

# Release Notes

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## V 2.0.1 (release on 2023-01-26)

### Bug fixes

- Fixed an issue to enable redirection of logfiles of artifact reduction
- Fixed an issue that the calculation also recognizes the milliseconds in start time
- Fixed an issue to enable the encevis and EpiSight distributor at the same time
- Fixed an issue where notch filter text was not visible
- Disabled the connect patient button when UNEEG Pro Connect is not available
- Fixed an issue when using autoscroll and close patient
- Fixed an issue where blank pages were inserted into the exported PDFreport
- Fixed an issue to display the new name "UNEEG EpiSight Analyzer" properly
- Added the root certificate to the resources of UNEEG EpiSight Analyzer
- Fixed an issue that causes a crash in the report PDF generation
- Removed misleading critical messages in log files and log entries in Distributor
- Corrected the title name in error messages
- Fixed an issue where spectrogram was not shown in the report
- Fixed an issue that causes a deadlock when EEG traces for the report are generated
- Removed support for all encevis related plugins in EpiSight
- Fixed an issue that spectrogram was able to show two channels only
- Fixed the name in the light installer
- Fixed an issue where marker remain selected while closing the patient
- Fixed an issue that causes a crash of the viewer during multiple marker approvals
- Fixed an issue where the progress bar remains green when the last file was corrupted
- Corrected missing translations
- Fixed an issue that causes a crash of the EpiSight Analyzer in special cases
- Fixed an issue that calculation is now continuing when files are corrupted in mid of calculation or within one calculation block
- Fixed an issue where EEG-traces could disappear when scaling to the largest X-Scaling value
- Fixed an issue where EEG-traces of marker where not shown in the report
- Fixed an issue where the EpiSight Analyzer blocks the activation of a new license
- Performance improvement of EpiSight Analyzer using MSSQL remote connection
- Fixed an issue in the initialization of internal buffer for EDF and EDFe files
- Fixed an issue reading EDFe data where in some circumstances the last second of an internal buffer was not properly read

- Fixed an issue with linking to UNEEG website
- Fixed an issue to also send the location of implant to UNEEG
- Fixed an issue with ODBC driver
- Fixed an issue in Database Migration Tool when updating to version 2.0 or above
- Fixed an issue while loading very small files during initialization
- Fixed an issue where the Admin Tool cannot connect to the database
- Fixed an issue that causes a crash of the viewer after manual import of data in special cases
- Fixed an issue that leads to complications when importing longer data than defined in the specification
- Fixed an issue with the type filtering in the marker list
- Fixed an issue with multi-selection of markers if the selection is done with SHIFT and arrow keys
- Fixed an issue where obsolete seizure marker types still exist in marker edit dialog
- Fixed an issue in the viewer when scrolling the EEG traces to the left side with keyboard in small window sizes
- Fixed an issue in the viewer to handle mixed data from encrypted EDF and unencrypted EDF within one patient.
- Fixed an issue where deleted user marker types could be chosen from a list of possible markers to add
- Fixed an issue where the EpiSight Analyzer got stuck in open patient state when patient files were deleted
- Fixed an issue that the tool to start the EpiSight Server checks if the corresponding port is free
- Fixed an issue where license check will fail if it takes too long
- Fixed an issue where just one day of a system report is generated when two days were selected
- Fixed an issue where the wrong hot key is shown in button hover over the spectrogram
- Fixed a small possible memory leak in calculation and general memory usage optimizations
- Fixed an issue where EEG position changed when clicking on y-axis of trending or spectrogram window
- Fixed an issue in artifact reduction initialization
- Fixed an issue with trending window cursor after rescaling
- Fixed an issue when viewer crashes due to very fast marker rating
- Fixed an issue that could cause a delay in calculation startup
- Fixed an issue where default path suggestion for report could be an invalid path
- Fixed an issue where predefined markers could be modified after being loaded
- Fixed inconsistencies in marker type filtering
- Fixed an issue where line breaks in patient labels causes overlaps with the following rows
- Fixed an issue when the number of user-defined marker types definitions increasing above 65
- Fixed an issue where rounding can cause a small shift after a very long recording times
- Fixed an issue in the markerlist where arrow keys and next button did not work consistently

- Fixed an issue where the calculation manager does not wait for the acknowledge of the plugin
- Fixed an issue where not all files are set in isCalculated state in database
- Fixed an issue where files are registered in database without a drive letter
- Fixed an issue where the spectrogram shows activity after the end of a file
- Fixed an issue in selecting markers in the EEG when selection is changed in the markerlist
- Fixed issues while handling special cases of arrow keys in the markerlist
- Fixed an issue with the naming of events shown in the report to make it more consistent with UNEEG Marco app
- Fixed an issue where arrow keys in the markerlist do not work after adding traces to the report
- Fixed issue where parallel initial data import from two implants to the same patient can lead to wrong implant serial number
- Fixed an issue that we warn the user at manual import when an EpiSight server is connected
- Fixed an issue in Database Migration Tool where an uncalculated patient might not be calculated after migration
- Fixed an issue that starting of more instances of the Admin Tool was possible
- Fixed an issue where patterns do not get selected after clicking in the pattern plot
- Fixed an issue where we could get a deadlock if problems in data polling occurs
- Fixed an issue where deleting of an online patient can cause a program crash
- Fixed an issue where the spectrogram does not show data if it was opened too fast after patient open

## Minor changes

- When open a patient review now starts at the begin of the recording
- General viewer performance was optimized
- Optimization of layout in the report and PDF export
- Added possibility to directly specify the MSSQL server name instead of an ODBC Object
- Added the possibility to connect to a MySQL servers using the new MySQL authentication mode
- Included a new ODBC driver for SQL Server in the installer
- Adapted the EpiSight logos to the new UNEEG CI
- EpiSight now accepts up to 5 years of data
- Provisioning state of the UNEEG ProConnect is now shown in the software
- The installer is now also available in German language
- Reading user marker from external file is now possible
- EpiSight Analyzer is no longer associated with EDF files
- It is now possible to activate a license during installation
- Marker rating is now included when pasting from the markerlist to the clipboard
- Marker are now also hidden in the EEG traces when the respective filter is applied
- We added UK and CH representatives in the about window (CE-certified version only)
- It is now possible to read additional markertype from the UNEEG host

- The time stamps when sending marker to UNEEG is not in UTC time format
- The marker layout in the EEGPlot was optimized to make the EEG better visible.
- The license text was adapted

## **V 2.0.0 (release on 2021-12-17)**

### **Features and improvements**

- New product which was previously part of the product 'encevis'. As this version was previously part of another product the release notes contain the history from first version were the parts of this product were introduced until this point were this product became a separate full standalone software suite.
- New seizure detection algorithm based was introduced
- Database Migration tool was updated to allow database migration from 1.11 to 2.0
- More flexibility for editing the markers, especially the length of the marker, in the EEG area of the viewer was provided
- The main window of the viewer now adjusted to the new values when editing the markers beginTime and endTime
- The maximum possible length of a single recording can now be 15 months
- A predefined list of marker names can now be imported into the viewer to provide a standardized set of user marker
- Shortcut key navigation through spectrogram and trending areas in the viewer has been added
- The reporting of the viewer has been extended to include spectrogram examples
- In order to conform with regulatory requirements the Server Admin Tool, EpiSight installer and viewer now contains UDI information
- The EpiSight viewer and server installers were unified into one installer
- To increase EpiSight viewer's user convenience when activating the license, the license (if not existing) is asked earlier on program start as before
- To increase performance of the program, some SQL queries in EpiSight have been optimized
- To increase convenience for the user a page wise auto scroll in the viewer's EEG area was added

### **Bug fixes**

- Fixing a misplacement of the viewer window in a multiple-monitor setup
- Fixing the Admin Tool crash on missing certificate
- Fixing a possible small shift of annotations when using EDF+ file with start time containing millisecond resolution
- Fixing a random occurrence of marker approval malfunction in the viewer
- Fixing marker time update in pattern detection plot of the viewer

- Fixing an inconsistency in the message in the viewer when creating a filtered marker type
- Fixing a wrong behavior of the viewer when scrolling with the mouse in pattern detections plot with dragging
- Fixing the behavior in seizures and markers plot of the viewer causing the failing update of viewer's time selection plot on marker-click
- Fixing the possibility of database reconfiguration in the viewer if the database is temporary unavailable on a computer with a running EpiSight server
- Fixing manual import failure in the viewer for some encrypted .edf files
- Fixing a failing PDF report creation in the viewer if some texts in the report are long
- Fixing a problem with visualization of long texts in the viewer's patient management
- Fixing misleading messages in the viewer on cancelling an EDF export
- Fixing a possible crash of the viewer on cancelling EDF export
- Fixing a possible crash of the viewer on cancelling patient import
- Fixing the number of selected markers in the viewer to correspond with what the user sees
- Fixing the possibility of adding a marker in the viewer after the end of a recording
- Fixing an unexpected occurrence of a bubble box containing a marker comment during its deletion
- Fixing the focus in an editing field of marker creation in the viewer
- Fixing the start of EpiSight server on some virtual machines due to wrongly created server configuration files
- Fixing the possibility of starting two EpiSight plugins with one license
- Fixing a deadlock possibility between EpiSight server components if EpiSight plugin closes unexpectedly
- Fixing gap-filling mode of the EpiSight plugin for very small files
- Fixing the loss in import of one file during the manual import of mixed EDF and EDFe file in the viewer
- Fixing an asynchronous movement of the timeline in viewer's EEG plot with respect to any other plots of the viewer until the start of the dataset recording is reached
- Fixing a stuck calculation for small datasets on the order of one minute
- Fixing a small mismatch in times of EEG plot and Trending plot of the viewer when screen scaling in Windows is activated
- Fixing the interruption of patient deletion in the viewer when pressing the 'Enter' key fast multiple times
- Fixing the viewer failure when database scheme gets deleted from outside
- Fixing the possibility of manual importing of a file with a start time before the start time of the already existing dataset
- Fixing the impossibility of deleting a patient for whom the calculation experienced unexpected failures
- Improving the viewer and server to accept datasets containing an apostrophe sign (') in the name of

the files during manual import and file download

- Fixing multiple occurrence of the same log dialog in the viewer after sending a log file
- Fixing the viewer's spectrogram to allow stacking multiple user-events
- Fixing a minor movement in time of the viewer's trending widget on the first opening of the plot
- Fixing a stuck focus of marker rating area when clicking on other parts of the viewer's trending plot
- Fixing the Administrator's manual of the EpiSight server to properly describe the case when cancelling firewall permission for the EpiSight server in Windows
- Fixing the possibility of sourceID=0 in the AITInterfaceDLL by actively preventing it

## **V 1.11.5 (release on 2022-02-28)**

### **Bug fixes**

- Fixed an issue with a popup warning dialog if someone starts encevis viewer without PureEEG license.
- Fixed an issue that PureEEG only accepts locally installed licenses if someone has only network licenses.
- Fixing the display of special German characters in the viewer when using Neurowerk files
- Fixing a problem when opening a file in the viewer that contains segments that have milliseconds for segment start time
- Fixing the handling of electrode labels that were not compliant with ACNS EEG standard guidelines
- Fixing a problem with start of a plugin when opening a file in encevis over Neurowerk for the second time
- Fixed an issue with reading of encrypted EDF data where in some circumstances the last second of an internal buffer was not properly read.
- Fixing a crash in the viewer due to a failed SQL query for markers that contained a special character (') in the comment section of the marker
- Fixed an performance issue with MSSQL remote database connections causing encevis to become slow on user interactions.
- Fixed an issue in viewer for low electrode setups where EEG traces were not shown in specific monitor setups.
- Fixed an issue in viewer for low electrode setups with a missing root certificate when communicating with UNEEG ProConnect

### **Minor changes**

- encevis now supports the case when customers use network licenses which are placed on each PC automatically by an IT-department of a hospital. In this case there is no need to install a local license on each PC.
- It is now possible to configure a MSSQL database server without the need of configuring a ODBC data source.

## V 1.11.4 (release on 2021-05-21)

### Bug fixes

- Fixed an issue where the user could not delete a patient in viewer for low electrode setups because of a wrong internal database state in case of very short data
- Fixed an issue in the analysis control component of the viewer for low electrode setups which caused a lock in the component when the analysis module exited in a very early state of the initialization. Also fixed some issues were analysis were stuck when calculating very short files.
- Fixed an issue in the analysis module of the viewer for low electrode setups which could cause an unexpected exit for data which has a length below 50 minutes.
- Fixed an issue in viewer for low electrode setups where the import for a file might failed when data of dataformats EDFe and EDF for the same patient and same implant were mixed in one folder.
- Fixed an issue in viewer for low electrode setups that was causing an asynchronous time line of the trending area when data with a length below 3 hours was reviewed.
- Fixed an issue in viewer for low electrode setups were the trending plots in the trending area of the viewer were shifted to the right due to a larger font size of the labels on the y axis when the scaling setting in windows was above 100 %.
- Fixed an issue in viewer for low electrode setups were it was possible to interrupt disconnect of a patient from UNEEG ProConnect when pressing the ENTER key very fast during this process.
- Fixed an issue in viewer for low electrode setups where the viewer stated an error when all tables were deleted from a active database schema instead of recreating the tables.
- Fixed an issue on manually importing files in viewer for low electrode setups were it was possible to import files before the absolute start time of a patient when data was previously downloaded from UNEEG ProConnect and the patient was never opened before.

### Minor changes

- encevis now supports retrieval of video start end end time for the NihonKohden data format. encevis Viewer is thus now able to play videos of NihonKohden files.

## V 1.11.3 (release on 2021-04-21)

### Bug fixes

- Fixed an issue in the marker list of encevis Viewer and Viewer for low electrode setups which prevented extension of the selection using the key combination SHIFT+Arrow.
- Fixed an issue were an empty page was exported in the PDF report generated in viewer for low electrode setups if the user did not add seizures to the report.
- Fixed an issue where the HTTP endpoint for receiving information about new available files to be

downloaded from external interface UNEEG ProConnect was not using HTTPs.

- Fixed an issue that allowed to download files from UNEEG ProConnect which have a start time before the very first file of the EEG data set of a patient.
- Fixed an inconsistencies in naming the "Request system report" functionality within the viewer for low electrode setups. In addition, a zip file is now downloaded instead of a gzip, user feedback for error cases was enhanced, and the selection behavior of the calendar items within the dialog was overworked.
- Fixed an issue in the analysis control which caused a component to crash when a different database gets configured by the user in viewer for low electrode setups.
- Fixed an issue on exit of the analysis control components which cause a possible dead end for five minutes
- Fixed an issue in the analysis setting where a wrong state could be written into the database in case the database connection was lost during analysis of data
- Fixed an issue in viewer for low electrode setup were some parts of the user interface were not properly updated when multiple users were working on the same database and reviewing the same patient
- Fixed an issue where the viewer for low electrodes always opened the english version of the direction of use.
- Fixed an issue where markers contained in files downloaded from UNEEG ProConnect were where not properly written into the database which prevented the viewer for low electrode setups to show these markers.
- Fixed headings in the PDF report for exemplar seizures
- Fixed an issue in viewer for low electrode setups which made it possible to delete a patient when wrong administrator credentials were inserted into a viewer instance running under a normal user.
- Fixed an issue which allowed to import the same files into the viewer for low electrode setups when the two files had different names. Now files must have different meta data which will prevent import of same files.
- Fixed an issue when importing files in viewer for low electrode setups which caused a file registration in decreasing order (only a performance optimization)
- Fixed an issue in encevis viewer and viewer for low electrode setups where opening of EDF EEG files with many markers was very slow.
- Fixed an issue in the analysis module generating result data for viewer for low electrode setups which caused an exit of the plugin before all analysis results were written into the database when the database connection was very slow.
- Fixed an issue where the analysis module for the viewer for low electrode setups ends in an calculation error if only one file contains invalid channel labels
- Added a validation checks for channel labels for viewer for low electrode setups and for downloading of EEG files from UNEEG ProConnect. Channel labels must no be one of the



labels "SQ\_C", "SQ\_D", "SQ\_P"

- Fixed an issue in viewer for low electrode setups causing a deadlock after opening data with more than 365 days.
- Fixed an issue when sending log files from the viewer for low electrode setups to UNEEG ProConnect. The temporary zip files are now properly cleaned up after sending.
- Fixed an issue where the QR code is not centered in the viewer for low electrode setups when initiating the pairing with a patient with UNEEG ProConnect.
- Fixed an issue in the administration tool where the `https://localhost` is now no valid configuration for the external interface UNEEG ProConnect.
- Extended logging was introduced into the analysis components of the viewer for low electrode setups.
- Fixed an issue, where the zoom range of the spectrogram for the viewer for low electrode setups was not stored when changing to another patient.
- Fixed an issue in the PDF generation for viewer for low electrode setups where a part of a legend was missing in the final report.
- Fixed an issue in the watchdog service that led to a restart of an already running component if this component was previously terminated manually by the user.
- Fixed a wrong HTTP endpoint call to the external interface UNEEG ProConnect when trying to retrieve log information from the external interface.
- Typos and smaller corrections were done in the manuals provided with encevis.
- Fixed an issue with the licensing of encevis where review licenses were not properly recognized when a full license was in use.
- Fixed an issue in encevis Viewer which caused a crash when changing the x-axis resolution to a small value while the window was resized to a very small size.
- Fixed an issue which prevented the EEG to be fully analyzed within EpiSight Server if the available disk space gets below 3GB.
- Fixed an issue with invalid database entries when downloading files from the external interface UNEEG ProConnect when a file in cache was made unavailable, or when requesting invalid HTTP packages.
- Fixed an issue where interrupting a file download prevented successful download of further files.
- Fixed an issue in encevis Viewer where the selected y-resolution was always set back to a default value when changing the montage in the EEG viewer.
- Fixed a crash of the viewer for low electrode setups when zooming into seven days while only a few seconds of data are available.
- Fixed minor translation typos for german language
- Fixed an issue when log files sent to external interface UNEEG ProConnect exceed the request size of 1MB. Logfiles are now split in smaller files in that case.
- Fixed an an issue in viewer for low electrode setups where exported EDF files showed minor

differences in the header information compared to the original EDF file.

- Fixed an issue in viewer for low electrode setups where sometimes the selection in the marker list moved to the first item in the list if a filter for the rating was enabled.
- Fixed an issue in viewer for low electrode setups which caused a wrong error message if files were not imported in case of mixed implant IDs for a previous patient.
- Fixed an error in encevis viewer that prevented opening an EDF file when the EDF file contained the wrong string "EDF-D" instead of the correct "EDF-C".

### **Minor changes**

- The analysis component of the viewer for low electrode setups listens now to default to port 8443 instead of 8081
- Viewer for low electrode setups prevents import of EEG data before 2010-01-01.
- For research purposes it is now possible to transmit annotations to the external interface UNEEG ProConnect.
- The external interface to the Moberg EEG system was removed from encevis.
- The headings in the report functionality of the viewer for low electrode setups where changed to more general terms.

## **V 1.11.2 (release on 2021-01-29)**

### **Bug fixes**

- Fixed an issue in encevis Viewer where the curve distance setting was not saved after change.
- Fixed an issue in encevis Viewer where the physical segment information could not be obtained for Nihon Kohden files.
- Fixed an issue in viewer for low electrode setups on deletion of a patient. Regular users are now asked for windows credentials while users with elevated credentials are not.
- Fixed an issue in viewer for low electrode setups where an error retrieved from the external interface UNEEG ProConnect was not shown to the user.
- Fixed an issue in EpiSight Server where very short files were not unmarked as being calculated.
- Fixed an issue in encevis Viewer where annotations from EDF written by Bittium were not shown in the marker list.
- Fixed an issue in viewer for low electrode setups where moving through patient overview using the arrow keys sometimes selected the first item instead the next item in the list.
- Fixed an issue in the administration tool for EpiSight Server which caused a misleading warning about a local file cache folder configuration when a remote folder was configured.
- Fixed an issue in viewer for low electrode setups where no feedback was given when a PDF Report was generated with a file name of a file that is currently open. Now a proper information is raised for the user.

- Fixed an issue in viewer for low electrode setups where the default name suggested for the PDF Report generation did not contain the patient ID if the first/last name of the patient was empty.
- Fixed an issue in viewer for low electrode setups where the data overview in the patient overview area was not immediately updated when the user added new markers during review.
- Fixed an issue in the windows service which is provided to keep the analysis components up and running when connected to the external interface UNEEG ProConnect. The service runs now in the context of the local administrator user which configures the connection to the external interface UNEEG ProConnect.
- Fixed an issue in viewer for low electrode setups where EEG data could be shown as flat line when files contain a rare constellation of overlaps between files.
- Fixed an issue in viewer for low electrode setups where the coloring of the titles in the section 'Example Electrographic seizures' of the generated PDF report for a patient was different from the coloring displayed within the reporting view in the user interface.
- Fixed an issue in viewer for low electrode setups where the PDF report generated for a patient contained all seizures marked to be added to the report in the section 'Example Electrographic seizures'. Now it only contains those within the user selected reference and current period.
- Fixed an issue in viewer for low electrode setups where the PDF report might have a different order of the seizures in the section 'Example Electrographic seizures' than the seizures shown within the report view in the user interface.
- Fixed an issue in uninstaller where not all plugins were exited if running during uninstallation process.
- The user manual for the administration tool which is used for configuring the external interface UNEEG ProConnect was extended with a section 'User account'.

## **V 1.11.1 (release on 2020-12-17)**

### **Bug fixes**

- Fixed an non functioning '?' help sign in several dialogs in encevis viewer and viewer for low electrode setups.
- Fixed an inconsistency between button states for notch filter in encevis viewer and viewer for low electrode setups.
- Fixed an issue when setting the EEG page movement setting to 1%.
- Fixed an issue in viewer for low electrodes where a newly created patient was not selected in the patient overview table.
- Fixed an issue in viewer for low electrode setups that was causing unexpected behavior when moving the splitter between EEG area and trending area when reviewing a patient and when maximizing the window.
- Fixed an issue that caused incorrect initialization of montages when starting the encevis viewer in

HIS mode.

- Fixed an issue in encevis viewer that prevented the opening of BDF files.
- Fixed an issue in viewer for low electrode setups which caused the request for the system log files from UNEEG ProConnect (3rd party) be requested for the wrong patient.
- Fixed an issue in viewer for low electrode setups which caused a slight overlap of the y-axis labels in the spectrogram when scaled to a low height.
- Updated the viewer for low electrodes and EpiSight Server to use a new SSL certificate from UNEEG ProConnect
- Corrected several typos in viewer for low electrode setups
- Added the patient comment editing possibility to the review area of viewer for low electrodes to make the meaning of the patient comment in patient management clearer for the user.
- Fixed an issue which prevented the configuration of a local drive for the file cache in EpiSight Server.
- Fixed an issue when reading EEG data with a large DC offset which caused a filter ringing at the beginning of a file.
- Fixed an inconsistency in naming of 'Open patient' button within in viewer for low electrode setups.
- Fixed issue in reading Xltek EEG data supporting new amplifier types.
- Fixed an issue where reading EEG files with an empty electrode name but available reference name failed.
- When changing a patient information in viewer for low electrode, the user can now use the ESC key to reset the edited field back to its initial value.
- Fixed an issue in viewer for low electrode setups, resulting in a progress dialog when exporting many encrypted EEG files.
- Fixed an inconsistency when checking for unique patient information when editing a patient in viewer for low electrode.
- Fixed an issue in viewer for low electrode which allowed deletion of pattern markers generated during EpiSight analysis
- Changed the default time duration for the spectrogram in viewer for low electrode setups to three minutes.
- Increased visibility of the rating buttons to better separate them from the unclickable disabled state
- Fixed inconsistent wording between reporting user interface and generated report PDF in viewer for low electrode setups.
- Fixed an issue where EEG images generated for the PDF report in viewer for low electrode setups were not deleted when deleting the patient.
- Fixed an issue which restricted generation of EEG images for the report to some marker types only.
- Fixed language inconsistency with am-pm labels within viewer for low electrode setups.
- Fixed an issue in viewer for low electrode setups which caused wrong entries in the encevis database when download of a system report file from UNEEG ProConnect failed.

- Fixed an issue which prevented EEG to be fully analyzed within EpiSight Server when a dataset contained corrupted files.
- Fixed an issue in viewer for low electrodes where the amount of available data was not always shown correctly in the patient management view.
- Fixed an issue causing the migration of databases of encevis 1.9 to current version to fail.
- Fixed a layout issue in viewer for low electrode setups when language was set to German.
- Fixed an issue where extending the element selection in the marker list did not work using the shortcut Shift+ArrowUp/ArrowDown in viewer for low electrodes setups.
- Improved log messages within EpiSight Server

## **V 1.11.0 (release on 2020-10-23)**

### **Features and improvements**

- The patient management for the viewer for low electrode setup has been completely overhauled and is now presented in a new, cleaner design.
- The viewer for low electrode setups provides now the possibility to rate markers generated during the analysis of data.
- The recycle bin functionality of viewer for low electrode setups was removed.
- The pattern markers generated during analysis are now displayed in the marker list in the viewer for low electrode setups.
- The viewer for low electrode setups provides now a spectrogram when reviewing a patient's EEG.
- The viewer for low electrode setups provides now the possibility to create a report and export it to PDF format.
- The viewer for low electrode setups can now download data from an external source using a specified external interface. It can also register patient patients, send log files, request a system log and display information using this interface.
- An administration tool was introduced to configure the external interface
- Analysis in the viewer for low electrode setups now starts automatically without user interaction. A windows service is provided to keep the analysis components up and running.
- An encrypted transaction logging was introduced in the viewer for low electrode setups.
- The viewer for low electrode setups is now able to read and display encrypted EDF data.
- The external interface to the Moberg EEG was adapted to also support the new interface version.
- Logging messages where improved
- The viewer for low electrode setups is now also available in German language.
- Support for windows 7 was removed and only Windows 10 is supported in encevis.

### **Bug fixes**

- Fixed a crash in encevis when specifying a zero-value for display calibration.

- The viewer for low electrode setups now always uses the distributor in the installation directory.
- Fixed issue in viewer for low electrode setups, where panning the EEG caused a marker to slightly move visually.
- Fixed an issue, where encevis viewer closed with an error when trying to add the same files to a recording multiple times.
- Fixed an issue, which could lead to an error during database creation due to a timeout.
- Fixed an issue in viewer for low electrode setups, which caused an unexpected movement of the trend widget plots when the user clicked the zoom drop down and moved the mouse over the trending area before.
- Fixed an issue, where NihonKohden data where concatenated if the file contains gaps.
- Time axis labels in viewer for low electrode setups at midnight are not shown in bold any more.
- Fixed an issue in viewer for low electrode setups which allowed to set a marker after the end of the recording.
- Fixed an issue, which allowed the user to disable the toolbar in viewer for low electrode setups
- Fixed an issue in encevis viewer where the spectrogram showed a discontinuity for certain non-integer sampling rates in case where several subsequent values in the EEG where identical.
- Fixed an issue, where moving within the EEG data in the viewer for low electrode setups did also apply the page movement setting defined in encevis viewer.
- Corrections and update of AITIntefaceDLL documentation for integration

### **V 1.9.3 (release on 2021-02-02)**

#### **Bug fixes**

- Fixed an issue in viewer for low electrode setups where EEG data could be shown as flat line when files contain a rare constellation of overlaps between files.

### **V 1.9.2 (release on 2020-02-14)**

#### **Bug fixes**

- Fixed an issue where adding new files to a recording that already contains files that have a later recording time and have already been processed could lead to an incorrect display in the result visualization of plugins.

### **V 1.9.1 (release on 2019-12-20)**

#### **Bug fixes**

- Fixed issue where encevis NeuroTrend did not show its 20 uV and 400 uV tick label.
- Fixed issue in encevis Viewer where the plot grid was not displayed properly when changing the x resolution to a higher value than 0.33 sec/cm.

- Fixed issue in database migration tool which caused spike detection results not to be fully migrated to new database.
- Fixed performance issues in encevis spike detection GUI when many spikes are detected in a short time period.
- Fixed issue in encevis Viewer with negative video offsets in Micromed EEG files.
- Fixed issue in encevis Viewer and Viewer for low electrode setups where display calibration could lead to a crash of the Viewer.
- Fixed issue in Viewer for low electrodes where insertion of a new marker in EEG plot did not immediately trigger an update in the trending and global time area.
- Fixed issue where sometimes "no EEG data available" was displayed in Viewer for low electrodes within the EEG plot when there were EEG data available.
- Added missing runtimes to deployment.
- Fixed issue in Viewer for low electrode setups where the analysis progress was not reset on patient change.
- Fixed issue, where Distributor did not send a proper acknowledge when a plugin was exiting because of time out.
- Fixed issue which caused an unclean exit of the calculation process when analyzing data within Viewer for low electrode setups.
- Fixed issue in Viewer for low electrode setups where the informational overlays sometimes did not show up when clicked on the information icon in the plots.
- Fixed issue in encevis Viewer where it was possible to change a marker type to type "Impedance".
- Fixed issue where the red indicator line was not displayed in encevis Viewer when starting spectrogram for for a marker
- Fixed issue were the Viewer for low electrode setups was scrolling by default 100% instead of 90 % of the current displayed range in plots.
- Fixed issue in Viewer for low electrode setups where it could have happen that unnecessary, empty recordings where created within encevis database.

## **V 1.9.0 (release on 2019-10-23)**

### **Features and improvements**

- encevis is now available in 64 bit
- The spike detection runtime performance increased significantly
- encevis Viewer provides now video support for Micromed and DICOM files
- Plugins for spike detection and for trending analysis in encevis for low electrode setups are now able to load EEG data on their own, increasing runtime performance significantly
- encevis Viewer supports now DICOM EEG file format including the visualization of annotations
- encevis Viewer and Viewer for low electrode setups now allow the configuration of a custom letter for marker types

- Micromed Interface is now able to work without access to the Micromed database
- Micromed Interface is now analyzing previously recorded data much faster
- The EEG navigation in encevis Viewer was improved
- Increased stability of Micromed Interface when files are archived while they are processed
- Viewer for low electrode setups allow now to go to begin and end of a recording by using the keys 'Home' and 'End'
- Montage definitions for Viewer for low electrodes setups where optimized
- Marker list in Viewer for low electrode setups cannot be undocked anymore
- Viewer for low electrode setups provides now an EEG data overview
- The high pass filter is now disabled by default in Viewer for low electrode setups
- Windows 8 is not longer supported by encevis
- Support for Neurofile/ITMed/Deltamed Interface was removed
- Support for reading ITMed and Nicolet EEG files was removed
- Removed marker type "Segment" for micromed files

## Bug fixes

- Fixed issue in encevis Viewer where a marker filter in the marker list appeared without functionality.
- Fixed issue in encevis Viewer for low electrode setup where markers imported from EEG files were not sorted correctly when sorting in ascending order of column 'Comment' in the marker list was selected
- Fixed issue where impedance markers where not selected in the marker list type filter when selecting "All types"
- Fixed misleading error message when the database can not be accessed
- The "About" window in encevis viewer for low electrode setups is now stating the correct build number
- Fixed issue where it was possible to start the spectrogram while no EEG data where loaded
- Fixed crash in Trends&Seizures during exit of the plugin when using a review only license
- Fixed crash of encevis Viewer when changing the reference electrode in EEG Patient Management and immediately activating PureEEG
- Fixed issue which caused plugins to start without window frame when using Micromed Interface
- Fixed performance issue in spike detection GUI when the average spike plot was activated. The restriction to 500 spikes now also applies to the average spike plot
- Fixed crash of encevis Viewer when configuring upper and lower frequency borders to the same value
- Added consistency checks to encevis Viewer spectrogram when configuring a start time before the begin time of the recording
- Fixed issue when Spectrogram was immediately started a second time.
- Fixed issue in Source localization where 'jump to EEG' did not bring the encevis viewer window to foreground



- Fixed issue where Distributor TCP connection fails if the Distributor runs on a different machine than the client
- Fixed issue where a click on a seizure marker in Trends&Seizures GUI seizure plot can show EEG that was some seconds before the marker time
- Corrected various error messages to be more user friendly and more informative
- Fixed issue where not all annotations from EMS files might be loaded when annotations were stored within the event database of EMS files
- Fixed issue where annotations imported from EEG files might not show the time in the marker list of Trends&Seizures
- Fixed issue in the spectrogram calculation of encevis Viewer when the spectrogram was not calculating from a marker and the whole displayed EEG page is used for calculation
- Fixed issue in HIS mode of Viewer where a dummy entry was shown in an empty database in EEG Patient Management
- Fixed issue where not all impedance measures from EMS files were loaded
- Fixed crash of Micromed Interface if an second instance was started
- Fixed issue for small screens, where marker list of encevis viewer scrolled to the last entry instead of begin during startup
- Fixed issue where it was possible to configure an invalid reference electrode withing encevis Viewer
- Introduced a migration option for old spike detection results that are not compatible anymore with the current version
- Fixed issue in Micromed Interface where wrong configuration might lead to a crash of the application
- Fixed issue in Micromed Interface where it can happen that too many errors were shown in a dialog. Now the number of shown error messages are restricted
- Fixed issue where marker type 'EDF annotation" was missing as type filter in marker list of Viewer for low electrode setups
- Fixed issue in Viewer for low electrode setups causing a crash when undocking and redocking the markerlist
- Fixed issue in Viewer for low electrode setups where it could have happened that trending results where "out of sync" with EEG when continuing a calculation.
- Fixed issue in Viewer for low electrode setups where the import of patient may have caused a database error
- Fixed issue where spike detection plugin was sending empty results in case it was configured to return results via XML over AITInterfaceDLL
- Fixed issue where it was possible to change the marker type and begin time of a marker within the marker list of Trends&Seizures

### **V 1.8.3 (release on 2019-09-26)**

## **Bug fixes**

- Fixed issue where the unit of the ECG signal stored within Sigma EEG files was not taken into account.

## **V 1.8.2 (release on 2019-07-03)**

### **Bug fixes**

- "Direction of Use" and "Gebrauchsinformation" delivered with encevis are now containing an issuing date
- The software manual for encevis Viewer and encevis Viewer for low electrode setups contains now an issuing date and the address of the manufacturer
- Correction of invalid product SVN number in About window of Viewer for low electrode setups.

## **V 1.8.1 (release on 2019-04-30)**

### **Bug fixes**

- Fixed issue where distributor prevented startup of encevis.
- Improved usability when new files for an already existing patient are imported into EEG Viewer for low electrode setups.
- Fixed issue where a change of the marker type was not immediately applied within the EEG Plot of the EEG Viewer for low electrode setups.
- Fixed issue where movement of a marker to recycle bin was not immediately applied within EEG Plot of the EEG Viewer for low electrode setups.
- Fixed issue where changing the coloring of marker type "EDF Annotation" was not properly stored and recovered in EEG Viewer for low electrode setups.
- Fixed issue where help texts in the EEG Viewer for low electrode setups were cut off in case the windows display scaling was higher than 100%.
- Corrections in default montages for encevis Viewer for montage Referential Alt Cz R-L and Referential Alt A1/A2 R-L.

## **V 1.8.0 (release on 2019-04-10)**

### **Features and improvements**

- A new EEG Viewer for low electrode setups was introduced, which is optimized to display EEG signals for a low number of electrodes. It includes frequency filtering of the data, the scaling of the data in x and y direction and the visualization in different montages. The EEG viewers can start an automatic analysis of the EEG signal. The analysis results are presented in the EEG viewer which shall aid the user in the examination of EEG recordings. The analysis includes the seizure

detection, detection of rhythmic pattern, background frequency and aEEG.

- encevis Viewer can now open an EEG files without creating a patient entry in the database system. In this "Read-only" mode the user can quickly open any files without the need to register a new patient. The "Read-only" does not have the possibility to start plugins or modify markers
- encevis Viewer can now to be started using a given XML-file that defines files that will automatically be opened in a "Read-only HIS" mode. In this mode plugins are not available and marker can not be modified.
- encevis Viewer is now able to visualize impedance measurements stored in Micromed and EMS files
- storage of encevis settings was optimized
- encevis Viewer can now start the Spectrogram from an arbitrary time point in the EEG plot

### **Bug fixes**

- Fixed issue where spectrogram throw error if all filters where disabled
- Fixed issue in encevis viewer where EEG file Management forces a unique patient name although the patient label is already different. (Fixed in 1.7.3 and upwards too)
- Fixed issue in NeuroTrend that might cause a time shift in the AEEG plot for uneven or non-integer sampling rate of the input data after longer recording times of several hours. (Fixed in 1.7.3 and upwards too)
- Fixed issue in Micromed vendor interface where Micromed vendor interface throws an error if tables are missing in the encevis database. (Fixed in 1.7.3 and upwards too)
- Fixed random crash on exit of Micromed vendor interface (Fixed in 1.7.3 and upwards too)
- Fixed issue where prefixes set in channelPrefix.txt were not applied to plugins (Fixed in 1.7.4 too)
- Fixed crash loading EMS files
- Fixed issue where SSL certificate could not loaded successfully when integrating AITInterfaceDLL
- Fixed issue in NeuroTrend causing an invalid database opening when the database name is empty for a local Firebird database
- Fixed issue where end of recording in NeuroTrend was not properly visualized
- Fixed memory leak on opening EDF files