

Neurotravel Light [v. "Minidesktop"]

EEG system

Technical Report



**Neurotravel Light
"Minidesktop" version**

(Image for illustrative purposes. The configuration offered may vary depending on the accessories offered)

Galileo Neurotravel Light "Minidesktop" version

**The most powerful and
versatile electrophysiological
acquisition unit ever**

FOCUS ON

"Minidesktop" version

- 48 total inputs
- USB connection
- Minidesktop PC with latest generation processor
- Articulated clamp support
- Extensive data storage options
- Interfacing with the outside world for data interconnection and archive recovery

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General description

Neurotravel Light is a medical system intended to be used for Electroencephalography (EEG) and Polysomnography (PSG) examinations, in combination with the Galileo NT Line software, to be used on humans to assist the user in the diagnosis and monitoring of diseases, injuries or disabilities

Neurotravel Light is an integrated unit based on USB connection to the PC with Windows® operating system for the acquisition, display, recording and review of EEG signals. The same USB interface to the Host PC also provides power.

It is particularly suitable for clinical EEG recording, EEG monitoring in the ICU, aEEG monitoring in Neonatology, brain death diagnosis, and examinations in the operating room.

The system's graphical interface allows for simple and direct control via PC mouse or keyboard. The software allows the recording of the EEG signal and its display both in unipolar and bipolar editing, as well as the possibility of applying different filters and sensitivities, both in acquisition and in revision. This solution also offers advanced features such as automatic reading and playback, zoom functions with measurements, event search and flash stimulator management in both manual and automatic modes.

NEUROTRAVEL Light Acquisition Module

The NEUROTRAVEL Light acquisition unit consists of 32 monopolar channels, 8 bipolar channels (4 pairs) and additional inputs including GND and multiple references (3 x NE and 5 x GND). There is a dedicated side input used to connect the acquisition module with any peripherals or devices that use a serial protocol (oximeter, flash stimulator, ...).



With low weight and size, this unit is equipped with on-board impedance control (with threshold selector), channel bushings with LED light for impedance control, channel labeling according to the 10-20 system.

Features that facilitate the operator in the preparation and assembly phases of the patient and in the control of the examination once started. A green multifunction LED signals the operator of the various indications of the status of the equipment.

The acquisition module is equipped with an articulated clamp support for its positioning on any surface/arm/shelf available in the environment of

use.

SLI (LED Flash Visual Stimulator) Lamp

For visual stimulation, the system is equipped with high-intensity, low-voltage LED flash stimulation kits. The SLI lamp is equipped with a USB connection and a support arm with table clamp.

Optional hardware

HD EEG Video Kit with Ethernet Camera

The Kit includes:

- Galileo VEEG software enablement
- enable for HD EEG video via TCP/IP protocol
- Ultra-sensitive microphone for audio recording
- Infrared sensitive CCD
- HD LAN camera with Power of Ethernet (PoE) management
- Maximum resolution 1980*1080
-

Bridge Electrode Accessory Kit

Includes the following accessories

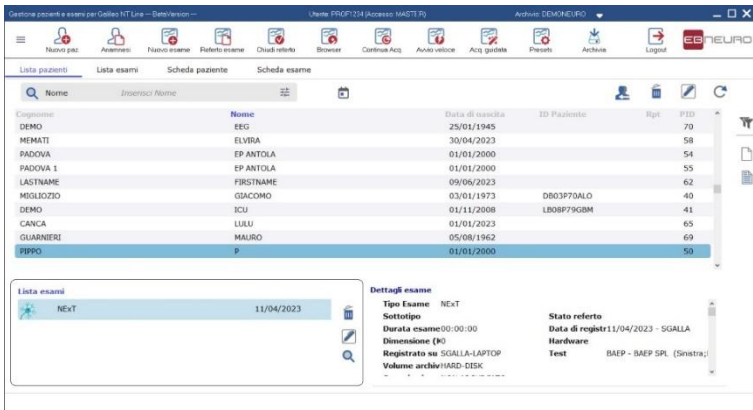
EEG Accessories Kit with Bridge Electrodes

Including:

- n° 1 of PTS Rubber Headcap 6x4, Adult Medium
- n° 24 of Ag/AgCl Adult Bridge Electrodes
- n° 24 of Connection Cable, 2mm Banana Connector
- n° 2 of Ag/AgCl Ear Clip Electrodes
- n° 1 of Conductive OneGel, 250ml

Software modularity

Galileo Patient Management System



Nome	Indirizzo Nome	Nome	Data di nascita	ID Paziente	PID
DEMO		EEG	25/01/1945		79
MEMATI		ELVIRA	30/04/2023		58
PADOVA		EP ANTOLA	01/01/2000		54
PADOVA 1		EP ANTOLA	01/01/2000		55
LASTNAME		Giacomo	09/06/2023		62
MISLOZIO		Giacomo	03/01/1973	080370ALO	40
DEMO		ICU	01/11/2008	LB0879GBM	41
CANCA		LULU	01/01/2023		65
GUARNIERI		MAURO	05/08/1962		69
PIPPA		P	01/01/2000		50

Lista esami	11/04/2023	Dettagli esame
NEXT		Tipo Esame: NEXT Sottotipo: Durata esame: 00:00:00 Disposizione (N): Registrata su: SGALLA-LAPTOP Volume archivio: ASD-DESK Stato referto: Data di referto: 11/04/2023 - SGALLA Hardware: Test: BAEP - BAEP SRL (Sinistra)

Galileo Patient Management System (PMS) is the single database integrated with all EB Neuro systems that allows you to manage patients' personal data, examinations performed and data for each EB Neuro application in a centralized and unambiguous way, allowing you to use a single management interface.

Galileo PMS also allows integration via HL7 with hospital information systems that support this integration.

Galileo PMS also implements data backup and recovery and allows the management of multiple archives. It can be fully integrated with the system you are using.

Patient/Examination Database



The SQL patient/examination database, oriented towards network connections (multiple and distributed archives) guarantees flexibility and security.

Each User is identified with a Name and can access the system by providing his or her own access password.

When you register on the list of authorized users, you receive an "access level or privilege" under which you will be allowed or prevented from doing so. There are four levels of access available for database, exam, and patient management: Reader, Writer, Master, or Service.

Service: is typically an EB Neuro technician who is delegated the installation of the system and its specifically technical maintenance. A user with this level of access can perform any operation. A similar level can also be assigned to personnel of the health facility that manages the system, but it is necessary that they are particularly qualified not only on the mechanisms of the Galileo software,

but also on issues related to the computer and in particular to the operating system under which Galileo works.

Master: is the highest level among non-technical users of the system, typically will be the medical manager. A user with this level of access can perform any acquisition, replay, reporting operation, can delete traces and/or patients from the archive, can add new users to the list of authorized users and can assign them an access level.

Writer: this is typically the level of the technician in charge of acquiring the traces. This level allows: the inclusion of new patients and/or traces in the database, to perform data acquisition, to open and write patient and/or trace reports. This level, however, does not allow you to declare a reported trace and therefore to modify its data and reports once it has been "closed".

Reader: basically a user with this level can only read and print the information present in the system.

The organization of the information allows you to sort the data according to different criteria and quickly search, even on multiple archives, patients, examinations, medical history, reports, Backup archives on the basis of name, age, pathology, type of examination and date.

A powerful statistical analysis, based on the attribution of customizable codes and values to data and patient info, allows you to extrapolate useful and always up-to-date information in a few steps, thanks also to the management of the ISTAT Codes of Cities and Nations.

The editing system based on the Microsoft Office package of the patient's medical history and report is fully integrated into the Database, with the possibility of using predefined template templates or creating and customizing new ones according to the needs of the medical/technical staff.

The database is set up for interfacing between different Galileo acquisition stations through dedicated software and offers the possibility of creating shared databases and workflows, as well as reading the exams on other PCs in the service network.

The SQL Client-Server database is able to read files exported in ASCII, EDF and EDF+, thus making it compatible for reading the recorded data with any type of instrumentation capable of exporting in these formats. The data made available by the EEG.NET functions can be exported in xml format (analysis) and pdf (report).

Archiving

The system is set up with an archiving software application dedicated to the safe management and execution of backup operations of all acquired data (patient data, traces, reports and medical history), with the possibility of storing such data both on centralized archives residing on company servers and on optical media, including:

- CD
- DVD
- Blue Ray (Optional Drive)



In addition to a traditional data archiving application, the system is equipped with a backup utility ("Data Browser") that allows data to be stored on any digital medium (CD/DVD/USB key) with the possibility of being able to reread the traces from any computer without the need to rely on the Galileo NT Line software. This opportunity creates a stand-alone re-reading tool, perfectly compliant with the directives of the "Regulation containing the Procedures for the Assessment of Brain Death", Ministerial Decree no. 582/94, Law no. 578 of 29/12/1993 and updated with Decr. Min. Health 11/04/2008.

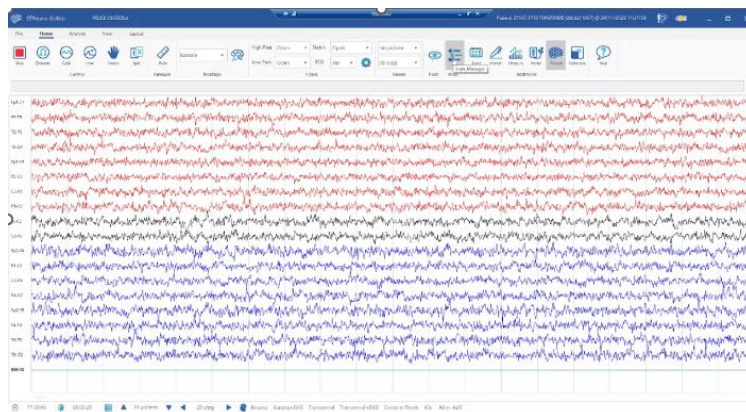
HL7 Compatibility (Included but need Optional Licenses and integration)

Galileo PMS is an advanced database system that integrates all the technologies necessary for the exchange of information between the Hospital Information System and the EB neuro acquisition systems. The platform includes everything necessary to communicate with the MIRT server, to be used between the systems and the Hospital Information System, to make the communication operational it is necessary to request a specific quotation that includes licenses and interfacing, through the configuration of messages and flows.

Galileo EEG.NET for EEG and Monitoring

General description

The Galileo line is now enriched with a software package dedicated to the acquisition, reading and processing of the electroencephalographic signal.



Galileo.NET complements traditional methods in particular departments such as intensive care, operating room, polysomnographic clinic, allowing the prolonged acquisition of neurophysiological signals.

The philosophy of Galileo.NET is inspired by two foundations: Multimodality and Monitoring.

Multimodality as several processes can be carried out at the same time: acquisition, quantitative data analysis, printing, reading, remote consultation, file transfer, etc.

Monitoring, which means everything that allows the monitoring of the patient's neurological activity: prolonged acquisitions over time and their management, through compressed representation, quantitative EEG analysis, remote online consultation, with the possibility of entering/modifying events.

Technology

The technology adopted to create the EEG.NET application is based on the "Microsoft .NET" framework. This platform offers the possibility of creating a useful and easy-to-configure interface even for less experienced users, as it uses the same methods adopted in the most common applications: insertion of icons for the most used commands, configuration of dedicated toolbars.

But the power offered by this framework is manifested more in the management of data on the network, as it realizes the possibility of remote monitoring through "broadcasting".

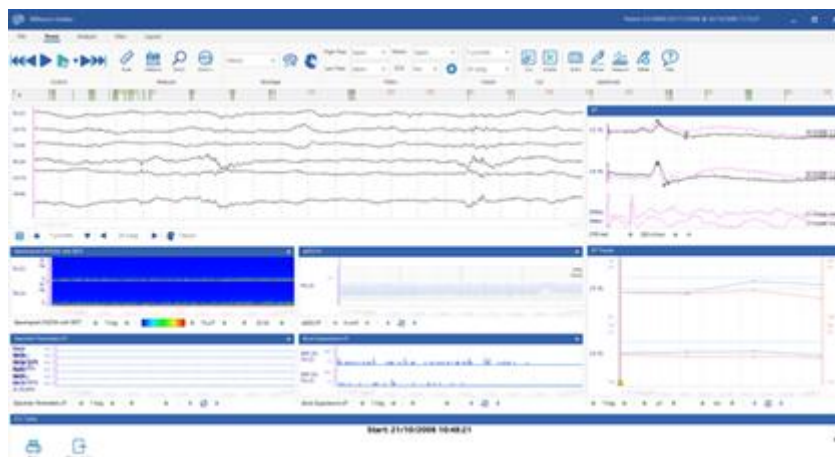
The .NET technology, in fact, allows the use of modules (acquisition, replay, processing, ...) indifferently locally or on the network, making it possible to distribute the application and run parts of it locally (e.g. user interface) and other parts on the network (e.g. data acquisition).

Headset and user interface

The User interface is now fully configurable according to the methods adopted by the MS Office applications and capable of managing up to 6 windows to contain tracing, processing, Video EEG, Trending, etc...

System capable of marking each individual recording with reference data (patient data, editing, filters, earnings, events, date, etc.).

The combinations of these windows, in terms of the contents that you want to attribute to them, their position and size, can be saved, both during acquisition and reading, in particular personalized "Scenarios" (or Layouts) that the user can recall at any time.



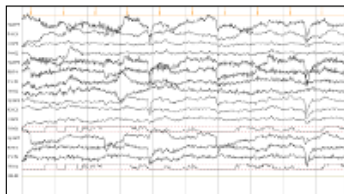
Track panel

Many of the most common controls used both in acquisition and in review, available in graphic interfaces, can be placed side by side with the main panel of the track, in order to have the greatest information content offered by them.

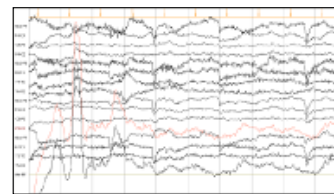
In the case of multi-channel acquisitions, it will be useful to be able to arrange the editing of the representation of the tracks on 2 columns, in order to have greater visibility of each track.

A graphic clipping, available for each track, will instead allow you to hide the signal in its values above a certain threshold, to avoid, for example, that in the presence of artifacts the "dirty" tracks overlap the good ones, hiding their trend and therefore the information content.

Prima



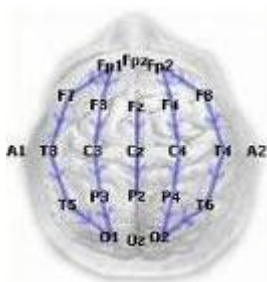
Dopo



Other useful properties are those of manual dragging of the tracks vertically, of inserting spaces (null tracks) to better discriminate the trends, of being able to represent the tracks as: tracks, histograms, sequence of numbers, tracks and sequences of numbers at the same time.

To further improve the visibility of the track and its possible processing, the viewer can, in the presence of an appropriate configuration of the video card, be "split" on two monitors, by means of a dedicated automatic control available from the interface.

Montages and Presets



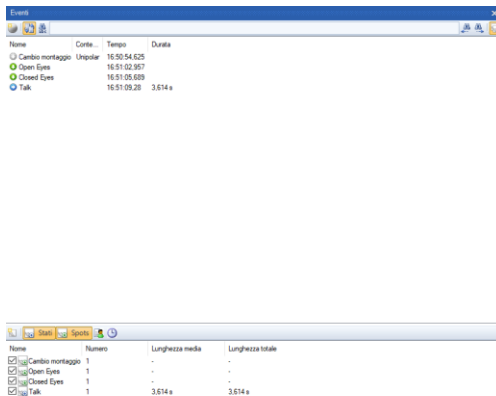
A window that can be placed next to the tracks allows the user to graphically view the available montages and, if necessary, to apply the desired one to the path (replay/capture).

An unlimited number of EEG/polygraphic montages (bipolar, monopolar, common reference, average) can be stored, which can also be redefined for a single trace. A special dedicated routine allows reading while preserving the exact sequence of montages that the

operator had selected during recording. The transition (or reconstruction) from one assembly to another is immediate both on the monitor and on paper (in the case of real-time printing).

It is also possible to store an unlimited number of working protocols (Presets), different in amplification, filtering, editing, time constant, paper scrolling speed, type of calibration, photostimulation program, for as many different uses in the recording of the EEG laboratory.

Event Insertion



Nome	Conto	Tempo	Durata
Cardiac montaggio	Unipolar	16:50:54.625	
Open Eyes		16:51:02.957	
Closed Eyes		16:51:05.689	
Talk		16:51:09.28	3.614 s

Nome	Numero	Lunghezza media	Lunghezza totale
Cardiac montaggio	1	-	-
Open Eyes	1	-	-
Closed Eyes	1	-	-
Talk	1	3.614 s	3.614 s

The list of events/statuses is available immediately next to the tracks and the insertion of the same takes place with an easy double click on the corresponding "button". At any time, the user can always insert a new event that will be saved in the layout. You can also insert events by exploiting shortcuts. You can also enter custom notes in addition to the default events/statuses.

Photostimulation

A particular routine of the device management program allows you to "build" and store work protocols also for photostimulation, with LED flashes or Goggles.

You can set up arbitrary stimulation sequences, including all available frequencies for the duration you deem necessary. During the acquisition, the operator can activate or not activate the stimulation program by pressing a single button, or set the stimulation frequency online.

Features during capture

Galileo.NET allows the following main functions during the acquisition of the trace:

- Real-time modification of all acquisition parameters (sensitivity, time constant, low-pass filter, notch and anti-muscle filter), both for single channel and for groups of channels
- Interelectrode impedance control with LED threshold indicator positioned directly on the patient head and numerical value with graphic indication of the value on the system monitor, active at any time. If the check is carried out during recording to internal memory, the values are stored together with the trace
- Total control of the parameters of light stimulation, program activation, frequency modification, stimulus power, etc., displayed together with the trace
- Direct storage of signals with "full band" characteristics (maximum bandwidth of amplifiers), independent of the filter values and time constant set by the operator for acquisition display
- Insertion of messages and annotations on the track even in programmable automatic mode
- Automatic management of statuses and events, thanks to which it is possible to set their type and duration. This process is particularly suitable for the automatic management of Hyperpnea and Post Hyperpnea, ensuring maximum flexibility.
- Ability to use the EKG channel to produce a Heart Rate trend.
- Real-time printing on the printer of all or part of the layout, including date, time, filters, sensitivity, time constant, paper speed and montages
- Control through dedicated function of recording times, hyperpnea, etc
- Editing of patient cards, tracing cards, etc
- Split-screen division both horizontally and vertically, with the possibility of reviewing previous sections of the track being acquired, or other selected tracks, even via remote location
- Complete configurability of the workspace in operator-programmable "layouts"
- Programmable filtering steps.

- Control of the video signal (framing, zoom, focus, ...) from the software interface integrated in the EEG viewer (for EEG Video option).

Online/offline monitoring

Electroencephalographic monitoring is developed on several fronts: the system must first of all be able to acquire EEG for several days, giving the possibility at any time to interrupt and resume the acquisition in the same way, and always have the acquisition history under control in terms of events/states and interruptions. This is guaranteed by the presence of a "navigator" (more commonly a navigation bar), in which the events that are entered by the user (hyperpnea, eyes open, eyes closed, ...) or automatically by the system (stimulation, calibration, ohmeter) appear during the acquisition or rereading of the exam.

It is possible to view an Event List to accompany the track, which is continuously updated and on which operations can be carried out to modify/delete them and export them to the report.

Split Track

Another fundamental aspect is to be able to view parts of the trace still being acquired. To meet this need, the Track Split function has been managed, which reopens, alongside the online track panel, the track acquired up to that moment. The user has the possibility to carry out any editing and analysis operation characteristic of the replay on this portion of the track.

The reopening of the traces during acquisition also takes place for Video EEG examinations.

EEG/Video EEG Readout (Optional)

The re-reading, in addition to all the editing and state/event input functions, has convenient controls for scrolling the tracks and their display.

The mouse cursor can change and take the shape of a hand with which you can act on the path in order to scroll it in small steps, forward or backward in time. The layout display can be compressed to such an extent that up to 5 hours per page can be displayed on one page.

The inspection of the route can take place in the following ways:

- Standard SEC/sec
- standard pag/pag
- frame by frame (in case of EEG VIDEO)
- defining a step of your choice
- through events/statuses (event list, exam overview, navigator)
- Bookmarks to instantly find points of interest

The main functions of the reading section are as follows:

- Automatic or manual page scrolling, EEG mode scrolling
- Immediate reading on a single graphic table of all messages and/or annotations entered during recording with automatic search for them on the track

- Continuous display of the amplification parameters used
- Reading the layout with reformatting of the montages and/or according to the montage used in recording
- Zoom of any detail of the trace, analysis through a "trend" graph (visualization in compressed form by means of parameter extraction) for the quick search for paroxysmal phenomena
- Digital filter function applicable on single track or on all tracks of the readout edit
- Selection of track tracks that are not of interest to be discarded and/or of interest for processing and/or archiving, printing, etc
- Calculation of the FFT spectral analysis for a single trace or for a portion of a trace both on-line and off-line of the EEG trace, through specific tools integrated within the Galielo NT Line software that allow to represent the frequency contributions in the form of graphs and spectral maps (2D/3D).
- Compact representation and visualization of the EEG signal in trend form, using different analysis algorithms, including: Min&Max, Burst Suppression and aEEG (CFM). In addition, the software offers the possibility of integrating the Spike & Seizure Detection diagnostic application (optional on request), for the determination and recognition of epileptic spikes both on-line and off-line.
- ERP module (optional on request) with its stimulation set. The module is based on the multimodal stimulation during continuous recording of the EEG, the subsequent segmentation of the trace underlying the different stimuli and the backaverage process for the extrapolation of the elicited cognitive potential. Customized measurements and the inclusion of the results in the report are available.
- Amplitude/time/delta frequency measurements via cursor
- Simultaneous comparison of tracks from different tracks on the screen (to be archived, from CD Rom, from other drives on the network) to make quick comparisons between the different recordings, with both horizontal and vertical split screen. This feature is automatically updated as registration progresses. In the review, all the reading and editing features available during the exam analysis phase are available.

Characteristic properties of EEG video rereading:



- Ability to scroll through EEG and video in synchronized mode: a purple marker on the EEG trace represents the activity recorded at the instant to which the image presented in the video window refers.
- The video window has a bottom scroll bar (video navigator) and some control buttons.
- The video navigator represents the entire video footage, and by moving the cursor along the bar, you can move freely through the footage.

The Video Replay window has all the controls to:

- Activate/deactivate the track-video synchronization mechanism ("EEG Video Lock");
- Mute/enable audio playback during track replay;
- Display the video window at its normal size (dictated by the resolution configuration in the capture preset) ("Normal View");
- Display the video window in full screen (i.e. occupying the full size of the monitor: "Full Screen");
- Reversal of video positions in the case of EEG with dual camera: in acquisitions with dual camera, the video is presented in PIP (picture in picture) mode and with this button you can inversion the video sources in the available areas.

Video Scrolling Mode:

- **Frame-by-Frame Navigation:** Movement within the video file (whether or not it is hooked to the EEG file) can be done, forward or backward, either one frame at a time (using the appropriate "Previous Frame" and "Next Frame" buttons) or with a speed set at the time of system configuration and regardless of the EEG display parameters ("Start/Stop Replay" buttons).
- **Play Video** (playback of the video at the same speed as the speed set at the time of setup)
- **Fast Play Video** (fast video playback, with a playback speed accelerated by a factor of your choice up to 20x)

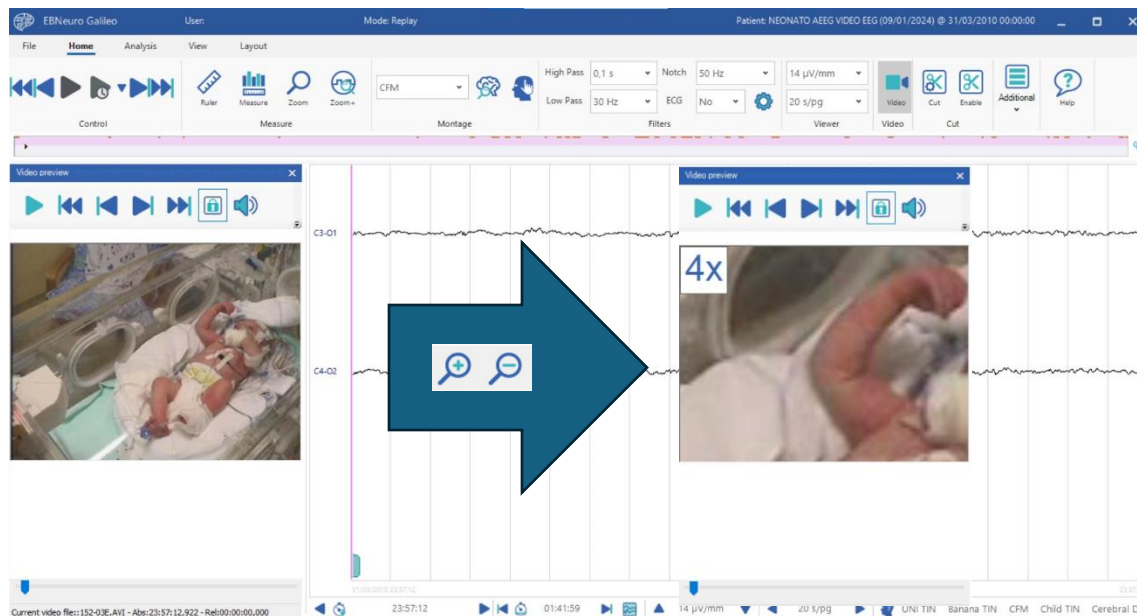
Digital Zoom:

By exploiting the resolution of the video image acquired in the VIDEOEEG layout, the user is given the opportunity to perform a **highly configurable digital zoom on it, available both in the acquisition and review** phases.

This feature will be very useful for:

- inspect portions of the video image,
- moving within the image itself in search of important details and
- play the video by focusing on a particular area of the video window,

all **while maintaining synchronism with the EEG data file**. By means of a dedicated icon on the toolbar of the video window, an additional box (zoom box) will appear within the video window, which represents the video window in scale.



In ZOOM mode, however, the "Play" of the track can be performed, limiting the inspection of the video exclusively to the highlighted area.

VIDEO/EEG SYNCHRONIZATION (EEG Video option)

The synchronized alignment between the path and the video image takes place either by pressing the Lock button on the toolbar of the video window ("EEG Video Lock"), or by pressing the cursor button on the toolbar of the EEG viewer.

When the path and image are aligned in time (Lock sliders active) a purple vertical bar (cursor) appears on the path indicating the synchronization point: the path at the point indicated by the purple marker represents the activity recorded at the instant to which the image presented in the video window refers.

When you are synchronized and start video playback using the "Play" button, both the movie and the drawing of the tracks are played in real time (if the audio has been acquired and the "Mute" button is not enabled, the EEG and EEG video reproductions will also be accompanied by the audio replay, always synchronized with the video).

The synchronism ("EEG Video Lock") is maintained even when moving on the track by means of the appropriate keys, previously described, which adjust the page navigation, the navigation of one second at a time, by events and the automatic display (if the "Lock Mode" is enabled, the Panning display mode for the track is disabled).

Once you have identified a point on the movie that you want to find on the track, just activate the appropriate button ("EEG Video Lock") on the toolbar of the video window. The track will immediately move to the required point and the synchronism marker will appear on the track panel.

Once the synchronism is activated, it will remain until it is explicitly removed by the user and then video and tracks will move together whether the video is moved (with the commands of the relative scroll bar), or whether the path is moved (with the standard commands such as PgUp, PgDown, etc.).

In case you want to hide the video window during the replay, there is a special button on the toolbar of the track viewer which, when pressed, satisfies this need.

VIDEO

Single EEG FULL HD Video with DOME camera, including:

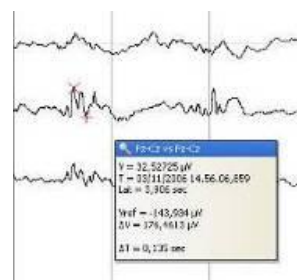
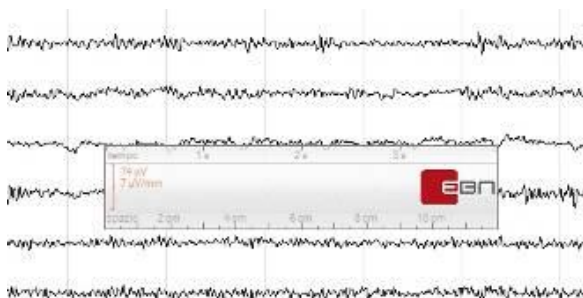
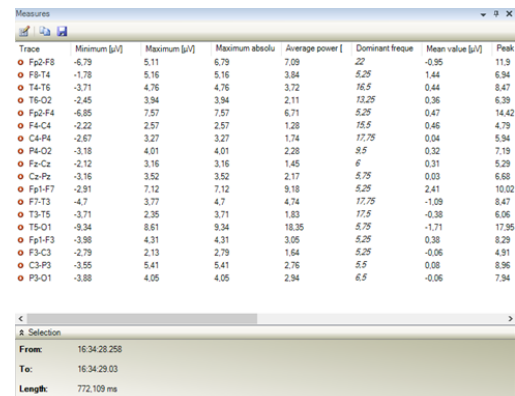
- Galileo VEEG software enablement
- **camera control via TCP/ protocol**
- Ultra-sensitive microphone for audio recording
- **Single camera Compact PTZ camera with HDTV 1080p resolution, 10x optical zoom and autofocus,**
- DOME camera mount
- Video always recorded continuously, regardless of the recording mode (LAN or WIFI)

Press

This selection allows you to launch the Print job on all selected pages. To carry out this function, simply call the print from the File menu and in the dedicated window through the Selection item, choose "Print" to print the pages selected for this purpose. Obviously the Print process can be done on any other type of selection, choosing the corresponding item, whether it is a system state or a user-defined state.

Zoom and Measurements

Apart from the standard modes adopted for measurements and zoom, the original functions of Ruler and Measurements with markers for latency and amplitude will be useful to the user. The "Ruler" allows the user to get an idea of the width of the track, sizing the vertical axis of the same in μV according to the most common representation sensitivity among the tracks. The Track Inspector control allows you to successively insert a reference marker on a track and a comparison marker to evaluate the difference in amplitude and latency between the two.



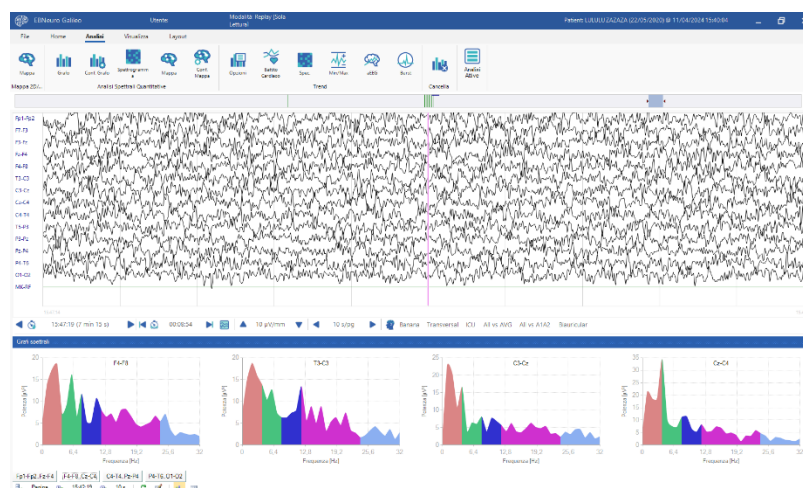
Quantitative Spectral Analysis

In addition to giving the fundamental possibilities of acquiring the EEG signal for a long time, the system allows you to create acquisition presets also dedicated to quantitative analysis, as well as to carry out these processing regardless of the preset in use.

The quantitative analysis of the EEG makes it possible to analyze signal epochs with the aim of extracting significant parameters whose representation is carried out in particular windows, which can always be recalled from the viewer and can be placed next to the trace panel, as well as saved within the user layout. The results of these processes become part of the EEG.NET exam as "child" exams.

An easy way to carry out spectral analysis of the trace is available for re-reading, according to the chosen assembly and on the following time intervals:

- Current Page
- states (with the ability to exclude any uninteresting internal states)



The graphical representation of the spectra (power/amplitude spectrum) is based on the definition of any number of spectral bands, identified by a special color. The possibility of representing the power/amplitude in the various bands in the form of cakes has been introduced, thus indicating the relative power for each band (flanked by the corresponding absolute value).

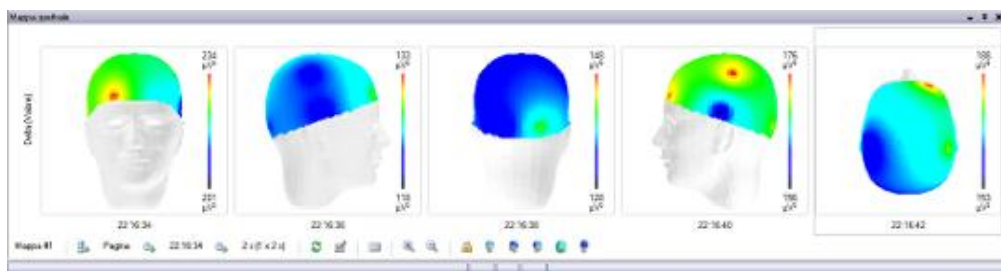
Potential Maps and 2D/3D Spectral Maps

Galileo EEG.NET allows you to create potential maps, with parameters freely configurable by the user, starting from the raw EEG signal distributed in the patient's cortical topology.

You can select and set the following calculation parameters:

- Single Value: Calculates instantaneous potential values based on cursor position
- Epoch: indicates the time interval starting from the cursor position from which a potential value is extrapolated based on the type of Aggregator
- Average: Returns the average of all potential values
- Absolute Average: Returns the average of the absolute values of the potentials
- Maximum: Returns the maximum of potential values
- Absolute Maximum: Returns the absolute maximum of potential values
- Peak-to-peak: Returns the maximum excursion between the maximum and minimum potential value

It is also possible to manage with Galileo EEG.NET the visualization of spectral maps in both 2D and 3D mode, configuring, among different computational options, each interpolation step, grid size, definition of contours and related approximations, etc. It will be possible to view individual maps (of eras, pages or entire exam) or divide the selected range into several maps and call up individually one at a time with a simple click of the mouse.



Trend Analysis

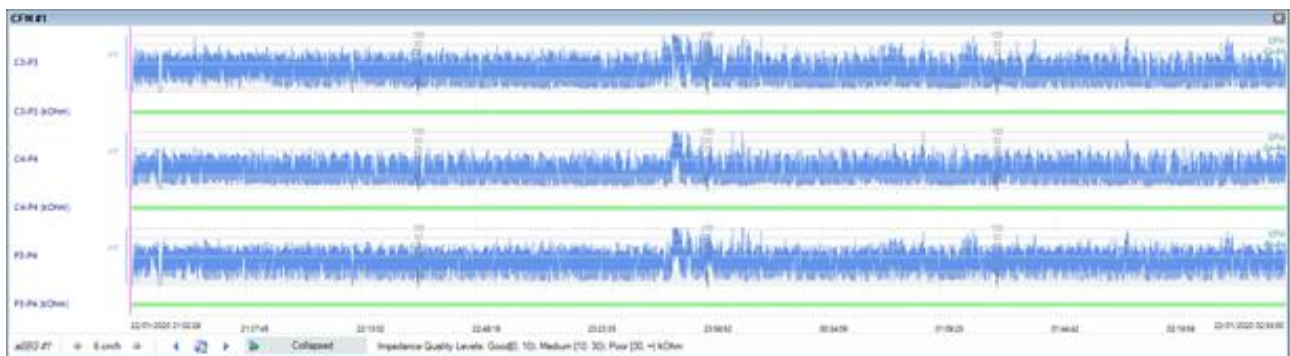
EEG analysis using quantitative trends makes it easier and more accurate for clinicians to diagnose different pathologies or patient conditions. Trends such as CFM/aEEG, DSA, CSA, etc... make the presence of some pathological EEG patterns immediately localized.

Compact representation and visualization of the EEG signal in trend form, using different analysis algorithms, including: CSA, DSA, Band Power, CFM/aEEG, Min&Max, Burst Suppression (Suppression ratio %, Burst/min, Inter-Burst Interval, Burst Suppression Ratio) and Entropy.

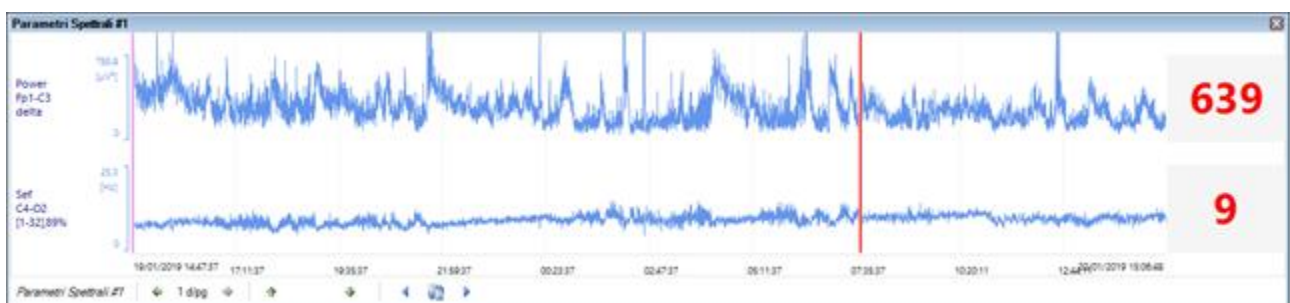
Examples TRENDS and MAPS



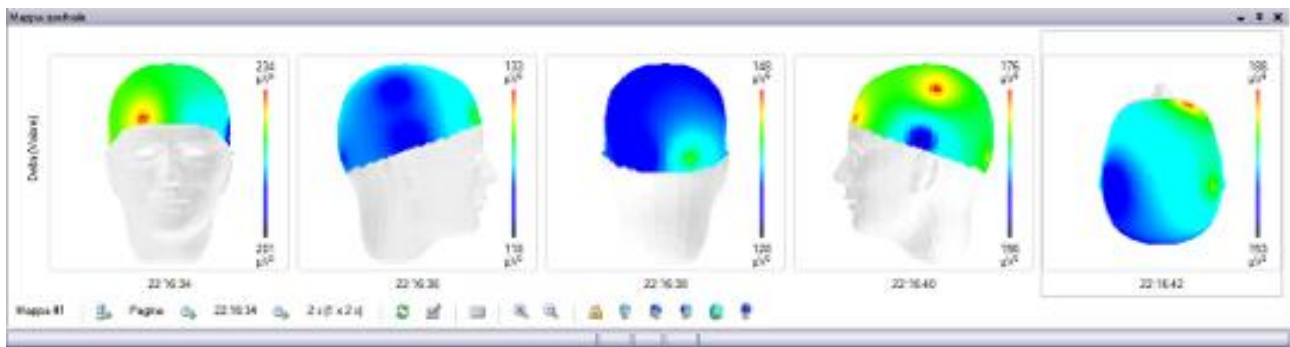
Example of EEG representation Quantitative spectrogram



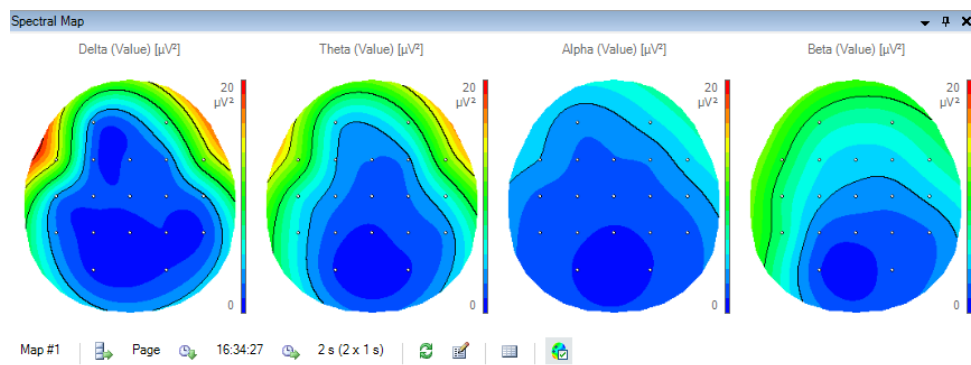
Example of aEEG/CFM representation



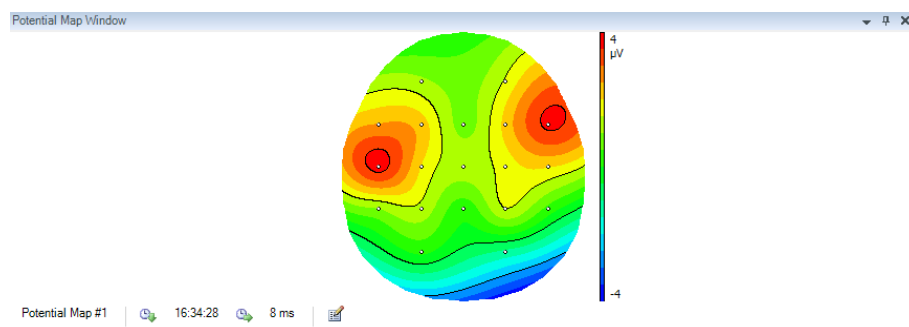
Example of representation of spectral parameters both in graphical and numerical form



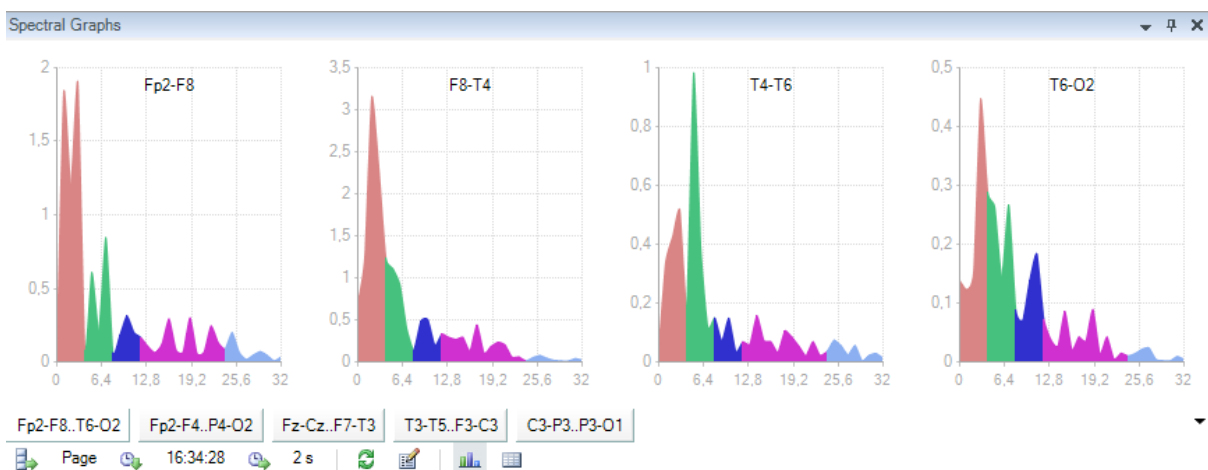
Example 3D spectral maps



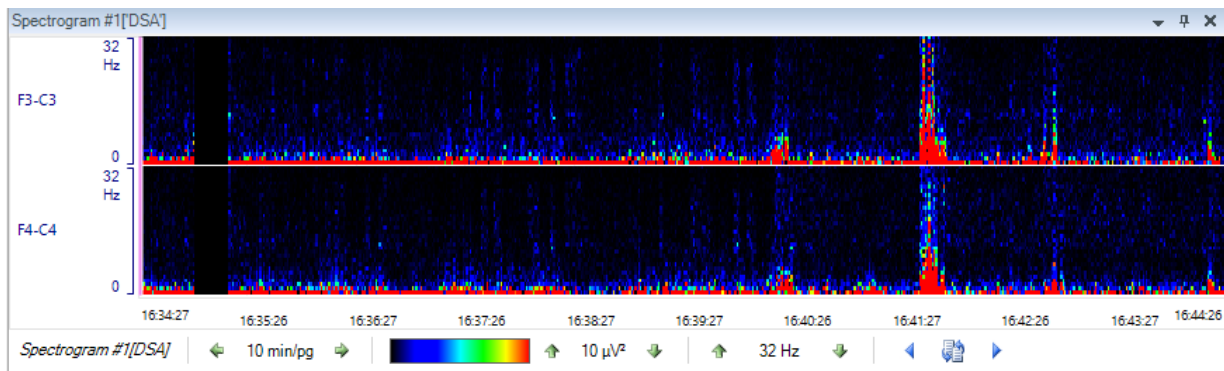
Example 2D spectral maps



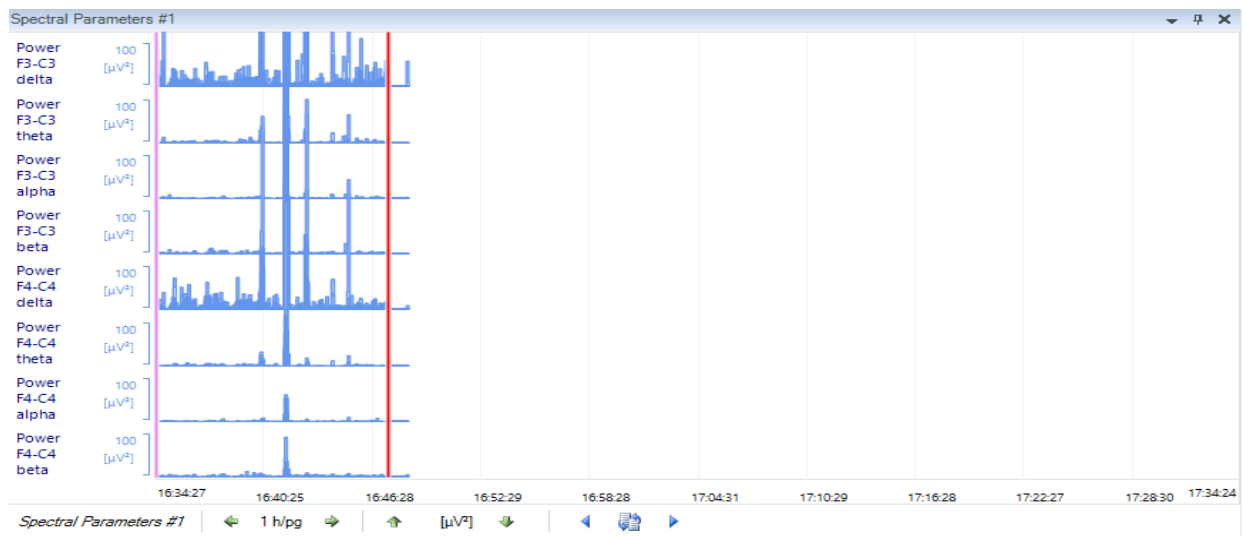
Example Potential Map



Example Spectral Charts



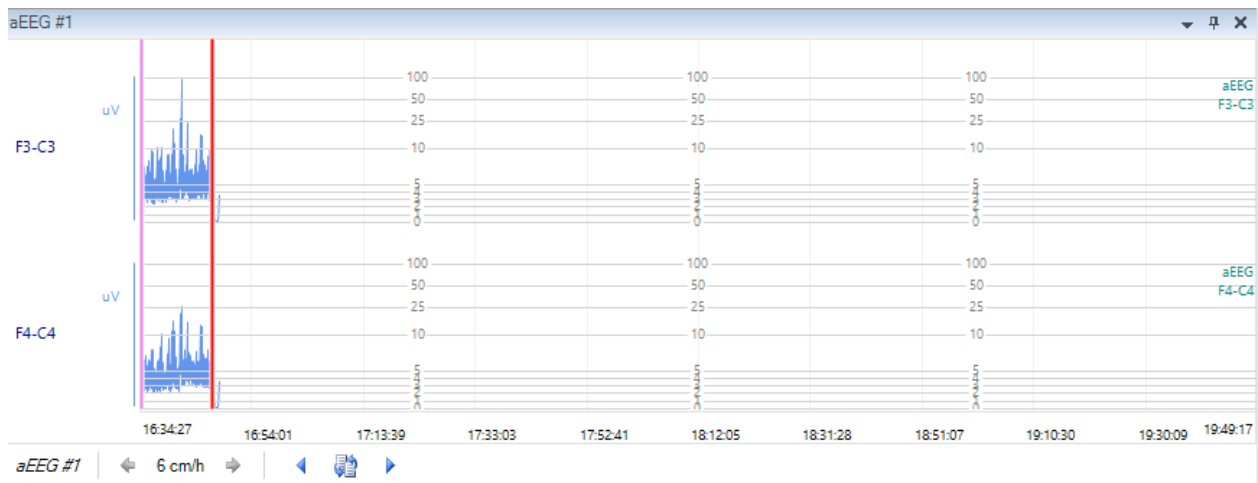
SLD example



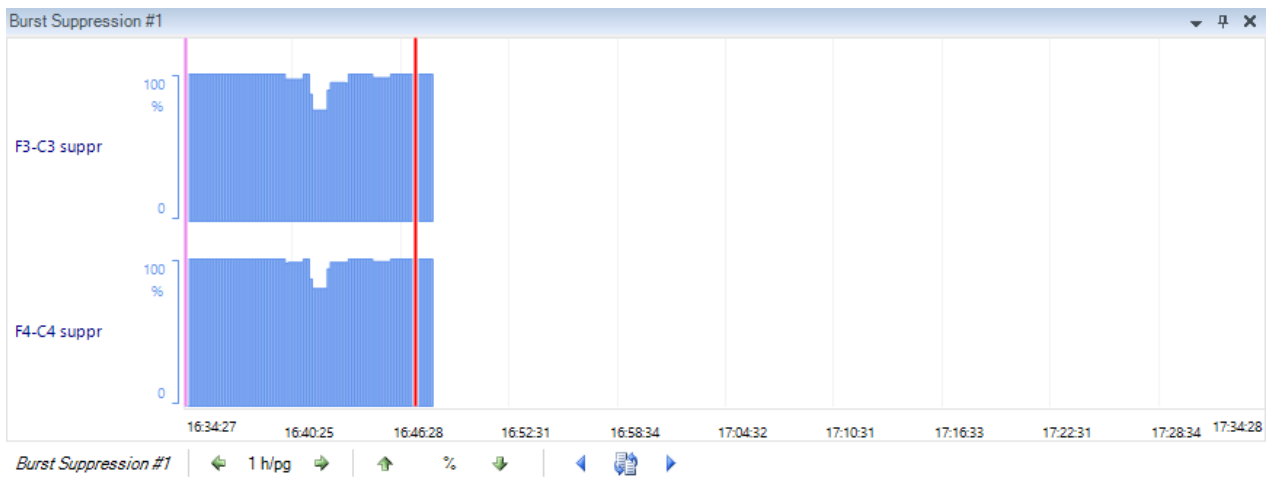
Example Spectral Graphs with Band Powers and Power Ratios between Frequency Bands



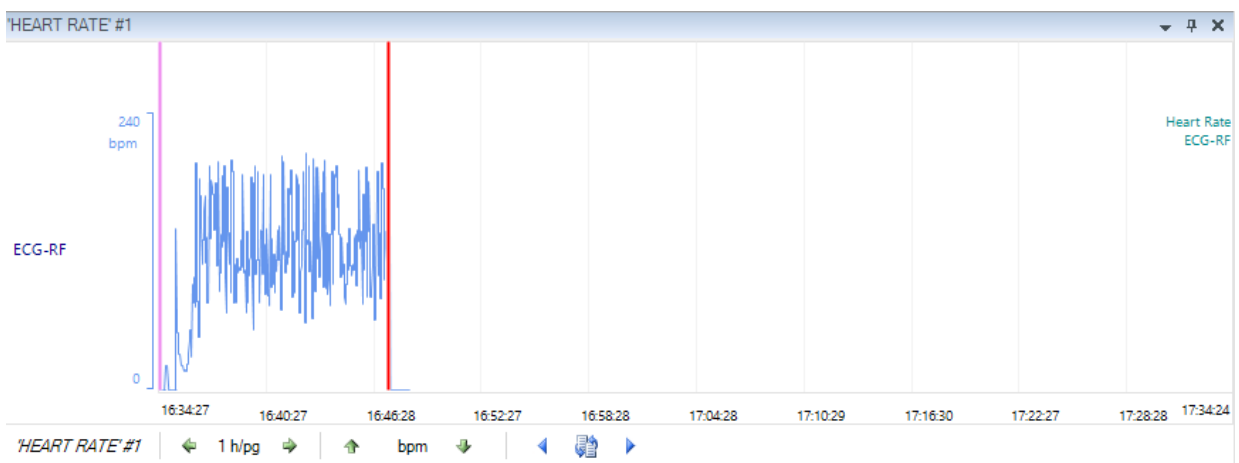
MinMax/Envelope Chart Example



Example Trend aEEG



Example Trend Burst Suppression



Trend Heart Rate Example

Trace	Minimum [µV]	Maximum [µV]	Maximum absolu	Average power [	Dominant freque	Mean value [µV]	Peak
Fp2-F8	-6.79	5.11	6.79	7.09	22	-0.95	11.9
F8-T4	-1.78	5.16	5.16	3.84	5.25	1.44	6.94
T4-T6	-3.71	4.76	4.76	3.72	16.5	0.44	8.47
T6-O2	-2.45	3.94	3.94	2.11	13.25	0.36	6.39
Fp2-F4	-6.85	7.57	7.57	6.71	5.25	0.47	14.42
F4-C4	-2.22	2.57	2.57	1.28	15.5	0.46	4.79
C4-P4	-2.57	3.27	3.27	1.74	17.75	0.04	5.94
P4-O2	-3.18	4.01	4.01	2.28	9.5	0.32	7.19
Fz-Cz	-2.12	3.16	3.16	1.45	6	0.31	5.29
Cz-Pz	-3.16	3.52	3.52	2.17	5.75	0.03	6.68
Fp1-F7	-2.91	7.12	7.12	9.18	5.25	2.41	10.02
F7-T3	-4.7	3.77	4.7	4.74	17.75	-1.09	8.47
T3-T5	-3.71	2.35	3.71	1.83	17.5	-0.38	6.06
T5-O1	-9.34	8.61	9.34	18.35	5.75	-1.71	17.95
Fp1-F3	-3.98	4.31	4.31	3.05	5.25	0.38	8.29
F3-C3	-2.79	2.13	2.79	1.64	5.25	-0.06	4.91
C3-P3	-3.55	5.41	5.41	2.76	5.5	0.08	8.96
P3-O1	-3.88	4.05	4.05	2.94	6.5	-0.06	7.94

From:	16:34:28.258
To:	16:34:29.03
Length:	772.109 ms

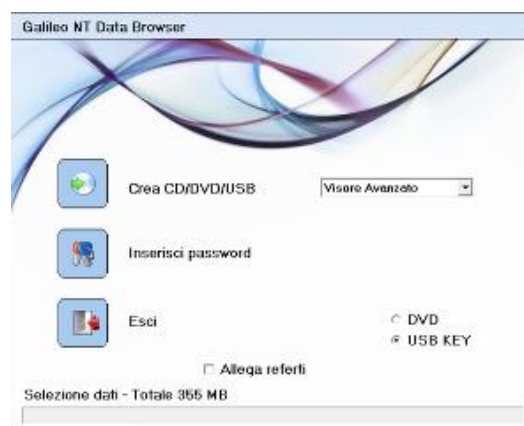
Example EEG measurements

"Quick Start" function

The "Quick Start" function allows you to quickly start a new acquisition by bypassing the standard procedure for entering the patient's mandatory personal data (Name, Surname and Date of Birth). The software automatically creates, in a completely transparent way to the user, a temporary patient, to whom, at the end of the acquisition, the correct personal references can be associated. This function allows you to make quick recordings in the event that the patient manifests a sudden crisis or to be able to manage emergency situations, where the patient's personal data have not yet been recovered and it is necessary to acquire the signal instantly.

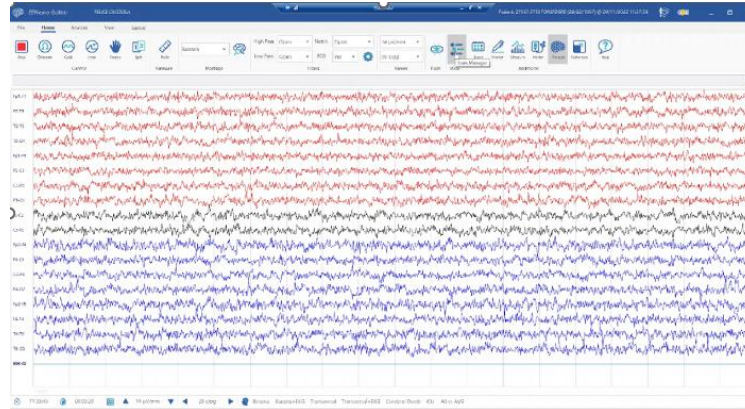
Data Browser

The "Data Browser" utility allows you to create a copy of the data on optical media such as CDs or DVDs or using USB flash drives. Galileo Data Browser offers the possibility of using two different types of viewers, with which it will be possible to view the data previously stored without the need to rely on the EBNeuro software, effectively creating a stand-alone reading tool.



Advanced Viewer

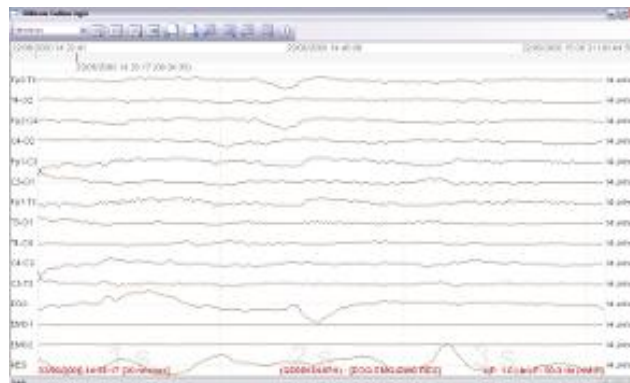
The Advanced Viewer is based on the .NET structure, replicating exactly the viewer used by Galileo, providing the user with many useful tools to navigate within the layout, make measurements, customize the mountings, etc.



Light Viewer

The Light Viewer, as the name suggests, is easier to use because only the main commands are active to allow the revision of the layout. The Light Viewer does not take advantage of the .NET structure, so it also guarantees greater "lightness" from the point of view of the overall space occupied. With this configuration, the icons for changing the display parameters are particularly intuitive and easy to interpret even by non-expert users.

This type of viewer is particularly suitable for exporting data following a brain death assessment.



Scheduled tasks

Scheduled tasks represent instructions stored within a user-defined protocol that Galileo will EEG.NET execute automatically once that protocol is activated and executed.

The user can enable scheduled operations when creating an automatic protocol or by calling up the appropriate item during acquisition.

For each operation, the "Delay" is represented, which indicates the delay offset of the start of the operation itself, starting from the general start of the protocol. The "Duration" represents the period of execution of the operation.

State Manager

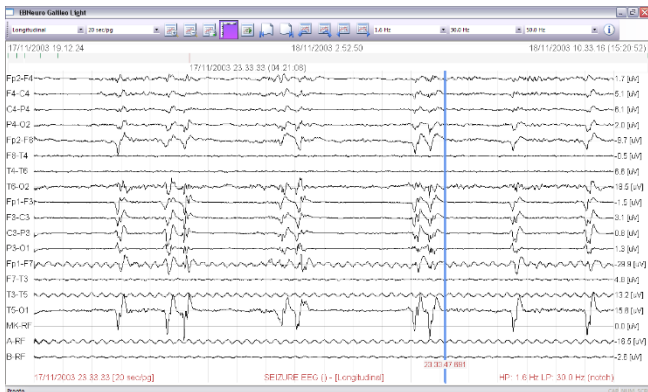
The State Manager is a tool, available in the "toolbox" section, for the automatic management of states in real time, thanks to which it is possible to set the type, duration and a possible state after the end of each execution. As you can see in the figure, to use the State Manager you need to set the box in the current layout, select State Manager, define a protocol with state and post state with relative duration, possibly save different protocols in the library and, once everything has been configured, start the execution. It is also possible to anticipate the closure of the primary state by allowing the Post-state to run immediately. This new process is particularly suitable for the automatic management of Hyperpnea and Post Hyperpnea, ensuring maximum flexibility.

Threshold States

The Management of Threshold States offers the doctor a useful and versatile tool to facilitate real-time identification during the acquisition of particular events, relating to the exceeding of a certain threshold of width of the trace and according to its duration.

Leaving maximum freedom in setting the parameters, both of the EEG channel group and of the single polygraphic channels, the customer has the opportunity to highlight particular clinical or artefactual events. The tool, which can be freely enabled or not, allows you to automatically enter a state selected by the user when the conditions defined by the set parameters occur. For this reason, the Threshold States Management is not a tool for self-diagnosis, but a support to facilitate rereading and to speed up reporting, also allowing the possible modification/deletion of the generated statuses. The figure shows the characteristics of the parameters for the Threshold State Management and the related Flow Chart.

EEG2Go



The EEG2Go utility allows you to create and associate an executable file (*.exe) to a single EEG data, allowing you to quickly launch the Light EEG viewer with a double click and open the EEG trace stored inside.

Unlike the Data Browser, the EEG2Go is more versatile because it can be created, as well as on optical media (CDs and DVDs), also on external memories such as Hard Disks and USB sticks and on the local PC by selecting

an internal save path.

These features make the EEG2Go an effective and quick to use review tool, effectively transforming any PC into a reader station and with the peculiarity that a single executable file is easier to manage and "transport" than a standard data browser that incorporates many more files and folders.

With EEG2Go it is possible to make precise measurements thanks to the new slider for Light viewer.

One of the main features of EEG2Go is related to the small size of the executable file, which occupies only about 3.5 Mb, without the need to install any component of Galileo NT.

Alarms

There are alarms that signal when the impedance threshold for each electrode is exceeded. When evaluating contact impedances (ohmmeter):

- 1) on the head the display shows differently the impedances of value higher than the set threshold and
- 2) Also on the head, the bushings relating to the inputs of the electrodes on which an impedance above the threshold is measured light up.

At the interface level, the software represents all the electrodes (poly and bipolar eeg) on a stylized head and colors them green/red depending on whether the impedance value (listed alongside) is below/above the threshold.

The system is also equipped with specific alarms (visual and acoustic) for patients in Intensive Care that alert clinical staff in the event of exceeding pre-set thresholds on all possible trends that can be set

Technical specifications

NEUROTRAVEL LIGHT ACQUISITION MODULE:

Canals	49 total inputs of which: 32 monopolar channels 8 bipolar channels (4 pairs) 1 oximeter channel (for 3 digital signals: SpO2, HR and Ptt) (opt.) 5 GND and 3 NE
Electrode Connections	32 active – one connection for each input (monopolar EEG) 8 active – two connections for each input (bipolar) 8 additional inputs, including GND and Multiple References (NE)
Contact impedance	1-100 KOhm +/- 10%
Bandwidth	Monopolar/Bipolar Channels: 1/4 Fc
Storage Frequency (32 kHz Sampling)	128, 256, 512, 1024, 2048 Hz
A/D Conversion and Resolution	24 bits sampling $\Sigma\Delta$ ADC
Dynamics	Monopolar/Bipolar: +/- 5mVac – +/-300 mV DC offset
Digital filtering	Time/frequency configurable (for high-pass filter) Configurable in the values to be used in acquisition/re-reading
Noise	< 0.5 μ Vrms
CMRR	> 100 dB
Other Interfaces	1 matrix of LEDs per ohmmeter (blue LED on the edge of each bushing) 4 LEDs for signalling the ohmmeter threshold 1 multifunction control button for marker signaling – also used for ohmmeter threshold selection 1 pre-assembled headphone connection 1 auxiliary connector with UART for oximeter – Trigger IN – FLASH_OUT (Flash Led Stimulator powered ext) 1 auxiliary connector for the reference electrode (NE) and isolated patient earth interconnect (GND)
Communication with HOST PC	Software-managed: USB 2.0+ Serial

DIMENSIONS AND WEIGHT

Width (cm)	12
Height (cm)	3,1
Depth (cm)	17,4
Weight (kg)	~0.3

COMPUTER (a higher quality model may be included at the time of submission)

Characteristic	Value	Source
Minimum technical characteristics	Optiplex XE4 Small Form Factor (SFF) Desktop Case, Black	
Dimensions	H 926 mm, W 290 mm, D 292 mm	
Weight	5.26 Kg approx	
Power supply	100V/240V-50/60Hz 300W	
Motherboard	DELL Inc. 0N5X78	
Slots on M/B	2 PCI-e Low Profile	
I/O Ports	1 x USB Type-C 3.1 Gen 2 (front); 5 x 3.1 Gen 1 Type-A (1 front, 4 rear) and 4 x 2.0 (2 front, 2 rear); 1 RJ-45; 3 Display Port; 1 line-out (headphones/speaker retro); 1 Universal Audio Jack (front speaker/mic)	
Video card	Integrated (Intel(R) UHD Graphics 770)	
Processor	Intel(R) Core(TM) i7-12700 CPU @ 2.10GHz 12core	
RAM	16GB 2666 MHz DDR4-SDRAM	
Hard disk	1 x 1TB 3.5inch Serial ATA (7,200 Rpm) + 1 x 1TB SSD	
Audio	Integrated	
Additional Network	Intel(R) Ethernet Connection I219-LM PCIe Low Profile	
Burner	8x Max Slimline DVD+/- RW	
Mouse	Optical USB 3 buttons + wheel, black color	
Keyboard	USB color black	
Operating system	Microsoft® Windows® 11 Professional (64-bit)	

"Document containing parts to be considered secret for the purposes of disclosure in the event of publication and request for access to the documents as provided for by Articles 35 and 36 of Legislative Decree no. 36/2023"