
Video.....	61
EEG.....	62
Lock.....	67

Locked Patient Mode.....	67
Acquire Pro	69
Launching iEEG Acquire Pro.....	69
Exams.....	69
Setup.....	70
Impedance	75
EEG.....	75
Event Palettes	78
Label Bar	80
Sidebar	81
Overview.....	85
Indicators.....	89
Clock	90
Video.....	91
Settings	91
Review	91
Lock	91
Review.....	93
Launch iEEG Review	93
Exam Mode.....	93
Exams Tab	93
Upload Tab	95
Processing Tab	95
Settings Tab	96
Review Screen	96
Channel Chart.....	96
Overview.....	97
Toolbar Controls.....	100
Channel Labels.....	106
Event Palette	108
Panel	113

Menu.....	120
Settings.....	123
Local and Server Settings.....	123
Montage.....	124
Events	135
Perspectives.....	138
My Settings.....	142
Acquisition.....	143

Intro

Intended Use

Lifelines iEEG is an EEG system that allows acquisition, display, archive, storage and analysis of physiological signals. The intended user of this product is a qualified medical practitioner trained in electroencephalography who will exercise professional judgment in using the information.

The Lifelines iEEG system also includes the display of quantitative EEG plots, power spectrum, which is intended to help the user to monitor and analyze the EEG.

This device does not provide any diagnostic conclusion about the patient's condition to the user.

Caution: Federal (USA) law restricts this device to sale by or on the order of a physician licensed by the law of the State in which he practices to use or order the use of the device.

Indication for Use

Lifelines iEEG is used as an aid in the diagnosis of neurophysiological disorders such as epilepsy.

Disclaimers and Warranties

The information in this section is subject to change without notice.

Except as stated below, Kvikna Medical ehf (Kvikna Medical) makes no warranty of any kind with regard to this equipment, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Kvikna Medical shall *-not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance or use of this equipment.

Misuse, accident, modification, improper operating environment, improper maintenance or damage caused by a product for which Kvikna Medical is not responsible will void the warranty.

Kvikna Medical does not warrant uninterrupted or error-free operation of its products.

Kvikna Medical or its authorized agents will repair or replace any products which prove to be defective during the warranty period, provided that these products are used as prescribed in the operating instructions in the user's and service manuals.

No other party is authorized to make any warranty to assume liability for Kvikna Medical's products. Kvikna Medical will not recognize any other warranty, either implied or in writing. In addition, services performed by someone other than Kvikna Medical or its authorized agents or any technical modification or changes of products without Kvikna Medical's prior written consent may be cause for invalidating this warranty.

Kvikna Medical manufactures hardware and software to be used on or with standard PC-compatible computers and operating software. Kvikna Medical, however, assumes no

responsibility for the use or reliability of its software or hardware with equipment that is not furnished by third-party manufacturers accepted by Kvikna Medical at the date of purchase.

All warranties for third-party products used within the Lifelines iEEG system are the responsibility of the relevant manufacturer. Please refer to the relevant documentation on each product for further details.

This document contains proprietary information that is protected by copyright. All rights are reserved. No part of this document may be photocopied, reproduced in any other form or translated into another language without the prior written consent of Kvikna Medical.

Compliance

Lifelines iEEG is designed to comply with the following medical safety standards.

International standards:

IEC 62304:2006	Medical device software – Software life cycle processes.
----------------	--

IEC 62366:2007	Medical devices -- Application of usability engineering to medical devices
----------------	--

Acquisition Systems:

IEC 60601-1:2006	Medical electrical equipment – Part 1: General requirements for safety.
------------------	---

IEC 60601-1-2:2007	Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance - Collateral Standard: Electromagnetic disturbances - Requirements and tests
--------------------	---

IEC 60601-2-26:2003	Medical electrical equipment – Part 2-26: Particular requirements for the safety of electroencephalographs.
---------------------	---

IST EN 60601-1-11:2010	Part 1-11: General requirements for basic safety and essential performance - Collateral standard: Requirements for medical electrical equipment and medical electrical systems used in the home healthcare environment.
------------------------	---

European standards:

EN ISO 14971:2012	Medical devices – Application of risk management to medical devices.
-------------------	--

US standards:

US Code of Federal Regulations Title 21, Chapter 1, Subchapter H – Medical Devices

Safety and Warning Notices

Warnings are directions which if they are not followed can cause fatal or serious injuries to a user, engineer, patient or any other person or can lead to a mistreatment.

WARNING: Safety of Lifelines iEEG medical devices cannot be ensured unless all hardware and software components are provided by Kvikna ehf or an authorized agent. Items not specified as part of a Lifelines iEEG system (including 3rd party software) must not be connected to or installed in a Lifelines iEEG system. Doing so may damage the equipment and result in injury.

WARNING: Do not open or modify the equipment without the authorization of the manufacturer. Unauthorized modification may damage the equipment and result in injury.

WARNING: Lifelines iEEG is intended to be installed, used and operated only in accordance with the procedures given within this manual and accompanying documentation for the purpose for which it was designed. Nothing stated in this manual reduces the user's professional responsibilities for sound judgment and best practice.

WARNING: Users shall only install, use and operate the equipment in such ways that do not conflict with applicable laws or regulations which have the force of law.

WARNING: Use of the equipment for purposes other than those intended and expressly stated by the manufacturer, as well as incorrect use or operation, may relieve the manufacturer or his agent from all or some of the responsibility for resultant non-compliance, damage or injury.

WARNING: This equipment is intended to be used by a healthcare professional.

WARNING: This equipment is intended only as an adjunct device in patient assessment; it must be used in conjunction with other methods of patient diagnosis. This equipment is not to be used for the determination of brain death.

WARNING: The Lifelines iEEG system is not intended to be used as a vital signs monitor.

WARNING: Lifelines does not supply the Nonin sensor. Only use the 'PureLight' sensors specified by Nonin to be used with their Oximeters.

WARNING: The function or safety of the equipment could be impaired if it has been subjected to unfavorable conditions in storage or in transit. If at any time function or safety is thought to be impaired, the instrument should be taken out of operation and secured against unintended use.

CAUTION: Do not touch simultaneously any accessible USB or other contacts on the PC or monitor and the patient.

WARNING: Lifelines iEEG may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the Lifelines iEEG system or shielding the location.

WARNING: The use of accessories, transducers and cables other than those specified, with the exception of transducers and cables sold by Kvikna ehf or an authorized agent as replacement parts for internal components, may result in increased emissions or decreased immunity of the Lifelines EEG system.

WARNING: Care should be taken in using systems with photic stimulator. The operator should not look into the photic device when it is turned on. When the photic stimulator is not in active use, it should not face anyone.

CAUTION: None of the equipment or packaged components in the devices is sterile. They should not be used in a sterile environment.

WARNING: Use only medical grade power supplies. These are provided with the system.

Additional Warnings Specific to Laptop and Tablet PC Systems

The following warnings, in addition to the other warnings in this chapter, must be heeded regarding the installation and use of the all laptop and tablet pc systems.

WARNING: All software components are supplied configured. The power options settings (in the Control Panel) must not be changed or tampered with.

WARNING: Do not place laptop or tablet pc on a soft surface, e.g. a couch or blanket. This can cause overheating and the system may shut down.

WARNING: Strangulation hazard due to long cables. Keep cables away from doorways and walkways and keep out of reach of children.

WARNING: Choking hazard. Contains small parts that may cause choking if swallowed. Keep out of reach of children.

WARNING: (Specifically for portable systems in a case, i.e. system 1020) To avoid a heating hazard, unplug the system from the wall socket when not in use for one hour or more.

Additional Warnings Specific to System 1040 WiEEG

The following warnings, in addition to the other warnings in this chapter, must be heeded regarding the installation and use of the 1040 WiEEG variant.

WARNING: The WiEEG amplifier must never be attached to a patient during the battery charge cycle. This could cause electrical burns to the patient.

CAUTION: The WiEEG amplifier must be turned off during the charge cycle.

WARNING: Review all Safety Information before connecting the BraiNet® WiEEG to a patient.

WARNING: Only individuals trained in the operation of the WiEEG recorder should connect a patient to the WiEEG recorder.

CAUTION: The WiEEG Transmitter Module must be fully charged prior to each EEG recording. 12 hours is recommended time for a full charge.

EEG Electrodes

The Trackit Mk3 amplifier and R40 connects to standard 1.5mm touch proof electrodes using DIN 42802-style connectors arranged in a standard 10-20 pattern, attached to the patient's head.

The WiEEG model 100 amplifier uses Ives EEG electrodes and a BraiNet® Kit. See the accompanying documentation for more information.

WARNING: Lifelines does not supply EEG electrodes. To ensure patient safety, the electrodes used must be approved to the Medical Device Directive 93/42/EEC in Europe or to the relevant local standards outside Europe.

CAUTION: The conductive part of electrodes and their connectors, including the Neutral electrode, should not contact other conductive parts including earth.

WARNING: Electrode Placement: Caution should be taken when plugging electrodes into the EEG Amplifier to ensure that the correct socket is used for each electrode.

Use with other equipment

Defibrillators and HF surgical equipment

The equipment is not defibrillator proof and should not be used in situations where a defibrillator is likely to be used.

WARNING: The equipment should not be used with high frequency surgical equipment.

CONTRAINDICATIONS: Do not use the amplifier in an MRI environment. Failure to follow this warning may cause serious electrical burn on the patient due to local heating caused by dielectric electromotive force.

CONTRAINDICATIONS: Do not use the amplifier near a defibrillator. Before defibrillation, remove the WiEEG transmitter module from the patient. If the discharged energy from the paddles were to come into contact with the device or its transducers, it could give the patient an electrical burn.

WARNING: Do not use the amplifier in an explosive atmosphere due to risk of explosion.

Other patient-connected equipment

When used simultaneously with other patient-connected equipment, for example a cardiac pacemaker or other electrical stimulator, it is unlikely that a safety hazard will arise. However always consult the documentation supplied with the other patient-connected equipment to ensure that all hazards, warnings and cautions are considered before the equipment is used together.

WARNING: Non-medical equipment, when used with the system, should comply with IEC/ISO safety standards relevant to that equipment. IT equipment should comply with IEC 60950.

Leakage current

This system is designed to comply with IEC 60601-1, the international standard for medical electronic equipment, which specifies the permissible levels of leakage current. A potential hazard exists in the summation of leakage currents caused by connecting several pieces of equipment together. Because this system can be used in conjunction with standard electronic devices, the total leakage current should be tested whenever the system is modified.

There should be no electrical connections between the system equipment, which is powered via the isolation transformer, and any other equipment powered from a non-isolated mains supply.

Interference

WARNING: The Trackit Mk3, R40 and WiEEG will continue to operate in the presence of radio frequency magnetic fields (RF) and the effects of electrostatic discharges (ESD) and other interference, in accordance with the requirements of EN60601-1-2. However, the amplifiers record signals of very low amplitude, and these signals themselves are not immune to the effects of RF, ESD and low-frequency magnetic field interference. Such interference may cause signal artefacts and compromise the intended use of this device.

The Trackit Mk3 may have internal radios fitted. These are approved industry-standard Bluetooth and Wi-Fi types which present minimal risk of reciprocal interference with other equipment.

WARNING: When in close proximity to the amplifier, do not use mobile phones, transmitters, power transformers, motors, or other equipment that generates magnetic fields. Do not use the device near radio stations, high frequency cables, radio or television. Refer to the Appendix for more information.

WARNING: The equipment or system should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the equipment or system should be kept under observation to verify normal operation in the configuration in which it will be used.

WARNING: Medical electrical equipment needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the Appendix.

Maintenance and Cleaning

The iEEG acquisition system contains no user-serviceable parts (apart from replaceable batteries of the Trackit recorder). The system uses solid-state components and requires no routine testing or maintenance procedures apart from occasional cleaning and checking for wear and damage to all parts including accessories. Replacement of individual system parts is done by qualified Lifelines iEEG distributors only.

Cleaning

The outer surfaces of the system may be cleaned using a soft cloth moistened with water and mild detergent. A low-pressure air-line or a vacuum cleaner can also be used.

It is recommended to clean the WiEEG amplifier between each patient application.

CAUTION: Do not allow any liquid to enter the case of any instrument or connector. Do not use acetone on any of the instruments.

Reusable electrodes are to be cleaned and disinfected according to the instructions provided by the respective manufacturer.

Useful Lifetime

The useful lifetime for the Lifelines iEEG Portable system is 5 years.

The useful lifetime for the Lifelines iEEG Clinical system is 3 years.

The useful lifetime for the iEEG software is 5 years.

Disposal



Items marked with this symbol require special recycling. Do not dispose of in landfill. When this equipment has reached the end of its useful life, it must be disposed of in an environmentally friendly way. Waste electrical and electronic equipment (WEEE) requires special procedures for recycling or disposal. This includes batteries, printed circuit boards, electronic components, wiring and other elements of electronic devices. Follow all of your respective local laws and regulations for the proper disposal of such equipment. Contact your local distributor for information concerning this.

The WiEEG units do not present any biological or radioactive threat and may be disposed of according to local regulations, or returned to the manufacturer for disposal.

The BraiNet® template is a single patient use disposable device and should be properly disposed of after use in accordance with your facilities procedures for such.

CAUTION: Do not dispose of batteries by incineration.

Environmental Parameters for Operation

The operational and storage/transportation environmental conditions are as follows:

Operational:

Temperature – Trackit Mk3, R40	+10°C to +40°C
Temperature – WiEEG	+5°C to +35°C
Relative humidity – Trackit Mk3, R40	25% to 95% non-condensing
Relative humidity – WiEEG	40% to 93% non-condensing
Atmospheric pressure - All	700mB to 1060mB

WARNING: Do not obstruct any cooling slots. Position the equipment so that air flows freely.

Storage and Transport:

Temperature – Trackit Mk3, R40	-10°C to +50°C
Temperature – WiEEG	-10°C to +45°C
Relative humidity – Trackit Mk3, R40	10% to 95% non-condensing
Relative humidity – WiEEG	40% to 93% non-condensing
Atmospheric pressure – Trackit Mk3, R40	500mB to 1060mB
Atmospheric pressure – WiEEG	700mB to 1060mB

Third-party Devices

Refer to all third-party device documentation and heed all warnings, cautions and safety markings associated with the installation and use of those devices before using this system.

Reporting Incidents

In the event of a malfunction or change in performance of the device that may affect safety, send a report to support@kvikna.com

Warning Symbols



Additional warnings are indicated by this symbol elsewhere in this document.

Device Description

The Lifelines iEEG medical device is intended for acquisition and review of EEG and other physiological data as well as digital video synchronized to the EEG. It offers industry standard features such as re-montaging, band pass filtering, and spectral analysis in the form of trend analysis and user selected section of EEG. Additionally, it offers a remote control feature whereby live recording is viewable from a remote client system.

The Lifelines iEEG acquisition system consists of the following:

- Proprietary software
- Off the shelf IT components
- Medical power supplies
- EEG amplifier

Optionally:

- Photoc Stimulator

The EEG amplifier is a medical device (Lifelines Trackit Mk3 – FDA K010460 (all Mk3 models); Lifelines R40 – FDA K151600; JNS iEEG model 100 – FDA K131944) and the photic stimulator is as well (Lifelines Photoc Stimulator – FDA K101691). The off the shelf IT components include a PC, for example a Laptop, a “power over Ethernet” switch, IP video cameras and cables. The PC and the switch are powered by medical power supplies. Cameras are powered through the switch.

The Lifelines iEEG acquisition software which is a part of the Lifelines iEEG software system allows the user to interact with the hardware, i.e. amplifier, photic stimulator and video cameras. Furthermore, it stores and presents the information collected by the hardware following industry standard, user customizable processing. Additionally, it allows the user to annotate the data during recording.

Lifelines iEEG is a software system also used to manage and review EEG examinations. It works on data acquired by the Lifelines iEEG acquisition software as well as data from some third party EEG equipment that is imported into the system. The EEG is presented in a conventional way and conventional signal processing is applied such as re-montaging and band pass filtering. The system is also capable of presenting digital video synchronized to the EEG if this is available. Some advanced analysis methods are provided as an aid: FFT analysis and Artifact Removal.

The software is designed using service oriented architecture enabling the possibility of reviewing data over WAN without the use of additional remote desktop software solutions.

The iEEG Centrum is the main patient and user administration area. It is used to manage patient demographics, keep track of exams and manage user access to clinical data. The system can be configured to allow access from the internet using encrypted communication.

The iEEG Review software is used for review and analysis of EEG data by clinical experts. The user can navigate within the EEG that can be many hours long, filter and re-montage as desired. Furthermore, the artifact removal feature can be used to automatically filter artifacts from the EEG. If video data is available, it can be shown synchronized to the EEG traces. Sections of relevance are manually marked by the user and the relevant sections are archived for long-term storage.

Essential Performance

The medical device is intended to be used as a tool to aid diagnosis of neurological diseases such as epilepsy. It does not provide life-support functions or monitoring of vital physiological signs. The symptoms to be diagnosed and treated are not acute in the sense that delay in the measurement will not result in harm to the patient. However incorrect output from the device could lead to an inappropriate treatment that would present an unacceptable risk to the patient.

Therefore, the Essential Performance of the device is to deliver accurate data in the following ways:

- Correct analog processing, analog to digital conversion, digital processing and host communication.
- Correctly interface to the EEG amplifier and write the data to file.
- Correctly read the data from the previously written file.
- Correctly process the data according to the specification given by the operator.
- Correctly display the data according to the specification given by the operator.
- Associate the data with the correct patient.

Connecting the System

All Acquire systems are provided with the software preinstalled on the appropriate hardware for the system. There are various hardware configurations available, therefore it is important to refer to the connections diagrams provided with your system to ensure that all parts are connected properly.

User Acceptance Test

A user acceptance test form is provided with the system. After checking the system against the appropriate connections diagram, sign the form and return it with any comments. If the form is not returned, it is presumed that installation was satisfactory and acceptance is agreed.

Starting the System

To start the system, proceed as follows:

- Ensure all components are connected according to the appropriate diagram.
- Plug the PC into the wall outlet.
- Switch on the PC and wait for the software to load.
- Start the recording following the steps in the chapters Acquire Touch or Acquire Pro.

Note: These procedures also apply following a mains power interruption.

Shutdown of the System

At the completion of a study proceed as follows to shut down the system:

- End the recording following the steps in the chapters Acquire Touch or Acquire Pro.
- Switch off the PC and disconnect the power cable from the wall outlet.

Warnings



The Lifelines iEEG medical device comprises software and hardware components that must not be tampered with or modified in any way. This includes connecting non-authorized components, opening or modifying the equipment, installing 3rd party software, and modifying power settings. Failure to heed this warning may result in personal injury, damage to the equipment and will void the warranty.

IMPORTANT: Read the warnings in the chapter, Safety and Warning Notices, before using this product.

Explanation of Symbols



Type BF equipment



Follow operating instructions



Input/output connection



Input connection



Special recycling required, do not dispose of in landfill. When this equipment has reached the end of its useful life, it must be disposed of in an environmentally-friendly way. Waste electrical and electronic equipment (WEEE) requires special procedures for recycling or disposal. This includes batteries, printed circuit boards, electronic components, wiring and other elements of electronic devices. Follow all of your respective local laws and regulations for the proper disposal of such equipment. Contact your local distributor for information concerning this.



Consult warnings in User Manual



Bluetooth



Internal radio device



WLAN WiFi



Pushbutton



SpO₂

Nonin Xpod Pulse Oximeter



Manufacturer



DC power



Internal battery hazard



Electrocap

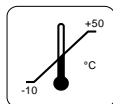


Battery Powered



Serial Number

Storage and transport symbols



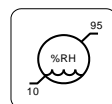
Temperature limits



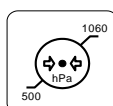
Fragile



Keep dry



Relative humidity limits



Barometric pressure limits

Compatible File Formats

Lifelines iEEG is compatible with the following file formats:

- Lifelines iEEG (*.ieeg)
- Lifelines Encrypted iEEG (*.ieegz)
- Lifelines Trackit (*.edf)
- EDF (*.edf)
- E (*.e)
- EEG (*.eeg)
- XLTEK (*.erd)
- Nihon Kohden (*.eeg)

Accompanying Documentation

For installation of the software and server and other administrative functions, refer to:

- Lifelines iEEG Technical Manual

For cart assembly of clinical systems, refer to:

- Lifelines iEEG Cart Assembly Guide

If using a Kvikna Medical approved external vital signs monitor, refer to:

- External Vital Signs Monitor Setup Guide

For other 3rd-party hardware components, i.e. Kvikna Medical approved amplifiers and photic, refer to the relevant guides available from the respective manufacturers.

This Manual

This manual accompanies the system for easy reference. The system described in this manual describes the most extensive configuration and every option may not be configured on your system.

Concepts

Before delving into the details of each feature of Lifelines iEEG, here is a short description of some of the concepts and terms we will be referring to. Some of these are user interface items you will see as you begin using the software.

Visits

Patient Visits are managed automatically by the system. Users cannot specifically add, update or delete visits.

When a patient is admitted into the system, a new Visit is created and a new exam is initiated. Subsequent exams are added to the current visit if the user creating or importing them has full access to the visit. Otherwise a new visit is created. A visit is considered completed once all the exams contained in the visit have been archived. If the patient is readmitted after the visit has been closed, a new visit is created.

In short, each patient in the database can be associated with more than one visit, and each visit can contain several exams.

Patient Database

The Patient Database includes all available patients in the system, past and present plus their demographics. Patients are identified by a distinct Patient ID. The Patient Database is automatically searched when admitting a patient to the system, when importing an exam, and when reassigning an exam to another patient.

Exams

All information and collected data associated with a clinical test make one exam, including reports, external files and workflow state. Each exam is identified by a distinct Exam ID.

Workflow

Each exam type is associated with a customizable Workflow, which includes several stages beginning with Initiate and ending with Archive. The Workflow State refers to the step in the workflow that is in progress or most recently completed.

Permissions

Permissions are granted to patient visits by user group. Individual users can belong to more than one group. When a user admits a new patient or creates a new exam where a new visit is created, the current user's default group is given full access to the new visit. Users are only aware of groups they are members of, while administrators have access to all groups.

Centrum

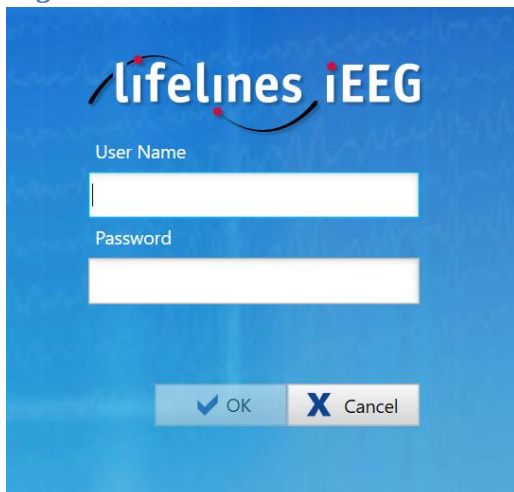
Login

If more than one database is available, select a database then enter user name and password. Click OK.

Database Button



Login

A login dialog box with a blue background. At the top, the text 'lifelines iEEG' is displayed in white, with a stylized black arc and red dots above it. Below this, there are two white input fields. The first field is labeled 'User Name' and the second is labeled 'Password'. At the bottom, there are two buttons: 'OK' with a checkmark icon and 'Cancel' with an 'X' icon.

After successfully logging in, your user name is stored and displayed in the user name field next time you log in.

Note: If the server you attempt to connect to is a newer version than your client (but within the same major version), you will be prompted to upgrade. Click yes to download and install the new version.

Note: After a number of consecutive unsuccessful login attempts (default 5), the user will be locked out.

Multiple Databases

Note: Non-acquisition systems only

To add a new database, click the Manage Connections icon then click the Add button on the Connection List. Under Connection Properties, give the database a name, select the host type

from the dropdown list and enter the host path. Enter the port number in the Port field. Click Save to add the database to the Connection List.

Add New Connection



You can also import a database. Click the Import button, browse for the database and click Open.

To delete a connection from the list, select it and press the Delete button.

Go back to the Login via the Login button on the top-left corner of the screen.

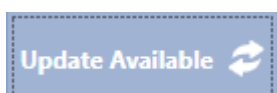
Back to Login



The User Interface

The main navigation of Lifelines iEEG Centrum is a row of tabs across the top of the screen. The tabbed pages are divided into panes by vertical dividers. The size of the panes can be adjusted, if necessary, by dragging the dividers to the right or left.

Update Available



If this button appears to the right of the main tabs, it means an update is available to the Centrum and Review software. Press the button to download and install the software.

Patient List


The Patient List tab is the main work area of iEEG Centrum and the first thing you see after logging in. Here you can search for patient visits, view and edit the corresponding patient and exam properties, and schedule new exams within a current visit. You can follow a workflow path associated with each exam, including launching external modality applications. You can also create and view reports or add imported documents to the patient visit. Read on for a detailed description of each section of the Patient List screen.

Patient Visits

The Patient Visit list shows a list of patient visits currently in progress. Click on a patient in the Patient Visit list to activate the Visit Properties on the right side of the screen. The Exam List will pop out below the selected patient visit. The items on the Patient Visit list can be sorted by clicking on each list header, for example, sort by Patient ID or Last Name.

Patient Visit list sorted by last name

Patient Visits


 From To
☐ Ready To Upload
☐ Assigned To Me
☐ Include Archived

Exam Type: State: Exam Space: Time:

Patient ID	Last Name	First Name	Date of Birth	Created	Access Level
RB21033266	Black	Rowan	21.3.1932	6.3.2012	Full Access
S80809442365	Browne	Shadey	8.9.1944	5.3.2012	Full Access
AC0405805521	Crimson	Alizarin	4.5.1980	1.3.2012	Full Access
AG0912583210	Greene	Amanda	9.12.1944	1.3.2012	Full Access
RM15101965	Madder	Rose	15.10.1965	1.3.2012	Full Access

If the list is very large, it will be displayed in pages. Click the arrows or page numbers at the bottom of the list to scroll through the pages. If you want to change the number of exams that are displayed on each page, type a new number in the Items per page box.

Showing items 1-25 out of 77
 
 1
 2
 3
 4
 
 Items per page

Search

Begin typing a name or ID to narrow down the choices displayed on the Patient Visit list. It is possible to search by the following criteria: First and last name, Patient ID, and Exam ID.

Filters

You can also narrow down the search by selecting filter options. The filters can be used to display only patient visits containing exams of a specific exam type, in a particular workflow state, exam space, or within a certain time frame. Select specific dates by typing in the "from/to" fields or clicking on the calendars. Use the Assigned to Me, Include Archived, or Ready to Upload check boxes to further filter the Patient Visit list.

Note: The system remembers the last used filters and keeps those settings until they are changed or cleared.




Refresh

Click the refresh button to make sure the list is always showing the most recent entries or changes.

Clear Filters

If you have filtered the search, the filter indicator will light up green, as shown below. Click the green indicator to clear all filters.

Patient Visits


 From To
☐ Ready To Upload
☐ Assigned To Me
☒ Include Archived  

Exam Type: State: Exam Space: Time:

Exam List

To display the Exam list, click a visit on the Patient Visit. The Exam list pops down under the patient visit. Select an exam from the list to reveal the exam properties and workflow associated with that exam, and also to activate the buttons described below.

Note: The buttons that appear will vary depending on the exam that is selected.

Exam List & Buttons

AG101	Greene	Amanda	28.10.2014	Full Access		
Exam ID	Exam type	State	Timestamp	Assigned To	Created	
AG101	Video ambulatory	Scheduled	19.11.2014 16:16:02	Administrator	29.10.2014 11:54	
 AG102	Generic	Recorded	25.3.2010 09:51:20	Administrator	28.10.2014 14:28	
 AG103	Video ambulatory	Recorded	27.10.2014 15:20:39	Administrator	27.10.2014 15:20	
 AG104	Video ambulatory	Recorded	23.10.2014 13:51:31	Administrator	23.10.2014 13:42	
 Add  Delete  Merge  Fetch  Associate  Export  Detection						

Add



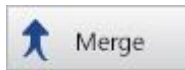
Initiate a new exam associated with the selected patient visit.

Delete

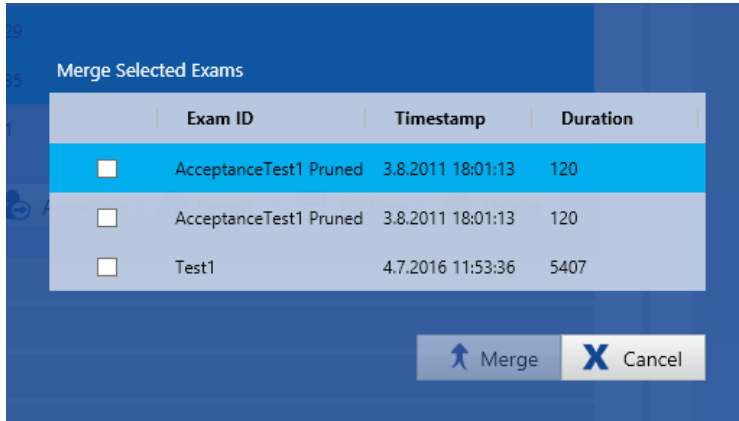


Delete the selected exam on the exam list.

Merge



Open a popup to select two or more exams to merge into one.



Fetch



The Fetch button is available when the exam has been recorded using the amplifier. Use it to fetch the EEG from the amplifier storage to the local iEEG database.

If the exam was recorded using dual storage mode (PC + Amplifier), then a new exam will be created on the exam list. Montage changes, events and video sync points are recalculated for the new exam.

Once the exam has been fetched, you can then upload it to the server (see next button, Upload).

Note: When fetching from a memory card, a dialog pops up indicating the progress of the file transfer and post processing tasks. It is important not to remove the card until these processes are complete.

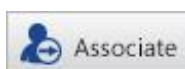
Note: See the Acquire chapter, Setup section for more information about recording storage modes.

Upload



The Upload button is available when the exam is ready to be uploaded to the server.

Associate



Associate the selected exam to another patient.

Export

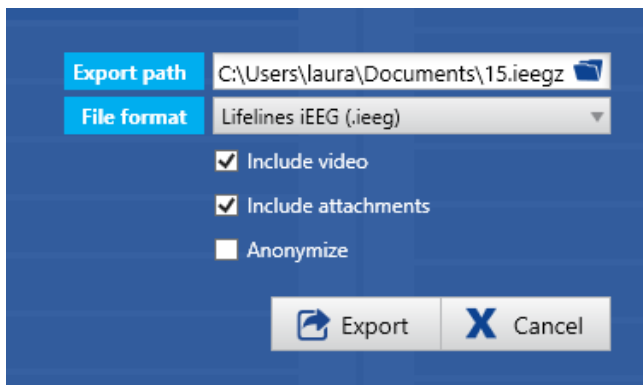


The export button opens a dialog that allows you to choose the location of the exported file and the file format of the exported file.

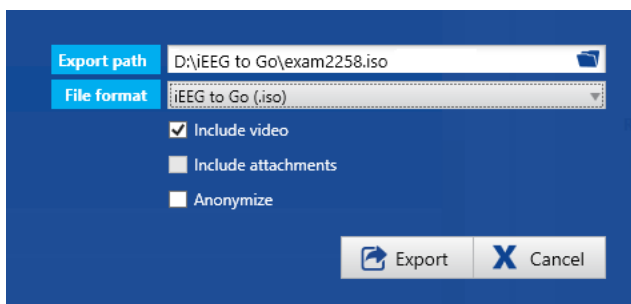
Export Path: Click the file folder icon to select the location for the exported file and change the name of the file if you wish. It is strongly recommended to keep the data on encrypted media.

File Format: If ieeeg is selected, you can check whether you want to include video or attachments, unless you choose Anonymize. Then the video and attachments options are disabled.

If edf format is selected, the exported file will be anonymous by default and the video and attachments options are disabled. If you uncheck the Anonymize box, personal information will be included in the exam.



iEEG to Go



The iEEG to Go option exports the exam contained in a read only version of the Review client. This is useful to be able to send the exam to someone who does not have the client installed. The recipient can review the exam and view the patient demographics.

Export Path: Click the file folder icon to select the location for the exported file and change the name of the file if you wish. It is strongly recommended to keep the data on encrypted media.

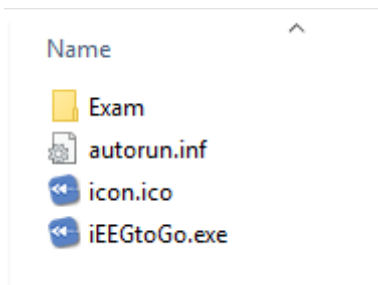
File Format: Select iEEG to Go (.iso) as the File Format.

Check whether you want to include video or attachments (such as reports).

Check Anonymize if you don't want any personal patient information included.

Press the Export button to export the file. You can follow the progress of the export on the Processing tab.

When the export is complete, double-click (mount) the .iso file, then double-click the iEEGtoGo file to view the exam.



The recipient of the exam will be prompted to calibrate their monitor before reviewing the exam. Follow the instructions on the Calibration tab using a ruler as a guide to adjust the virtual rulers on the screen.



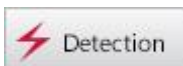
WARNING: It is important to calibrate the screen so exams can be interpreted correctly. The screen calibration must be performed for every new computer screen.

Archive



Archive the selected exam.

Seizure Detection



Perform spike and seizure detection on the selected exam.

Exam List Indicators

To the left of each exam on the exam list, you may see small icons indicating the following about the exam:



Exam is ready to be uploaded to server from this computer.



Exam is ready to be uploaded to server from another computer.



Upload is in progress.



Data is ready to be fetched from amplifier or CF card.



Data is ready to be fetched from amplifier or CF card of a dual-storage recording. A new exam will be created on the exam list.



Warning to archive exam.



Exam archive is overdue.



The exam has been pruned.



The exam has had spike and seizure detection performed.



The exam includes video.

Visit & Exam Properties

When a patient is selected from the Patient Visit list, the visit properties appear in the right-hand section of the screen, with the name of the selected patient appearing at the top. The visit properties consist of tabbed pages with information related to the currently selected patient visit. When an exam is selected on the drop-down exam list, additional tabs appear with information about that specific exam. These tabs are all described in detail below.

Patient Properties

The Patient Properties tab shows the patient demographics of the selected patient and the fields (besides ID) are editable. Upload a photo by clicking on the Upload Image rectangle and browsing for a photo. Be sure to click Save after editing.

Patient Properties


The screenshot displays the 'Patient Properties' tab of the Lifelines iEEG Acquire software. The interface is organized into a form with various input fields and a sidebar. At the top, there are three tabs: 'Patient Properties' (selected), 'Permissions', and 'Reports'. The 'Patient ID' field is highlighted in blue and contains the text 'QuickPatient_442'. Below this, there are several text input fields for 'SSN', 'Salutation', 'Last Name', 'First Name', 'Middle Names', 'Date of Birth' (with a calendar icon), 'Time of Birth' (with a time picker), 'Gender' (radio buttons for Male, Female, and Unknown), 'Hand Dominance' (radio buttons for Left, Right, and Unknown), 'Height' (with a unit of 'cm'), 'Weight' (with a unit of 'kg'), 'Gestational age' (with a unit of 'Weeks (at birth)'), 'Street Address', 'City', 'Zip Code', 'Telephone', 'Mobile Phone', and 'Email'. To the right of these fields is a large 'Upload Image' button. At the bottom of the form are two text areas for 'Patient Notes' and 'Clinical History'. A 'Save' button with a floppy disk icon is located at the bottom right of the form.

Permissions

Use the Permissions tab to assign access rights to the selected patient visit. Access rights are assigned to user groups. When a user initiates a visit, the user's default group automatically gets full access to the visit.

Users with full access to a visit can give other user groups access to the visit. Be sure to click Save after changing or assigning permissions.

Patient Properties	Permissions	Reports	Exam Properties	Patient State	Exam History	
No access - no permissions for this visit Anonymized - can view EEG but no patient identifiable data and can't modify Read-only - can view EEG and patient identifiable data but can't modify Blinded - can view EEG but no patient identifiable data and can modify but not delete and archive Analysis - can view EEG, patient identifiable data and can modify but not delete and archive Full access - can view EEG, patient identifiable data and can modify, delete and archive						
User Group Name	No Access	Anonymized	Read-only	Blinded	Analysis	Full access
A	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alliance	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AnonymizedGroup	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
BlindAccessGroup	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Default	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Dr Jones	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Kvikna Admin	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lifelines Demo	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lifelines Support	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NoAccessGroup	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

 Save

The permissions options are as follows:

Full Access: user can see and edit all patient and exam information, delete and archive.

Example: Technologists, technicians

Analysis: user can see and edit all patient and exam information, but not delete or archive.

Example: Doctors

Blinded: user can view EEG but no patient identifiable data. Can edit but not delete or archive.

Example: Research, pharmaceutical trials

Read Only: user can see all patient and exam information, reports and video, but not edit.

Example: Review for reference.

Anonymized: user can view EEG but no patient identifiable data and cannot edit.

Example: Educational, second opinions

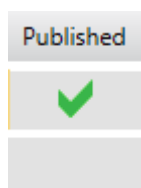
No Access: users with no access cannot see the visit.

See the Admin View > User Administration for information on creating user groups, assigning users to groups and selecting the default user group for each user.

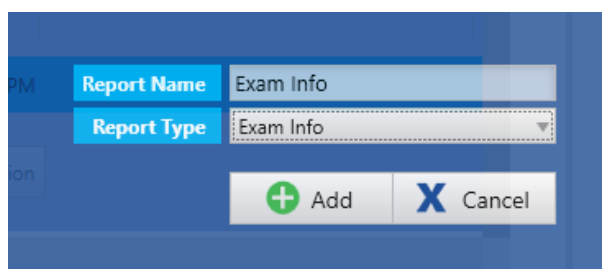
Reports

On this tab is a list of all reports and documents created or uploaded during every exam of the visit. Select a report from the list to open, publish or delete the report.

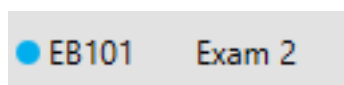
When a report is published, and new report is created and a checkmark appears under the Published column.



To create a new report, you must first select an exam from the Exam List. The report will be associated with that exam. Give the report a name, select the Report Type and click Add.



You can see at a glance which reports are associated with an exam by selecting the exam on the Exam List. All reports associated with the selected exam will be indicated with a blue dot next to the exam ID.



Exam Properties

To display the Exam Properties you must first select an exam on the Exam List. The Exam Properties, Patient State and Exam History tabs are then displayed.

The Exam Properties tab shows information about the exam, such as exam type and workflow state (see image below). To edit the info, simply type in new information or make selections from the drop-down lists and then click Save.

Note: Not all fields are editable at all times.

Note: The date and time may change between the scheduled and recorded states to reflect the actual time the recording was started.

Exam Properties

Patient Properties	Permissions	Reports	Exam Properties	Patient State	Exam History
<div> <div>Exam ID</div> <div>119</div> </div>					
<div> <div>Exam type</div> <div>Video ambulatory</div> </div>					
<div> <div>State</div> <div>Initiated</div> </div>					
<div> <div>Date</div> <div></div> </div>					
<div> <div>Time</div> <div>12 : 00 AM</div> </div>					
<div> <div>Exam Space</div> <div>Default</div> </div>					
<div> <div>Duration</div> <div>00:00:00</div> </div>					
<div> <div>Assigned To</div> <div>Administrator</div> </div>					
<div> <div>Secretary</div> <div></div> </div>					
<div> <div>Recorded By</div> <div></div> </div>					
<div> <div>Reading Physician</div> <div></div> </div>					
<div> <div>Referring Physician</div> <div></div> </div>					
<div> <div>Anesthesiologist</div> <div></div> </div>					
<div> <div>Surgeon</div> <div></div> </div>					
<div> <div>Exam Folder Info</div> <div>Exam Access Info</div> </div>					
<div> <div>Save</div> <div>Cancel</div> </div>					

Exam Folder Info

Users with full access to an exam will see the Exam Folder Info button.

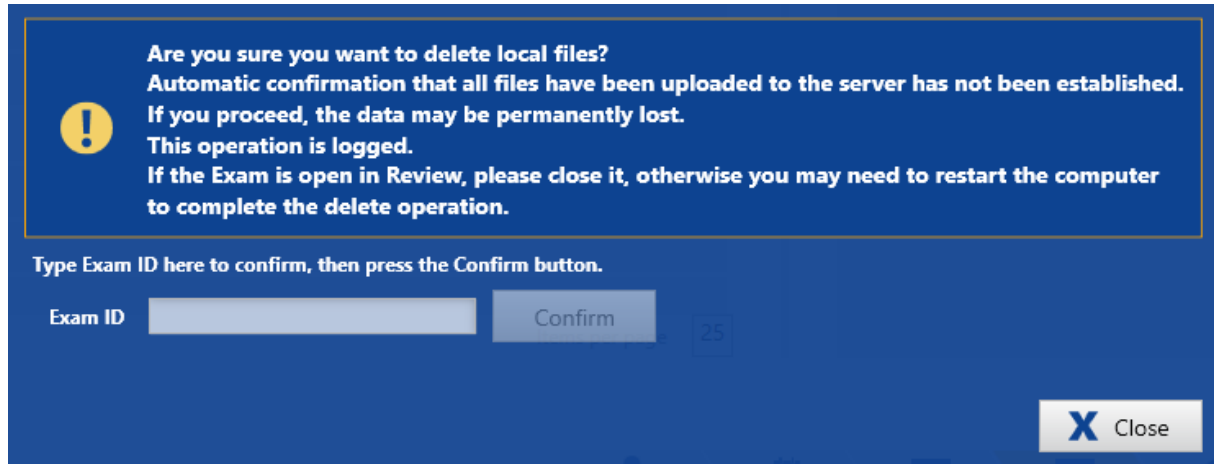
Press this button to see the full path of the exam folder, all files included in the folder, file sizes and the last modified date.

Delete Local Files

If you are on an Acquire system, you may also see a button with the option to delete local files. This button only appears after a recording has been completed, but has not yet been confirmed to be uploaded to the server. This option should **only** be used when it is not possible to connect the Acquisition device to the server for the automatic confirmation, but you need to free up space on the Acquisition device.

IMPORTANT: Before deleting local files, ensure that the exam has been exported (for example, to a usb stick) and then uploaded successfully to the main server/cloud account. Otherwise, data may be permanently lost.

When you press the Delete Local Files button this warning displays:



A warning dialog box with a blue background and a yellow border. It contains a yellow warning icon (an exclamation mark inside a circle) on the left. The text inside the dialog reads: "Are you sure you want to delete local files? Automatic confirmation that all files have been uploaded to the server has not been established. If you proceed, the data may be permanently lost. This operation is logged. If the Exam is open in Review, please close it, otherwise you may need to restart the computer to complete the delete operation." Below the text, there is a prompt: "Type Exam ID here to confirm, then press the Confirm button." This is followed by a text input field labeled "Exam ID" containing the number "25", a "Confirm" button, and a "Close" button with a blue 'X' icon.

Type in the Exam ID to confirm the delete.

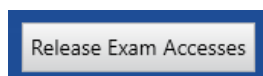
If the exam is open in Review, close it before deleting, otherwise you may need to restart the computer to complete the delete operation.

If upload of the exam is in progress, you will need to wait for the upload to complete, or cancel the task on the Processing tab before deleting the local files.

Exam Access Info

Users with full Admin privileges will see the Exam Access Info button.

Press this button to see a list of current exam access locks with the option to release all locks by pressing the Release Exam Accesses button.



CAUTION: Before releasing access locks, be sure that the current in-progress action does not conflict with the action you want to perform.

Patient State

On this tab you can enter information about the patient's state during the exam, hours since last meal, medication, notes, or clinical information. Press Save to save any changes.

Patient Properties	Permissions	Reports	Exam Properties	Patient State	Exam History
Patient State					
Hours Since Last Meal					
Medication					
Exam Notes					
Clinical Information					

Exam History

View the workflow history of the selected exam. This information is automatically generated and not editable.

Workflow

When an exam is selected on the Exam list, the workflow for that exam appears along the bottom part of the screen. The highlighted (yellow) button indicates the current state of the exam in the workflow. The next button in the row (blue) is an active button that can be pressed to perform the next stage of the workflow, although sometimes the system moves the exam automatically to the next state by an action performed elsewhere.

Moving Back a State

Sometimes it is possible to move an exam back to the previous workflow state, in this case, the previous state will become an active (blue) button. A popup window appears to allow you to confirm that you intend to move the exam to the previous state.

Below is a description of the default workflow states.

Note: Custom workflow states can also be added to the workflow. See the Definitions>Modalities section under The Admin View in this manual.

Also note that while Prune is available as a default state, it is optional.

Workflow Buttons

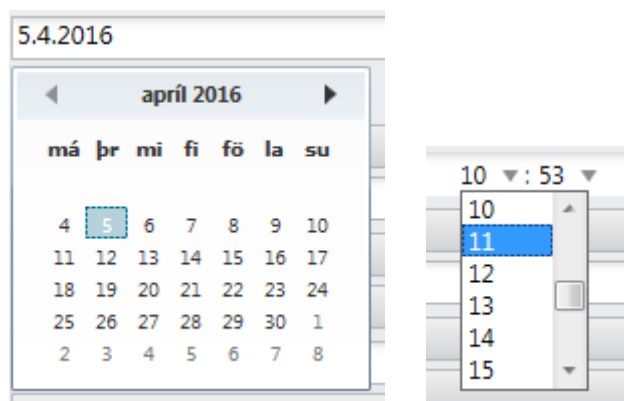


Initiated

When a new patient is admitted or a new exam is created, it is in the initiated state and the Initiated button will be highlighted in yellow. The Scheduled button then becomes active.

Scheduled

Press the Scheduled button to schedule the exam. The system automatically schedules the exam to the current date and time. The Date and Time fields of the exam properties become editable if you want to schedule the exam to a later date and time.



Recording

When the exam has been scheduled, you can click the Recording button to launch the modality application associated with the Exam Type selected when the exam was created. The associated modality is defined under Admin>Definitions>Exam Type.

The workflow state is now "Recording" and is highlighted yellow.

You can also start the recording in Acquire, and the exam will be moved automatically to the Recording state.

Note: It is not possible to start another acquisition until the current one has completed.

Recorded

After the exam has finished recording, it is automatically moved to the Recorded state.

Uploaded

If your Server Upload Mode has been set to Online, the exam moves to the Uploaded state automatically after it has been uploaded to the server. If you have selected Manual as the upload mode, then you will manually upload after the recording is finished. To do so, press the Uploaded workflow button, or press the Upload button on the Exam List.

You can set the Server Upload Mode to Online or Manual on the Setup tab of Acquire. This should be done before starting the recording, but can also be changed during the recording.

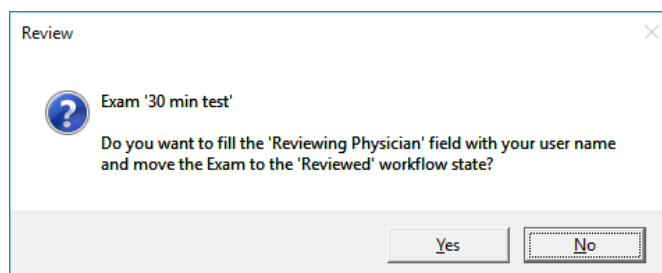
Pruned

After the exam has been pruned, press Pruned to move it to the Pruned workflow state.

Note: This workflow state is optional

Reviewed

Press the Reviewed button to review the exam and mark it as Reviewed. When you close the exam after reviewing, a popup appears so you can confirm that you want to move the exam to the Reviewed workflow state and fill the Reviewing Physician field with your user name.



Archived

For an exam to be archived, it must be moved to the Archived workflow state, either by pressing the workflow button, or the Archive button on the exam list (see Exam List, above). Doing so finishes the workflow for the exam.

The exam data is then moved to the archive path and the exam is no longer visible on the Exam List unless the 'Include Archived' box is checked.

Patient Visits

☐ Assigned To Me
 ☒ Include Archived

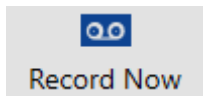
From To

<Exam Type Filter> <State Filter> <Time Filter>

Note: Archiving can take up to a couple of hours and you can review the progress on the Processing tab.

Record Now Button

Record Now Button



The Record Now button is located to the right of the workflow and allows quick launch of the recording if necessary even before the exam has been scheduled. This method of starting the exam also moves the workflow state to Recording.

Review Button

Review Button



Once the exam has reached the Recorded state, the Review button replaces the Record Now button to the right of the workflow bar. If you are recording locally, you can begin Reviewing the exam while recording.

Note: Using this button to review the exam will not move the exam to the Reviewed state. To move the exam to the next state, you must open the exam using the Reviewed button on the Workflow Bar.

Remote Review

For non-local recordings, if Online Server Upload Mode has been selected in Acquire setup, you can begin to review the exam in near real-time while it is being recorded. Otherwise, you can begin review after the exam is recorded and transferred to the server.

Note: Remote review requires the optional Online Networking license.

Reviewing an Archived Exam

You can review an archived exam, but it will be a read-only version of the exam and changes will not be saved. After reviewing, the local copy is deleted but the archived copy is untouched and can be retrieved again at a later time.

Restore Archived Exam



To restore an archived exam back to its unarchived state, press the previous workflow button on the workflow bar. A popup dialog appears asking you to confirm that you want to go back to the previous workflow state.

Changes can now be saved to the exam, but the archived copy is now invalid and the exam must be archived again.

Note: It is recommended to use the Restore option only if the exam was archived by accident before the final review was completed.

Control Button



Remote Control

Press the Control button to open an in-progress remote recording. The exam is opened in Acquire Pro with all of the features of a locally recorded exam, with the exception of photic control. See the Acquire Pro chapter for details on using Acquire Pro.

Note: Remote control requires the optional Online Networking license.

Patient Admission

Use the Patient Admission tab to enter a new patient into the database, and also to start a new patient visit or initiate a new exam with an existing patient.

Begin by typing a name or Patient ID into the spaces provided under Patient Properties and the system searches the Patient Database for matches. The Patient Database is shown next to the Patient Properties form.

New Patient

If no match is found, continue entering information and click Save to add the patient to the database. You can now enter an Exam ID under the New Exam area of the screen and click Initiate to initiate a new exam. A new patient visit is added to the Patient Visit list on the Patient List tab.

Note: Both the Patient ID and Exam ID are required fields.

New Exam

Exam ID	<input type="text"/>
Exam type	Generic ▼
Exam Space	Default ▼
Assigned To	Administrator ▼
Referring Physician	<input type="text"/>

Existing Patient

If a match is shown on the list in the Patient Database, click the entry to select it and the rest of the Patient Properties will be filled in. Enter an Exam ID under the New Exam section and click Initiate to initiate a new exam. If the patient already has a visit in progress, the exam will be added to that visit which appears on the Patient Visit list on the Patient List tab. If the previous patient visit has already been archived, a new patient visit is created when you initiate the new exam.



WARNING: It is important to enter the correct ID associated with the patient so exams can be interpreted correctly.

Upload

Use the Upload tab to fetch exams recorded on another device and upload them to the server. Exams recorded in another format are converted to the native format so they can be edited, pruned, etc.

Click the file folder icon to browse for the file to upload.

Select the exam type from the drop-down list.

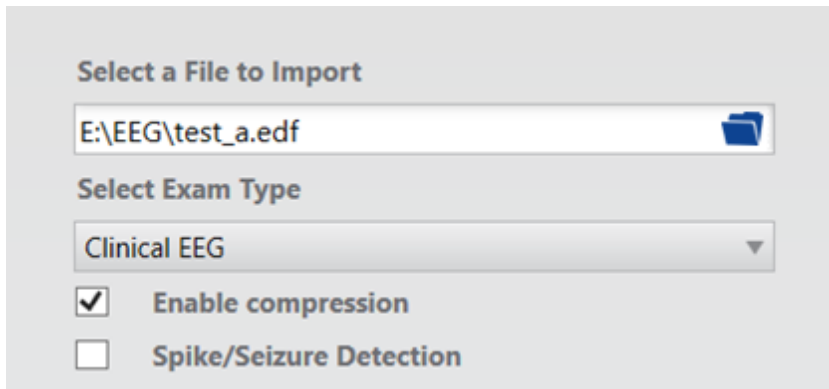
Check "Enable compression" if you are on a slower connection. This will compress the EEG and video files before transferring to the server.

If Spike & Seizure Detection (Persyst) integration is installed on the iEEG Server, check "Spike/Seizure Detection" to run the seizure detection algorithm as a part of the upload process. System detected events will be inserted at the top of the channel chart where the system has detected seizure and will also appear on the Event List.



WARNING: The Persyst User Manual must be read before using the Spike & Seizure Detection feature.

Browse to upload an exam on the Upload tab



Select a File to Import

E:\EEG\test_a.edf

Select Exam Type

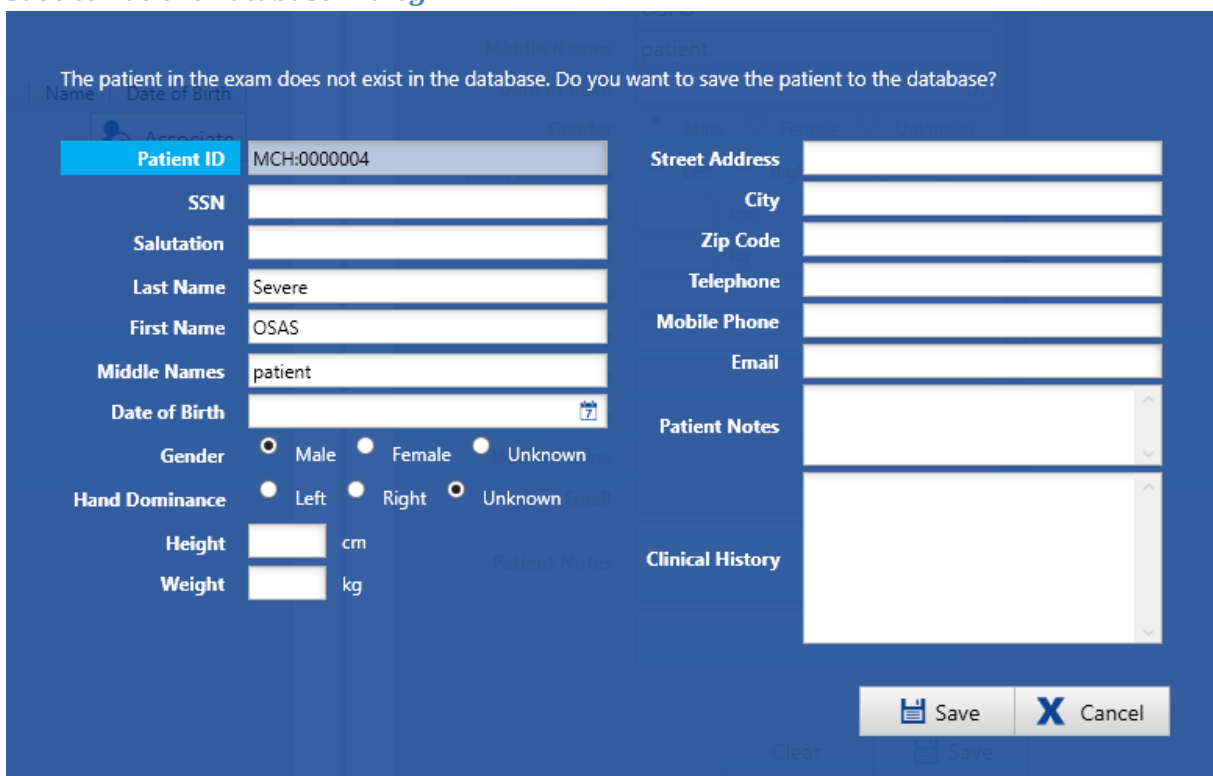
Clinical EEG

☒ Enable compression

☐ Spike/Seizure Detection

If the patient information associated with the file is not already in the database, the following popup dialog appears asking if you want to save the information to the database. Fill in the appropriate information and click Save.

Save to Patient Database Dialog



The patient in the exam does not exist in the database. Do you want to save the patient to the database?

Associate

Patient ID: MCH:0000004

SSN:

Salutation:

Last Name: Severe

First Name: OSAS

Middle Names: patient

Date of Birth:

Gender: ☒ Male ☐ Female ☐ Unknown

Hand Dominance: ☐ Left ☐ Right ☒ Unknown

Height: cm

Weight: kg

Street Address:

City:

Zip Code:

Telephone:

Mobile Phone:

Email:

Patient Notes:

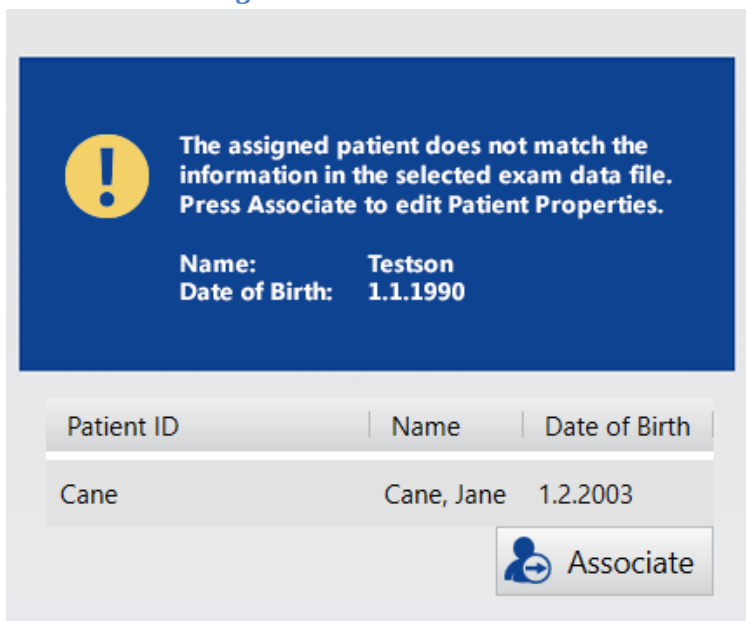
Clinical History:

Save Cancel

Associate

If there is no patient information included in the file, or if you need to reassign the exam to another patient, click the Associate button.


Associate Warning



The assigned patient does not match the information in the selected exam data file. Press Associate to edit Patient Properties.

Name: Testson
Date of Birth: 1.1.1990

Patient ID	Name	Date of Birth
Cane	Cane, Jane	1.2.2003

 Associate

Enter the patient information under Patient Properties. If matches are found, suggestions will populate the Patient Database list shown below the patient information. Select a patient from this list and the rest of the info is filled in for you. Click Save.




WARNING: It is important to enter the correct ID associated with the patient so exams can be interpreted correctly.

Permissions

If you want to override the default permissions, you can assign permissions to the selected exam before uploading. Click the Permissions button to open a popup window to select the permission level for each user group.



Permissions  Preview  Upload  Cancel

Upload Button Bar

See a description of the permissions levels under Patient List>Visit Properties.

Preview

Click the Preview button to open the data file in a simple viewer if you want to view the EEG before uploading.

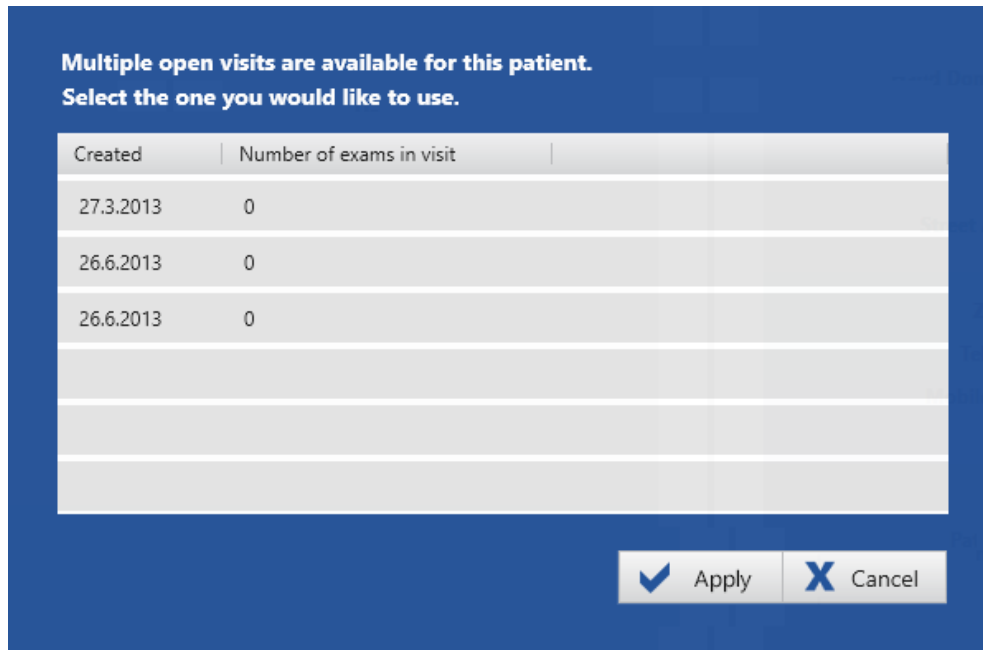
Exam Properties

When uploading from the Upload tab, it is possible to change or add to the current exam properties by typing in new information before clicking Upload.

Patient Visit

If a current visit exists for the patient that is not read-only and that the current user has full access to, then the exam is associated with that visit. Otherwise, a new visit is created.

If more than one open visit exists for the patient, the following window will pop up prompting you to select the visit you want to associate with the exam.



**Multiple open visits are available for this patient.
Select the one you would like to use.**

Created	Number of exams in visit
27.3.2013	0
26.6.2013	0
26.6.2013	0

☒ Apply ☐ Cancel

See the section Intro>Concepts>Visits near the beginning of this manual for more information about the meaning of Patient Visits.

Upload Cost

The upload cost appears above the row of buttons before uploading.

Note: this does not include the cost of running spike and seizure detection even though this option is selected.



Import cost 6 Units

Progress

The upload process can take some time depending on the size and complexity of the file. You can monitor the progress on the Processing tab.

Processing

On the Processing tab, you can monitor the progress and results of processes such as file uploading, video encoding or archiving, to name a few.

The left side of the screen shows the progress of each action with a progress bar, and the right side of the screen shows the results of the process. The progress bars on the right side of the screen are color coded to match the results, which are also printed in text above each bar along with the process type, file name, and time and date stamp.

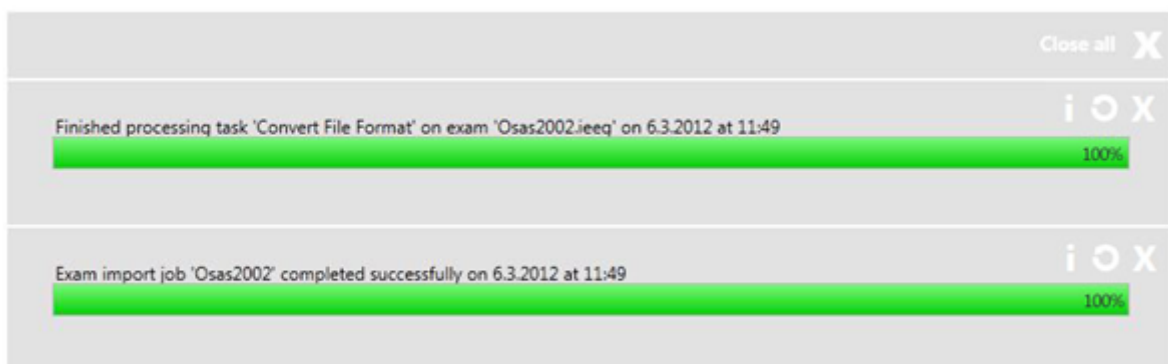
Green = the process completed successfully.

Yellow = the process completed with warnings.

Red = the process failed.

Blue = the process was cancelled.

Completed processes



Buttons

Click the x box of any progress bar while processing to cancel the process.

Click the circular arrow icon to retry a failed process.

Click the i icon for additional info (if available) about the process.

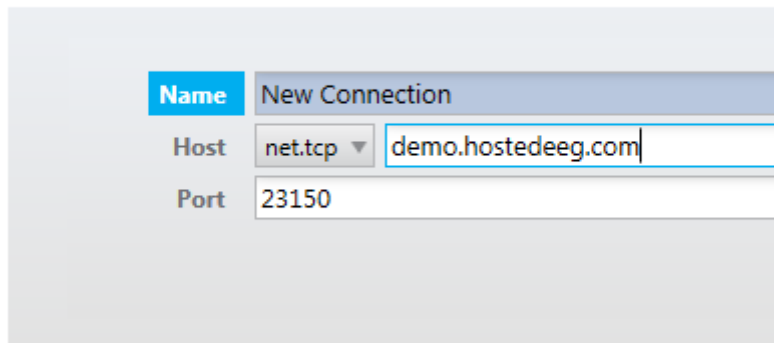
My Settings

Connection List

Here you can add or import new database connections. Click the Add or Import button and type in a name and path for the database under Connection Properties. (If importing, the path will be filled in already). Select between net.tcp and https from the combobox.

Connection Properties

Connection Properties



The screenshot shows a 'Connection Properties' dialog box. It has three fields: 'Name' with the value 'New Connection', 'Host' with a dropdown menu set to 'net.tcp' and a text box containing 'demo.hostedeeg.com', and 'Port' with the value '23150'.

Click Save and the database will be added to the Connection list and will then be available when logging on to the system.

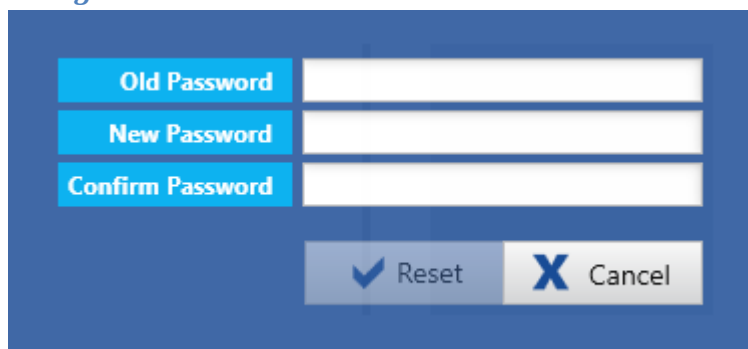
Select a database from the Connection list and click Delete to remove the database from the list.

Note: Multiple databases is only supported on non-acquisition systems.

Settings

Change

Change



The screenshot shows a 'Change Password' dialog box. It has three text input fields labeled 'Old Password', 'New Password', and 'Confirm Password'. At the bottom, there are two buttons: 'Reset' (with a checkmark icon) and 'Cancel' (with an 'X' icon).

Click Change Password to change your password. You will be asked to type in your old password, a new password and your new password again to confirm. Click Reset to complete the process.

Video Player Version

By default, this is set on version 2. If you are having trouble viewing video recordings made from systems other than iEEG Acquire, you may need to switch to version 1.

The Admin View

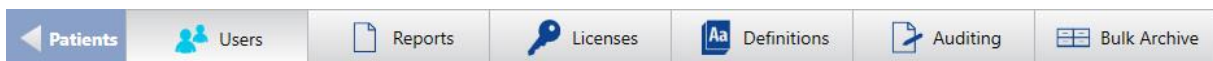
If you have administrator access rights, you will see the Admin button on the top-left corner of the screen, next to the tabs. Click this to display the admin tabs. When you are in admin view, the button on the top-left changes to Patients, to take you back to patient view.

The following sections describe the various features available on the Admin tabs and how they work.

Admin Button



Admin Tabs & Patients Button



User Administration

Access to the Lifelines iEEG system is password protected. Only defined Users have access to the system. Users that have administrative privileges can manage user accounts.

Add Users

Before adding users to the system, you first need to add some User Groups and Roles to associate with the new users. See the User Group and Roles sections below if you have not already added user groups and roles.

To add a new user, click the Add button under the Users section of the Users tab, then fill in the information in the form that appears below. The email field is optional, but the rest of the fields are mandatory. Note that users can belong to more than one user group. Users (besides administrators) are only aware of user groups they belong to.

User Name	admin	Reset Password
Full Name	Administrator	
Email Address		
Role	Technologist	
User Groups	Default	
Default group	Default	
	<input checked="" type="checkbox"/> Administrator <input type="checkbox"/> Locked Out	
		<input type="button" value="Save"/> <input type="button" value="Cancel"/>

If a user belongs to more than one user group, you can select the user's Default Group. That is the group that gets full access to new exams the user creates.

If you want the user to be an administrator, check the Administrator box. Administrators have access to the Admin tabs and can edit everything in there, and they also have full access to all visits and user groups. Administrators are marked with a green A on the Admin column of the Users list.



To lock a user out of the system, check the Locked Out box. Locked out users are indicated by a lock icon in the Locked Out column of the Users list.



When all mandatory fields have been filled in, the Save button becomes available. Clicking it opens a password dialog box. Enter and confirm the password and click Reset.

The new user is now ready. You can add as many users as you want and it is possible to modify their properties afterwards, except for the User Name.

Search and Filter

Use the Search box to filter the Users list by text string. Select an option from the 'Filter by user group' drop-down list to filter by a specific group or show users from all groups.

The screenshot shows the 'Users' tab selected in the top navigation bar. Below the navigation bar, there is a search bar with the letter 'J' entered and a 'Filter by user group' dropdown menu set to 'Show all'. The main area displays a table of users with the following columns: Full Name, User Name, Role, User Groups, Admin, and Locked Out.

Full Name	User Name	Role	User Groups	Admin	Locked Out
James Dolitt	james	Default	Technicians		
Jane Doe	jane	Default	Technicians		
John Smith	john	Default	Physicians		

Image shows the Users list filtered by the letter J.

User Groups

Permissions are granted to patient visits by User Groups. To create a user group, click Add on the User Group tab under Settings on the Users tab. Type in a name for the user group and click Save. You can add as many user groups as you want and you can change their names afterwards.

Roles

To add a new role, click Add on the Roles tab under Settings on the User Administration tab. Type in a name for the role and click Save. You can add as many roles as you want and you can change their names afterwards.

Password Policy

On the Password Policy tab, you can set requirements for passwords such as minimum number of characters, or whether a certain number of special character, numbers or capital letters are required. Click Save to save the changes.

Reports

Lifelines iEEG offers the ability to create custom Word report templates to allow different reports for different exam types. The custom report templates are then available for selection when adding a new report to an exam.

Associate Workflow State

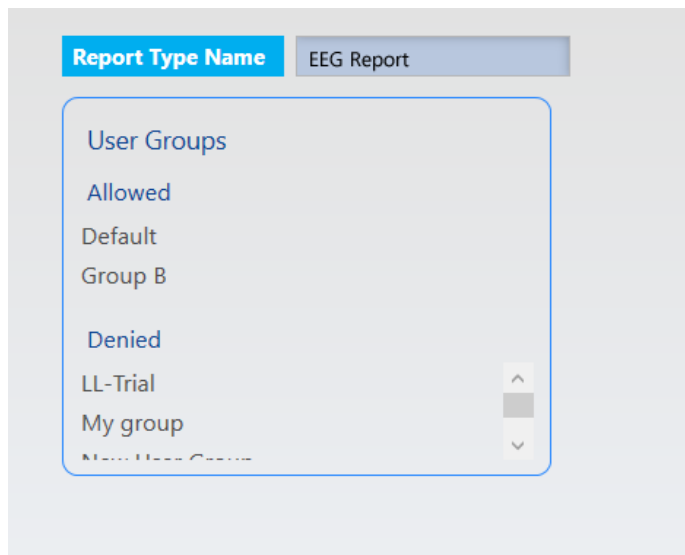
It is also possible to associate a report template with a specific workflow state of an exam type. Then the associated report template pops up automatically when the exam reaches the specified workflow state. (See Definitions > Exam Types to do this.)

Associate User Group

In addition, you can choose to associate user groups with a report type. Then, only members of allowed user groups (as well as administrators) will see and have access to those report types. To do so, select the report from the Report Template list to show the allowed and denied user groups below. Double-click a group from the denied list to add it to the allowed list. Double-click a group from the allowed list to remove it.

Report Templates

Name
EEG Report
Exam Info
Blank
Ambulatory

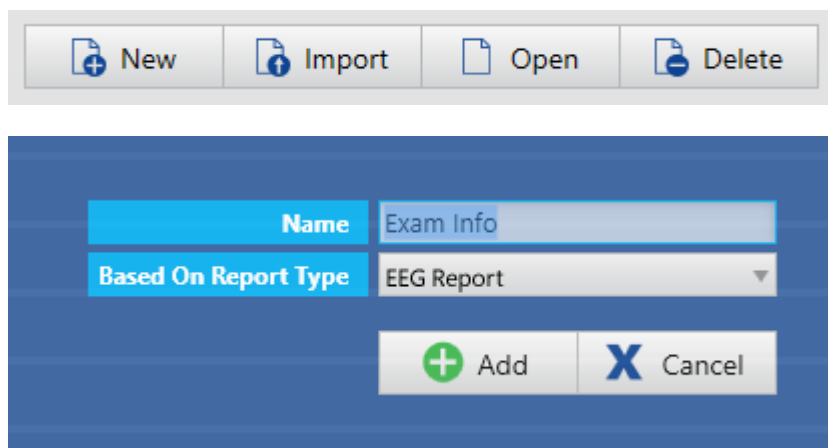


Create a Word Report

In the iEEG installation wizard, there is an option to set up the iEEG Report tab in Microsoft Word. This option is checked by default, but if for some reason you cannot install this add-on, you can still create Word reports using the second method described below.

Method One - With the iEEG Report Tab add-on installed

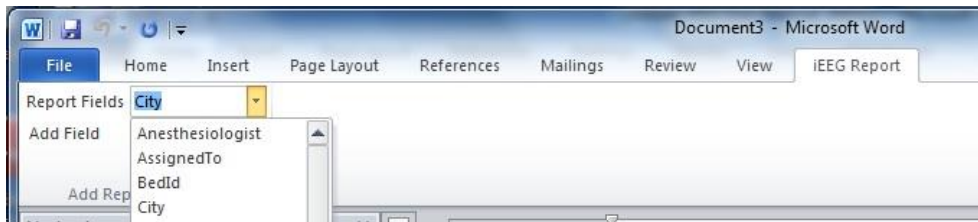
Click the New button to open the new template popup. Give the new template a name and select whether you want to base the template on another template, or start from a blank document. Click Add and the report template is added onto the Report Template list and Word is launched.



Edit the document just as you would any other Word document by inserting and formatting text, pictures, tables, checkboxes, etc.

You can even include macros in your report template. This could be used, for example, to populate a field based on previously provided information.

To generate the required fields from the iEEG system, insert fields from the iEEG Report tab. Select the field you want from the Report Fields list and click Add Field. These are the fields that will be filled in automatically by the iEEG system when you add the report to an exam.

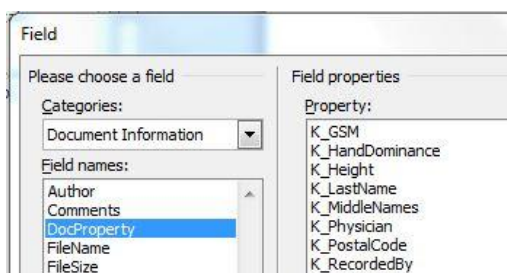


Save the document and your template is now available for selection when adding a new report to an exam. (See the section Patient List > Reports and Documents).

Method Two – Without the iEEG Report Tab add-on installed

If you did not set up the iEEG Report Tab in Word during the iEEG installation process, you can still insert the required fields by following these steps:

1. Click New to create a new template either based on the default template or a blank one.
2. Edit as desired.
3. To insert the required fields, choose Quick Parts > Field on the Insert tab.
4. Then select the category Document Information and the field name DocProperty in the Field popup.
5. You now have a list of field properties that you can insert into the template. The fields beginning with K_ are the field properties from the iEEG system. These were copied temporarily into Word when you opened Word from the iEEG system.
6. Save and close the template.



Edit an existing Template

Select a template on the Report Templates list and click Open. Make the changes you desire then save and close the document.

Import

You can also open a Word document independently of the iEEG system, save it locally and close it. You must then import the document into the system. To do so, click the Import button, browse for the template you created and click Open.

Licenses

On the License tab, Administrators can check the number of cost units for each service, as well as Order History and Usage.

Click an item on the Order History list to display an order summary report which can be printed by clicking the Print button. Click the arrow on the right of the Order Overview bar to close the report.

The Usage list can be filtered by dates using the interactive calendars.

Usage

Show usage from To

Description	Exam ID	Patient ID	Name	Units	Date	User
Import exam (22 ch, 0 hours)	98-002	MP40267	Patterson, Marion	6	20.9.2013 10:21	Administrator
Import exam with video (25 ch, 0,41 hours)	1234-12	AG55123	Greene, Amanda	9	19.9.2013 16:55	Administrator
Import exam with video (25 ch, 0,41 hours)	1234-12	JB46554	Browne, Jackson	9	18.9.2013 17:10	Administrator

Definitions

Exam Types

You can define your own Exam Types and assign a custom workflow to each. To do so, click the Exam Types tab under the Definitions header on the Definitions tab.

Click the Add button.

Enter the exam type name in the Exam Type Name field. Select the modality from the Modality Name list and the Default Perspective you want associated with that Exam Type.

Helper Page

The Helper Page option is for Acquire users to be able to create and upload their own custom help page to be displayed on the Acquire Help tab with each exam type.

The helper page needs to be in .xps format. This can be easily created in Word by choosing Save As and selecting XPS Document as the type. Browse for the file using the browse button on the Helper Page text box.

Properties

Exam Type Name	Video ambulatory
Modality Name	iEEG Acquire
Default Perspective	Default
Acquisition Perspective	Acquire
Helper Page	
Disabled	<input type="checkbox"/>

Save Cancel

Disable Exam Type

If the Disabled box is checked, the exam type will not be available for selection when adding a new exam.

Click Save to create the new Exam Type, which will now appear on the Exam Types list.

Edit Workflow States

With the exam type selected on the Exam Types list (on the left), you can now edit the workflow states (on the right).

Name	Report Type
Initiated	
Scheduled	
Recording	
Import	
Recorded	
Archived	

Up Down Remove

Workflow State Report Type: Sigla

The predefined workflow states are included and they cannot be modified or removed. It is however possible to add user-defined workflow states to the exam type. Select the desired workflow state from the Select Workflow State list and click the Plus button.

The workflow state is added to the list of workflow states and it can be moved up, down or removed using the controls.

Note that some of the predefined workflow states are fixed so user-defined workflow states cannot be added before, after or between them.

A report type can be added to a workflow state. Select the workflow state then select a report type from the drop-down list. The associated report template pops up automatically when the exam reaches the specified workflow state.

You can add as many exam types as you want and their properties can be changed afterwards.

Exam Types	Modalities	Exam Space	Workflow States
Exam Type Name	Modality Name	Default Perspective	Disabled
Generic	Lifelines Trackit	Default	
NicOne	NicoletOne	Default	
Video ambulatory	iEEG Acquire	Default	

Modalities

Before you can initiate a recording of data from the system you must set the modality application used to acquire the data.

Go to the Modalities tab under Definitions and select one of the applications from the list on the left.

On the right side of the screen, click the browse button for the Recording Application.

Modality Properties

Properties

Modality Name	iEEG Acquire Pro
Recording Application	C:\Program Files (x86)\Kvikna ehf\Lifelines iEEG Acquire 2.x\iee...
NicOne Recorder	<input type="checkbox"/> Check here if the selected recording application is NicOne recorder
Trackit Plus Recorder	<input type="checkbox"/> Check here if the selected recording application is Trackit Plus recorder
RecArea Registry Key	
RecArea Registry Value	
Exam Data File Extension	
IRecorderCommunicator Assembly Name	
IRecorderCommunicator Class Name	

Check the correct recording device. Click Save. The modality is now set.

Exam Space

Hospitals are equipped with many devices. The ability to track which device was used when recording an exam can be simplified by defining exam spaces. Exam spaces can be room numbers, bed numbers, device numbers, etc.

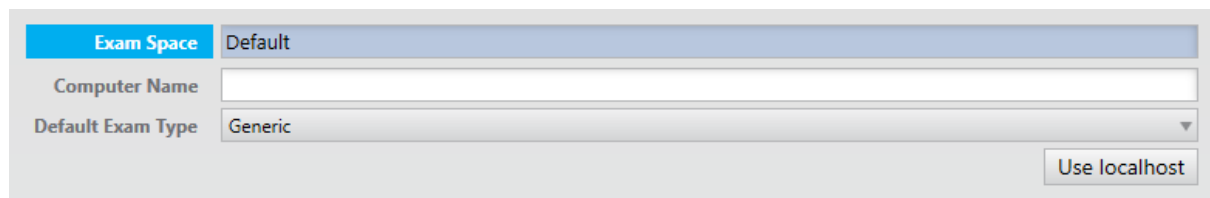
On the Exam Space tab under Definitions, click Add.

Enter a name for the new Exam Space (or bed).

Default Exam Space

It is possible to specify a computer name for a selected exam space. Then when a new exam is created, the default exam space (or bed) is the exam space that is associated with the computer creating the exam.

The computer's short name is sufficient. It is also possible to click the Use Localhost button which then generates the fully qualified name of the current computer.



You can also select a default Exam Type from the drop down list to associate with the Exam Space.

Click Save.

You can add as many exam spaces as you want and their properties can be changed afterwards.

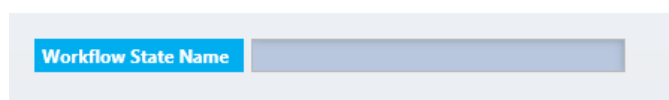
Workflow States

You can create custom workflow states which can then be selected when associating a workflow to an Exam Type (explained above).

Click Add on the Workflow States tab under Definitions.

Enter a name for the workflow state under Properties.

Click Save.



You can add as many workflow states as you want and their names can be changed afterwards.

Auditing

All user actions that deal with patient data are logged to an audit trail. For example, actions such as creating or deleting patients, exams or reports are logged, as well as actions relating to modifying or accessing data. Administrators can view the audit trail via the Auditing tab.

Under the Search section, you can filter the log by User, Date, Category and Action. Click the Search button to perform the search. The results appear on the right part of the screen. Click Copy to Clipboard if you want to paste the results into an Excel or Word document.

Search

By User: All Users

Date from: 7

Date to: 7

Category: All Categories

Action: All Actions

- All Actions
- Access Attachment
- Access Exam
- Access Patient Information
- Access Report
- Create Attachment
- Create Exam
- Create Patient
- Create Report

Hint: To see a list of actions that are logged, look on the Action drop-down list in the search filter section of the Auditing tab.

Bulk Archive

The bulk archive feature makes it possible to archive or delete multiple exams at once. Select a date on the calendar to show exams that should be archived by that date.

Show exams due for archive before: 7

Open	Patient ID	Exam ID	Created
	QuickPatient_443	443	3/27/2018
	QuickPatient_442	442	3/12/2018
	QuickPatient_441	441	3/8/2018
	QuickPatient_440	440	3/5/2018

July 2018

Su	Mo	Tu	We	Th	Fr	Sa
24	25	26	27	28	29	30
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

Click Select All or Select None at the bottom of the list, or use the Shift or Control keys to select multiple exams. Then press the Archive Selected button or Delete Selected button.

Archive selected

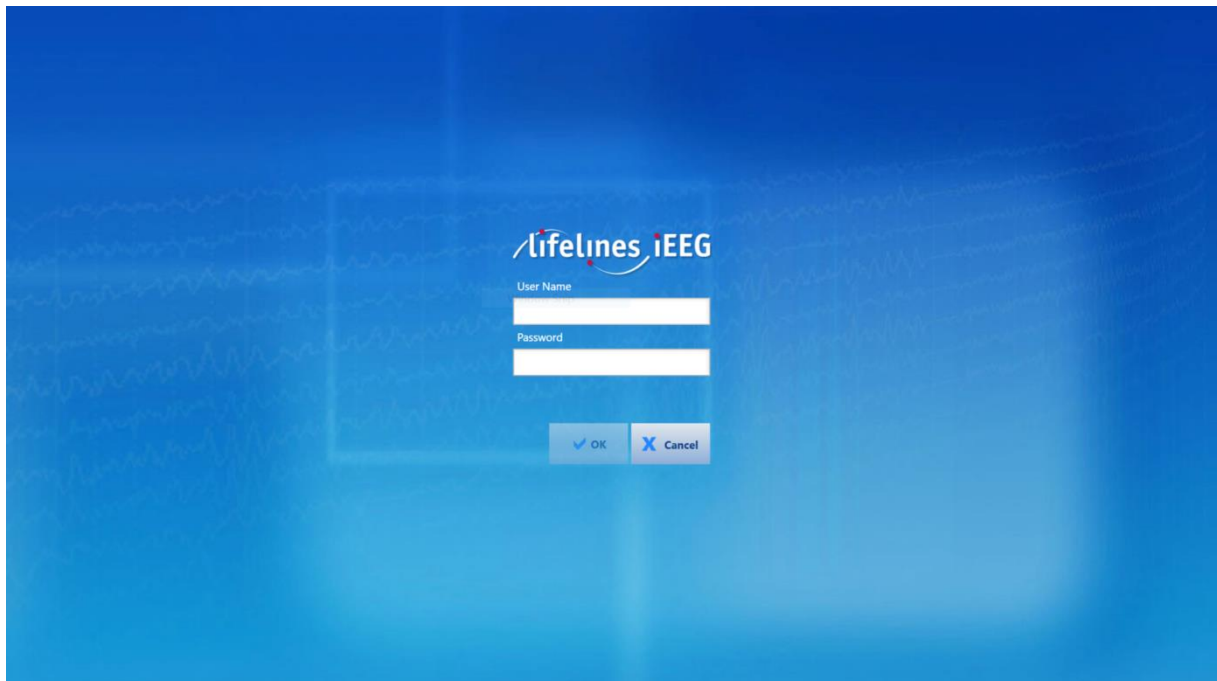
Delete selected

Acquire Touch

Intro

Acquire Touch is optimized for touch screen laptop or tablet devices and allows the acquisition of up to 40 channels of EEG, as well as synchronized digital video from one or two cameras. It includes a protected bedside mode feature so the device can be taken to another location and left unattended for longer recordings.

Launching Acquire

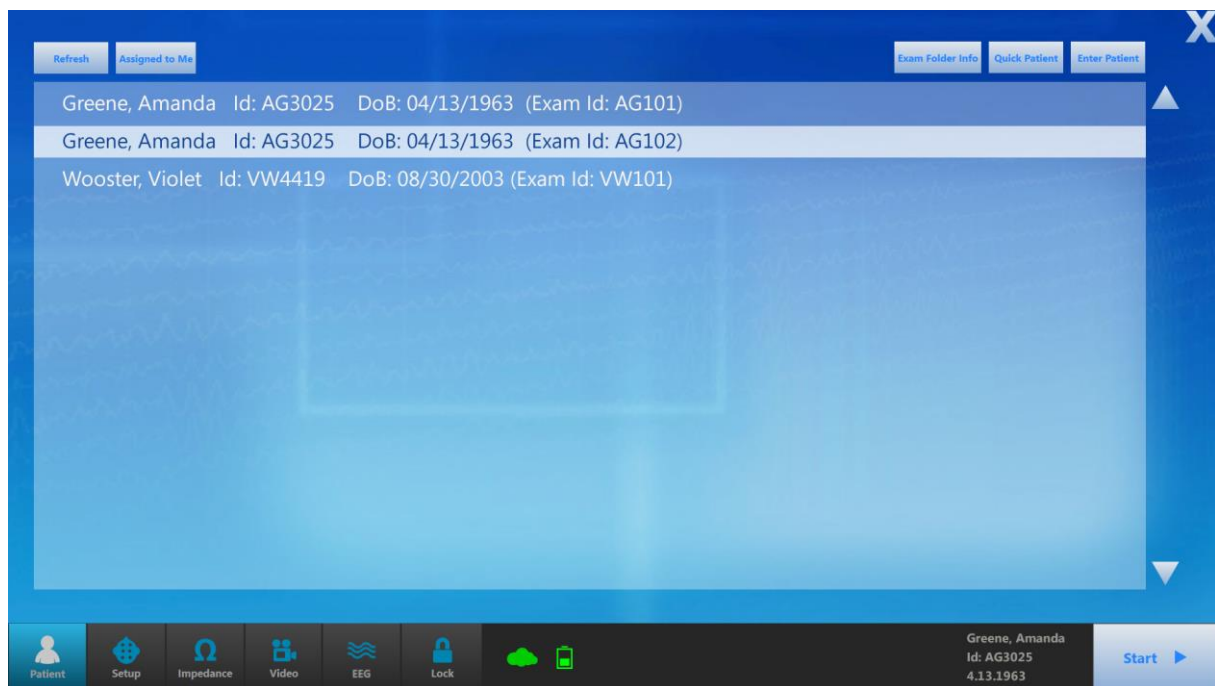


Acquire Login Screen

Log in to Acquire Touch and the first of a series of screens appears – the Patient screen.

Note: If you are launching Acquire Touch from Centrum, you will skip the Select Patient screen and arrive at the next screen, Setup. See the Centrum chapter for more information on launching from Centrum.

Patient



Patient Screen

Select Patient

Select a patient from the list, or enter a new patient by pressing the Enter Patient button and filling in the information on the Enter Patient screen.

The Assigned to Me button filters the list to show only exams assigned to the currently logged in user. Deselect this option to view the complete list of available exams.

Enter Patient

Enter Patient Screen

Quick Patient

If you need to start the exam immediately, press Quick Patient. You can then enter the patient information later and associate it with the exam in Centrum.

Exam Folder Info

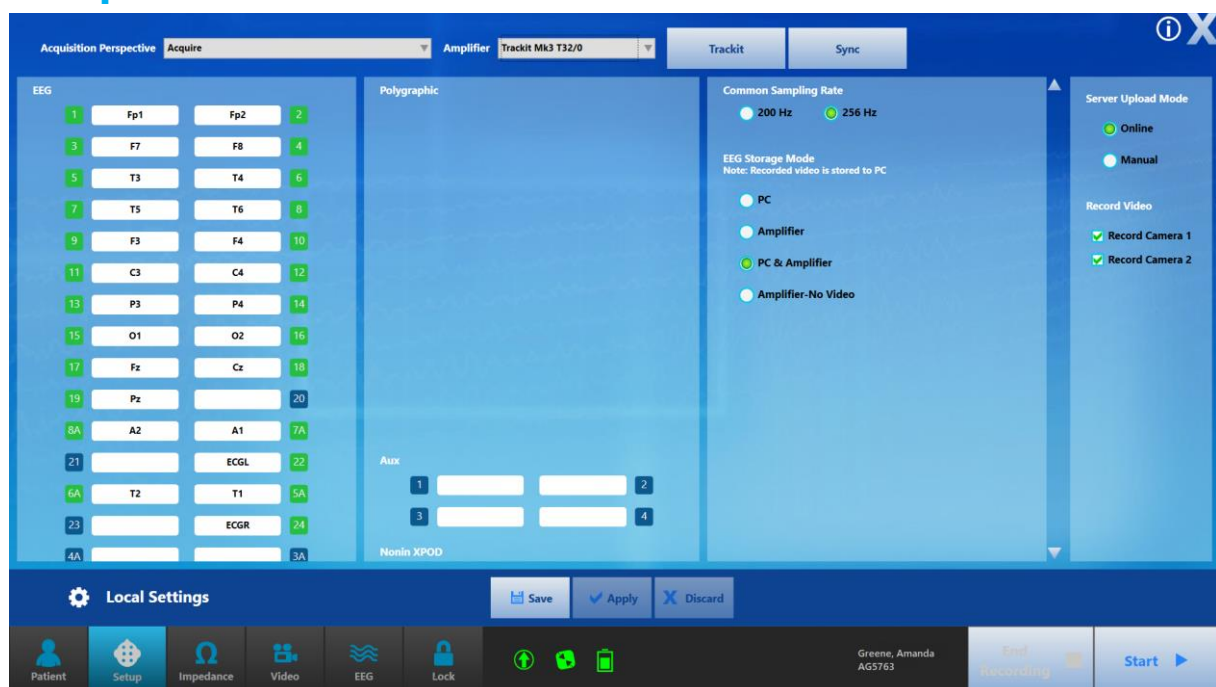
When an exam is selected on the exam list, the Exam Folder Info button becomes available; use this to check the contents of the folder containing the exam.

Start

If the amplifier has previously been detected by the system, the EEG and Start buttons will be activated; either one will start the recording.

If the amplifier has not yet been detected, or if you want to select a new amplifier before starting the recording, go to the next step, Setup.

Setup



Amplifier Setup Screen

Touch the Setup button at the bottom of the screen to access the Setup screen.

Note: You must have a patient selected or select Quick Patient in order to enable the Setup screen.

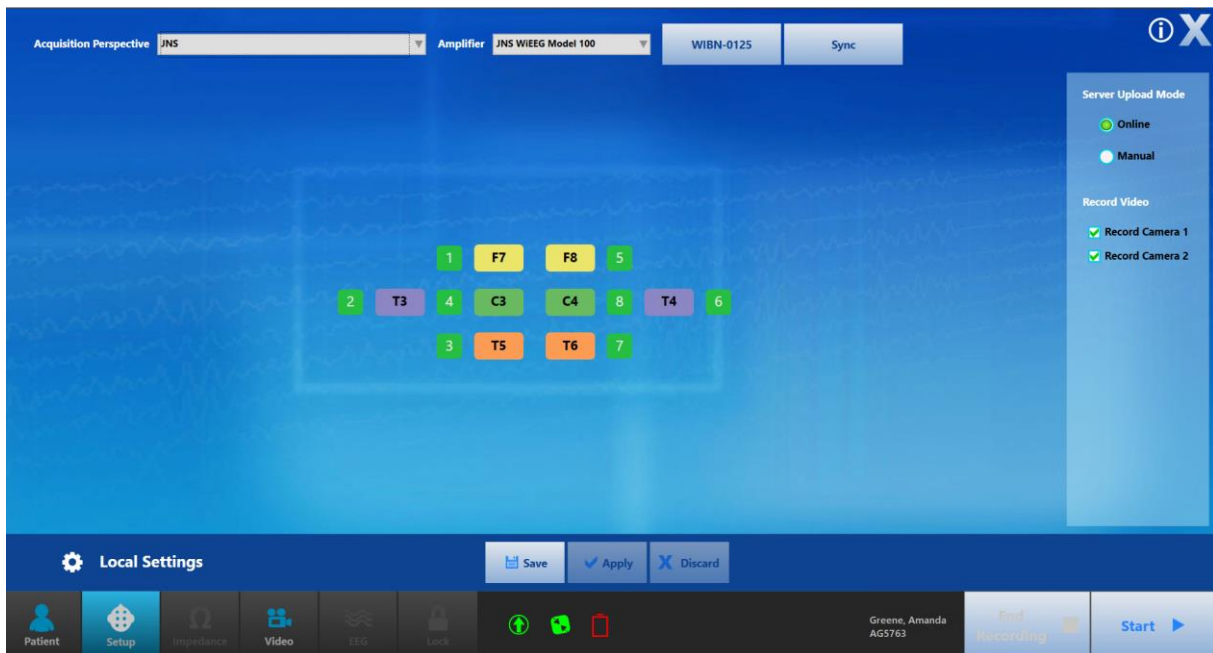
Select Perspective

Select the Acquisition Perspective from the drop-down list. The amplifier associated with that perspective will automatically be selected on the Amplifier list, but you can change this if you need to.

Note: The perspective cannot be changed during acquisition unless you are currently acquiring in PC mode, and the perspective you want to change to has the same amplifier and PC recording mode.

WiEEG

WiEEG users will have the Perspective and Amplifier Setup pre-selected, and the setup screen will appear as shown below.

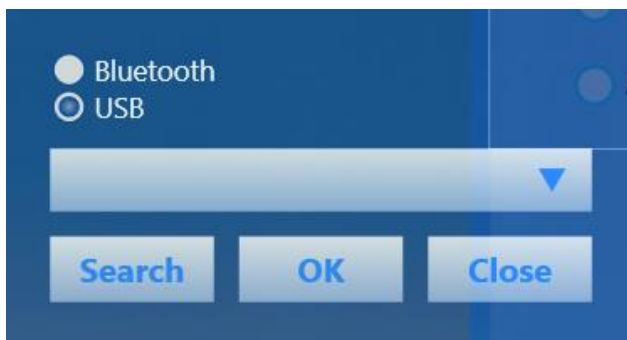


Search for Device

Press Search for Device to open the Search popup.



Select Bluetooth or USB (make sure the USB cable is connected if you choose that option).



Press Search to populate the list with available devices and select the one you want. Press OK.

Note: If you are using the WiEEG amplifier and it is not detected, you may need to restart the amplifier. Refer to the WiEEG Quick Guide for instructions.

Start Recording

The Start button as well as the EEG button will be activated as soon as the amplifier is detected and a patient (or Quick Patient) is selected. Either one will start the recording.



Sync Perspectives

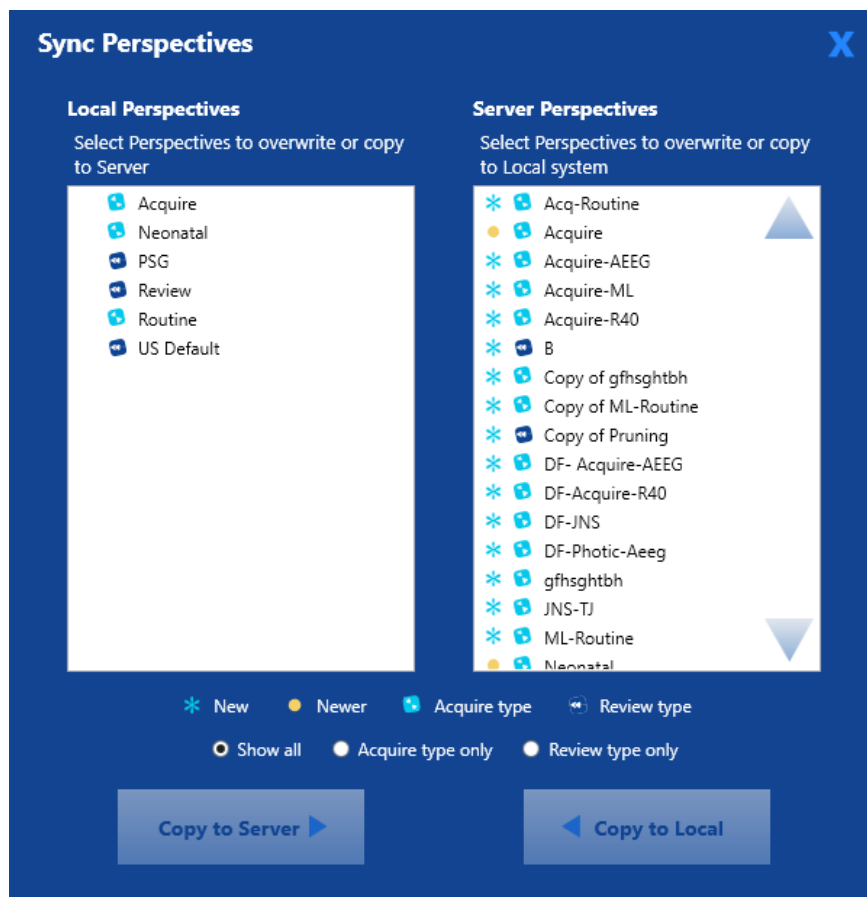
Select perspectives from the Local column that you want to sync to the server. Then press Copy to Server. If a perspective with the same name already exists on the server, you will overwrite it with the one you're copying.

Select from the Server column to sync locally. Press Copy to Local. You will overwrite local perspectives with the same name.

A blue star (asterisk) appears in front of a new perspective that only exists in that location.

A yellow dot indicates that the perspective is newer than the one with the same name in the other location.

The perspective type is indicated by a small Acquire or Review icon.



Edit Channels

Press the input number to toggle a channel on or off – green indicates on, blue indicates off.

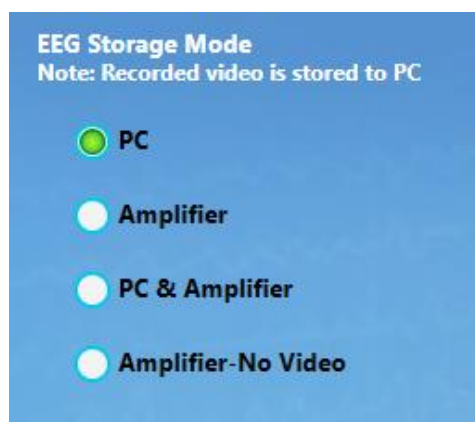
Press a blank channel or channel label to select a channel from a popup list, or enter another valid channel directly into the space.

Input Settings Dialog

Common Sampling Rate

Select the sampling rate to be used for all channels.

EEG Storage Mode



Select the desired storage mode:

PC = EEG, video and events are recorded to the computer hard disk.

Amplifier = EEG is recorded to the Amplifier CF card; video and events are recorded to computer.

PC & Amplifier = EEG is recorded both to Amplifier CF card and computer; video and events are recorded to computer.

Amplifier-No Video = EEG is recorded to Amplifier CF card and no video is recorded. This mode is used for setting up more than one ambulatory recording from the same laptop or tablet system.

Server Upload Mode

Choose Online to have the data uploaded automatically in near real-time. You must be connected to the internet for this option. Choose Manual to upload after the recording is complete. This setting can be changed during the recording.

Note: Manual upload is performed in the Centrum client on the Exam List. See the Centrum chapter for more information.

Record Video

Select the cameras you want to record from. If neither camera is selected, the video screen on the EEG tab will show the words NOT RECORDING until video is turned back on.

Save, Apply, Discard

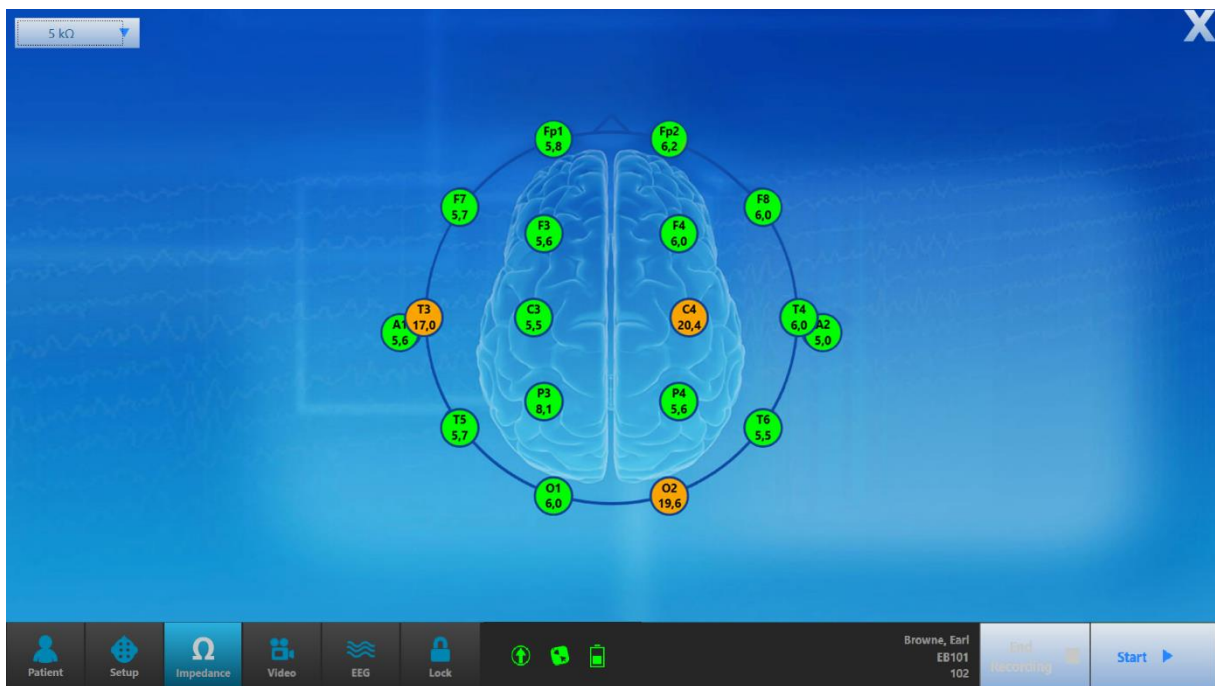
Press Save to save any changes to the perspective.

Press Apply to apply the changes to the current session without saving them.

Press Discard to cancel any changes.

Note: Some actions cannot be carried out during a recording session.

Impedance



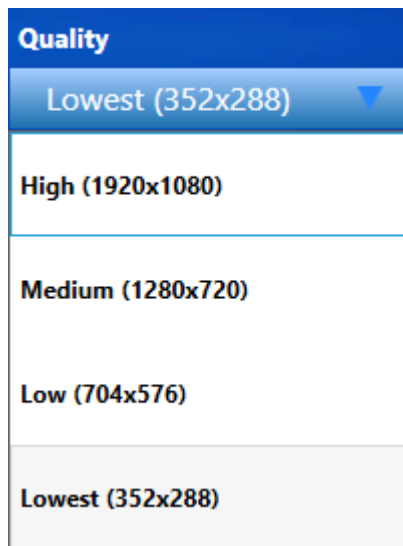
Impedance Screen

Check the impedance on this screen. Select the threshold level from the dropdown list. The green color indicates that impedance is within the selected threshold. The color changes to orange when the impedance is above the selected threshold.

Note: The Impedance button is disabled if the amplifier is not connected and turned on.

Video

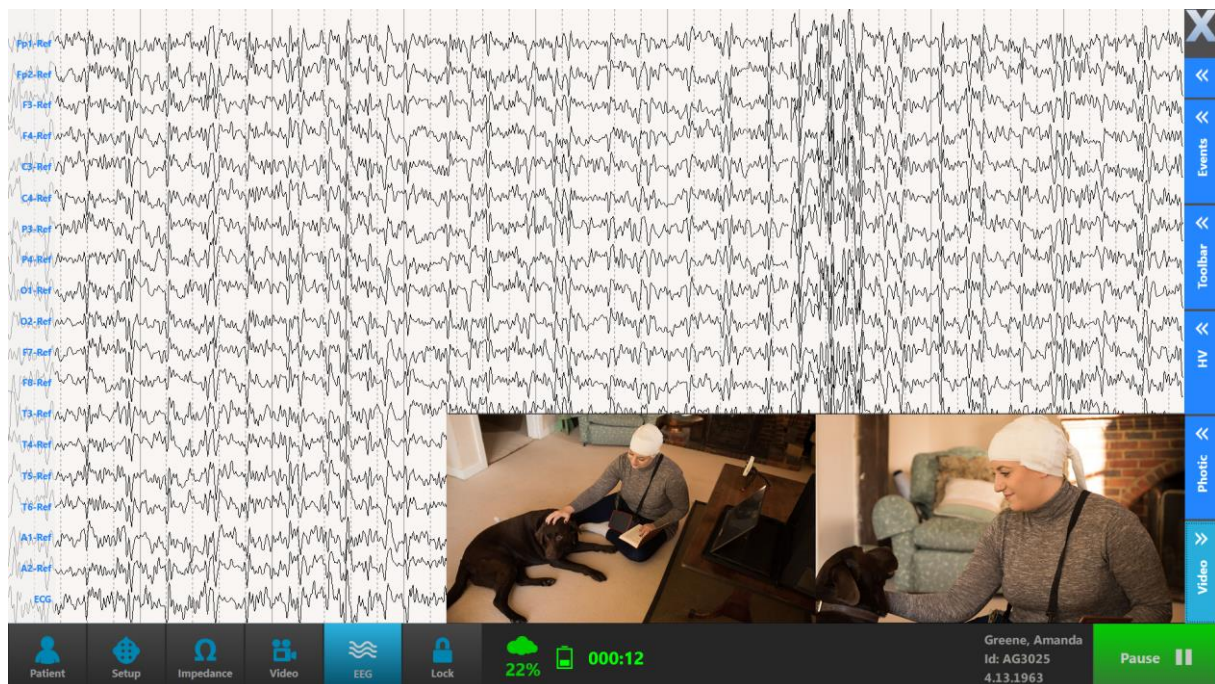
On the Video tab you can preview the video image and also change the quality of video to be recorded. Higher quality settings show better detail but require more disk space.



If the camera is a pan-tilt-zoom camera, you are also able to adjust those settings from this screen by using the pan-tilt-zoom buttons.

Note: The video tab is unavailable if you don't have the video license.

EEG



Pause/End Recording

When you press the EEG button, the signals begin recording automatically. The appearance of the Start button changes to a green Pause button, and a red End Recording button is also activated.

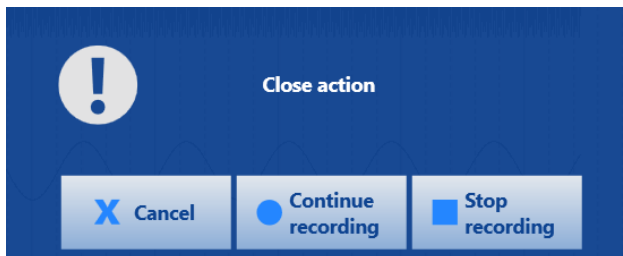


Choose Pause to pause the recording momentarily and resume again; choose End Recording to finish the exam without closing Acquire.

Note: The EEG button is disabled if you have not yet selected a patient to record and connected the amplifier.

Close Acquire

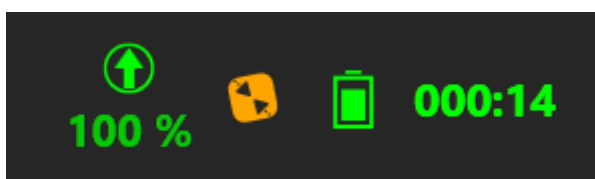
Press the Close X at the top right of the screen. You will be given the option to close the client while continuing to record, or to stop the recording completely.



Note: If you are ending a Quick Patient recording, you will get a reminder to associate it with the correct patient.

Indicators

When the recording has started, the following indicators will appear at the bottom of the screen:



From left to right:

Percentage of the recording that has been uploaded to the cloud (this will not appear if you are uploading manually).

Remote Control indicator. (The orange color indicates that remote control is currently not available).

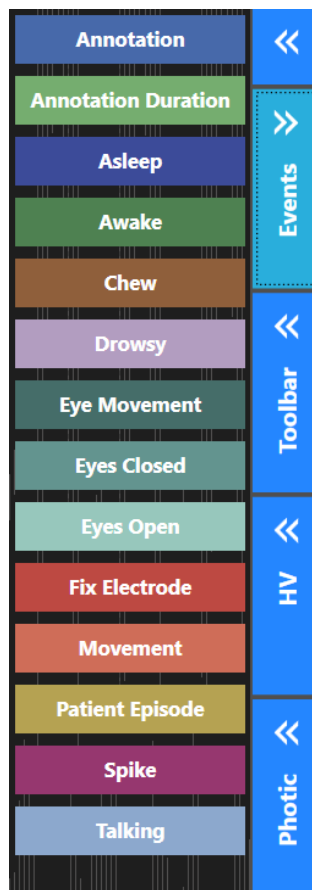
Amplifier battery life. (Orange color indicates that the battery life is low).

Elapsed time of the recording.

Sidebar

On the EEG screen, you can add events, change filters, perform a hyperventilation test, photic stimulation and view EEG and video. Press the buttons along the right side of the screen to hide/show these tools.

Events



Press the Events button to display and hide the event pallet. Press an event to enter it at the top of the trace display at the point in time of entry. If the event is a duration event, press on the event again to end it.

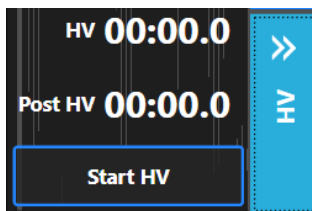
Annotation events allow you to enter text to the event.

Toolbar



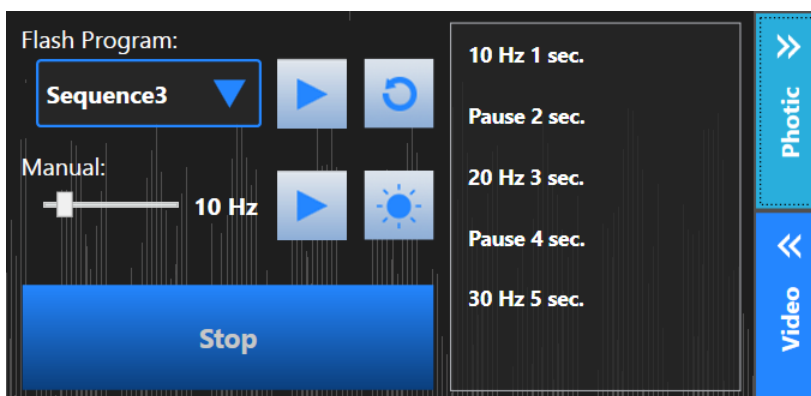
The toolbar allows you to change several parameters on the channel chart. They are: sensitivity, paper speed, montage, low cut filter frequency, high cut filter frequency, notch filter toggle button and calibration mode toggle button.

Hyperventilation



Press Start HV to start the hyperventilation timer. The button changes to Post HV, which you can press when you want to start the post hyperventilation timer. The button then changes to Stop HV which stops the timer. Finally, it changes to Reset so you can reset the times to zero.

Photic



Before using the photic tool, be sure to change your recording montage from the default to Input.

Select a pre-configured Flash Program from the drop-down list. Press the arrow button to start the sequence. The button changes to a Pause button so you can pause or resume the sequence at any time. Click the reset button to reset the sequence at the beginning. The list on the right shows the progress of the sequence as it runs.

To start the photic manually, choose a frequency on the slider bar and press the arrow button to the right of it. Press the large blue button to stop.

To produce a single flash, press the button with the sun icon.

The large Stop button stops the photic immediately, regardless of whether you are using manual or program mode.

Video

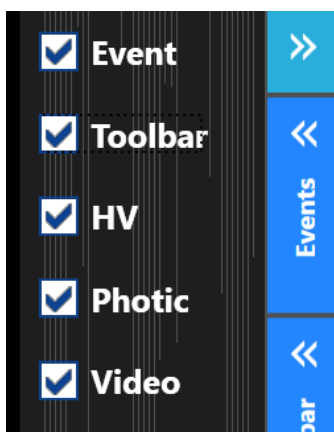


Press the video button to hide or show the live video.

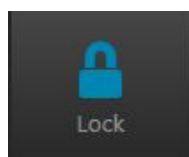
Note: The video tabs are unavailable if you don't have the video license.

Toolbar Configuration

You can choose to hide some of the side toolbar buttons by pressing the small arrow button at the top of the side toolbar. Uncheck the items you want to hide.

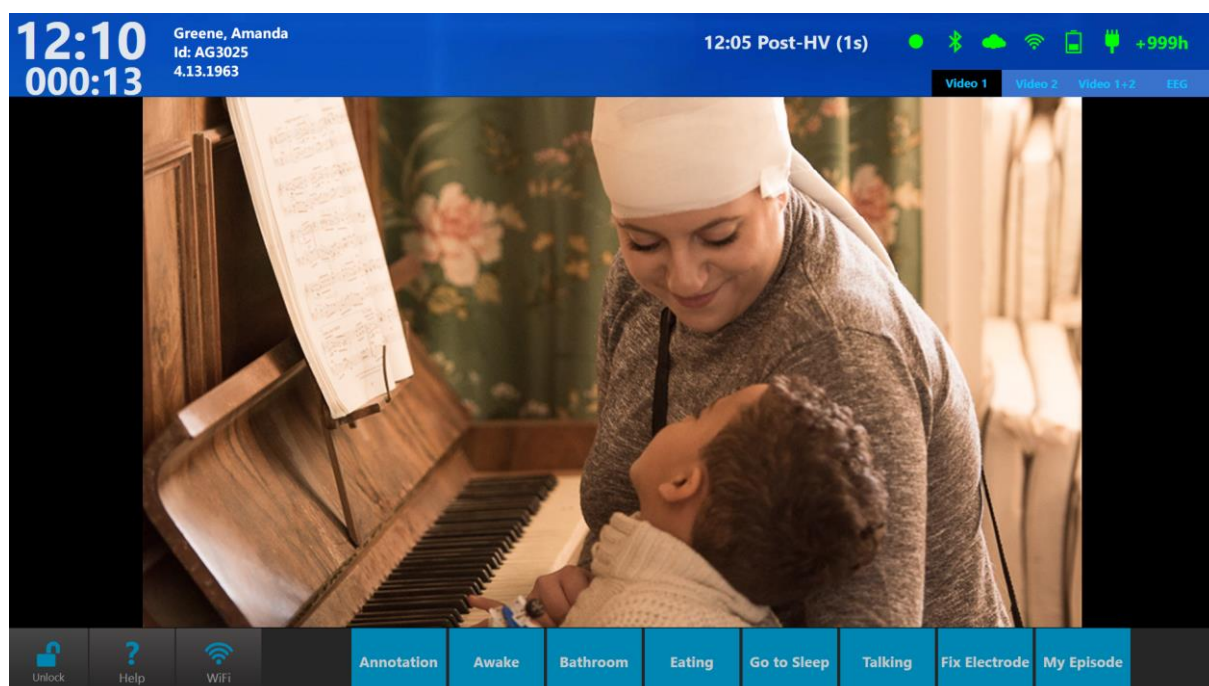


Lock



When you are finished with the EEG screen and everything else is as you want it, press this button to go to the locked patient mode. Note that the patient mode will not be locked if not recording. Unlocking requires logging in again.

Locked Patient Mode



Patient View

In this mode, it is possible to view video, and optionally, EEG, and also to enter events by pressing the event buttons along the lower edge of the screen.

Indicators



Indicator icons at the top right of the screen represent (from left to right) recording status, connection to the amplifier, remote control connection, exam upload status, internet connection, amplifier battery life, and connection to wall outlet. If everything is connected properly, the indicators are green; if there are any interruptions, the corresponding icon will change to orange or red.

In addition, the words “Not Recording” appear on the screen if connection to the amplifier is lost.

Note: “Not Recording” also appears if the user pauses the recording.

The current time and the patient’s name and ID are displayed at the top left of the screen, with elapsed time displayed below the current time. The most recently entered event is displayed near the indicator icons along with the time of the event.

Display Options

If you have more than one video camera, you can view one at a time or both using the tabs at the top of the video display. If you have the EEG or Trend options enabled, those will also appear on a tab.

Help

A help screen is provided to be able to view custom created documents for each exam type. To create a help document, start by creating the file in Word, then choose Save As and select XPS Document as the file format.

To upload the help document you created, go to Centrum>Admin>Definitions>Exam Types. Under the Exam Type Properties, click the Browse button (folder icon) on the Helper Page option. Browse to the XPS document you want to upload and click Open. Click Save to save the Help file to the exam type. (See also the section The Admin View>Definitions>Exam Types).

Centrum>Admin>Definitions>Exam Type

Properties

Exam Type Name	Video ambulatory
Modality Name	iEEG Acquire
Default Perspective	Default
Acquisition Perspective	Acquire
Helper Page	<input type="text"/>
Disabled	<input type="checkbox"/>

Note: XPS documents can be easily created in Word by choosing Save As and selecting XPS Document as the type.

Unlock

Press the Unlock button (you will be prompted log in again) to return to setup mode to change settings or end the recording

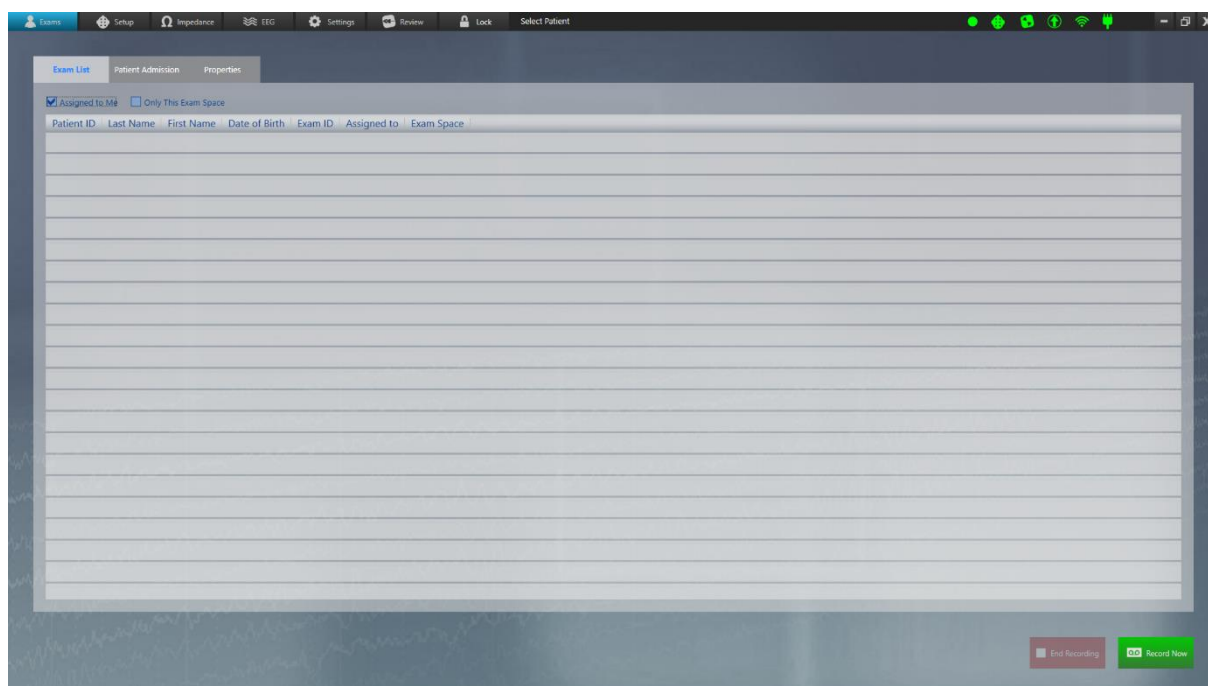
Acquire Pro

Acquire Pro allows the acquisition of up to 40 channels of EEG, as well as synchronized digital video from one or two cameras. It is optimized for clinical use on desktop or laptop systems for all your routine and bedside recording needs. It includes a protected bedside mode feature so the device can be taken to another location and left unattended for longer recordings.

Launching iEEG Acquire Pro

After logging in, you are presented with the Acquire Pro interface, which is navigated by a series of buttons at the top of the screen.

Exams



The first screen is the Exams screen.

Note: If you have launched Acquire Pro from Centrum, you will skip this step and go directly to Setup.

Exam List Tab

Select an exam from the exam list. If the amplifier has already been connected, you can begin recording immediately by clicking the Record Now button. Otherwise, proceed to the Setup page by clicking the Setup button at the top of the screen.

Note: A patient needs to be selected for the Setup Tab to be enabled.

If you begin recording without selecting an exam, a 'Quick Patient' exam is started. You will be prompted to associate the exam with a patient when you stop the recording.

Check the 'Assigned to Me' or 'Only This Exam Space' checkboxes if you want to filter the list.

Patient Admission Tab

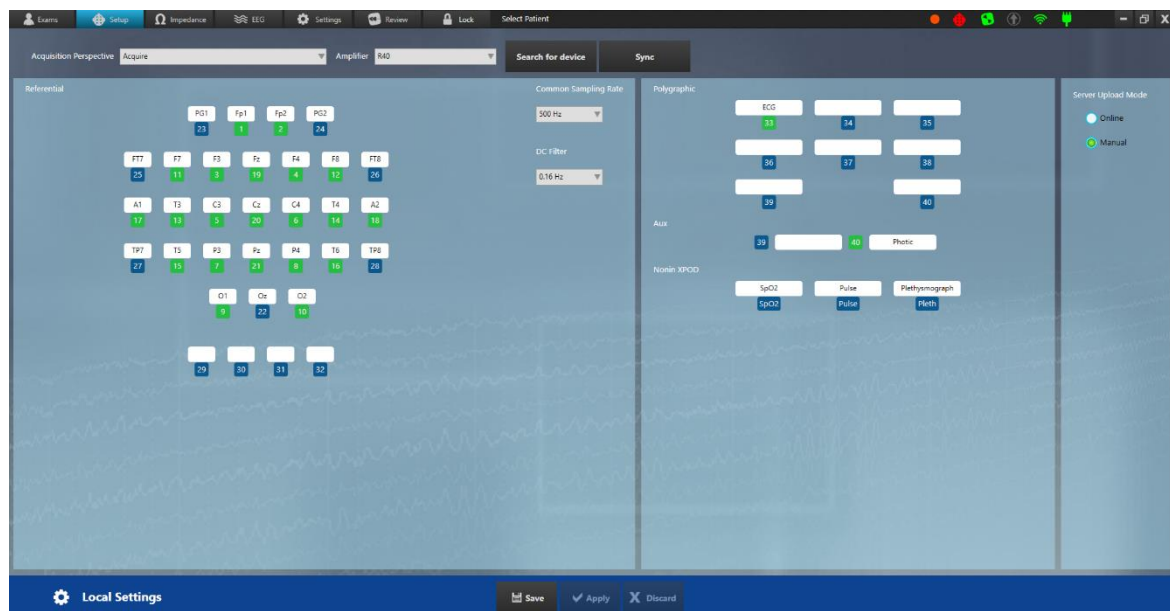
On this tab, you can enter a new patient and/or initiate a new exam, just as you would in Centrum. If the patient is already in the database, begin filling out the Patient Properties form and a list of possible matches will appear in the Patient Database section. When you see the patient you want, click on it to select it. If the patient is a new Patient, click Save to save the patient into the database.

You can then initiate an exam by entering an Exam ID in the New Exam section. Confirm Exam Type, Exam Space, Assigned to, Referring Physician (optional) and click Initiate. The exam will now appear on the Exam List tab.

Properties Tab

Access the patient and exam properties of the selected patient on this tab. You can also edit the information here or add patient and exam notes.

Setup

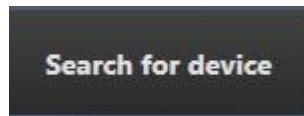


Select Perspective

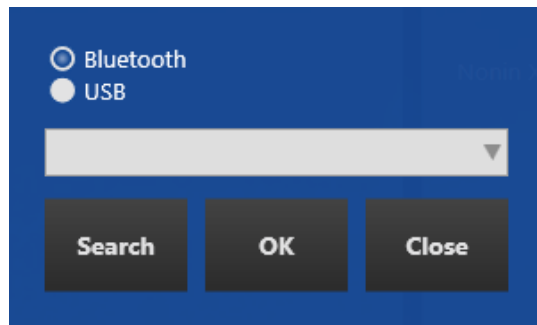
Select the Acquisition Perspective from the drop-down list. The amplifier associated with that perspective will automatically be selected on the Amplifier list, but you can change this if you need to.

Search for Device

Press Search for Device to open the Search popup.



Select Bluetooth or USB (make sure the USB cable is connected if you choose that option).



Press Search to populate the list with available devices and select the one you want. Press OK.

Sync Perspectives

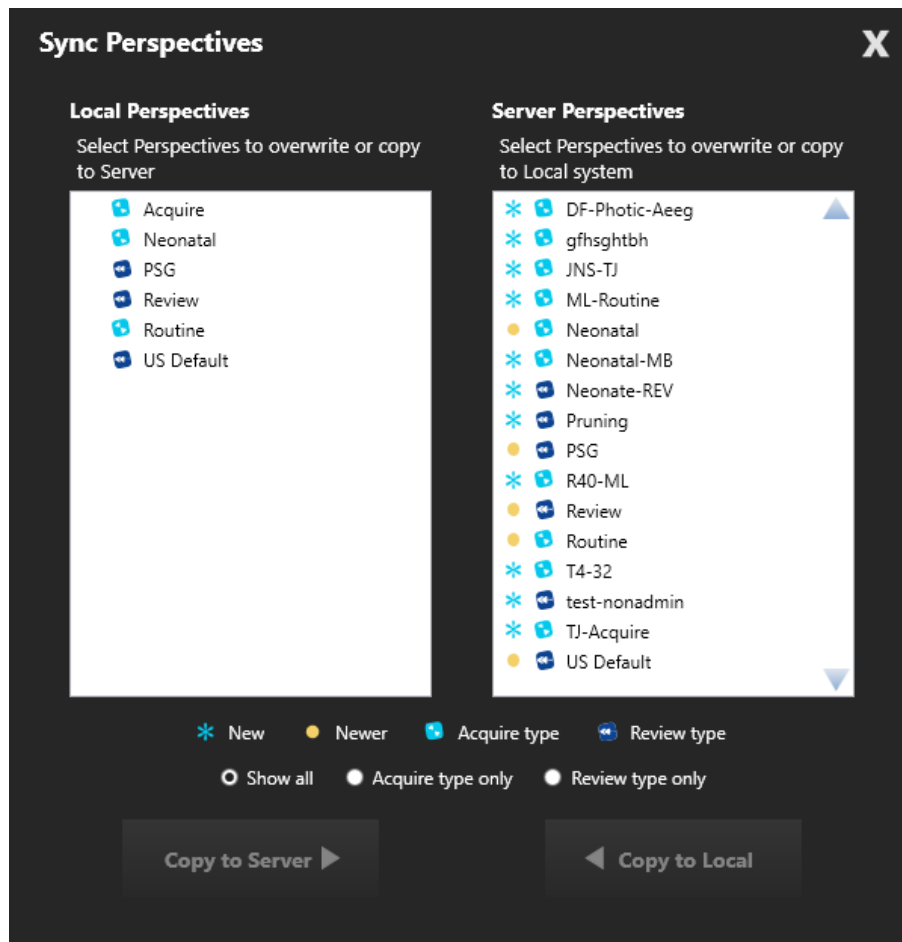
Select perspectives from the Local column that you want to sync to the server. Then press Copy to Server. If a perspective with the same name already exists on the server, you will overwrite it with the one you are copying.

Select from the Server column to sync to the local perspective. Press Copy to Local. You will overwrite local perspectives with the same name. If a perspective with the same name already exists on the locally, you will overwrite it with the one you are copying.

A blue star (asterisk) appears in front of a new perspective that only exists in that location.

A yellow dot indicates that the perspective is newer than the one with the same name in the other location.

The perspective type is indicated by a small Acquire or Review icon.



Channels

Press the input number to toggle a channel on or off – green indicates on, blue indicates off.



Press a blank channel to select a channel from a popup list, or enter another valid channel directly into the blank space.

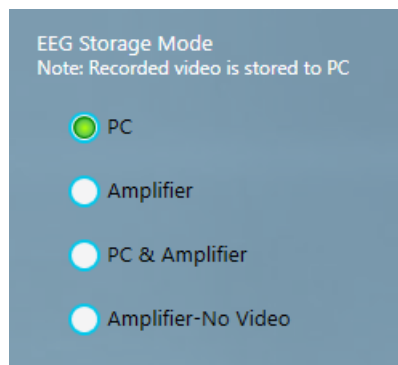
Common Sampling Rate

Select the sampling rate to be used for all channels.

DC Filter

Choose on or off.

EEG Storage Mode



Select the desired storage mode:

PC = EEG, video and events are recorded to the computer hard disk.

Amplifier = EEG is recorded to the Amplifier CF card; video and events are recorded to computer.

PC & Amplifier = EEG is recorded both to Amplifier CF card and computer; video and events are recorded to computer.

Amplifier-No Video = EEG is recorded to Amplifier CF card and no video is recorded. This mode is used for setting up more than one ambulatory recording from the same laptop or tablet system.

Server Upload Mode

Choose Online to have the data uploaded automatically during recording. You must be connected to the internet for this option. Choose Manual to upload after the recording is complete. This setting can be changed during the recording.

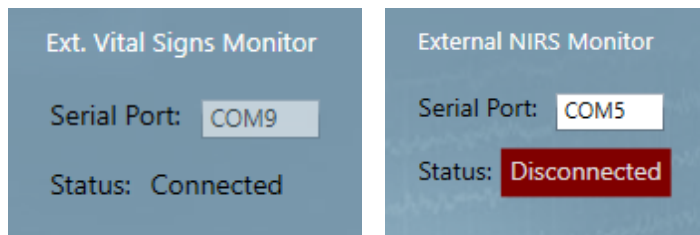
Note: Manual upload is performed in the Centrum client on the Exam List. See the Centrum chapter for more information.

Record Video

Select the cameras you want to record from. If neither camera is selected, the video screen on the EEG tab will show the words NOT RECORDING until video is turned back on.

External Vital Signs and NIRS Monitor

Select the serial port that your external monitor is connected to. The status will show whether the device is connecting, connected or disconnected.



When your device is connected, you can begin to add channels in the External Vital Signs area of Setup. Click on a blank area to add a channel.

A yellow warning triangle indicates that the parameter reading is inaccessible. A red warning triangle indicates that the parameter is unavailable.



Note: External vital signs and NIRS monitoring is an optional feature that must be licensed separately. Supported devices include the Invos Cerebral/Somatic Oximeter, Model 5100C, the Philips M1165/66/67/75/76/77A CMS Patient Monitoring System, and the Philips M1205A V24 and V26 Patient Monitor.

Save, Apply, Discard

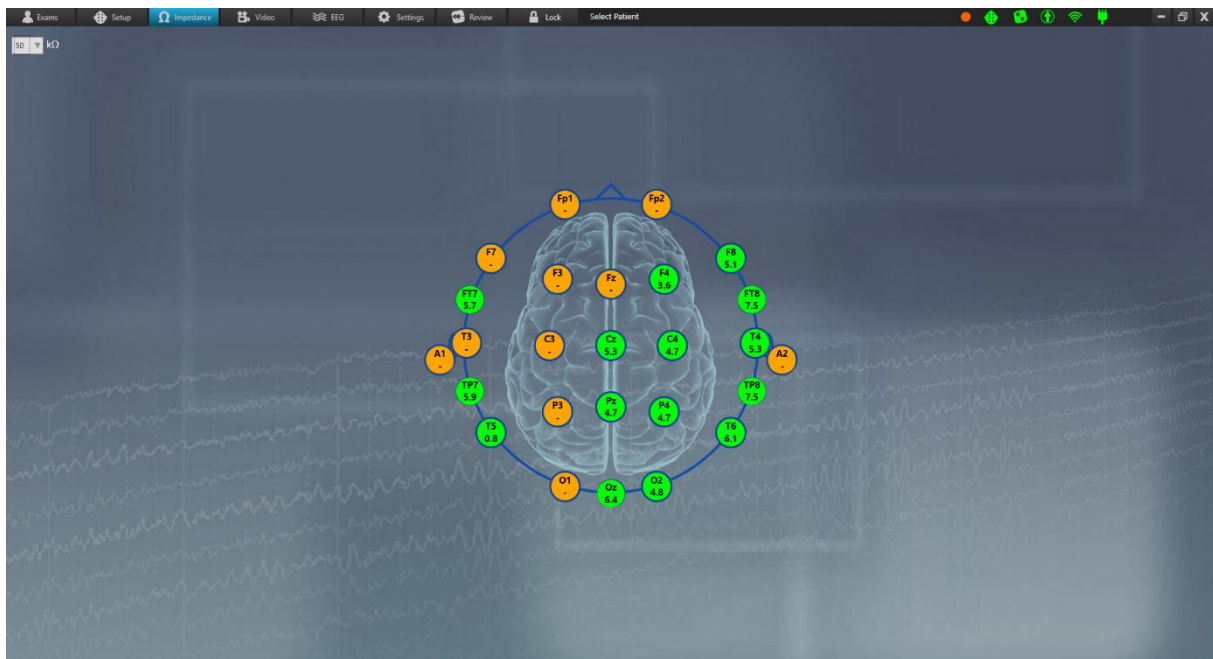
Press Save to save any changes to the perspective.

Press Apply to apply the changes to the current session without saving them.

Press Discard to cancel any changes.

Note: Some actions cannot be carried out during a recording session.

Impedance



Check the impedance on this screen. Select the threshold level from the dropdown list. The green color indicates that impedance is within the selected threshold. The color changes to orange when the impedance is above the selected threshold.

Note: The Impedance button is disabled if the amplifier is not connected and turned on.

EEG



The EEG screen is the main screen of Acquire Pro. It is here that you can follow the recording and live video, add events, change filters and parameters, and perform hyperventilation and photic tests. The following sections describe the various parts of the interface and their functions.

Live and Review Panes

The screen is divided into the live pane on the right and the review pane on the left. To adjust the size of the panes, grab the white vertical divider line and drag it in either direction. On the review pane, you can scroll back and forth through the parts of the exam that have already been recorded. Each pane has its own toolbar for changing parameters and an event palette for adding events. They also each have a label bar where individual channels can be selected for changing parameters.

Live Pane Toolbar



The live pane toolbar contains buttons for starting and stopping the recording, as well as tools for changing parameters and adding note during the recording. Below is a description of these buttons and tools.

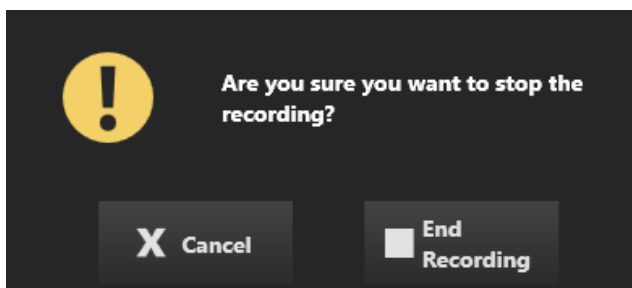
Start/Pause Recording

To start the recording, press the Record button. It changes to a Pause button in case you need to pause the recording.



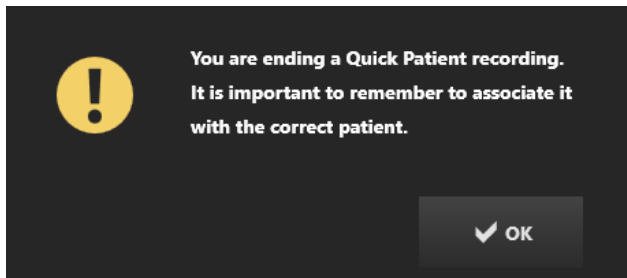
End Recording

The End button ends the recording completely, without closing the Acquire application.



Quick Patient Prompt

If the recording was a Quick Patient recording, you will also be prompted with a reminder to associate the exam with the correct patient.

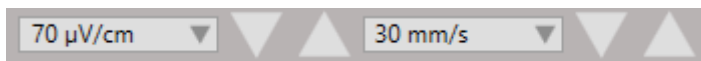
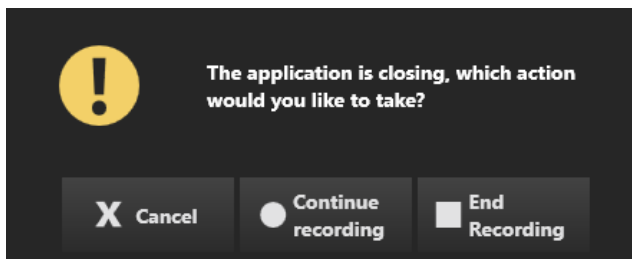


Close Application

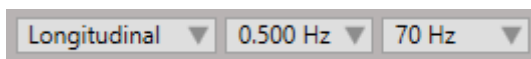
Closing the application is performed by using the Close X in the upper right corner.



You are given the choice to end the recording, continue recording or cancel.



The next two controls on the live pane toolbar are to change the sensitivity and paper speed. You can do this by using the drop-down lists or by pressing the down/up arrows to the right of each control to change the values a step at a time.



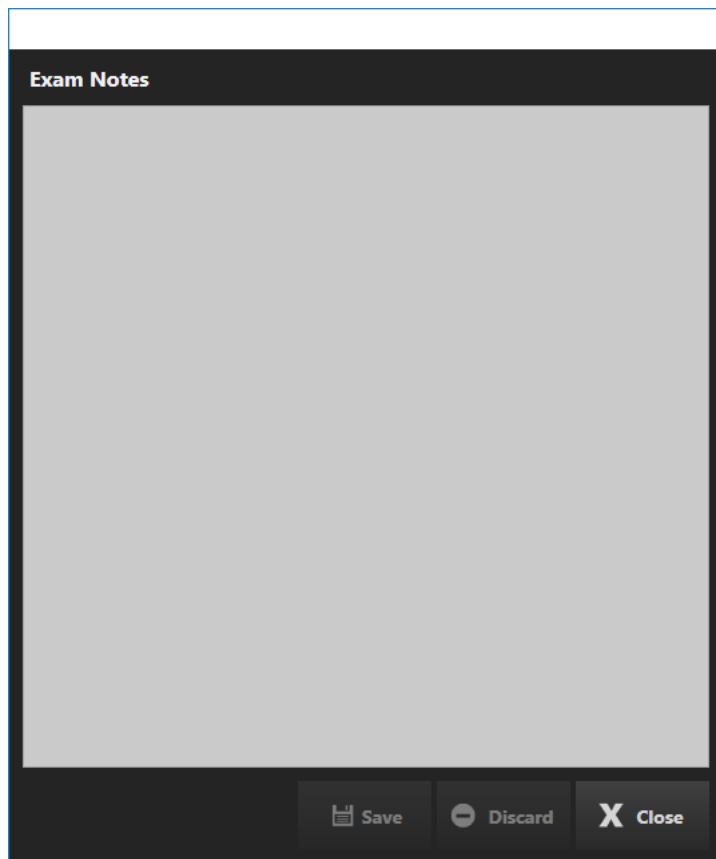
Next come controls to select the montage, low-cut filter and high-cut filter.



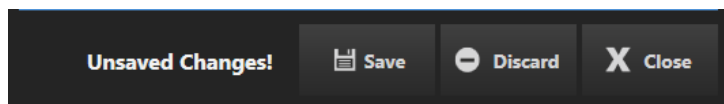
After that are the notch filter and calibration buttons, which can be toggled on or off. (The Notch filter is shown toggled ON in this image).



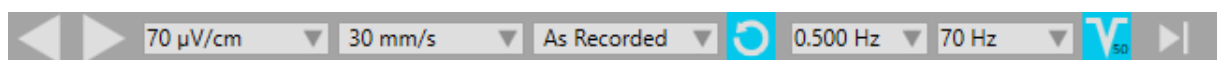
The last button is the Notes button. Press this to open the notes window. Enter notes and press Save to save the notes to the exam properties.



A warning will appear when you have unsaved changes:



Review Pane Toolbar



The toolbar controlling the review EEG pane is similar to the live pane toolbar, with a few variations. From left to right the controls are: paging buttons, forward and back, sensitivity, paper speed, montage selection, reset to the “As Recorded” montage, high-cut filter, low-cut filter, notch filter and the “go to end” button which will take you immediately to the current page of the recording.

Note: The Go to end button also snaps the Zoom bar to the right of the Overview, which locks it into displaying the most recent duration. See the Overview>Zoom Bar section of this chapter for more information.

Event Palettes

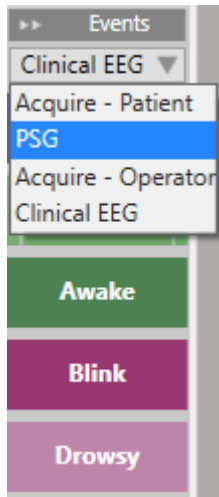
There is an event palette located to the right of both the live and recorded EEG panes.

Hide/Show

You can hide or show either palette by clicking the arrow at the top of the palette.

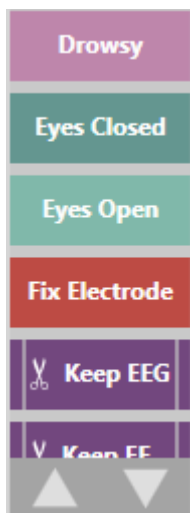
Switch Palettes

Use the drop-down list to quickly switch to another palette set.



Scrolling

Use the up and down arrows at the bottom of the event palette to scroll palettes which contain too many events to fit on the screen.



Placing Events

To place an event in the **live pane**, simply click the event in the live palette and it is automatically inserted at the current position.

To place an event into the **recorded pane**, you click on the event in the recorded event palette once to select it (it will be highlighted with a yellow outline), and then click on the recorded pane at the place you want to insert the event.



To place duration events in the **live pane**, click once on the event at the time of insertion, and again at the time the event ends. For the **recorded** pane, click once to select the event, then click on the recorded pane where you want the event to begin and again on the recorded pane where the event should end.

More Information

Please see the Event Palette section in the Review chapter for more detailed information about types of events: duration, annotation, context, numerical and prune.

Creating Events and Palettes

For information on creating and customizing events and event palettes, see the Settings chapter.

Label Bar



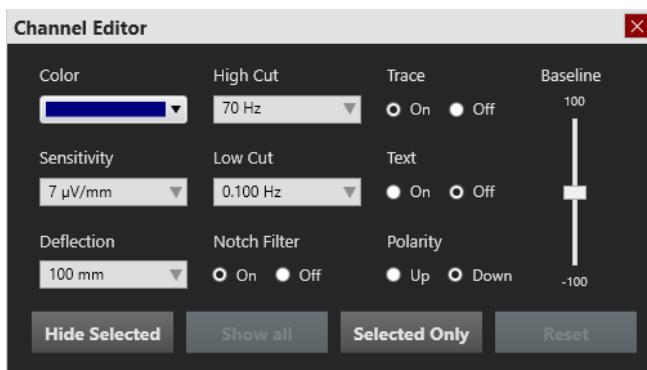
There is a trace label bar located to the left of both the live and recorded panes. You can select one or more channels by clicking on the label and then change a number of display settings or filters on those channels.



To easily select or deselect all channels, use the checkmark and X buttons located at the bottom of each label bar.

Hide/show the label bars by clicking the double arrow button on the label bar header.

Special Channels



Right-click on one of the selected channels to open the Special Channel popup. You can then change the color of the trace, sensitivity, deflection, filters, display type, polarity and baseline position by using the corresponding controls. You can also choose to hide the selected label(s) or display only the selected labels(s). Click Show All to show labels that you have previously hidden. Click Reset to remove the special channel settings from the selected labels.

A checkbox appears in front of the label on special channels. Unchecking the box resets the settings for that channel only.

Note: These settings are applied but not saved unless you save them on the Montage tab in the Settings.

Sidebar

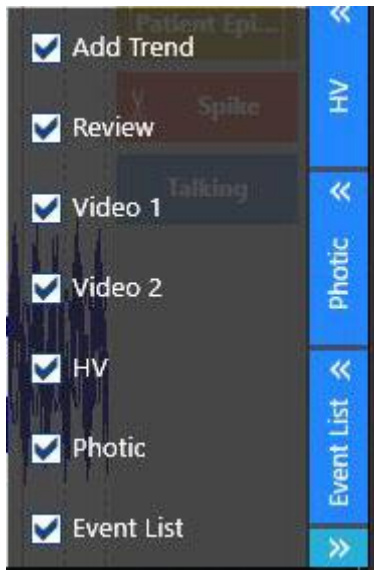
A vertical toolbar located on the right edge of the screen has interface items and tools that you can hide or show by clicking on them.

The Video and the the Event List will appear docked in a palette to the left of the toolbar. You can also choose to pop those tools out into resizable, floating windows which can be dragged to any position on the screen. To do so, click the left chevron icon at the top of the Video or Event List. Click the close X to redock the window to the palette.

Hide/Show Sidebar Buttons

Click the small arrow button at the bottom of the side bar to select the items you want to be available on the sidebar. You can save this configuration to the perspective by going to Setup or Settings and pressing the Save button.





Hide/Show Sidebar Buttons

Review

Hide or show the Review EEG pane by using this toggle button.

Photic

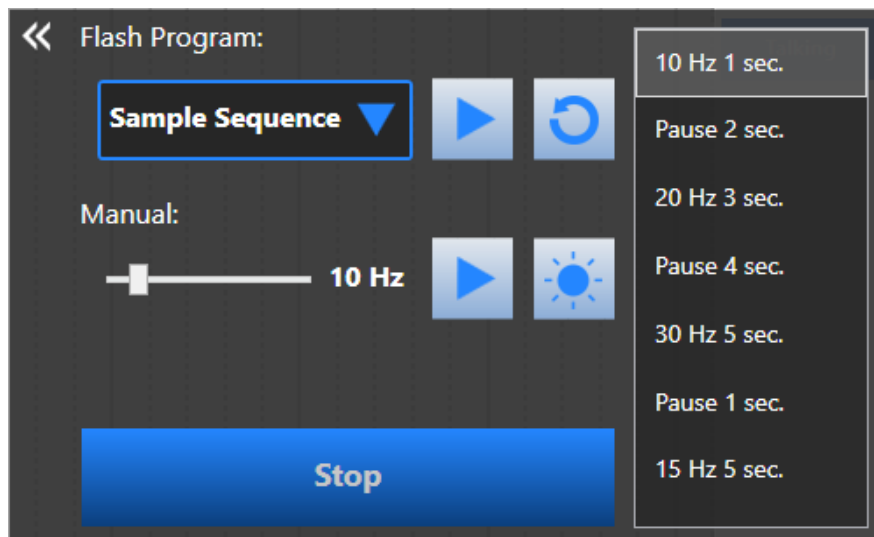
Before using the photic tool, be sure to change your recording montage from the default to Input.

Select a pre-configured Flash Program from the drop-down list. Press the arrow button to start the sequence. The button changes to a Pause button so you can pause or resume the sequence at any time. Click the reset button to reset the sequence at the beginning. The list on the right shows the progress of the sequence as it runs.

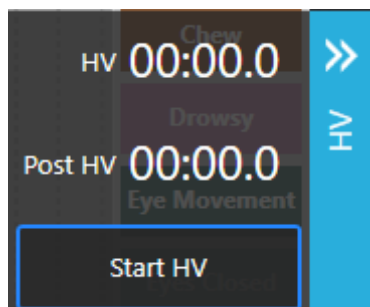
To start the photic manually, choose a frequency on the slider bar and press the arrow button to the right of it. Press the large blue button to stop.

To produce a single flash, press the button with the sun icon.

The large Stop button stops the photic immediately, regardless of whether you are using manual or program mode.



Hyperventilation



Press Start HV to start the hyperventilation timer. The button changes to Post HV, which you can press when you want to start the post hyperventilation timer. The button then changes to Stop HV which stops the timer. Finally, it changes to Reset so you can reset the times to zero.

Event List

The Event List displays a list of all the events in the exam by name, timestamp, and duration. Click on any event in the list to go to that event on the Review Pane.

Sort the list by name, timestamp or duration by clicking on the headers.

Change the font size of the list by clicking the font size buttons at the bottom of the list.

Click the Copy Events to Clipboard button and you can then paste the list, including all columns, to an Excel or Word document.

Click the Delete button to delete selected events, both from the list and the Review Pane.

To select multiple events, select an event, then hold down the control key while selecting additional events. To select consecutive events, select the first event, then hold down the shift key while selecting the last event in the row. All of the events in between will also be selected.

Name	Timestamp	Duration
Impedance Test	8:39:00 AM	0.00s
Impedance Test	8:40:43 AM	0.00s
Eye Movement	8:40:53 AM	0.00s
Eyes Closed	8:41:02 AM	0.00s
Drowsy	8:41:04 AM	0.00s
Impedance Test	8:43:43 AM	0.00s
medication	8:43:54 AM	0.00s
Annotation Dura	8:44:19 AM	06:21
Spike	8:45:29 AM	0.00s
Impedance Test	8:46:21 AM	0.00s
Spike	8:46:21 AM	0.00s
Movement (0s)	8:50:24 AM	0.10s

Event List Settings

Event List Filter
×

Search

Type	Category	Priority
<input checked="" type="checkbox"/> All	<input checked="" type="checkbox"/> All	<input checked="" type="checkbox"/> All
<input checked="" type="checkbox"/> Agitated	<input checked="" type="checkbox"/> Measurement	<input checked="" type="checkbox"/> High
<input checked="" type="checkbox"/> Amp disconnect	<input checked="" type="checkbox"/> Other	<input checked="" type="checkbox"/> Normal
<input checked="" type="checkbox"/> Amp reconnect	<input checked="" type="checkbox"/> Patient	<input checked="" type="checkbox"/> Low
<input checked="" type="checkbox"/> Annotation	<input checked="" type="checkbox"/> System	
<input checked="" type="checkbox"/> Annotation Duration	<input checked="" type="checkbox"/> Waveform	
<input checked="" type="checkbox"/> Arousal		
<input checked="" type="checkbox"/> Asleep		
<input checked="" type="checkbox"/> Awake		

Spike Threshold: 0.0%

Click the gear icon on the bottom of the Event List to open the Event List Settings. Check all the events you want to appear on the list. Use the search field to search for an event type.

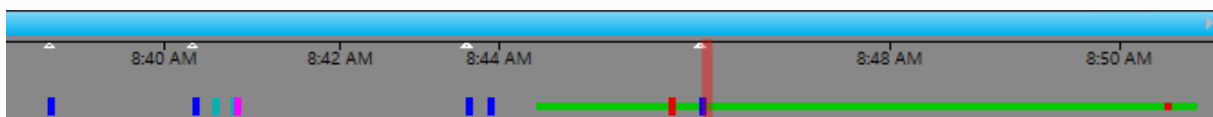
If the Persyst seizure detection is enabled, you can filter spike events by confidence threshold using the slider.

The filtered results are reflected on the Overview and Review Pane as well as on the Event List.

The events are arranged in columns by type, category and priority. Check or uncheck the "All" checkbox to select or deselect all events in the column.

Overview

The Overview is located above the Channel Chart and provides a visual representation of the duration of the exam.



Video



When video is recording, the green indicator will be on. To pause the video recording, click the indicator to turn it off, as shown below:



Click again to toggle video recording back on.

Use the slider bar to adjust the speed of the pan-tilt-zoom controls. The arrow buttons are used to pan and tilt the camera, and the plus and minus buttons will zoom the image in and out.

Note: The video tabs are unavailable if you don't have the video license.

Timeline

Tic marks on the timeline show evenly spaced intervals. The actual interval depends on the length of the exam. You can click anywhere on the timeline and the Channel Chart will display that page on the Review pane.

Current Page Marker

A red, translucent marker indicates where the currently displayed page of the Review Pane is located on the timeline. Hover over the red marker to see a tooltip with the current page's start time and date.

Segment Breaks

Segment breaks in a recording are indicated on the timeline with small white triangles.

Event Overview

Events are indicated on overview as small, vertical bars in a brighter shade of the color of the event marker, except for Duration Events, which appear as horizontal bars for the length of the duration. Click on any event on the overview to go to that event on the Review pane.

Video Overview

If video is present in the exam, a dark red bar appears in the overview. A second video appears in dark blue. A continuous bar indicates that video is present during the entire recording. Breaks in the bar indicate breaks in the video.

Zoom Bar

The Zoom Bar is located at the top of the overview. Its purpose is to be able to zoom into a long timeline so you can see the overview more clearly. To zoom in, drag either the left or right end of the zoom bar to shorten it. The zoom bar then works a bit like a scrollbar. You can move the zoom bar to the right or left to show later or earlier parts of the timeline.

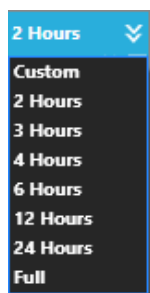
Paging on the Review Pane while you are zoomed into the timeline will cause the zoom bar to move so that the red current page marker is always visible.

When the zoom bar is moved all the way to the right, it "snaps" in place and will continue to display the most recent duration of the recording until you unlock it by dragging it to the left.

Note: Paging back on the Review pane can also unlock the zoom bar if you page back to a point preceding the current duration.

Zoom Duration

Use the drop-down menu to select a set duration of the overview.



Note: If you zoom in using the Zoom Bar, the Zoom Duration will automatically change to Custom.

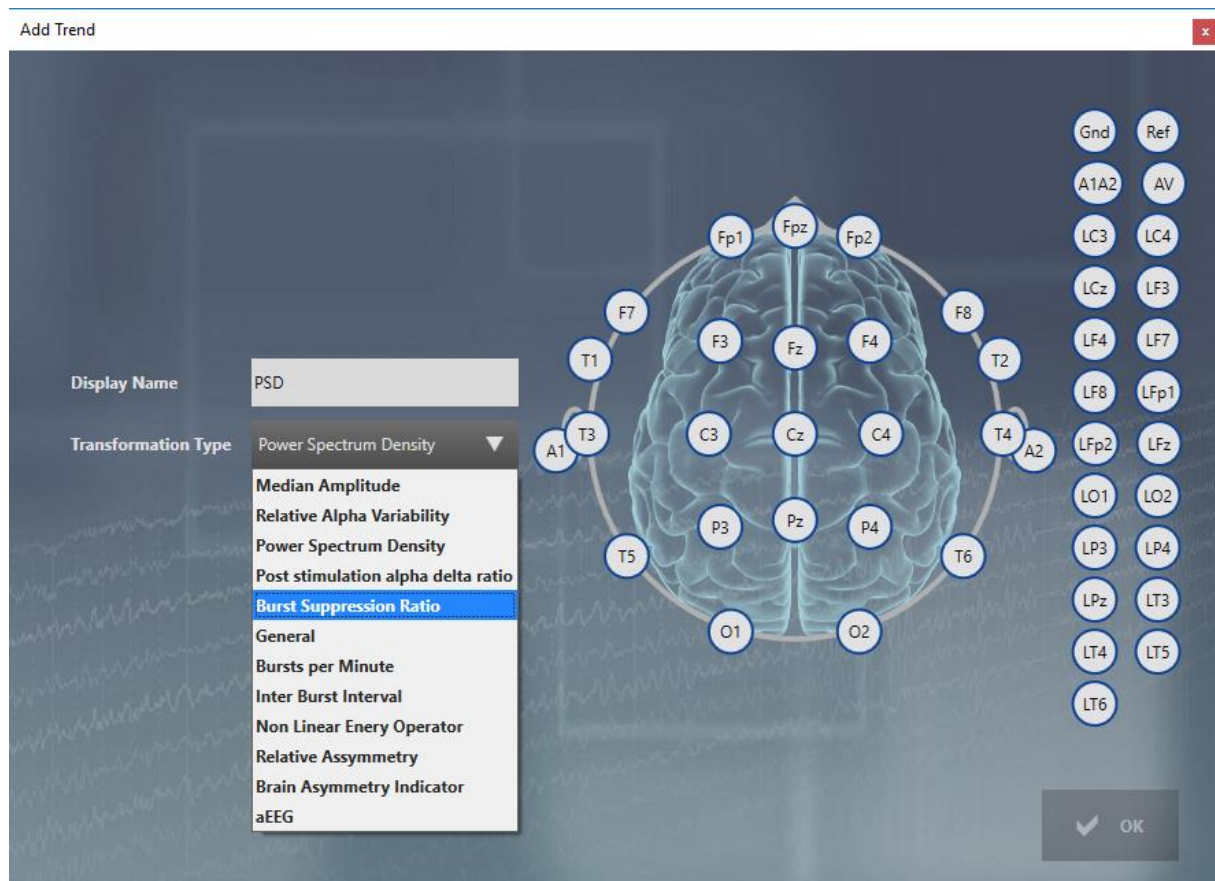
Trends

Add a trend to the overview by clicking the Add Trend button on the right sidebar.

Note: Trends is an optional feature that is not available without a license.



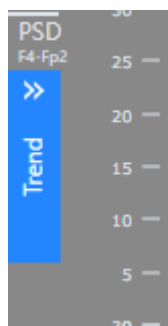
Select a Transformation Type from the drop-down list and give the trend a display name.



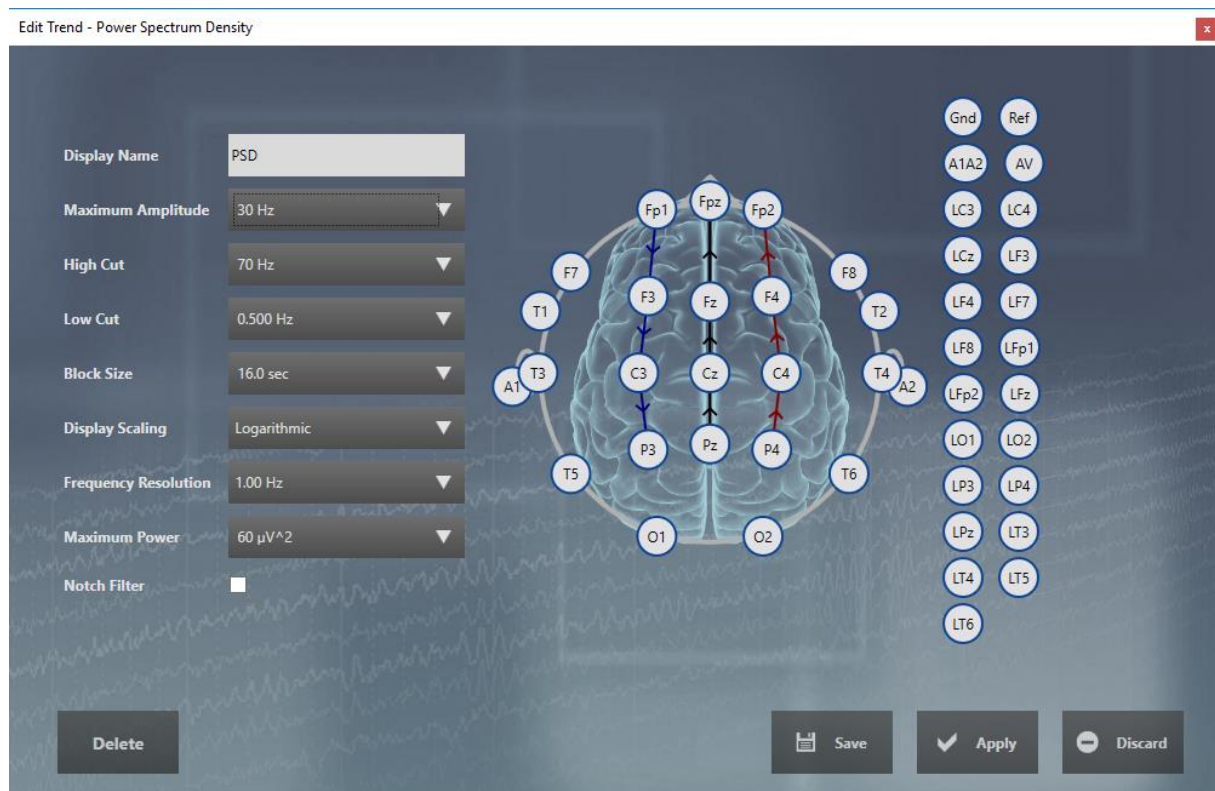
On the montage head, click on the electrode you want as the active electrode, then click on the one you want as the reference. Repeat for the electrode pairs you want to be displayed in the trend, then click ok.

Alternatively, you can select the electrode pairs on the label bar on the trace display BEFORE you click the Add Trend button. Then the electrode pairs are already drawn on the head diagram.

To edit a trend, click the blue arrow button to the left of the trend to open the Edit Trend popup. From this popup, you can also save the trend to the perspective, or delete the trend.



Note: Alternatively, you can right-click the trend overview to open the Edit Trend popup.



Click Save to save the trend to the current perspective. Future exams using this perspective will display the saved trend.

Click Apply to apply the changes to the current recording session only.

Click Discard to discard the changes you made before closing the popup.

Click Delete to remove the trend.

Indicators



A series of indicators in the upper right of the screen light up green when things are running smoothly. Otherwise, they will change to red or orange and the appropriate action should be taken. The Recording indicator will also blink when recording is interrupted and the words "Not Recording" appear on the screen.

The indicators are, from left to right:

Recording Status: Green indicates an ongoing recording. Blinking red/orange indicates that the exam is in a "not recording state". This means that the recording has not been started, has been paused or is in Impedance check mode.



Amplifier Connection: If green – amplifier is connected. If red – amplifier is not connected. Furthermore a message appears in a yellow bar at the top of the screen



indicating the amplifier is not connected. If this happens, take these steps:

Check the amplifier itself. Check if you can see a green light close to the cable connection.

If yes, the amplifier is connected. Try to unplug the cable and re-connect. If message on screen does not disappear, contact Lifelines iEEG support.

If no, check cable connections both at the amplifier side and at the computer side (back of screen). If connections are ok, the cable may be broken. Contact Lifelines iEEG support.

Remote Control Status: If green – remote control is available.



If orange – remote control is unavailable. Check Network Connections (see below).

Upload Status: If green – online upload is available and you can proceed as intended.



If orange – online upload is unavailable. Check Network Connections (see below). If network connections is not the problem, contact Lifelines iEEG support.

If gray – manual upload was selected in Setup.

Network Connection: If green – network connection is good.



If orange – network connection is limited. Check Ethernet cable connections. When cable connections are ok, open a web-browser on the computer and see if the PC connects to the internet. Contact hospital IT for further support.

If red – no network connection. Check Ethernet cable connections. When cable connections are ok, open a web-browser on the computer and see if the PC connects to the internet. Contact hospital IT for further support.

Battery Life (Amplifier): If green – battery life is good. If orange – battery life is low. If red – battery life is depleted.

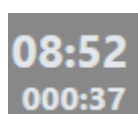


Connection to Electricity: If green – system is plugged into a wall outlet. If red – system has become unplugged from outlet. If using a laptop, it is recommended to plug the system in to avoid depleting the laptop battery.



Hours Remaining: If disk space becomes low, you will see an estimate of remaining time in hours.

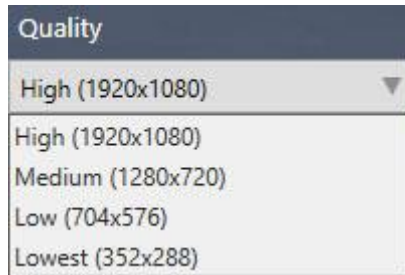
Clock



A clock to the left of the overview shows the current time, with the elapsed time of the recording underneath.

Video

On the Video tab you can preview the video image and also change the quality of video to be recorded. Higher quality settings show better detail but require more disk space.



If the camera is a pan-tilt-zoom camera, you are also able to adjust those settings from this screen by using the pan-tilt-zoom buttons.

Note: The video tab is unavailable if you don't have the video license.

Settings

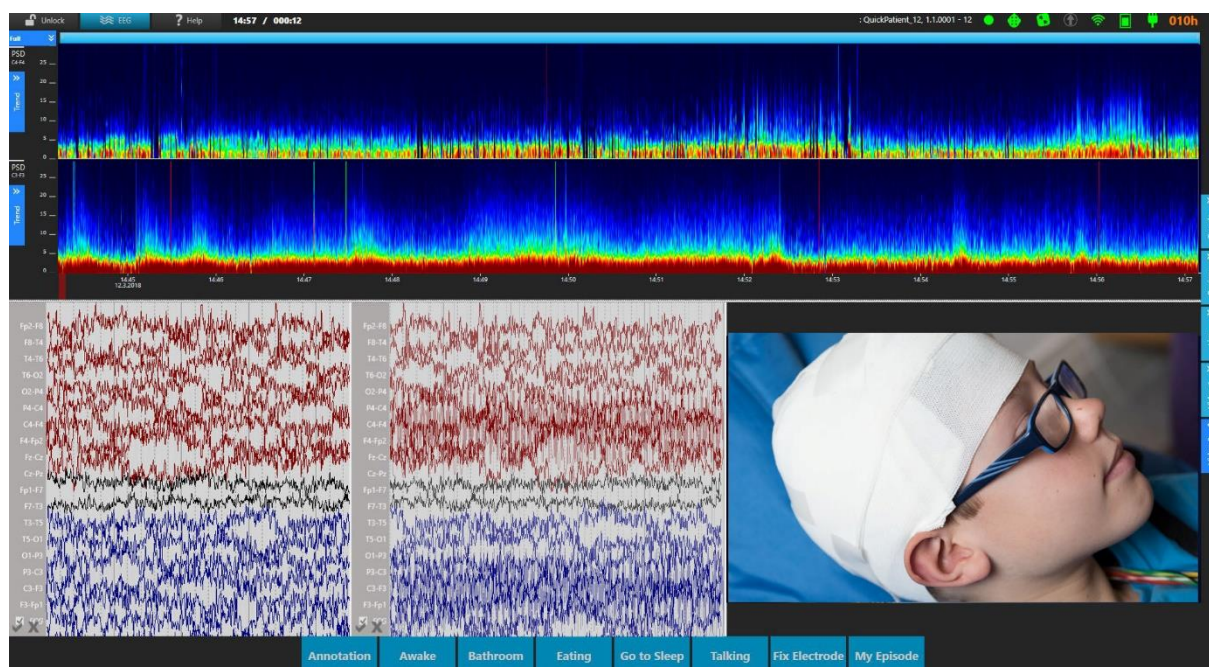
Lifelines iEEG is highly customizable in the way your data is displayed. With the settings editor, you can create your own montages and event palettes, then save them to a group of settings called Perspectives. See the Settings chapter later in this manual for a complete description of how to customize your settings.

Review

Click the Review button to launch the iEEG Review client for live review of the in-progress exam. See the Lifelines iEEG Review chapter for a complete description of iEEG Review.

Lock

Press this button to change the screen to a simplified, locked version of Acquire. In this view, the user can enter events using the buttons at the bottom of the screen, but all other controls are hidden. Elements of the lock screen can be displayed or hidden by using the side bar toggle buttons on the right. These elements include video, the live and review EEG panes and Trends. To unlock the screen, press the unlock button and enter your login credentials.



Locked screen showing trends, video and both eeg panes

Review

Lifelines iEEG Review allows advanced review of EEG exams of up to 128 channels and 2 synchronized video captures. Other features include event placement and annotations, customizable montages and filters, pruning and optional spike and seizure detection.

Launch iEEG Review

The iEEG Review client can be launched by selecting an exam in the Centrum client and pressing the Review button, or you can launch the Review client directly.



WARNING: To ensure accuracy, before reviewing an exam for the first time on a new screen, or when adding a second screen, the screen must be calibrated under Settings > My Settings > Screen.

Exam Mode

If you have selected an exam in Centrum and pressed the Review button, the exam will be opened in review mode, where you can begin review of the exam immediately.

If you have launched Review without first selecting an exam, the client opens on the Exams tab in exam mode. You will also see tabs for Upload, Processing and Settings.

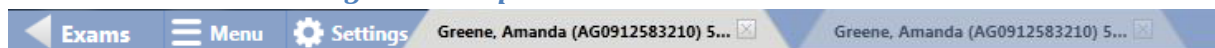
You can switch between exam and review modes via the left arrow button located on the top left of the screen.

Note: Review mode is only available after at least one exam is selected and opened for review.

Exam mode tabs



Review mode tabs showing 2 exams open



Exams Tab

On the Exams tab you will find a sortable list of current exams ready to be reviewed. Click the headers (Patient ID, Last Name, etc.) to sort the list by that header.

Search and Filter

Search for exams by using the search field. You can narrow down the search results by using any of the filter options shown below. The filter indicator lights up green when filters have

been applied. Click the green indicator to clear all filters. Click the refresh button to make sure the list is always showing the most recent entries or changes.

From To

Exam Type: State: Exam Space: Time:

☐ Assigned To Me ☒ Include Archived

Note: The system remembers the last used filters and keeps those settings until they are changed or cleared.

Pages

If the Exam List is very large, it will be displayed in pages. Click the arrows or page numbers at the bottom of the list to scroll through the pages. If you want to change the number of exams that are displayed on each page, type a new number in the Items per page box.

Showing items 1-25 out of 77

1 2 3 4

Items per page

Indicator Icons

Indicator icons appear to the left of each exam when applicable to that exam. The indicators are as follows, from left to right:



Ready to upload – local



Ready to upload – not local



Upload in progress



Ready to fetch



Dual recording



Archive warning



Overdue archive warning



Pruned



Spike & Seizure



Video

Function Buttons

Select an exam on the list and press one of the following buttons at the bottom of the screen to perform the following functions:

Review

Review in the bottom-right corner to open the exam for review.

Control

If the exam is in progress, click Control to gain remote control of the recording in Acquire.



Review and Control buttons

Clinical History

Click the Clinical History button to show the history for that exam.

Exam History

Click the Exam History button to display the dates of each workflow state for the exam.

Reports

Click the Reports button to view, import or create reports to associate with the exam.



Clinical History, Exam History and Reports buttons

Workflow Bar

The workflow bar indicates the workflow state, the same as in Centrum. See the Workflow section of the Centrum chapter for a detailed description of the workflow states and the function of these buttons.

Upload Tab

The Upload tab in iEEG Review works the same as in iEEG Centrum. Refer to the Centrum chapter for more information.

Processing Tab

The Processing tab in iEEG Review works the same as in iEEG Centrum. Refer to the Centrum chapter for more information.

Settings Tab

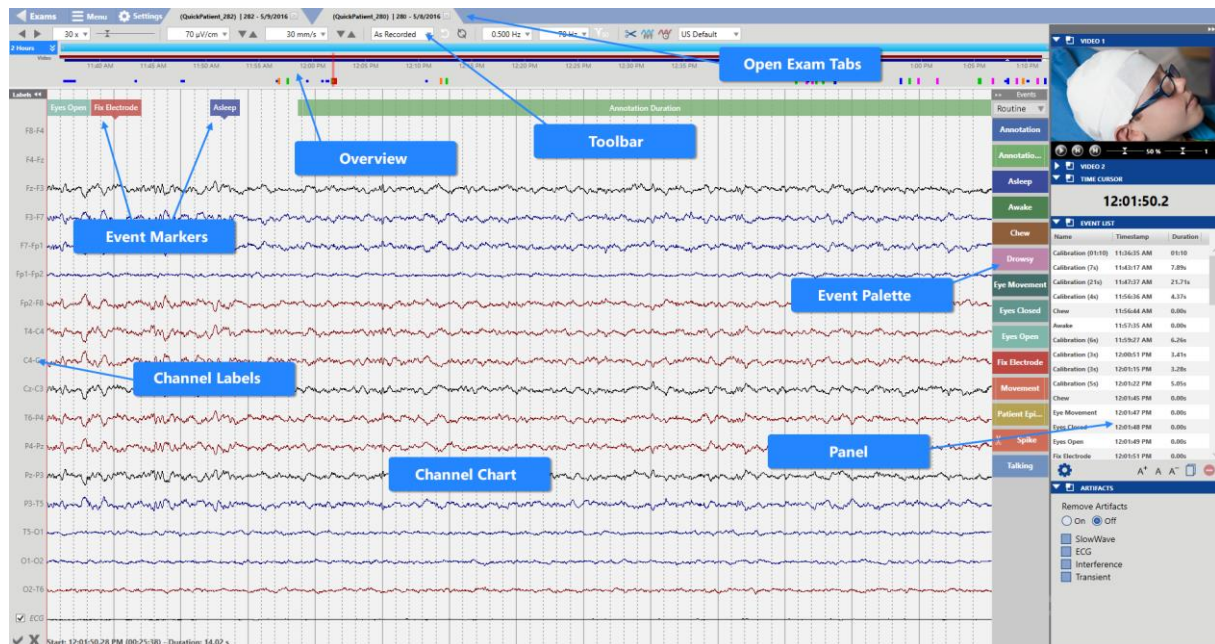
Lifelines iEEG Review is highly customizable to the way you review data. You can create your own montages and event palettes, then save them to a group of settings called Perspectives. This allows you to quickly switch between the settings that are available during review.

See the Settings chapter for a full description of the settings features.

Review Screen

The review screen is where the review of exam data takes place. The following diagram shows the review screen with the main components labeled. These components are described in the following sections.

The iEEG Review Screen



Channel Chart

The Channel Chart is where the exam data, such as EEG channels and events, are presented. The display of the chart is highly customizable, for example by user-defined montage, timebase, filters, sampling rates and display of individual channels.

This section describes the navigation of the Channel Chart and the modifications that can be made quickly during review.

Detailed descriptions of how you can further customize your Channel Chart are found in the Settings chapter.

Overview

The Overview is located above the Channel Chart and provides a visual representation of the duration of the exam.

Timeline

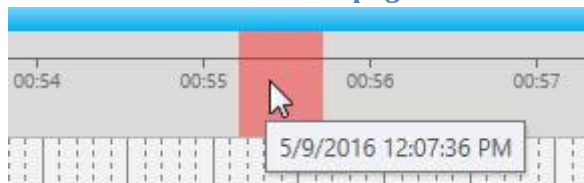
Tic marks on the timeline show evenly spaced intervals. The actual interval depends on the length of the exam. You can click anywhere on the timeline and the Channel Chart will display that page.

Note: it is also possible to display the timeline below the channel chart. See Settings>Perspectives>Defaults for more information.

Current Page Marker

A red, translucent marker indicates where the currently displayed page is located on the timeline. Hover over the red marker to see a tooltip with the current page's start time and date.

Timeline with red current page marker



Segment Breaks

Segment breaks in a recording are indicated on the timeline with small white triangles.

Event Overview

Events are indicated on the Event Overview just below the timeline. They appear as small, vertical bars in a brighter shade of the color of the event marker, except for Duration Events, which appear as horizontal bars for the length of the duration. Click on any event on the overview to go to that event in the Channel Chart.

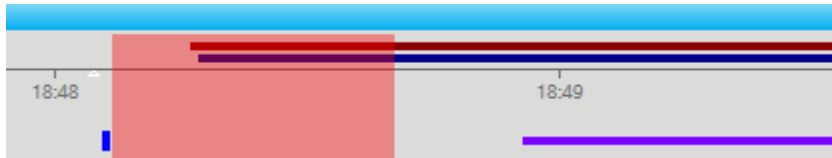
Timeline showing current page marker and event overview



Video Overview

If video is present in the exam, a dark red bar appears in the overview just above the timeline. A second video appears in dark blue. A continuous bar indicates that video is present during the entire recording. Breaks in the bar indicate breaks in the video.

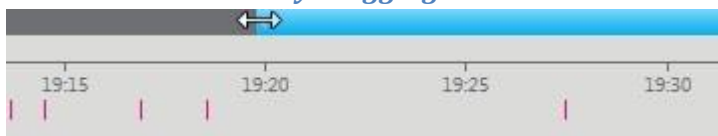
Timeline showing 2 video recordings



Zoom Bar

The Zoom Bar is located at the top of the overview. Its purpose is to be able to zoom into a long timeline so you can see the overview more clearly. To zoom in, drag either the left or right end of the zoom bar to shorten it. The zoom bar then works a bit like a scrollbar. You can move the zoom bar to the right or left to show later or earlier parts of the timeline.

Resize the Zoom Bar by dragging to zoom in or out

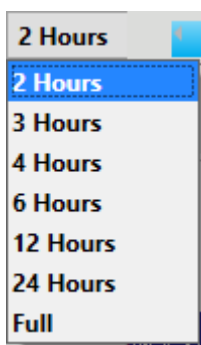


Paging while you are zoomed into the timeline will cause the zoom bar to move so that the red current page marker is always visible.

If you drag the zoom bar all the way to the right, it “snaps” into place and will display the most recent duration of the recording while paging. Drag the zoom bar to the left to unlock. Paging back will also unlock the zoom bar when you reach the point preceding the current duration.

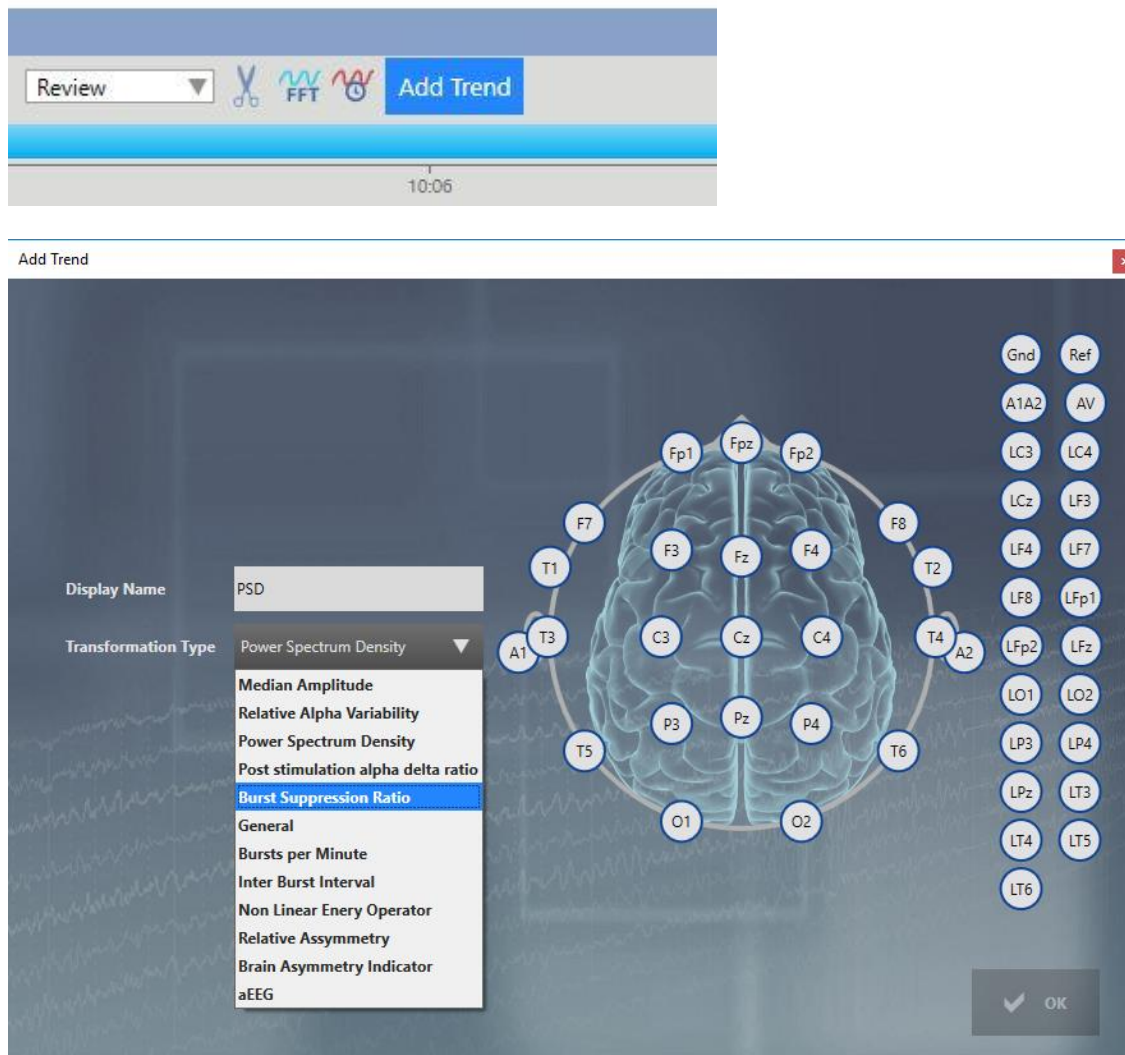
Zoom Duration

Use the drop-down menu to select a set duration of the overview.



Trends

Add a trend to the overview by clicking the Add Trend button on the toolbar.

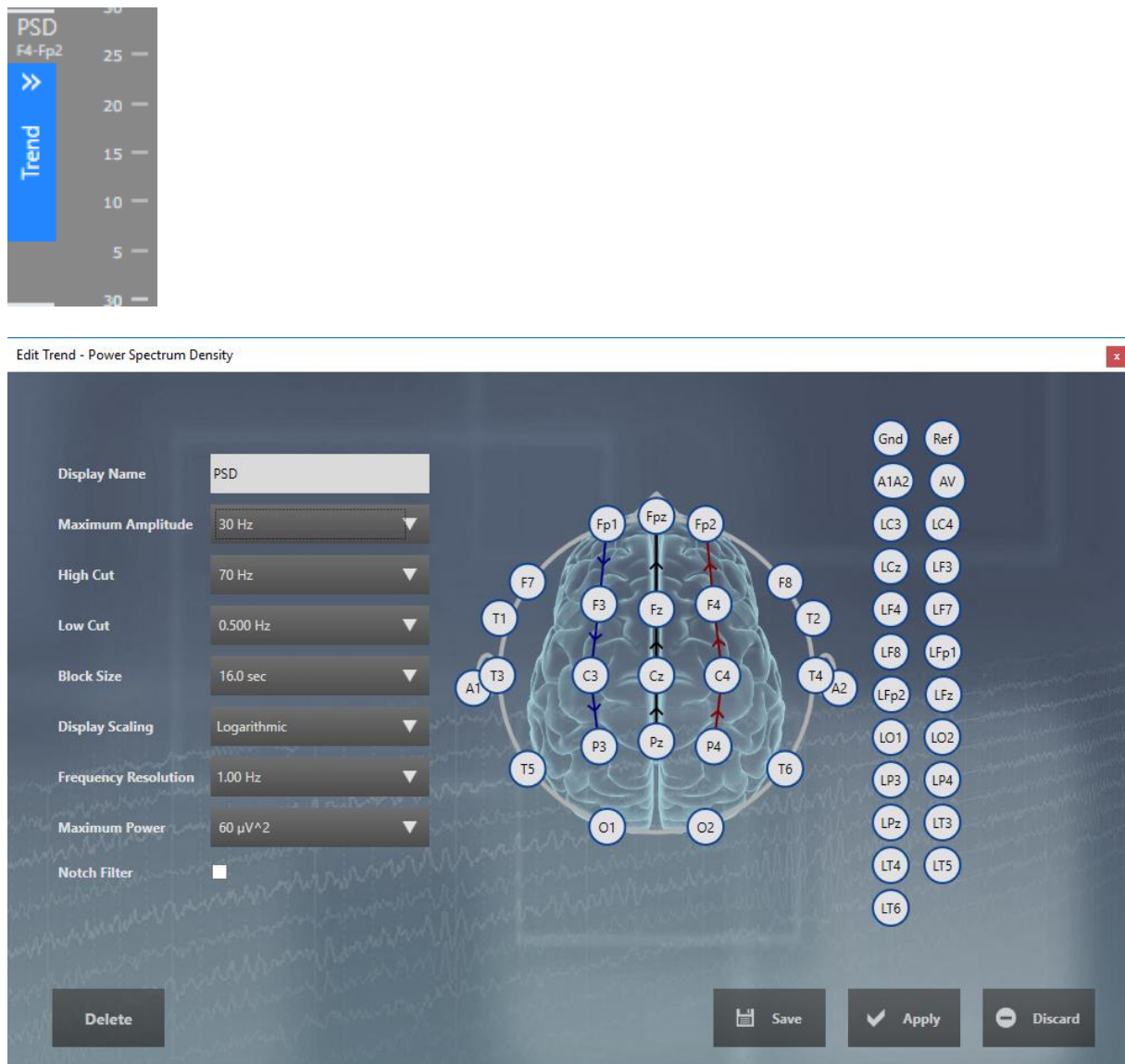


Select a Transformation Type from the drop-down list and give the trend a display name.

On the montage head, click on the electrode you want as the active electrode, then click on the one you want as the reference. Repeat for the electrode pairs you want to be displayed in the trend, then click ok.

Alternatively, you can select the electrode pairs on the label bar on the trace display BEFORE you click the Add Trend button. Then the electrode pairs are already drawn on the head diagram.

To edit a trend, click the blue arrow button to the left of the trend to open the Edit Trend popup. From this popup, you can also save the trend to the perspective, or delete the trend.



Click Save to save the trend to the current perspective. Future exams using this perspective will display the saved trend.

Click Apply to apply the changes to the current recording session only.

Click Discard to discard the changes you made before closing the popup.

Click Delete to remove the trend.

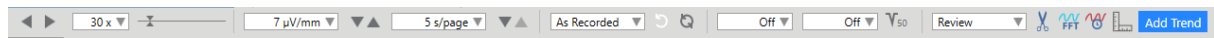
Note: Trends is an optional feature. You can only add trends if the exam was recorded with the trend license or if your server has been specially configured to add trends. Be aware that if you add trends to an exam that was recorded without the trend license, a charge will incur.

Toolbar Controls

Located near the top of the screen just below the tabs area is a toolbar with controls affecting the navigation and display of the Channel Chart. Here you will find controls for

paging, sensitivity, time base, montage, filters, perspective, and other tools - all described in the sections below.

Toolbar showing channel chart controls



Paging

The left and right arrows are the Auto Paging Buttons. Press once to begin paging forward or back, again to stop. The paging speed can be set using the drop-down list, or use the slider bar to raise or lower the paging speed. The drop-down list is editable: type in a new value and press the Enter key to apply. Note: paging may slow down due to heavy data or high network activity.

Toolbar paging buttons, paging speed dropdown and slider



There are some alternative ways to navigate the Channel Chart, described below.

Space Bar: Press the space bar to page forward and again to stop.

Arrow Keys: Step forward or back one second using the right and left arrow keys. Press and hold the arrow keys to page continuously at a high speed.

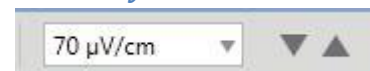
Page Up, Page Down Keys: Use these keys to page forward or back one whole page. Clicking on the right or left half of the Channel Chart does the same thing.

Sensitivity

Use the Sensitivity drop-down menu to select another value, or use the up/down arrows on the toolbar to change the value one step at a time. The drop-down list is editable: type in a new value and press the Enter key to apply.

Use the up/down keys on the keyboard to increase/decrease sensitivity.

Sensitivity menu

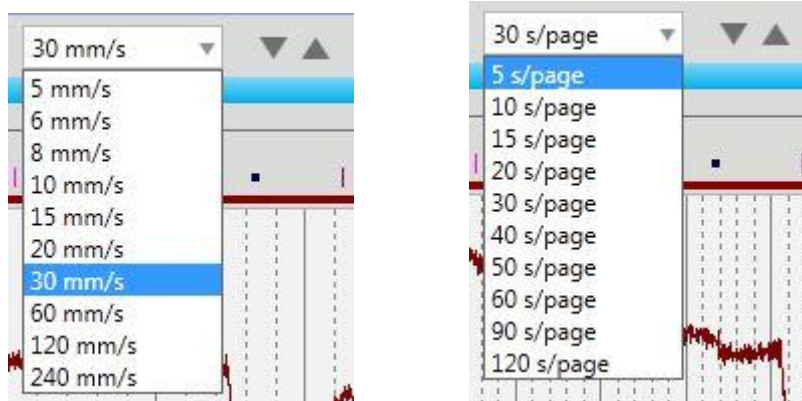


Timebase

You can control how much data is displayed on the channel chart (time-wise) by setting its timebase. According to which default timebase mode has been set (see the Settings>Perspectives to change the timebase mode), you will see either the Paper Speed or Page Duration drop-down menu on iEEG Review toolbar, where you can quickly change the timebase while reviewing. Alternatively, you can use the up/down arrows next to the drop

down list to increase or decrease by one step. The drop-down list is editable: type in a new value and press the Enter key to apply.

Change timebase controls – paper speed and page duration



Montage Selector

Quickly change to another montage using the Montage Selector. Select As Recorded to view the montage used during recording minus any applied filters. To view the As Recorded montage plus the filters applied during recording, use the back arrow button. Use the double arrow button to go back to the previously selected montage.

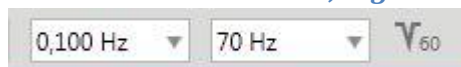
Montage Selector



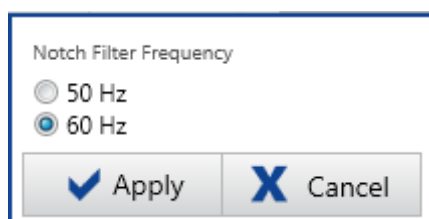
Filters

The next three controls on the toolbar are the filter controls – Low Cut, High Cut and Notch. Select a value for low or high cut. The drop-down lists are editable: type in a new value and press the Enter key to apply.

Filter Controls – Low Cut, High Cut and Notch



Click the Notch icon to toggle the notch filter on or off. Click and hold the button to get a popup window where you can change the frequency between 60 and 50.



Perspective Selector

Use the Perspective Selector to quickly change the view from one perspective to another. A perspective is a group of settings that you can create and name yourself. (See the Settings chapter for more information).

Prune Preview

Pruning is used to selectively throw away unwanted parts of an exam. Press the Prune Preview button to view the effects of the prune settings before actually throwing out any data. The button is a toggle button so you can view the effects of pruning and then go back to the previous view.

The Prune Preview toggle button



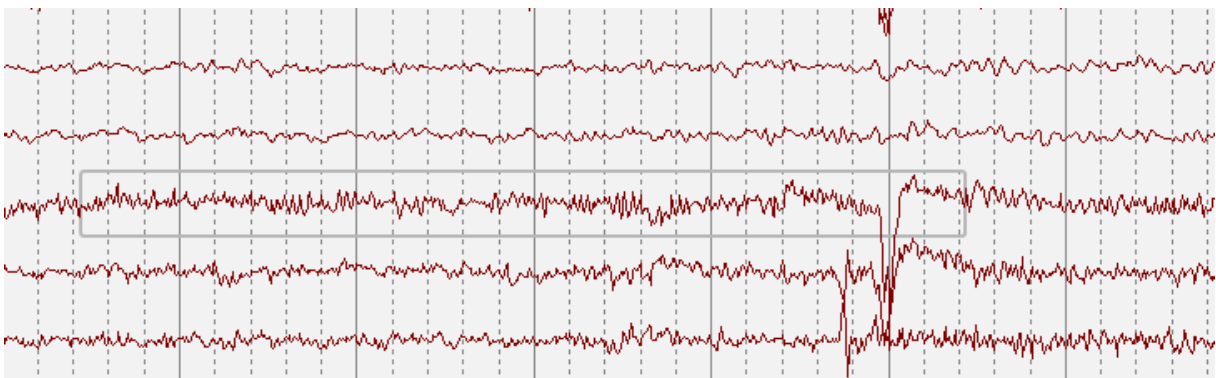
The Prune Preview button becomes active when you have marked certain events as Prune Events. To learn how this is done, see the Events section of the Settings chapter of this manual.

See the Menu section of this chapter for two ways to perform the prune after you are satisfied with the preview.

Frequency Analysis

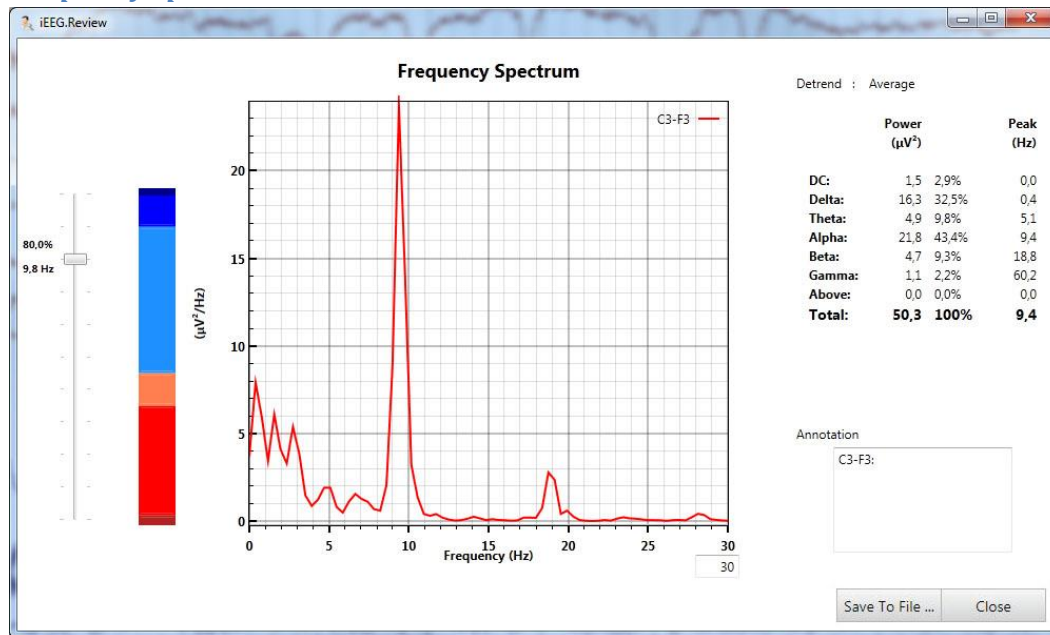


It is possible to perform frequency spectrum analysis on any of the traces as they are displayed in the review screen. To do so, click the FFT button in the Measurement Tools panel, then select a portion of a trace by either clicking on the start point of the channel and then again at the end point, or by dragging from the start point to the end point. A box is drawn around the selected portion of EEG on the channel chart as shown:



A popup window opens with the calculations as shown:

Frequency Spectrum Window



The results for the selected EEG shown in the frequency spectrum window are calculated with the Welch's method:

1. The signal selected by the user and as displayed, i.e. with same filtering settings, is divided into 2-second blocks, overlapping by 50%.
2. If the sampling rate is not in power, each block is zero padded until next the power of two samples
3. If the last block is not a full 2 seconds, it is zero padded until it is 2 full seconds.
4. The mean is subtracted from each block (**Detrend: Average** as shown in the results window)
5. Each block is windowed by a Hamming window function.
6. The periodogram is calculated of each block using a standard FFT algorithm with 0.5 Hz frequency resolution.
7. All the periodograms are averaged into the resulting frequency spectrum.

The power in the following frequency bands is calculated by summing the power in the frequency bins within the frequency bands:

- **DC:** 0 – 0.5 Hz
- **Delta:** 0.5 – 4 Hz
- **Theta:** 4 – 8 Hz
- **Alpha:** 8 – 13 Hz
- **Beta:** 13 – 30 Hz
- **Gamma:** 30 – 100 Hz
- **Above:** 100 – Nyquist frequency

The power values for each band is always shown in μV^2 in the first column and the relative percent power in the second column, i.e. power in the band divided by total power in all bands times 100, where total power is the sum of the power in all bands.

The spectral edge shown on the left in the Frequency Spectrum window is calculated as the frequency where the power below the frequency is x% of the total power, where x is 80% by default but can be changed by using the slider.

Click the Save to file button to save the results to disk.

Time Domain



The Time Domain tool is used to measure amplitude and duration of a selected section of a waveform. Click the Time Domain button and then select a section of a waveform on the channel chart either by clicking and dragging, or by clicking first on the start point and again on the end point.

A window opens showing an enlarged view of the selected waveform. Click on the waveform where you want the measurement to begin and again where you want the measurement to end. The amplitude and duration are displayed.

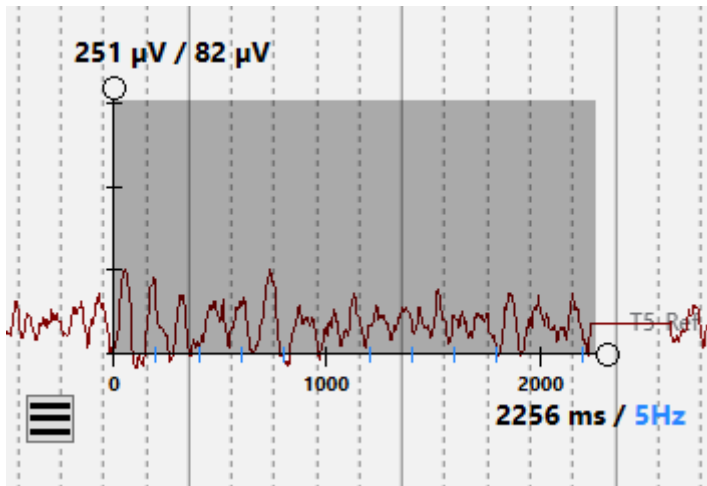
Amplitude is measured in μV and duration in milliseconds. The accuracy of the measurement is dictated by the accuracy of the bio potential amplifier used to acquire the data.

Scale Indicator



Press the Scale Indicator button to toggle on a tool to measure amplitude and duration of a waveform.

Drag the Scale Indicator to line up with a waveform. The circular ends of the horizontal and vertical axis can be dragged to increase the total duration and amplitude displayed.



The main tick marks on the horizontal axis indicate full seconds, and the smaller tick marks in a contrasting color indicate Hz. The first number shows the total duration of the horizontal axis in milliseconds, and the second number shows the frequency of the smaller tick marks in Hz. In this example, the value is set to 5Hz. You can change the value by hovering over the horizontal axis and using the scroll wheel on the mouse.

The vertical axis indicates the amplitude. The first number is the total value, followed by the value of each tick mark. Change the value of the tick marks by hovering over the vertical axis and using the scroll wheel on the mouse.

A good way to measure the amplitude of a waveform is to scroll until the tick mark lines up with the top of the wave, then read the tick mark value. See the illustration above.

Use the menu button to change the orientation of the x and y axis to fit better on different parts of the screen.

Toggle the toolbar button off to close the Scale Indicator tool.

Channel Labels

To the left of the Channel Chart you will see the Channel Labels.

You can hide the Channel Label bar by clicking the hide/show arrow button at the top of the labels. This display option is stored on the computer between sessions for each user.

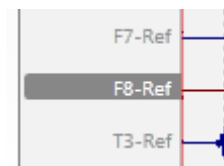
Hide/Show Labels



Special Channels

You can select one or more channels by clicking on the label and then change a number of display settings or filters on those channels.

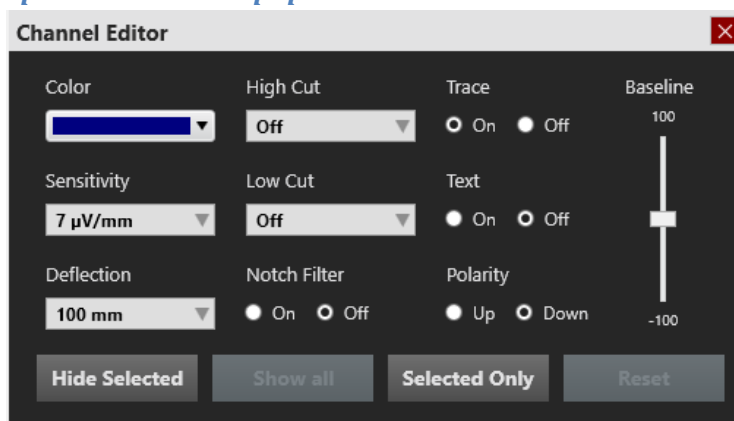
Selected Channel Label



Right-click one of the selected channels to open the Special Channel popup. You can then change the color, sensitivity, deflection, filters, display type, polarity and baseline position by using the corresponding controls. You can also choose to hide the selected label(s) or display only the selected label(s). Click Reset to remove the special channel settings from the selected labels.

A checkbox appears in front of the label on special channels. Unchecking the box resets the settings for that channel only.

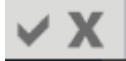
Special Channel Popup



Note: These settings are applied but not saved unless you save them on the Montage tab in the Settings.

At the bottom of the label area are two buttons. The X clears all selections and the checkmark selects all labels.

Select or deselect all labels



Event Palette

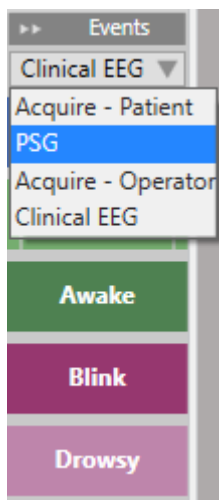
Located to the right of the Channel Chart is the Event Palette. The Event Palette contains a customizable set of event markers that can be placed either directly onto a channel, or at the top of the Channel Chart at the time of the event. The event changes are automatically saved to the central data storage.

Hide/Show

You can hide/show the Event Palette by clicking the hide/show arrow button at the top of the palette. This display option is stored on the computer between sessions for each user.

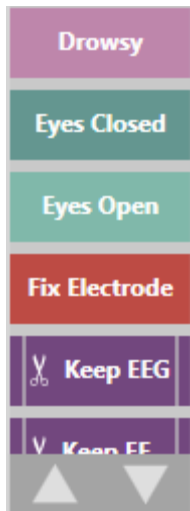
Switching Palettes

Use the drop-down list to quickly switch between different palette sets.



Scrolling

Use the up and down arrows at the bottom of the event palette to scroll palettes which contain too many events to fit on the screen.



Place an Event

To place an event, click the event on the event palette (it will become highlighted with a yellow outline), and then click on the channel chart where you want the event marker to appear. A vertical positioning line and crosshairs appear to help you with the positioning.

Selected Event Marker



To place multiple instances of the same event, double-click the event marker first, and then you can insert an event marker onto the channel chart with each subsequent click, without having to go back to the event palette. Right-click on the channel chart to stop this action.

Note: if the montage is changed such that the channel where the event was placed no longer appears, the event marker will be displayed at the point where the active electrode appears again, or at the top of the channel chart in the case that the active electrode does not appear.

Event Shortcut Keys

Instead of clicking on the event markers, you can also use the F-keys F1-F10, which correspond to the first 10 event markers on the event palette. Press the F-key then click the channel chart to place the event.

Place Event at Video Marker

During video playback or online video review, simply click an event or its shortcut key to automatically place the event at the point of the video marker. The event marker appears at the top of the channel chart.

See additional event placing information under Duration Events and Annotation Events.

Duration Events

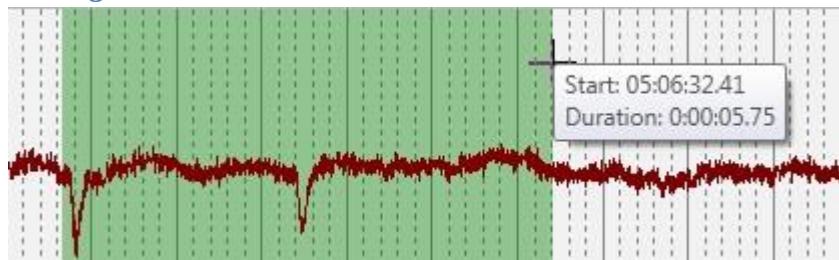
Duration Events are events that happen over a period of time. These event markers can be recognized as they are marked with a vertical bar at each end.



Place Duration Event

To place these events, click on the event on the event palette, and then click on the channel chart where you want the event to begin. Before releasing the mouse button, drag to the point where you want the event to end. In addition to the crosshairs, a translucent background color appears to indicate the horizontal area that will be covered by the event.

Placing a duration event

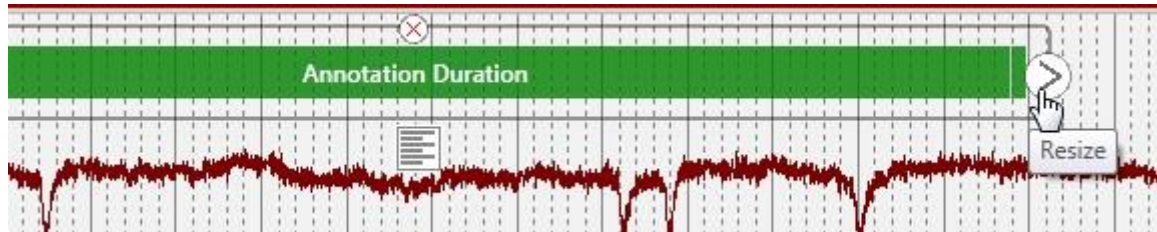


After placing the event, you can adjust the duration by dragging either end of the event marker to extend or contract the area being covered.

Paging during duration event placement

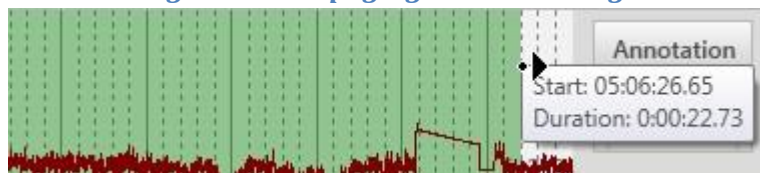
If the duration of the event extends for more than one page, place the event, then hover over the event marker and click the resize arrow that appears to the right of the event. You are now able to extend the length of the duration without holding down the mouse button. You can also click the Resize button and select a place on the timeline. Then click on the original channel again to end the duration event.

Click the Resize button to adjust the length of the duration



When you need to page forward, move the cursor just above or below the channel you are on and it changes to an arrow so you can click to page forward. Click again in the original channel to end the duration event.

Cursor changes to allow paging when hovering above or below the channel



Place Duration Event at Video Marker

To place a duration event while playing video, click the event marker or press its shortcut key to place the beginning of the event at the current location of the video marker, then click the marker or press the key a second time to end the event.

Event Caption

Hover over the event marker on the channel chart and click the small text box icon that appears below the event. You can then type in your own caption for the event which will appear after the event name on the event marker.

Adding a caption to an event



Annotation Events

Annotation events allow you to type in a note which becomes the caption on the event marker.

Place Annotation Event

To place an Annotation Event, simply start typing the annotation. A text box appears automatically for you to type in your annotation. The marker appears at the top middle of the channel chart, or at the video marker if video is playing.

Context Events

Context Events store information about the channel chart settings at the time of placement. Later, you can revert back to these settings by clicking the Context toggle button that becomes visible when you hover over the event marker.

Context events store montage, general channel settings and timebase information.

Context Event toggle button

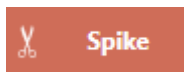


Numerical Events

Numerical events store numerical information associated with the event. Hover over the placed event on the Channel Chart to select a new numerical value from a drop-down list.

Prune Events

Prune events are used to mark areas of the Channel Chart that you want to keep after pruning the exam. On the Settings>Events tab, you can set the number of seconds before or after the event that you want to keep. You can also choose whether the event saves the EEG and video, or only the EEG. You can recognize prune events by the scissors icon:



For more info about pruning, see also the Prune Preview section under Toolbar Controls in this chapter, and the Events section of the Settings chapter.

Move an Event

Drag an event to a new position on the channel chart. This will change the timestamp of the event.

Delete an Event

To remove an event once it has been placed, hover over the event and click the x that appears over the event.

Deleting an event



You can also delete an event by selecting it on the Event List and clicking the delete button.

Creating Events and Palettes

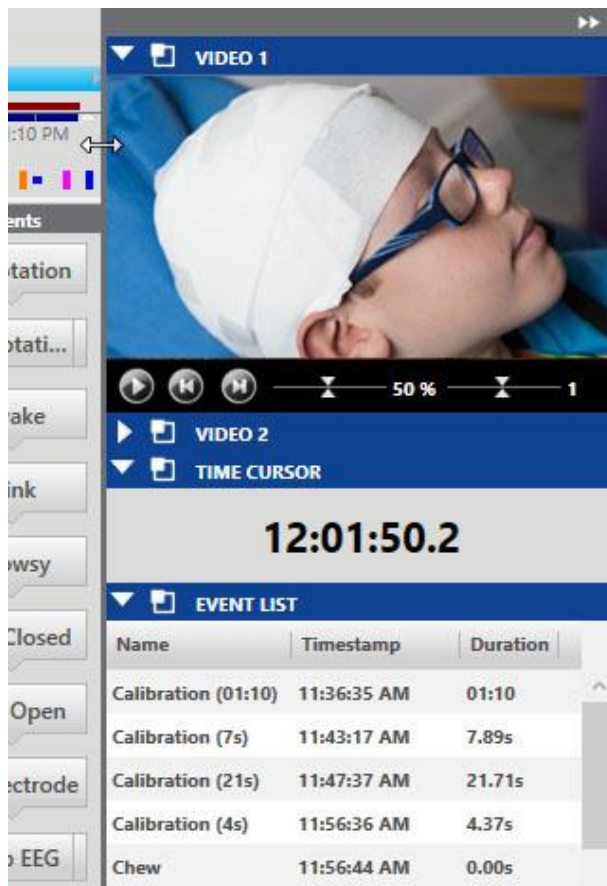
For information on creating and customizing events and event palettes, see the Settings chapter.

Panel

Intro

The Panel is located on the right side of the screen and contains additional tools for navigating and analyzing the exam. The individual items on the panel can be expanded or collapsed by clicking the panel headers, and the entire panel can be hidden by clicking the hide/show arrow button on the gray bar at the top of the panel. The hide/show display option is stored on the computer between sessions for each user.

You can adjust the width of the panel by dragging the left edge of the panel to the right or left.



Click the small “popout” icon in the header to open the panel item in a separate window. The window can be resized and dragged to any position. Click the close X to put the panel item back on the panel.

Video 1 panel shown popped out

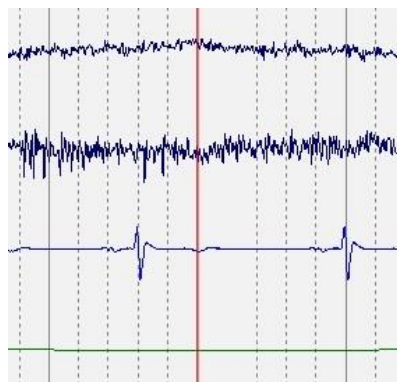


Video

If video is included in the exam data, it is displayed in the panel and can be played in synchronization with the exam data.

Click the play button to start video playback. A red video marker moves across the Channel Chart to show the position of the video in the EEG data. The Channel Chart pages automatically at the rate of video playback. You can also drag the video marker to a point in the EEG to start the video at that point.

Red video cursor



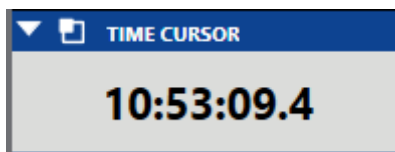
The play button changes to a pause button while the video is playing, so you can press again to pause the video. The other buttons on the video panel are for stepping back and forward one step at a time, adjusting the volume, and adjusting the playback speed.

Zoom

Select an area of the video display to zoom into that area. After zooming in one or more times you can reset the video to the originally displayed size by a right-click with the mouse.

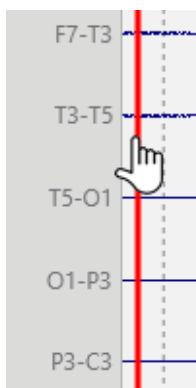


Time Cursor



The Time Cursor panel shows the time of the time cursor on the currently displayed page of the exam. The time cursor is a red vertical line found on the left side of the screen near the trace labels (shown below).

You can fine tune the time cursor by increments of a tenth of a second (0.1 seconds) by dragging the red line to the correct spot on the screen.



Event List

The Event List displays a list all of the events in the exam by name, timestamp, and duration. Click on any event in the list to go to that event on the Channel Chart.

Sort the list by name, timestamp or duration by clicking on the headers.

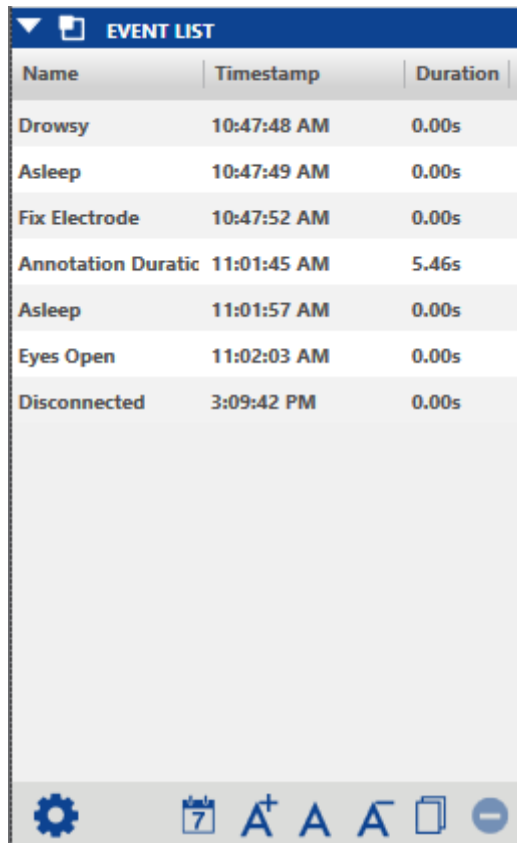
Change the font size of the list by clicking the font size buttons at the bottom of the list.

Click the Copy Events to Clipboard button and you can then paste the list, including all columns, to an Excel or Word document.

Click the Delete button to deleted selected events, both from the list and the Channel Chart.

To select multiple events, select an event, then hold down the control key while selecting additional events. To select consecutive events, select the first event, then hold down the shift key while selecting the last event in the row. All of the events in between will also be selected.

Click the Calendar icon to hide/show the dates on the Timestamp column.



Name	Timestamp	Duration
Drowsy	10:47:48 AM	0.00s
Asleep	10:47:49 AM	0.00s
Fix Electrode	10:47:52 AM	0.00s
Annotation Duratic	11:01:45 AM	5.46s
Asleep	11:01:57 AM	0.00s
Eyes Open	11:02:03 AM	0.00s
Disconnected	3:09:42 PM	0.00s

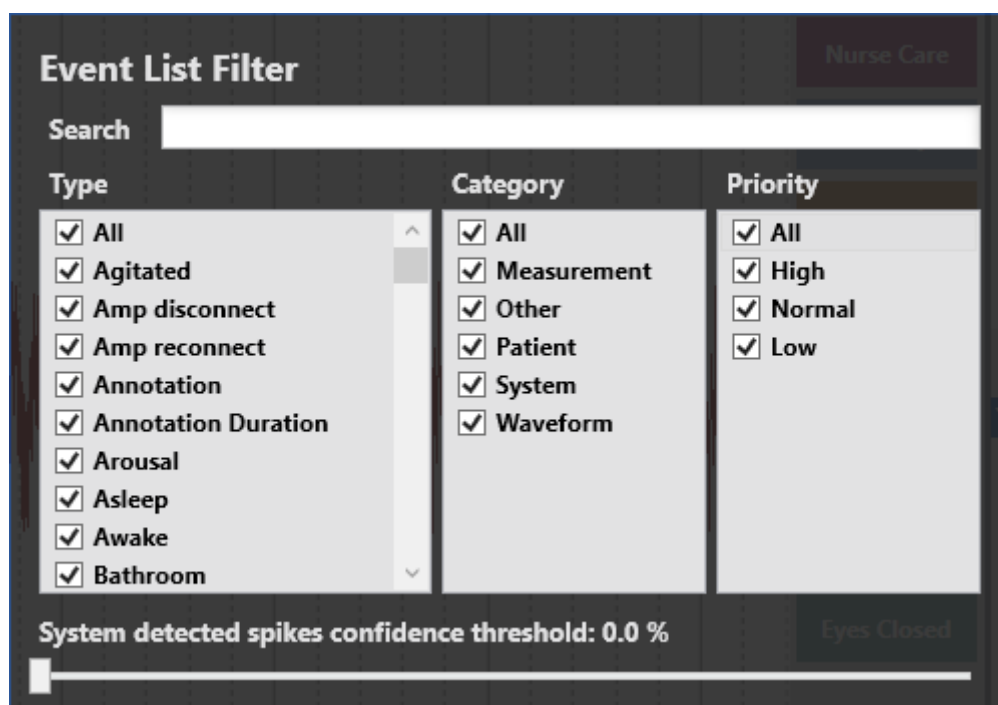
Event List Settings

Click the settings icon to open the Event List Settings popup. On the Event List Filter tab, you can select which events you want shown or hidden in the Event List. You can also filter by free text by typing into the Search field.

If the Persyst seizure detection is enabled, you can filter spike events by confidence threshold using the slider.

The filtered results are reflected on the Overview and Channel Chart as well as on the Event List.

The events are arranged in columns by type, category and priority. Check or uncheck the "All" checkbox to select or deselect all events in the column.

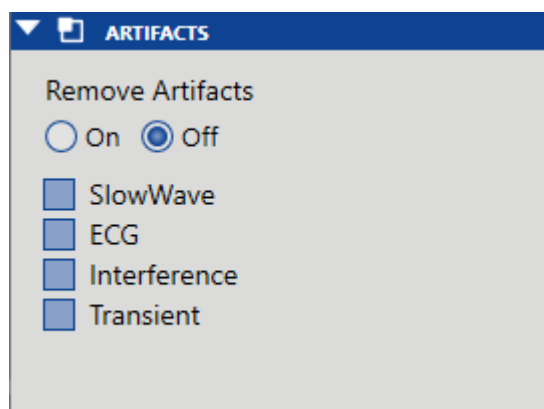


Artifacts

The artifact removal feature uses advanced signal processing methods to remove artifacts from the EEG while leaving the original EEG unaffected.

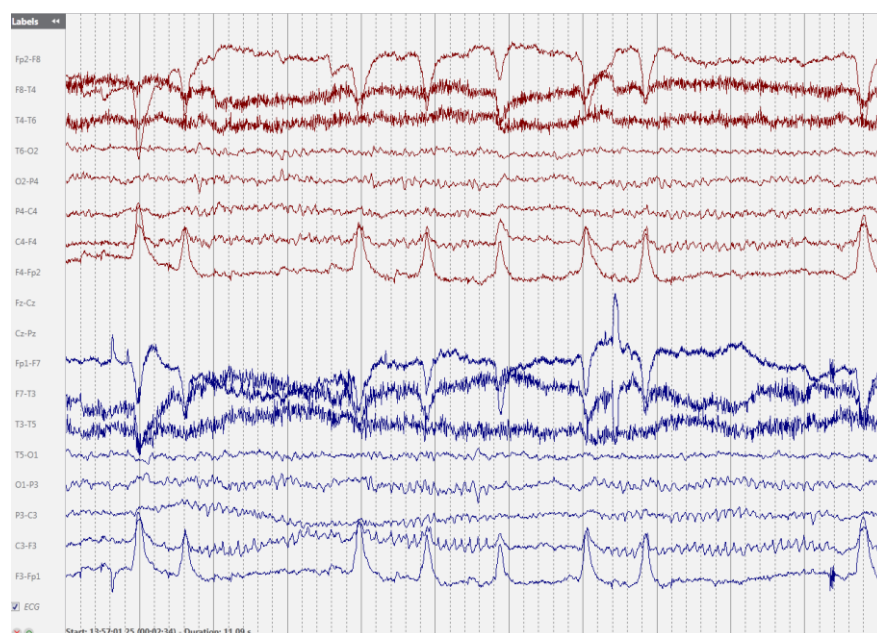
Check the types of artifact removal you want to activate, then click On or Off to show or hide the effects of the artifact removal.

Note: While artifact removal is On, the system will slow down considerably for actions such as paging.

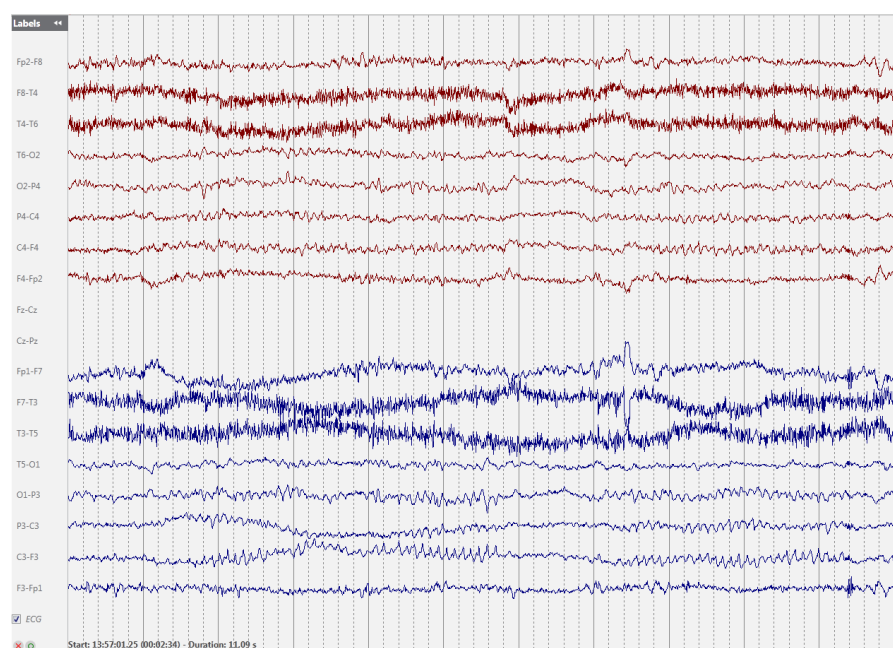


The artifact removal feature is provided as a supplement to conventional EEG processing such as band pass filtering. Artifacts are removed from one page at a time by user request.

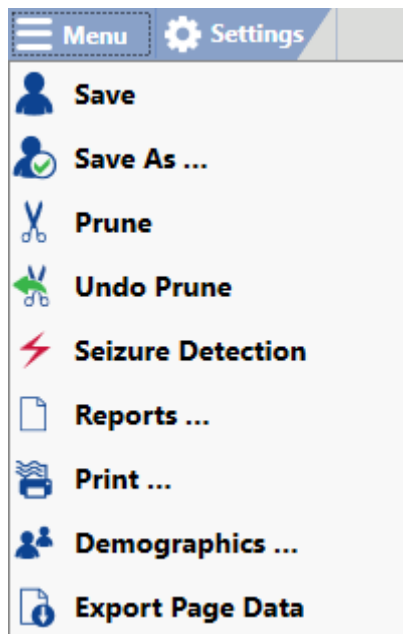
The following image shows a page of EEG with eye blink artifact present. The artifact can be clearly seen on channels Fp2-F8, F4-Fp2, Fp1-F7 and F3-Fp1 but it is present on other channels as well to a lesser extent.



The next image shows the same page of EEG with the eye blink artifact removed.



Menu



The Menu button located at the top of the screen holds functions which are typically located on the File menu in common applications, such as Save and Print.

In addition, there are the following functions:

Save As

Save a copy of the exam with a new ID. The copy can also be saved pruned. Pruning using this method cannot be undone with the Undo Prune command, however you will still have the original data in another file. The pruned copy will appear with the scissors icon in the Exam List, as well as the date of the prune.

You can also use this feature during a recording. You are then able to assign a pruned copy of the in progress exam to the Physician.

Prune and Undo Prune

The Prune command on the menu is similar to the Prune Preview button (see the Prune Preview section under Toolbar Controls) in that the prune can be undone by choosing Undo Prune. The differences between Prune/Undo Prune and Prune Preview are:

1. If you close the exam without choosing Undo Prune, the scissors icon appears on the Exam List and when you open the exam again, it is still pruned. This does not happen with Prune Preview.
2. When the pruned exam is ready for archive, it will be pruned for good. Therefore, if you want to archive the full exam, you must either undo the prune before archiving, or use Save As to make a copy of the full exam.

The advantage of using Prune/Undo Prune over the Save As option (above) to prune is that it is fast. The system keeps a hidden copy of the original data until the exam is archived.

Seizure Detection

If the Persyst Spike and Seizure Detection option is installed on the iEEG Server, selecting this option on the menu will run the seizure detection algorithm. System detected events will be inserted at the top of the channel chart where the system has detected seizure and will also appear on the Event List.

You can also run the Spike and Seizure detection automatically on upload by selecting the Spike/Seizure checkbox on the Upload tab.

Note: the Spike & Seizure process can take up to a few hours. Progress can be monitored on the Processing tab.



WARNING: The Persyst User Manual must be read before using the Spike & Seizure Detection feature.

Reports

This takes you to the Reports and Documents tab for the exam and allows you to create a new report. Enter a name for the report in the popup window, select the report type from the drop down list, then click Add.

Report Name	My Report
Report Type	Exam Info
<div>+ Add X Cancel</div>	

New report types can be created in Centrum. Refer to that chapter for more information.

Print

This command opens the print dialog. Select Current Page to print the currently showing page of EEG, or select Custom to choose the pages you want to print. Use the slider to adjust the trace thickness and the checkbox to include patient information.

You can also adjust your printer settings, as you would with a standard Windows print dialog.

Demographics

Select this option to open the patient and exam properties of the open exam. The patient and exam properties can be edited in the same way as on the Patient List tab in iEEG Centrum. Refer to the Centrum chapter for more information.

Export Page Data

Export a text document with the current page in numerical values (ascii).

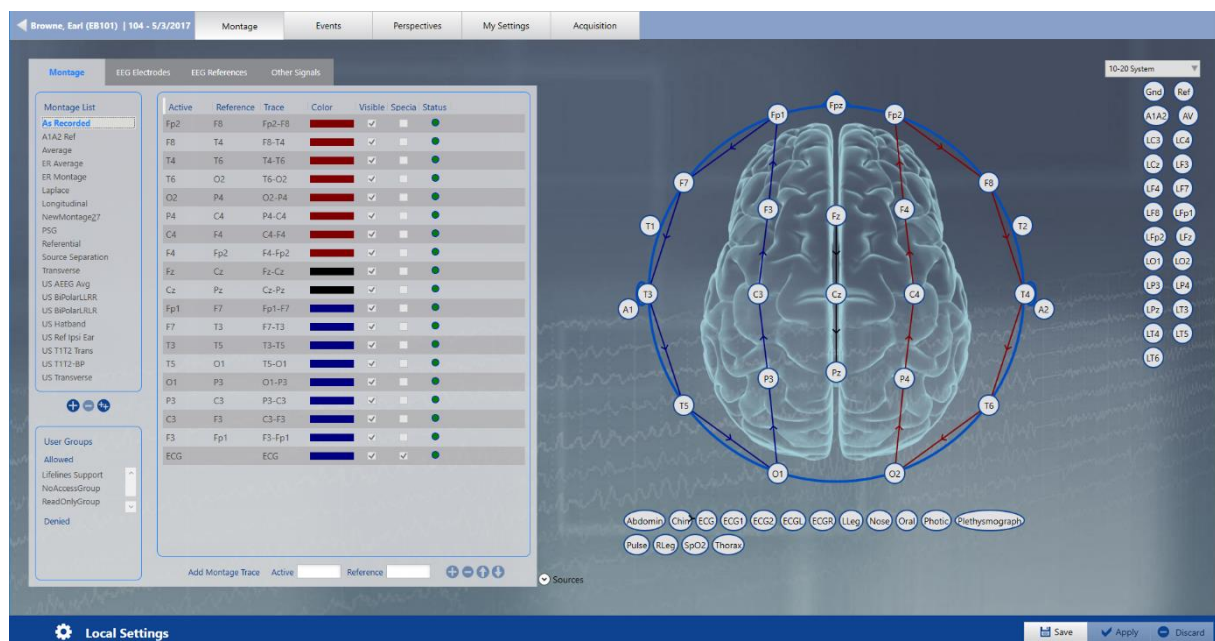
Settings

Lifelines iEEG is highly customizable to the way you record and review data. You can create your own montages and event palettes, then save them to settings groups called Perspectives. This allows you to quickly switch between the settings that are available during recording or review.

Local and Server Settings

Settings are accessible via the Settings tab in both Acquire Pro and Review. You can also access settings from within an exam you are reviewing in Review. You may be editing settings either locally or on the server depending on the exam. A colored banner (shown below) appears at the bottom of the Settings screen to indicate whether you are editing locally or on the server.

Local Settings are indicated with a dark blue banner and gear icon:



Note: Montages will be sorted in alphabetical order. In Review Settings, As Recorded will be at the top.

Duplicating Montages

Select a montage from the list of montages.

Click the Duplicate button at the bottom of the Montage list.

Double click on the montage name to edit it.

Deleting Montages

Select a montage from the list of montages.

Click the Delete button at the bottom of the Montage list.

Note that the As Recorded montage cannot be deleted.

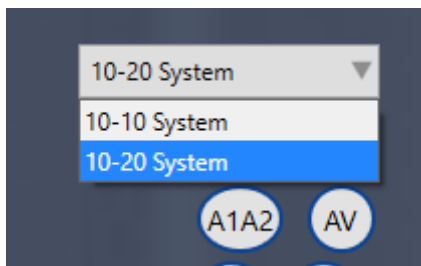
Associate User Groups to Montage

Select the montage from the Montage list, then move the user groups you want to have access to the Allowed user groups box using the arrow buttons and click Save. Only members of allowed user groups (as well as administrators) will see and have access to the montage.

Adding Montage Channels

There are two ways to add channels to a montage – drawing the channels on the Montage Head, or entering the active and reference electrodes in their respective fields.

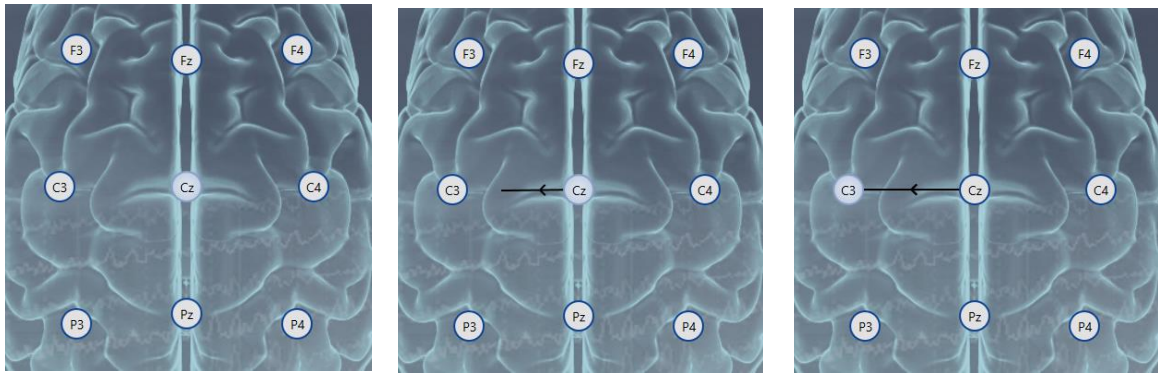
Montages can be made by using any of the available label systems (upper right corner).



You can still use any of the electrodes in the system, even though the selected label system does not include them.

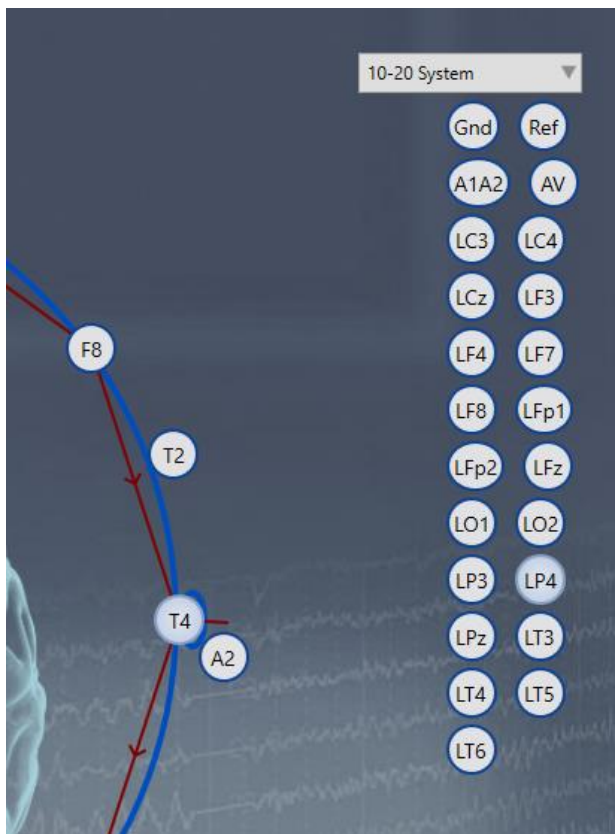
Drawing channels on the Montage Head

Click on the electrode you want as the active electrode, then click on the one you want as the reference.



The channel has now been added to the montage, both to the montage head and to the channel list.

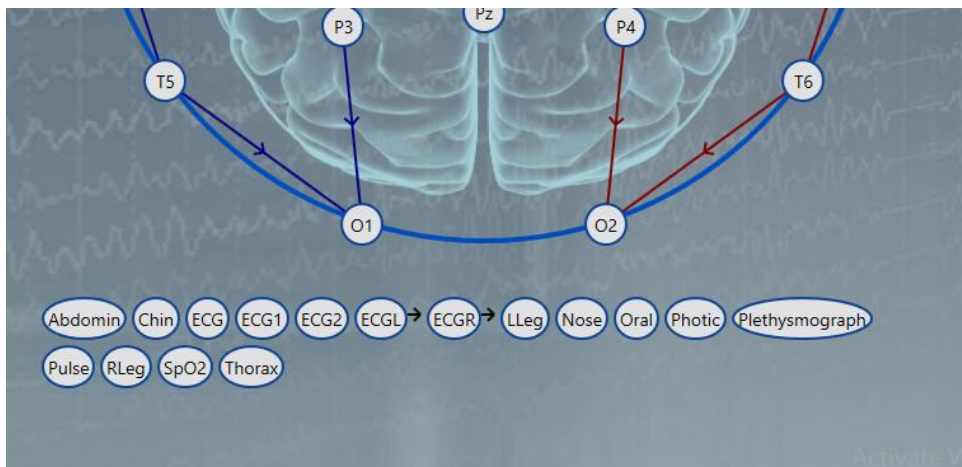
It is also possible to select an active electrode from the head and a reference from the list of References (to the right of the head).



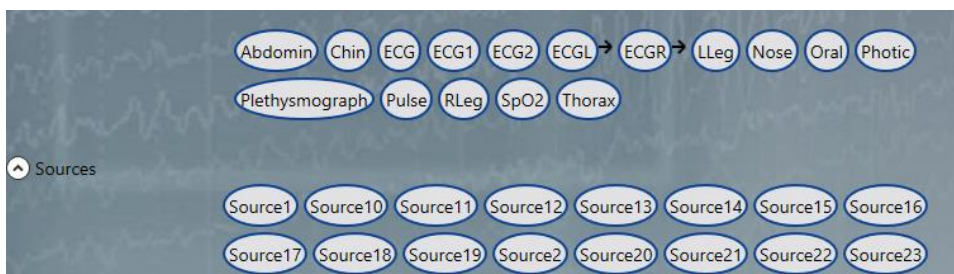
Clicking on a reference activates it so that many electrodes can be selected from the head. Each one then becomes the active electrode against the selected reference in a montage channel.

To deselect a reference, either click on the selected reference again, or select another reference from the list.

It is possible to add Non-EEG signals to the montage (located below the head) by clicking on the electrode. The non-EEG signals do not need to have references.

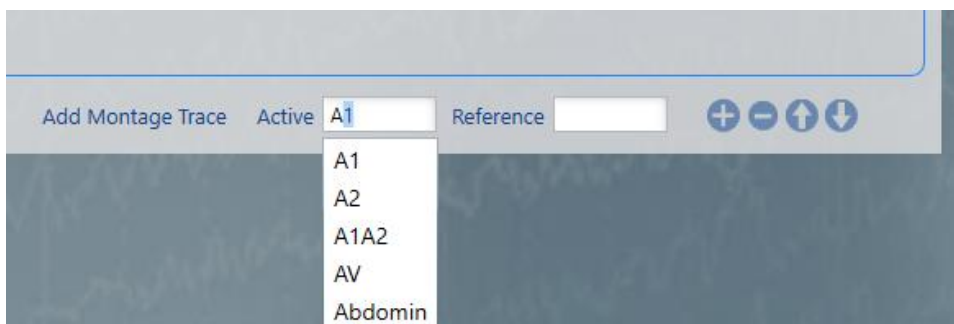


It is possible to add Sources to the montage (located below the Non-EEG signals) by clicking on the electrode. The sources do not need to have references.

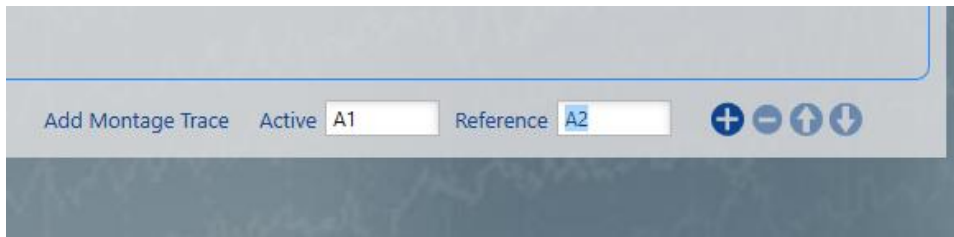


Entering active and reference labels

Start entering the name of the active electrode in the Active field. The system displays all available electrodes matching that name. Select the electrode you want. Do the same for the Reference field.



Once valid electrodes have been entered, the Add button becomes available.

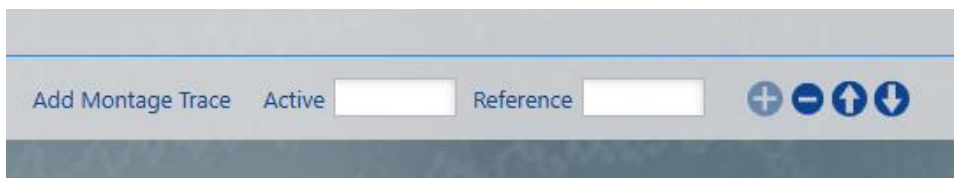


Clicking the Add button adds the channel to the montage, both to the channel list and to the montage head.

Sources and Non-EEG signals can be added this way as well.

Deleting Montage Channels

It is possible to select channels (one or more) from the Channel list and delete them by clicking the Delete button.



Rearranging Montage Channels

It is possible to move selected channels in a montage up or down by clicking the Up or Down arrow buttons.

Making Channels Special

Special channels do not conform to the general channel settings, but have their own special settings.

It is possible to make a channel special by checking the Special box when you add the channel. The channel can also be made special afterwards by checking that channel's Special box.

Special settings can be applied to a single channel by clicking the Special box

The screenshot shows a window with tabs: Active, Reference, Trace, Color, Visible, Special, and Status. The 'Special' tab is selected for channel Fp1-F7. The settings are as follows:

Setting	Value	Unit
Sensitivity	70	$\mu\text{V}/\text{cm}$
Baseline	0	
Show Units	False	
High Cut Filter		Hz
Notch Filter	Off	
Deflection	100	mm
Display Type	Trace	
Polarity	Down	
Low Cut Filter		Hz

Below the settings, a table lists other channels:

Channel	Reference	Trace	Color	Visible	Special	Status
F7	T3	F7-T3	Blue	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Green
T3	T5	T3-T5	Blue	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Green
T5	O1	T5-O1	Blue	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Green

The settings that can be made special are the following:

- Sensitivity ($\mu\text{V}/\text{cm}$) or ($\mu\text{V}/\text{mm}$) depending on the system's default setting
- Deflection (mm)
- Baseline
- Display type (Trace/Text/Trace&Text/Off)
- Show Units (True/False)
- Polarity (Up/Down)
- High Cut Filter (Hz)
- Low Cut Filter (Hz)
- Notch Filter (On/Off)

It is possible to remove the Special settings by unchecking the Special box. After that the channel will conform to the general channel settings again.

Visibility of Channels

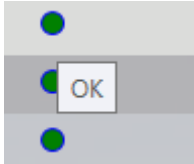
Channels are visible on the EEG by default but it is possible to make a channel invisible on the EEG by unchecking that channel's Visible box.

The screenshot shows the 'Visible' tab for channels F7 and T3. The settings are as follows:

Channel	Reference	Trace	Color	Visible	Special	Status
F7	T3	F7-T3	Blue	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Green
T3	T5	T3-T5	Blue	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Green

Channel Status

The channels show their status with a colored dot, and a tool tip explains the status more thoroughly.



The dark green dot shows if the channel is OK.

The light green dot shows if the channel electrodes have different polarity or different sensor types.

The orange dot shows if the channel electrodes compare AC to DC, compare digital to analog, or match unipolar with bipolar.

The red dot shows if the channel electrodes compare different units.

Channel Color

The color of a channel can be changed by selecting it from the Color drop-down list.

Editing the color of a channel does not make it a Special channel.



Editing Channels

It is possible to edit the electrodes of a channel afterwards. This can be done either in the channel list itself or on the montage head.

On the Channel List

By clicking on an electrode (active or reference) in the Channel list, the name of the electrode becomes editable. Start entering the name of the new electrode in the field and the system displays all available electrodes matching that name. Select the electrode you want and the channel in the list as well as the channel on the head will be changed.

On the Montage Head

To edit an existing channel on the montage head, you must first delete the arrow connecting the channels and then create a new one as described in the section above: Drawing Channels on the Montage Head. To delete the arrow, hover over the arrow until the delete icon appears and then click with the mouse to delete.

EEG Electrodes

This tab under Montage is for adding electrodes and creating electrode label systems. All of the electrodes added to the system are available for creating montages whether or not they are grouped into an electrode system.

Adding Electrode Systems

Click the Add Item button at the bottom of the Electrode System list.

Add Item, Delete Selected Item, Duplicate Selected Item buttons



Double click on the system's name to edit it.

Duplicating Electrode Systems

Select an electrode system from the list of electrode systems.

Click the Duplicate button at the bottom of the Electrode System list.

Double click on the electrode system's name to edit it.

Deleting Electrode Systems

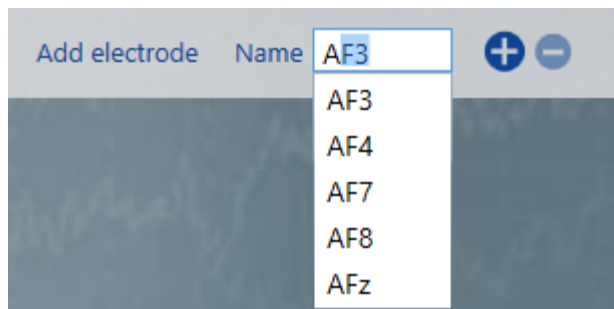
Select an electrode system from the list of electrode systems.

Click the Delete button at the bottom of the Electrode System list.

Note that the predefined 10-10 and 10-20 systems cannot be deleted.

Adding Electrodes to an Electrode System

Select an electrode system from the Electrode System list. Start entering the name of the electrode in the Name field. The system will display all available electrodes matching that name. Select the electrode you want and click the Add button.



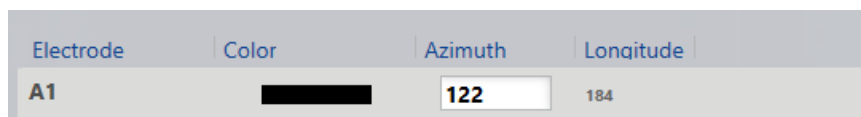
The electrode has now been added to the electrode system, both to the electrode list and the head.

Deleting Electrodes from an Electrode System

It is possible to select an electrode from the electrode list or from the head and delete it by clicking the Delete button.

Azimuth and Longitude

Edit the azimuth and longitude of an electrode by clicking to activate the field and typing in a value (between -359 and +359).



Color

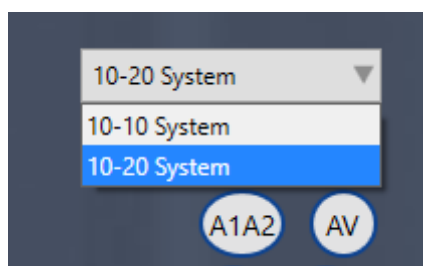
Click the color bar to select a new default “active” color for the electrode. This determines the default color of the trace where the electrode is the active one.

EEG References

This tab under Montage is used to add EEG reference electrodes which are then available when creating montages.

Adding References

Before you add a reference, make sure you have the correct electrode system selected (upper right corner). The reference you make will only be added to the chosen electrode system.



Click the Add Item button at the bottom of the reference list.



The system will prompt you with a message to enter a name for the reference. Note that the name cannot be changed afterwards.

Enter a name and select a type for the new reference and click OK.

The available reference types are: New, Average and Duplicate.

- Selecting the New reference will create an empty reference. Add combination items to the reference by selecting an available electrode from the Name list. Edit the electrode weight and click the Add button.

- Selecting the Average reference will create a reference with every electrode in the selected electrode system, each with the weight 1.
- Selecting the Duplicate reference is only possible when duplicating references (see the Duplicating References section below). Click OK to duplicate the selected reference.

Duplicating References

Select a reference from the list of references (except for the predefined Ref).

Click the Duplicate button at the bottom of the reference list.

Enter a name for the reference, make sure the Duplicate type is selected and click OK.

Deleting References

Select a reference from the list of references.

Click the Delete button at the bottom of the reference list.

Note that the predefined Ref reference cannot be deleted.

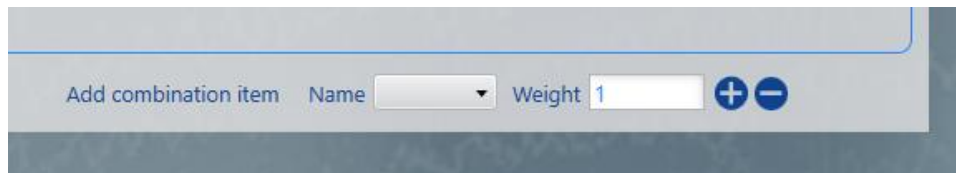
Adding a Combination Item to a Reference

Select a reference from the list of references. Select an electrode from the Name list and enter its weight. Click the Add button.

Note that combination items cannot be added to the predefined Ref and Gnd references.

Deleting a Combination Item from a Reference

Select a reference from the list of references. Select a combination item from the list of combination items. Click the Delete button.



Non-EEG Signals

It is possible to add signals from other sources to a montage, for example EKG, respiratory and other signal types. Use this tab under Montage to define these sensors so that they are available to add to montages.

Adding Non-EEG Signals

First make sure you have the correct electrode system selected (upper right corner). Type a name for the new sensor in the Name field. Note that the name cannot be changed afterwards. Select a sensor type from the Type list. Click the Add button.

If the new sensor has a unit other than μV , the Units/ μV and Offset can be edited.

- Each signal is measured in μV . If however the signal being measured has a unit that is not μV , the units/ μV indicates how many of the signal's unit one μV represents.
- The measured signal may be biased in such a way that the zero point in the measured signal's unit does not coincide with zero μV measured. The offset (in signal units) represents at what point in the unit's scale the zero μV is set.

Changing the Non-EEG Signal Type

Select a sensor from the Non-EEG Signal list, then change the sensor type by selecting another one from the Type drop-down list.

Non-EEG Signal Color

The color of non-EEG signals can be changed by selecting a new color from the Color list.

Deleting Non-EEG signals

Select sensors (one or more) from the Non-EEG Signal list. Click the Delete button.

Events

Events are used to mark the EEG. The most basic events mark a noteworthy incident with a text. More complex events can be used for marking parts of the EEG for pruning, holding annotations and numerical values, and some events even store the current montage at the time of event insertion.

Use the Events tab in Settings to create event types and group them into palettes. You can then assign palettes to different Perspectives to be able to switch between them quickly during review.

Adding Event Palettes

Click the Add Item button at the bottom of the Palette list.



Double click on the palette name to edit it.

Duplicating Event Palettes

Select a palette from the list of palettes.

Click the Duplicate Selected Item button at the bottom of the Palette list.

Double click on the palette name to edit it.

Deleting Event Palettes

Select a palette from the list of palettes.

Click the Delete Selected Item button at the bottom of the Palette list.

Note that predefined palettes cannot be deleted.

Adding Event Types

Click the Add button at the bottom of the available event types list.



Event Settings

It is possible to edit events at all times. Select an event on the Event Types list and edit the event under the Basic Properties section. Numerical and Prune events have additional properties that can be edited (see those sections below).

The screenshot shows a 'Basic Properties' dialog box for an event type. The 'Name' field is 'Spike' and the 'Color' is a red bar. The 'Description' field is 'Spike in EEG' and the 'Category' is 'Waveform'. The 'Predefined' checkbox is checked. The 'Annotation Event' checkbox is unchecked. The 'Prune Event' checkbox is checked. The 'Context Event' checkbox is unchecked. The 'Duration Event' checkbox is unchecked. The 'Priority' is 'High' and the 'Numerical' value is 'No'.

Basic Properties	
Name	Color
Spike	[Red Bar]
Description	Category
Spike in EEG	Waveform
<input checked="" type="checkbox"/> Predefined	Priority
<input type="checkbox"/> Annotation Event	High
<input checked="" type="checkbox"/> Prune Event	Numerical
<input type="checkbox"/> Context Event	No
<input type="checkbox"/> Duration Event	

The Name and Description fields of the event type can be edited.

A color can be selected for the event type.

The event type category can be selected from a drop-down list.

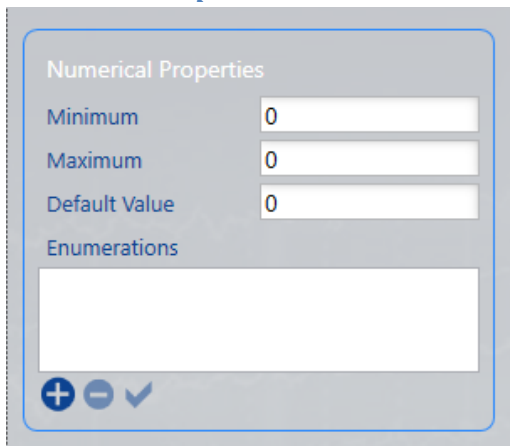
The event type priority can be selected from a drop-down list for display purposes.

Numerical Events

To set an event type as Numerical, select one of the options from the drop-down list.

Set the Minimum, Maximum and Default values.

Numerical Properties



Numerical Properties

Minimum

Maximum

Default Value

Enumerations

+ - ✓

Annotation Events

If the Annotation Event checkbox is checked, the event will be an annotation event, and display the event's annotation as its caption.

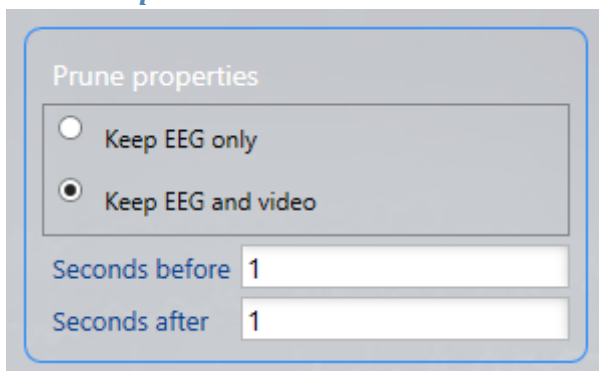
Prune Events

If the Prune Event checkbox is checked, the event will be a prune event. It is possible to prune exams, cutting out unwanted data and only leaving the segments marked with prune events.

Under Prune Properties, choose whether you want to keep EEG and video, or only EEG.

You can also choose the number of seconds before and after the event that you want to keep in the pruned exam.

Prune Properties



Prune properties

☐ Keep EEG only

☒ Keep EEG and video

Seconds before

Seconds after

Context Events

If the Context event checkbox is checked, the event will be a context event. The system then saves the montage, general channel settings and time base of the exam at the point of insertion. After a context event has been added to an exam, it is possible to toggle its context button and the system will display the event's settings.

Duration Events

If the Duration event checkbox is checked, the event will be a duration event. The Default Duration of the event type can be set.

Duplicating Event Types

Select an event type from the list of available event types.

Click the Duplicate button at the bottom of the available event types list.

Deleting Event types

Select an event type from the list of available event types.

Click the Delete button at the bottom of the available event types list.

Note that predefined event types cannot be deleted.

Adding Event Types to Palettes

Select the palette you want to edit from Palettes list. In the Available Event Types list, double click on the event type you want to add to the palette. It will move to the Event Types in Palette list.

Removing Event types from Palettes

Select the palette you want to edit from Palettes list. In the Event Types in Palette list, double click on the event type you want to remove from the palette. It will move back to the Available Event Types list.

Ordering Events in a Palette

To arrange the events in a palette in a particular order, simply drag and drop the events in the Event Types in Palette list to the position where you want them.

Perspectives

Sometimes you need to re-use the same combination of event palette, montages, general channel settings and more. You can store these combinations into a settings group called Perspectives. It is then possible to easily switch between perspectives during review, resulting in increased efficiency if you need to change the EEG environment frequently. Perspectives can be easily added and modified.

If no Perspective is created, the Default perspective is used, and its settings can be modified on this tab.

Adding Perspectives

Click the Add button at the bottom of the perspectives list to create a new perspective.



The following popup appears. Give the perspective a name and select the perspective type (either Acquisition or Review). If Acquisition, then select the amplifier and amplifier template. You can then select the permissions for this perspective. At least one user group must be selected. Click Add when you are finished.

Customize your perspective further by modifying the parameters in the section below, Editing Perspectives.

Editing Perspectives

It is possible to edit perspectives at all times. To edit, select the Perspective you want to edit from the list. Then modify the following settings.

Montage for Perspective

Select a montage from the Available Montages list and click the right arrow button to move the montage to the perspective. Montages can be removed from a perspective by selecting the montage from Montages for Perspective and clicking left arrow button.

Note that the As Recorded montage cannot be removed from any perspective.

Montages will appear on the Montage Selector in Acquire and Review with As Recorded and Input at the top, and the rest of the montages in alphabetical order.

Available Montages	Montages for Perspective
US BiPolarLRLR	A1A2 Ref
US T1T2-BP	Longitudinal
US AEEG Avg	Transverse
US T1T2 Trans	Average
US Hatband	Laplace
Source Separation	Referential
PSG	As Recorded
ER Montage	Input
US Transverse	
US Ref Ipsi Ear	
US BiPolarLLRR	
ER Average	

Defaults

Following are a number of other options (shown below) where you can set the default values for your selected perspective. (The options vary depending on whether your perspective type is Acquisition or Review.)

You can change from the defaults during acquisition or review, but these will be the settings you will start with when your perspective is selected.

Perspective Type	Acquisition	
Amplifier	Generation ▼	
Event Palette	Operator ▼	
Operator View Palette	Operator ▼	
Patient View Palette	Patient ▼	
Photic Program	iPS Basic ▼	
Montage	Longitudinal ▼	
Label System	10-20 System ▼	
Sensitivity	7 μ V/mm ▼	
Deflection	100 mm ▼	
Low Cut	0.100 Hz ▼	
High Cut	70 Hz ▼	
Notch Filter	<input checked="" type="checkbox"/> On / Off	
Timebase	Paper Speed ▼	3 cm/s ▼
Timeline Position	<input checked="" type="checkbox"/> Top / Bottom	

Timebase

You can control how much data is displayed on the channel chart (time-wise) by setting its timebase. Choose between two modes: paper speed (represents the length of the page used to display each second of the data) and page duration (represents the number of seconds per page).

Set the default timebase mode by choosing either Paper speed or Page Duration under Timebase. Then select the default paper speed or page duration from the second drop-down list. The list can be edited by typing in a new value (between the upper and lower limits) and pressing Enter.

Edit Name

Double click on the perspective name to edit it. Press Enter after changing the name.

Duplicating Perspectives

Select a perspective from the list of perspectives.

Click the Duplicate Selected Item button at the bottom of the perspectives list.

Double click on the perspective name to edit it.

Note: When duplicating a perspective, it is not possible to change the perspective type.

Deleting Perspectives

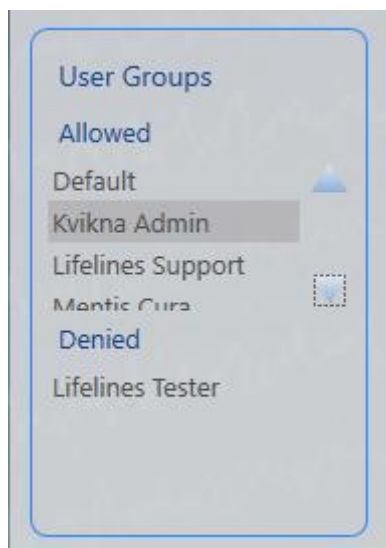
Select a Perspective from the list of perspectives.

Click the Delete button at the bottom of the perspectives list.

Note that the predefined perspectives Default and PSG cannot be deleted.

Associate User Groups to Perspective

Select the perspective from the Perspective list, and you will see which groups are allowed or denied access to that perspective. Double-click on the user group name to change the access of that group. Only members of allowed user groups (as well as administrators) will see and have access to the perspective.



My Settings

Screen

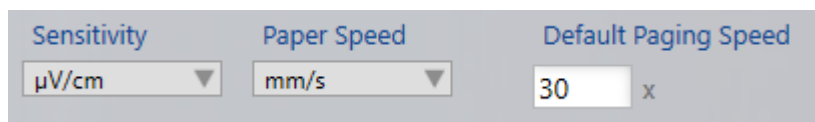
Here you can calibrate the screen for accurate representation of the onscreen channel chart. When calibrated, 1 cm displayed on the channel chart will actually measure 1 cm. The screen calibration must be performed for every new computer screen.

Using a real ruler, drag the handles on both system rulers, vertical and horizontal, so they match exactly 10 cm.



WARNING: It is important to calibrate the screen so exams can be interpreted correctly. The screen calibration must be performed for every new computer screen.

Settings



Sensitivity

The unit for sensitivity can be either $\mu\text{V}/\text{cm}$ or $\mu\text{V}/\text{mm}$.

Paper Speed

The unit for paper speed can be either cm/s or mm/s .

Default Paging Speed

Type in a default paging speed in the box provided.

Gridlines

Show or hide major and minor gridlines.

Gridlines
☒ Show Major Gridlines
☒ Show Minor Gridlines

Change Password

Click here to change your password.

Change Password

Default Perspectives

Each exam type has default settings associated with it when the exam type is created. You can override the default Review Perspective by selecting another one here.

Default Perspectives	
Exam Type	Review Perspective
ARoutine	<input type="text"/>
External	<input type="text"/>
Clinical EEG	<input type="text"/>
Exam Type B	<input type="text"/>
Exam Type K	<input type="text"/>

Acquisition

On the Acquisition tab, there are two tabs, one for modifying the amplifier setup associated with a perspective, and another for creating your own photic programs.

Note: The acquisition tab is only available on acquisition systems.

Amplifier Setup

Select the perspective and amplifier type you want to modify.

Your current amplifier setup will appear and can then be edited. Save your changes.

Note: The amplifier setup changes only apply to the selected perspective and do not change the amplifier setup template.

Amplifiers

To clear amplifiers that are not needed, select the amplifier name on the Amplifiers list, the click the Delete button below. You cannot delete amplifiers that are being used in a Perspective.

Note: At this time, you cannot add amplifiers using this tab.

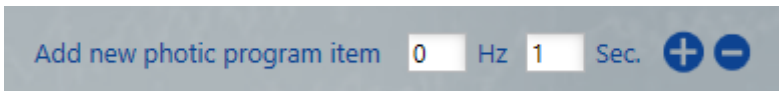
Photic Program

Create a photic program which is then selectable in the photic tool in Acquire.

To create a new photic program, click the Add button at the bottom of the Photic Programs list. Type in a name for the new program and press enter.



To create your sequence of flashes and pauses, enter a flash frequency in Hz. A value of zero will create a pause instead of a flash. Then enter the number of seconds you want the flash or pause to last. Press the Add button to add this item to the flash program. To delete a flash item or pause, select it on the list and press the Delete button.



Click Save to save your changes.