

# BE PLUS PRO Standard System

## Workstation Version

*Technical report*



**BE PLUS PRO Standard**  
(Illustrative Image)

### BE PLUS PRO LINE

The most powerful and versatile electrophysiological acquisition unit ever

### FOCUS ON

Workstation version

- 49 EEG/Polygraphic inputs
- LAN, USB and WIFI connection
- EEG video with PTZ camera (optional)
- Medical workstation cart
- Wide range of data storage possibilities
- HL7 interface

CND: Z12040104 / RDM: 1345707

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## GENERAL DESCRIPTION

BE Plus Pro Standard "Workstation" version, is the state-of-the-art technology for the acquisition and processing of electrical signals generated by the central and peripheral nervous system and for all types of electrical signals generated by the human body. Features of excellence, combined with the typical modularity that unites all EB Neuro systems, ensure the highest level of functionality in the main diagnostic investigation activities.

BE Plus Pro Standard has been studied taking advantage of the decades of activity and experience acquired by EB Neuro in this specific field, and it finds its optimal placement in the study of the cerebral electrical activity aimed at routine EEG, LTM, EP and the execution of Brain Death Assessments. BE Plus Pro Standard "Workstation" version, also allows the realization of patient monitoring through Digital Video EEG camera, remotely controlled via software or control and / or video interface inside the instrument. The high performance of this solution allows the easy realization of any movement, even small and fast.



taking  
experience  
and it finds  
cerebral  
Video EEG,

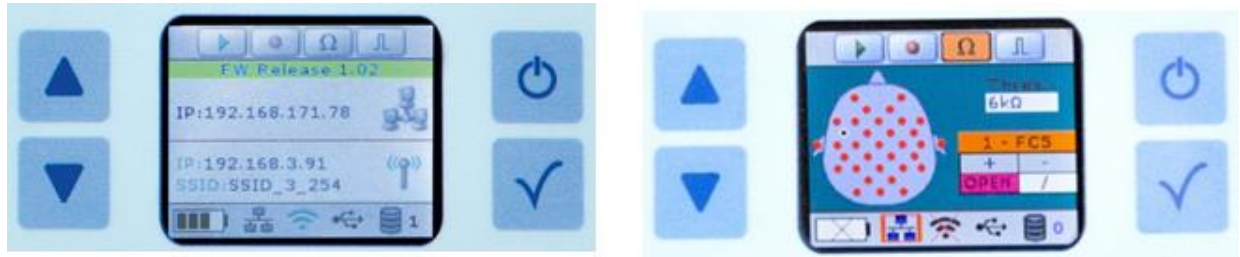
realization of  
with PTZ  
via remote  
instrument.  
the easy  
fast.

## HARDWARE MODULARITY

BE Plus Pro STANDARD acquisition unit has **49 total inputs, of which 26 monopolar, 16 bipolar (8 pairs), operating both in AC and DC and 7 additional inputs including GND and Multiple Reference (NE)**. There is an integrated self-calibrating saturation meter, which can be used with direct-attached sensors, providing Pleth, HR and SpO2 signals (3 additional digital channels).

With reduced weight and size, this unit is equipped with a color display for visualization of traces, impedance and control buttons, useful during patient fitting to facilitate setup operations and an effective control of the examination.

In addition, each input allows to make an evaluation of the contact impedances of the electrodes through colored LEDs.



BE Plus Pro Standard can also be equipped with:

- N.1 Wireless module (WIFI)
- N.1 removable and rechargeable battery pack
- N.1 internal memory module

The bipolar channels can also be used as referential (for a total of 34 referential channels), while according to the needs all channels can work both in AC and DC.

The analog-to-digital converter works at a sampling rate of 32 KHz for all channels and, according to the needs allows to select the number of samples that can be stored.

A rejection of >160 dB combined with residual noise < 0.15  $\mu$ V rms, 24 Bit resolution and dynamics up to 600mV guarantee maximum signal fidelity and cleanliness.

A flash LED/Goggles visual stimulator, equipped with wide-spectrum white light, is capable of handling an unlimited number of programmable protocols and manual sequences.

## Connectivity

BE Plus Pro Standard is interfaced to the computer in both USB, LAN and WIFI modes.

**LAN mode:** when this is active, the acquisition module and the computer are interfaced through a single connection cable, which in addition to ensuring communication and data transmission, guarantees the power supply to the acquisition module. A snap-on/off mechanism of the connection cable allows the acquisition head to be quickly, safely and easily connected and disconnected from the rest of the system, allowing the patient to be fully autonomous in cases where he/she needs to move.

*With the LAN mode active, the acquisition system works according to the same principle as traditional stationary acquisition systems.*

**Wi-Fi Mode (opzionale):** WIFI mode is always "listening", waiting to establish a secure connection the moment the LAN connection drops or is interrupted. When the WIFI mode is active, the acquisition module and the computer communicate through a secure wireless network connection "ad hoc" and the power supply of the acquisition module BE Plus Pro Standard is guaranteed by the battery pack integrated in it. Once the LAN connection is re-established, the system automatically returns to LAN mode while the WIFI mode goes back to "listening", ready to intervene again if necessary. The real strength that distinguishes BE Plus Pro Standard, is represented by the fact that this system integrates a unique operating principle, which guarantees continuous operation in any condition, exploiting and combining all the advantages, in terms of security, speed



and synchronism offered by LAN and WIFI technologies. In case both LAN and WIFI connection are not available, the working continuity is guaranteed by the presence of an internal memory of 16GB that, compatibly with the exceptional autonomy of the battery, ensures 7 hours of recording even at high sampling rates in dynamic recorder mode. As soon as at least one of the two connection modes (LAN or WIFI) is restored, the acquisition module returns to communicate data in real-time and at the same time, in the background, an automatic process is activated that safely transfers all the data previously stored in the internal memory, synchronizing them to those present on the PC. This principle of operation ensures the continuity of recording without any loss of sensitive data, even in the absence of a direct connection (LAN) or WIFI.

**Holter Mode:** BE Plus Pro Standard can record without the need for a computer connection, thanks to the built-in controls in the head. All information necessary to start recording, such as impedance check and a preview of the tracks, will be shown on the color display integrated in the acquisition module. Once started the recording, EEG Holter type, the amplifier will save the data directly into the internal memory, until the memory or battery life is exhausted. The system can operate in this mode also connected to an external medical power supply with appropriate cable and medical power supply in order to extend the recording time available.

## **Transport cart "Workstation" Version**

BE Plus Pro Standard "Workstation" version is based on a medical trolley of small size and easy maneuverability, with small size and weight, rear door for the protection of wiring, interference shielding, isolation transformer, designed to be easily used in any situation. The trolley is specially designed to accommodate on multiple shelves (which can be positioned at will) all the components of the system with all possible options, such as PC latest generation high performance, high-resolution 22-inch color LCD monitor that can simultaneously manage all the traces acquired according to the protocol in use, keyboard and mouse and high performance laser printer for printing reports in A4 format.

The acquisition head and the LED Flash stimulator, can be housed either on the right or on the left side. The trolley, built in a robust manner, has 4 non-marking wheels, two of which are equipped with parking brake, and is designed to accommodate any future expansions/options. On the bottom is housed an isolation transformer with fuse and ground socket, which supplies all parts of the system making it compliant with the regulations in force. Automatic switching on and off of the isolation unit from the PC switch to facilitate ready-to-use operations. The features described above contribute to creating an ergonomic system that is easy to use and operate.

## **Optional Hardware**

### **Kit Video EEG HD con telecamera Ethernet.**

Kit includes:

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



### **Adult SpO2 Module for BE Plus PRO.**

Saturimetry interface module complete with reusable flexible sensor for Adults.

The offer includes Environmental Microphone Kit with pole support and camera support rod.

In addition, the offer includes EEG and VEEG accessory kit including 10 EEG headphones adult-small size and 5 headphones child-large size.

## **SOFTWARE MODULARITY**

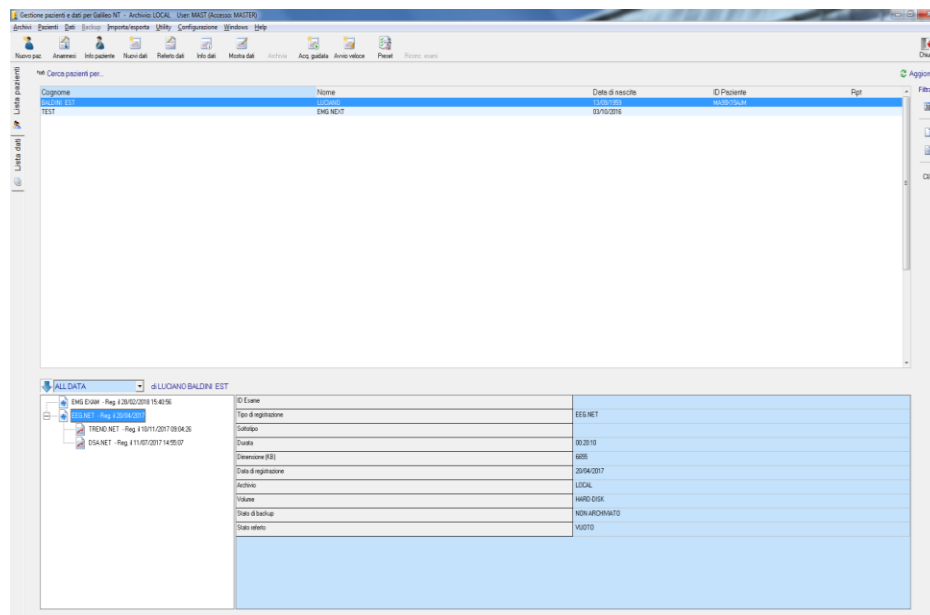
The Galileo line is now enriched with a new software package dedicated to the acquisition, reading and processing of the electroencephalographic signal. Galileo.NET completes the traditional methods in particular departments such as intensive care, operating room, polysomnographic clinic, allowing the prolonged acquisition of neurophysiological signals. The philosophy of Galileo.NET is inspired by two fundamentals: Multimodality and Monitoring.

Multimodality in that more than one process can be carried out simultaneously: acquisition, quantitative data analysis, printing, reading, remote consultation, file transfer, etc. Monitoring, with which we mean everything that allows the monitoring of the neurological activity of the patient: acquisitions prolonged in time and management of the same, through compressed representation, quantitative analysis of the EEG, on-line remote consultation, with the possibility of inserting/editing events.

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

But the power offered by this framework is more evident in the management of data on the network, as it realizes through the "broadcasting" the possibility of remote monitoring. The .NET technology allows, in fact, to use modules (acquisition, replay, processing, ...) indifferently in local or in network, making possible to distribute the application and to execute parts of it in local (for ex. user interface) and other parts in network (for ex. data acquisition).

## PATIENT/EXAM DATABASE



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

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

At the moment of his registration in the authorized users list, he receives an "access level or privilege" according to which he will be allowed or prevented certain operations. There are four levels of access available for database, exam and patient management: Reader, Writer, Master or Service.

**Service:** is typically an EBNeuro 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. Such a level can also be assigned to personnel from the health care facility that manages the system, but they must be particularly qualified not only in the mechanisms of the Galileo software, but also in issues related to the computer and in particular to the operating system under which Galileo runs.

**Master:** is the highest level among the non-technical users of the system, typically 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 insert new users in the authorized user list and can assign them an access level.

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

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

The organization of the information allows to quickly search, even on multiple archives, patients, exams, medical history, reports, backup archives on the basis of name, age, pathology, type of exam and date. A powerful statistical analysis, according to various levels of attribution of codes and values to data and patients, allows to extract useful and always updated information in a few steps, thanks also to the management of ISTAT Codes of Cities and Countries.

The editing system (PDF) of the patient's history and report is completely integrated in the Database, with the possibility to use predefined templates or to create and customize new ones according to the needs of the medical/technical staff.

The database is predisposed for interfacing between different Galileo acquisition stations by means of dedicated software and offers the possibility to create shared databases and workflows, as well as to read the exams on other PCs in the service network.

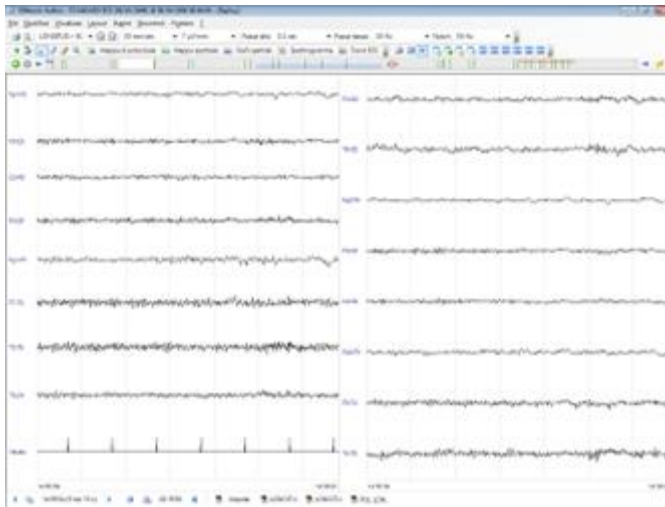
## Archiving

The functional archiving is dedicated to the management and safe execution of backup operations of all acquired data (patient records, tracings, reports and history), with the possibility of storing data on centralized archives residing on company servers and/or on optical media through an integrated burner (EEG2Go function):

- CD
- DVD
- Hard disk externals
- Blue Ray (optional)

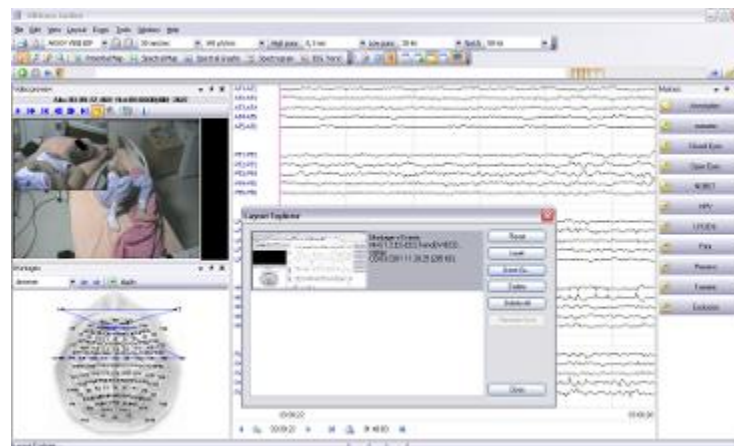
There is also a special "Data Browser" feature, which allows the storage on CD/DVD/USB Key of traces that can be read on any computer, without the need to install a specific application. This feature actually creates a stand-alone re-reading tool, fully compliant with the directives of the "Regulation containing the modalities for the ascertainment and certification of death" (Law of 29 December 1993, no. 578 - Ministerial Decree of 22 August 1994, no. 582 - updated by Decree of the Ministry of Health of 11 April 2008).

## Galileo Software – EEG.NET



The user interface is now completely configurable according to the modalities adopted by MS Office applications and capable of managing up to 6 windows to contain tracing, processing, Video EEG, Trend, etc. ...

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



### Framework tracks

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

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

A graphical clipping, available for each track, will instead allow you to hide the signal in its values above a certain threshold, for example to avoid that in the presence of

artifacts "dirty" traces overlap with the good ones, hiding the trend and therefore the information content.

Other useful properties are the manual dragging of traces vertically, the insertion of spaces (null traces) to better discriminate trends, the possibility to represent traces as: traces, histograms or sequence of numbers.

In order to improve the visibility of the track and its eventual elaborations, the viewer can, in presence of a suitable configuration of the video card, be "split" on two monitors, through a dedicated automatic control available from the interface.

### **Editing and Presets**

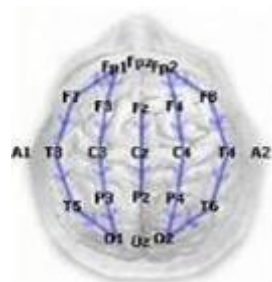
A window next to the traces allows the user to visualize graphically the available montages and, if necessary, to apply the desired one to the trace (replay/acquisition).

An unlimited number of EEG/polygraphic montages (bipolar, monopolar, in average reference) can be stored and redefined even for single traces. A special routine allows the reading preserving the exact sequence of montages that the operator had selected during the recording. The passage (or reconstruction) from one assembly to another is immediate both on the monitor and on the paper (in case of real-time printing).

You can also store an unlimited number of working protocols (Presets), different in amplification, filtering, mounting, time constant, paper sliding speed, type of calibration, photostimulation program, for many different uses in the recording of the EEG laboratory.

### **Event entry**

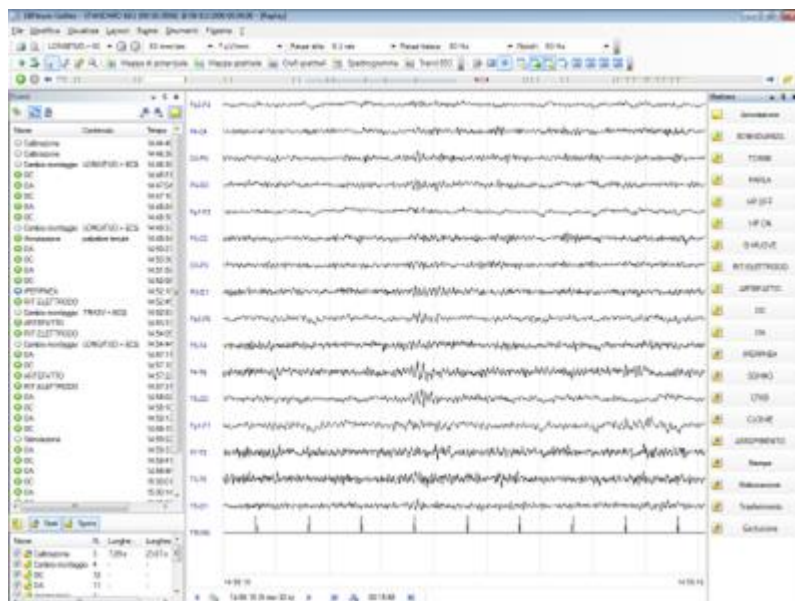
The list of events/states is available immediately below the tracks and the insertion of the same takes place with an easy double click on the corresponding "button". At any time the user can insert a new event that will be saved in the track.



## Photo stimulation

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

Arbitrary stimulation sequences can be set, including all available frequencies for the duration that is deemed necessary. During acquisition, the operator can activate or not



the stimulation program by pressing a single button or set the stimulation frequency on-line.

## Functionality during acquisition

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

- 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 check 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 control is carried out during the recording on the internal memory, the values are stored together with the trace.
- Total control of the light stimulation parameters, program activation, frequency modification, stimulus power, etc., displayed together with the trace
- Direct storage of signals with "full band" characteristics (maximum bandwidth of the amplifiers), independent of the filter values and time constant set by the operator for the display in acquisition

- Insertion of messages and annotations on the path also in automatic programmable mode
- Real-time printing on printer of all or part of the trace, including date, time, filters, sensitivity, time constant, paper speed and mountings
- Control through dedicated function of recording times, hyperpnea, etc.
- Editing of patient cards, trace cards, etc.
- Split-screen both horizontal and vertical, with the possibility of reviewing previous sections of the track being acquired, or other selected tracks, even via remote workstation
- Complete configurability of the workspace in "layouts" programmable by the operator
- Programmable filtering steps

### **Monitoring**

The 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, to have always under control the acquisition history in terms of events/states and interruptions. This is ensured by the presence of a "navigator" (more commonly navigation bar), in which appear the events that are entered by the user (hyperpnea, open eyes, closed eyes, ...) or automatically by the system (stimulation, calibration, ohmeter) during the acquisition or re-reading of the examination.

It is possible to visualize a List of Events to be placed side by side to the trace, which is continuously updated and on which it is possible to carry out operations of modification/deletion of the same and export to the report.

### **Split Track**

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

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

### **EEG/Video EEG reading**

In addition to all editing functions and insertion of states/events, the re-reading has convenient controls for scrolling the tracks and their visualization.

The mouse cursor can modify and take the form of a small hand with which to act on the track in order to scroll it in small steps, forward or backward in time. The visualization of the track plan can be compressed to the point of representing up to 5 hours per page.

The inspection of the track plan can take place in the following modes:

- standard sec/sec
- standard pag/pag
- by defining a step at will
- through events/states (event list, exam overview, navigator)
- Bookmarks to instantly find points of particular interest.
- The main functions of the reading section are as follows:
  - Automatic or manual page scrolling, scrolling in "EEG Mode".
  - Immediate reading on a single graphic table of all the messages and/or annotations inserted during the recording with automatic search of the same on the trace
  - Continuous visualization of the amplification parameters used
  - Reading of the track with reformatting of the editing and/or according to the editing used in the recording
  - Zoom of any particular of the track, analysis through "trend" graph (compressed display by means of extraction of parameters) for the quick search of paroxysmal phenomena
  - Digital filter function applicable on a single track or on all tracks of the reading assembly
  - Selection of tracks that are not of interest to be discarded and/or of interest for processing and/or archiving, printing, etc.
  - FFT for single track or portion of track
  - Measurement of amplitude/time/delta frequency by cursor
  - Simultaneous comparison of different tracks on the screen (to archive, from CD Rom, from other units on the network) to make quick comparisons between different recordings, with split screen both horizontal and vertical.

## **Print**

This selection allows you to launch the Print process on all the selected pages. To do this, just call Print from the File menu and in the dedicated window, through the item Selection, choose "Print" to print the pages selected for this purpose. Obviously the Print process can be done on any other type of selection, by 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 measures and zoom, the user will find useful the original functions of Ruler and Measures with marker for latency and amplitude. The "Ruler" allows the user to get an idea of the amplitude of the track, sizing the vertical axis of the same in  $\mu V$  according to the sensitivity of representation most common among the tracks.

The "Track Inspection" control allows the user 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 (optional)**

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

The quantitative analysis of the EEG allows to analyze signal epochs with the aim of extracting significant parameters whose representation is carried out in particular windows, always recallable from the viewer and joinable to the traces panel, as well as saved within the user layout. The results of these processes become part of the EEG.NET examination as "child" examinations.

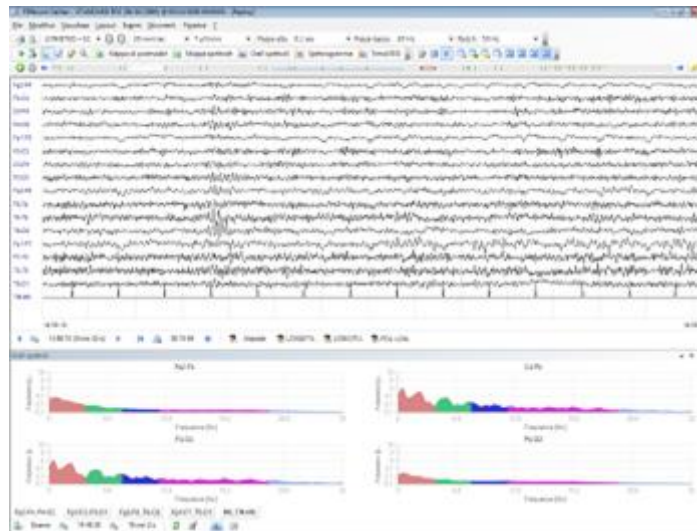
An easy way to carry out the spectral analysis of the trace, according to the chosen montage and on the following time intervals, is available in the re-reading:

- current page
- states (with the possibility of excluding possible internal states of no interest)

The graphical representation of the spectra (power/amplitude spectrum) is based on the definition of any number of spectral bands, identified by appropriate color. It has been introduced the possibility to represent the power/amplitude in the various bands in the form of pies, with an indication of the relative power for each band (accompanied however by the corresponding absolute value). In addition to giving the fundamental possibilities to acquire the EEG signal for a long time, the system allows to create

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### Quick Start function



The "Quick start" function allows you to quickly start a new acquisition by-passing the standard procedure for the insertion of the patient's compulsory personal data (Name, Surname and Date of birth). The software automatically creates, in a way that is completely transparent to the user, a temporary patient to whom, at the end of the

acquisition, the correct personal data can be associated. This function makes it possible to carry out rapid registrations in the event that the patient manifests a sudden crisis or to manage emergency situations, where the patient's personal data have not yet been recovered and it is necessary to acquire the signal instantly.

### **Advanced Viewer**

The Advanced Viewer is based on the .NET structure replicating exactly the viewer used by Galileo, making available to the user many useful tools to navigate within the track, make measurements, customize the assembly, etc..

### **Visor Light**

The Light Viewer, as the name suggests, is easier to use since only the main commands are active in order to allow the review of the layout. The Light Viewer does not use the .NET structure, therefore it also guarantees a greater "lightness" from the point of view of the global space occupied. With this configuration the icons for the modification of the visualization parameters are particularly intuitive and easy to interpret even by a non-expert user.

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

### **Potential Maps and 3D Spectral Maps (optional)**

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

You can select and set the following calculation parameters:

- Single value: calculates the instantaneous potential values taking the cursor position as reference
- Epoch: indicates the time interval starting from the cursor position from which a potential value is extrapolated according to the type of Aggregator
- Average: returns the average of all the potential values
- Absolute Average: returns the average of the absolute values of the potentials
- Maximum: returns the maximum of the potential values
- Absolute maximum: returns the absolute maximum of the potential values
- Peak-to-peak: returns the maximum excursion between the maximum and minimum potential values.

It is also possible to manage with Galileo EEG.NET the visualization of the spectral maps both in 2D and 3D mode, configuring, among different computational options, each interpolation step, grid dimensions, contour definition and relative approximations, etc. It will be possible to visualize single maps (of epochs, pages or entire examination) or

to divide the selected interval in more maps and recall singularly one at a time with a simple click of the mouse.

### **Trend Analysis (optional)**

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

### **Scheduled Operations**

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

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

For each operation is represented the "Delay" 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 inside 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 post-state at the end of each execution. As you can see in the figure, to use the State Manager it is necessary to set the box in the current layout, select State Manager, define a protocol with state and post-state with relative duration, eventually save different protocols in the library and, once everything is configured, launch the execution. It is also possible to anticipate the closing of the primary state by allowing the immediate execution of the Post-state. This new process is particularly suitable for the automatic management of Hyperpnea and Post Hyperpnea, guaranteeing maximum flexibility.

### **Threshold States**

The Threshold State Management offers the physician a useful and versatile tool to facilitate the real time detection during the acquisition of particular events, related to the exceeding of a certain threshold of amplitude of the trace and depending on its duration.

Leaving maximum freedom in the setting of parameters, both of the EEG channel group and of the single polygraphic channels, the customer has the possibility to highlight particular clinical events or artifactual events. The tool, which can be freely enabled or not, allows to automatically insert a state selected by the user when the conditions defined by the set parameters occur. For this reason the Threshold State Management is not a tool for self-diagnosis, but a support to facilitate the re-reading and to speed up the report, also allowing the possible modification/deletion of the generated states. The characteristics of the parameters for the Threshold State Management and the relative Flow Chart are highlighted in the figure.

### **GDPR**

**The offered system is compliant with the General Data Protection Regulation (Application EU Regulation 2016/679) in force since May 25, 2018 (so-called GDPR):**The provided systems are equipped with Galileo NT Line software applications that meet the requirements of EU Regulation 2016/679 by implementing, for example, features of encryption of sensitive data (master data, reports, medical history), software access control, protection of exam CDs/DVDs, secure data storage (protection from deletion, corruption or theft), improved login management, timed password expiration, minimum password requirements, automatic logout for inactivity, logout/login on the fly, report versioning, disaster recovery, etc.

## TECHNICAL SPECIFICATIONS

### Normative applicate

93/42/CEE 1998 (s.m.i. 2010)	EN ISO 14971 2012 Dispositivi medici
(MDD) Direttiva 2007/47/EC e 2002/96/EC	IEC 62133 Ed 2 / 2012
EN 60601-1 Ed. 3 / 2006	EN 62304 Ed. 1 / 2006
EN 60601-1-2 Ed. 3 / 2007	EN ISO 14155-1 Ed. 1 / 2009
(MDD) Direttiva 2007/47/EC e 2002/96/EC	EN ISO 14155-2 Ed. 1 / 2009
EN 60601-1-6 Ed. 3 / 2010	EN ISO 9919 2009 Apparecchiature
IEC 60601-2-26 Ed 3.0	ISO 13485 2007 Dispositivi medici
EN ISO 15223-1 2012 Dispositivi	ISO 9001 2008 Quality management system

### Classification according to MDD 93/42/EEC

Medical, Active, Non-Invasive Device of class **II b**

### Protection type against electrical hazards

Class I device, when powered by specific power supply (model SINPROMPU51-106, or model ICCNEXERGY MWA050015A).

Internally powered appliance, when powered by specific internal rechargeable battery pack.

### Degree of protection against direct and indirect electrical contacts

Type BF (Patient Inputs)

Type B (Auxiliary Input/Output port)

### Degree of protection against Penetration of solids and liquids

Comune (IPX0)

### Operation mode

Continuous, within specified limits

## BE PLUS PRO STANDARD ACQUISITION MODULE

<b>Channels</b>	<b>49 total inputs of which:</b>  26 AC/DC monopolar + 16 bipolar (8 pairs) AC/DC with possibility to use them as additional AC/DC monopolar, 4 GND and 3 NE, saturimetry predisposition with 3 channels SpO <sub>2</sub> , HR and Plethism.
<b>Contact impedance</b>	1-100 K $\Omega$ +/-10%
<b>Storage frequency (32kHz sampling)</b>	128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768 Hz
<b>Bandwidth</b>	Monopolar/bipolar channels: DC (0 Hz) to 8,198 Hz (1/4 Fc)
<b>A/D conversion and resolution</b>	EEG channels: 24 bit sampling $\Sigma\Delta$ ADC
<b>Dynamics</b>	Monopolar/Bipolar: +/- 4.10mV AC +/- 1200mV DC
<b>Noise</b>	Offset +/- 131mV DC (256 total)
<b>CMRR</b>	Bipolar: +/- 307mV DC
<b>Electrode Connections</b>	<0.15 $\mu$ Vrms
<b>Other Interfaces</b>	>160dB

## BATTERY

<b>Internal battery life</b>	8 hours, rechargeable from system or external charger (optional)
<b>Input</b>	Connection with specified AC/DC power supply
<b>Absorption</b>	<8.8W

<b>Interfaces</b>	1 green Led (Battery charger powered)
<b>Output connector</b>	1 yellow Led (Battery charging)

## SATURIMETER

<b>Model</b>	<i>OEM III Module</i>
<b>Oxygen Saturation Range</b>	0%-100%
<b>Heart Rate Range</b>	18-321 pulsations per minute
<b>Wavelengths using Nonin sensors</b>	Red: 660 nm @ 0.8 mW maximum average Infrared: 910 nm @ 1.2 mW maximum average
<b>Sensors</b>	All those compatible with the OEM III Module saturation meter, belonging to the families:  Internal Spring Finger Clip, External Spring Finger Clip, Flex, Ear Clip, Reflectance Sensor, Reusable, Soft Sensor, Disposable.  Additional models specifically mentioned by EB Neuro

## DIMENSIONS AND WEIGHT

	<i>Acquisition unit</i>	<i>Wheeled system</i>
<b>Width (cm)</b>	12	78
<b>Height (cm)</b>	21	125
<b>Depth (cm)</b>	4,8	90
<b>Max Weight (g)</b>	600	35

## PC

<b>Brand and Model</b>	<i>Optiplex XE3</i>
<b>Type</b>	Compact Desktop
<b>Power</b>	100/240V-50/60Hz 315W
<b>Processor</b>	Intel® Core i5-8400
<b>Video Card</b>	Intel® UHD Graphics 630

Ram	8 GB expandable to 16 GB
Hard Disk	1 TB + 1 TB + SSD 256 GB
CD/DVD R/W	8x DVD+/- RW Drive
Operating System	Microsoft® Windows® 10 Professional
Keyboard and mouse	Including
Software license	Microsoft Office 2016: MS Word, MS Excel, MS Power Point, MS Outlook e MS OneNote
(optional on request)	22"
Monitor	Laser B/N

***"Document containing parts to be considered secret for the purposes of disclosure in the event of a request for access to documents" as provided for in Art. 53 of Legislative Decree no. 50 of 18/04/2016 and more specifically pages 19-20-21-22"***

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