



Viewing and Editing WatchPAT Signals

Operation Manual

Itamar Medical OM2198460

Software Operation Manual



Caution: Federal law restricts this device for sale by or on the order of a licensed healthcare practitioner

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Date	Revision Level	Author	ECO No.	Change Description
Aug 2025	1			1st Release
Nov 2025	2			Viewer version 1.2: Major updates include undo/redo for event editing, persistent user settings and montage preferences, customizable event colors, multi-night study support, clearer event rendering and drag/resize visuals.
May 2026	3			Viewer version 2.1: First non-limited release. Includes Integrated viewer complete release, improved event deletion and replacement workflows, cursor time display, segment-selection information and accuracy improvements.

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1. Introduction to the viewer

The Viewer is the application used to review WatchPAT study signals and edit events generated in zzzPAT or zzzPATAnalyzeReport.

1.1. Intended use of the WatchPAT™ products

The WatchPAT devices are non-invasive home care devices for use with patients suspected of having sleep related breathing disorders. The WatchPAT™ device is a diagnostic aid for the detection of sleep related breathing disorders, sleep staging (Rapid Eye Movement (REM) Sleep, Light Sleep, Deep Sleep and Wake), snoring level and body position. The devices generate a peripheral arterial tonometry Respiratory Disturbance Index ("PRDI"), Apnea-Hypopnea index ("PAHI"), Central Apnea-Hypopnea index ("PAHlc"), PAT sleep staging identification (PSTAGES) and optional snoring level and body position discrete states from an external integrated snoring and body position sensor. The device's PSTAGES and snoring level and body position provide supplemental information to its PRDI/PAHI/PAHlc. The device's PSTAGES and snoring level and body position are not intended to be used as the sole or primary basis for diagnosing any sleep related breathing disorder, prescribing treatment, or determining whether additional diagnostic assessment is warranted.

PAHlc is indicated for use in patients 17 years and older. All other parameters are indicated for 12 years and older.

1.2. The viewer

The Viewer can be opened in two modes: as a standalone web application in a supported third-party browser, or as an integrated application launched from the zzzPAT Microsoft PC application. In both modes, users can review studies, make manual event edits, save those edits, and adjust the layout to suit their workflow.

1.3. Overview

This manual explains how to review signals, navigate the display, and edit events in the Viewer. Minor differences may exist between the web and integrated versions. The web version is typically launched from external patient-management software, such as CloudPAT, while the integrated version is launched from zzzPAT.

For device-level instructions for WatchPAT™ products and for further information regarding zzzPAT, refer to the ZOLL Itamar Medical website (itamar-medical.com).

2. Hardware and Software requirements

The Viewer requires the hardware environment described below.

2.1. Integrated viewer

The Integrated Viewer requires zzzPAT to be installed and follows the hardware and software requirements defined for the zzzPAT application.

2.2. Web viewer

The Web Viewer requires the following minimum environment:

- A quad-core i5/i7-class CPU or equivalent at 2.2 GHz or higher
 - Minimum screen resolution of 1920 x 1200
 - 8 GB RAM or higher
 - Networking and security: Gigabit Ethernet (1 Gb/sec)
 - A Chromium browser (for example, Chrome, Microsoft Edge, or equivalent). Firefox is not supported.
 - Operating systems: Windows 10* or later, or macOS 11 Big Sur or later
- * Window 10 - Requires extended security updates program from Microsoft or equivalent

2.3. Cybersecurity

Please refer to the zzzPAT Operation Manual for important information about cybersecurity provisions and management. For information and guidance on implementing proper cybersecurity in the healthcare IT environment, see "Health IT Privacy and Security Resources for Providers" at <https://www.healthit.gov/topic/privacy-security-and-hipaa/> for information and guidance on implementing proper cybersecurity in the healthcare IT environment.

Please follow the recommendations below when using the Viewer application.

- **General Cyber Safety Practices**

- Keep Your browser Updated: Always keep your browser updated with the latest security patches and software updates. These updates often include important security improvements.
- Avoid Using Public Wi-Fi: Do not connect to unsecured, open Wi-Fi networks, as they can expose your data to potential risks. Use trusted, password-protected networks whenever possible.
- Protect Your PC with Strong Security: Set a strong password, PIN, or MFA on your PC to prevent unauthorized access.
- Be Cautious with Links and Attachments: Avoid clicking on suspicious links or downloading attachments from unknown sources, as these can contain malware or phishing attempts.
- Report unusual app behavior or suspected compromise to Itamar Medical support (customersupportinc@itamar-medical.com)
- **Device and Network Requirements**
 - Network Security: Your PC must be connected to a secure local area network, one that provides protection against computer viruses and other harmful code or traffic. Ensure the local area network uses appropriate protection, such as only using secure wireless technologies, firewalls, intrusion detection and prevention systems, and vulnerability scanners.
 - High-level description of the device features that protect critical functionalities of zzzPAT Viewer:
 - There is no personal data or identifying information stored.
 - Communication between zzzPAT Viewer and the cloud is done via a secured HTTPS communication protocol.
- **List of network ports, communication interfaces, and data endpoints**

Port / Interface	Direction	Functionality	Approved Endpoint
TCP 443 (HTTPS/TLS 1.2 and above)	Outgoing + incoming	Secure communication for review and analysis of study data. Outgoing data contains no PHI/PII data	Itamar Medical Cloud

- **Response to Product-Security Incidents and Recovery**
 - In the event of a product-security incident, or if you detect malware (malicious software) on the system, immediately report the incident to your Healthcare IT Security department and report the incident by sending e-mail to: customersupportinc@itamar-medical.com
 - Itamar Medical may require users to install a security patch. Notifications will be sent by email to registered contacts with instructions (targeted to affected browser type if needed).
- **Software Bill of Materials (SBOM)**
 - Itamar Medical maintains a detailed Software Bill of Materials (SBOM) for its application, outlining all software components used to ensure transparency and security. If you wish to obtain a copy of the SBOM, please contact our support team at customersupportinc@itamar-medical.com.
- **Logging and Monitoring**
 - Product engineering groups within Itamar Medical monitor continuously for new security vulnerabilities of our systems, including those identified by third-party-software and operating-system vendors and those reported from individual healthcare organizations
- **Software Updates and End of Support**
 - Itamar Medical manages device and software lifecycle through a documented End-of-Support procedure. When a supported application, or supported device or supported browser reaches end of support, Itamar Medical will notify customers in advance through established communication channels. This ensures hospitals and users have sufficient time to plan upgrades or replacements. As part of End of Life procedure, vulnerabilities are reviewed and support is provided based on risk.

3. Using the viewer

The Viewer supports study review, signal navigation, and manual editing of events and sleep stages.

Users can review all recorded signals and the events associated with the study.

Available channels, whether calculated or raw, are displayed as synchronized graphs.

Depending on the study, these may include PAT, SpO2, pulse rate, raw pulse rate, PAT amplitude, snore, and body position (BP).

Note: Snore and BP channels are available when the RESBP sensor is connected.

The RESBP chest-movement channel is available when the RESBP sensor is connected.

The Viewer is intended to be used by a healthcare professional trained in the operation of this product.

3.1. The display screen

The main screen displays the WatchPAT™ graphs together with events identified by automatic analysis. All traces are aligned to a common time base so the study can be reviewed across channels.



The Screen Header displays “Viewer,” followed by the patient ID and study date.

Events identified by Automatic Analysis are shown in the Signals Display Window.

Hover the mouse pointer over an event to display a tooltip with the following details:

- Event name
- Event source (Analysis or User)
- Start time
- Duration

3.1.1. The all-night window

Any displayed channel can be pinned to an All-Night Window so it remains visible while the main display is zoomed to other time ranges.

To pin a channel, right-click the channel and select “Pin channel as All Night,” or enable the pin icon in the Channel List drop-down menu:



You can change a channel’s height by dragging its upper or lower edge. To restore the default sizing, right-click and choose “Reset height” or “Reset heights of all channels,” or use the toolbar button that resets all channel heights:



To remove the All-Night Window:

Use either of the same controls: right-click the pinned channel and select “Unpin channel,” or clear the pin icon in the Channel List drop-down menu.

Key features of the All-Night Window:

- The Range Indicator Mask appears as a highlighted rectangle and marks the portion currently shown in the Signals Display Window.
- You can move to another part of the study by clicking within the All-Night display or by dragging the highlighted rectangle.
- When the All-Night Window is shown, right-clicking within its title area opens a context menu with actions such as changing the source channel, inverting the data, unpinning the channel, and other display options.

Right-clicking the graph area of the pinned All-Night channel opens additional channel actions.

3.1.2. The active channel

Click a channel title or graph to make that channel active and highlight it.

Right-clicking a channel title or graph also makes that channel active and opens a context menu. In context menus, a checkmark next to an item indicates that the option is currently enabled or shown; selecting the item toggles the option on or off.

To select multiple channels, press Ctrl while left-clicking additional channels. Some toolbar actions apply only to the selected channels rather than to a single channel or to all channels.

3.1.3. The status bar (integrated only)

The Status Bar at the bottom of the integrated Viewer shows:

- Real Time Clock
- Highlighted segment start time
- Highlighted segment end time
- Duration
- Time mode (REL/ABS)

3.2. Signal layout display and options

3.2.1. Montage

Users can create, save, and reuse personalized montage layouts from the Montage drop-down menu in the top toolbar.

A montage is a saved display layout for the Viewer.

It determines which channels appear on screen, their order and size, which channel is pinned in the All-Night Window, and other display settings.

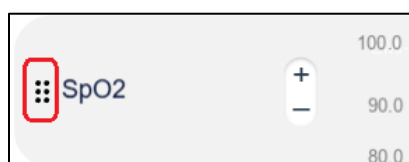
You can maintain multiple montages for different review needs and switch between them at any time from the Montage drop-down menu in the top toolbar:



From the same Montage menu, user montages can be saved, renamed, deleted, or set as the default.

Montage settings are stored per user.

Channels can be reordered by dragging them with the handle shown here:



To add or remove channels from a montage:

To add channels, show the required channels from the Channel List drop-down menu, then save the montage.

To remove channels, hide the required channels from the Channel List drop-down menu or from the channel right-click menu, then save the montage.

Itamar Montage

If no other montage has been created and set as the default, the Viewer opens with “Itamar Montage.” This layout is the recommended default for study review and editing and was created by medical specialists.

Note: The Itamar Montage cannot be modified or deleted.

3.2.2. Vertical zoom

You can change the vertical zoom for an individual channel in several ways. These actions adjust the Y-axis span of the selected channel:

- Shift + Mouse Wheel / Shift + Trackpad: zoom vertically around the cursor location.
- Right-click and drag on a channel’s Y-axis: select the vertical range to zoom into. A black selection box appears, similar to a segment selection. When you release the mouse button, the selected range is applied to the Y-axis.
- Zoom In/Out Buttons: use the gain buttons on the channel to increase or decrease vertical zoom:



To return a channel to its automatic scaling, right-click the channel and select “Fit to Window.”

3.2.3. Time window selector

Use the Time Window Selector in the top toolbar to choose from predefined time windows. Changing the time window zooms all time-synchronized channels, including regular channels and channel groups, while keeping the current start time and changing only the end time.

3.2.4. Fit to window

Fit to Window scales the selected signal so it uses up to 80% of the available channel height.

Fit to Window applies only to the portion of the study currently displayed on screen. It is disabled when the user pages through the study or scrolls. The option can be enabled for one channel or for all selected channels by right-clicking the channel title or by using the global toolbar button:



3.2.5. Horizontal grid

You can show or hide the horizontal grid for channel Y-axis labels. Enable or disable the grid for a single channel by right-clicking that channel, or for multiple channels by selecting the required channels and using the toolbar button:



3.2.6. Relative/absolute time

This setting switches the study display between Absolute Time and Relative Time.

In Relative Time mode, the start of the study is shown as 00:00:00 on the Viewer x-axis, and all times are measured from the start of the recording.

In Absolute Time mode, the x-axis shows the actual clock time recorded by the WatchPAT™ device.

Use the toolbar buttons to switch between these time modes: ABS  or REL 

The cursor time display follows the selected time mode and shows the corresponding Relative or Absolute time within the study.

3.2.7. Horizontal zoom

To zoom in horizontally, use the mouse wheel when the cursor is in “Wheel zooms” mode (enabled with ) , select a segment and choose “Zoom In” from the right-click menu (hotkey: I), or click the Zoom In button in the top toolbar: 

When you zoom in, the Time Base is updated so the highlighted segment fills the full width of the Signals Display Window.

To zoom out horizontally, use the mouse wheel in “Wheel zooms” mode, choose “Zoom Out” from the right-click menu (hotkey: O), or click the Zoom Out button in the top toolbar: 

To return immediately to the full-study view, double-click anywhere in the graph area or choose “All Night” in the Time Window Selector. This restores the original time scale.

3.2.8. Channel group

A channel group combines up to five channel signals into a single stacked display. To create a group, select the channels, right-click one of them, and choose the grouping option.

New channel group appears at the bottom of the display by default, but it can be dragged to any position in the channel list.

After a group is created, signals can be added to or removed from it, up to a maximum of five signals.

3.2.9. Segment selection

Create a segment selection by clicking and dragging horizontally across the graph area of time-synchronized channels, including regular channels and channel groups. The selected region appears as a highlighted rectangle spanning those channels, with inverted colors to show the active selection.

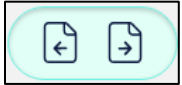
The segment selection can be used to zoom in, manage events within the selected area, and, when enabled from the toolbar , display a tooltip when the pointer hovers over the selection.

When a segment is selected or adjusted, the Viewer displays the selected segment start time, end time, and duration.

3.2.10. Multi-night studies

The Viewer supports multi-night studies recorded with WatchPAT devices (WP300 and WP1-M). When a multi-night study is opened, each night is shown separately with clear date and position indicators, for example, “1 of 3.”

Use the navigation controls in the top toolbar to move forward or backward between nights:



Manual-scoring edits are saved independently for each night, so users can review and edit multi-night studies at their own pace.

3.2.11. Channel properties

To view additional information for a channel, right-click the channel title and select “Properties.” The Channel Properties window includes:

- Channel name
- Channel Sample rate
- Recording system (WP200, WP300, WP1 or WP400)

3.3. Review and analyze the study data

3.3.1. Event management

Events identified by automatic analysis appear as color-shaded boxes. Hover over an event to display a tooltip with:

- Event name
- Event source (for example, Automatic Analysis or User)
- Start time
- Duration

Events are color-coded by type, and each type can also display a matching background color. To show or hide event backgrounds for a channel, right-click the channel graph and choose “Show/Hide Event Backgrounds.”

Use this button in the top toolbar to show or hide events:



Some events are defined as general events.

You can choose which channel displays general events by right-clicking the channel and selecting “Attach general events to channel.”

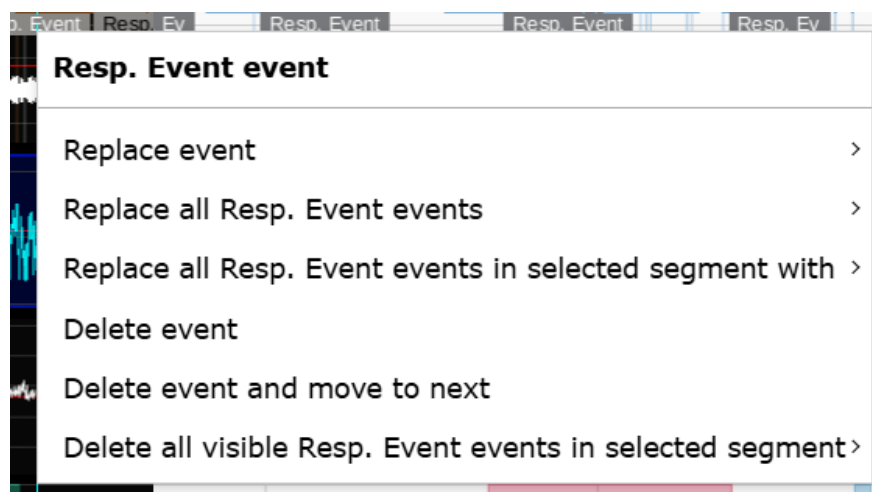
3.3.2. Editing or deleting events

To delete an event, right-click it and select “Delete Event.” To delete the event and automatically advance to the next event on the same channel, select “Delete Event and Move to Next.” The display then moves so the next event is visible and highlighted.

If an event is highlighted, pressing Delete performs the same action as “Delete Event and Move to Next.”

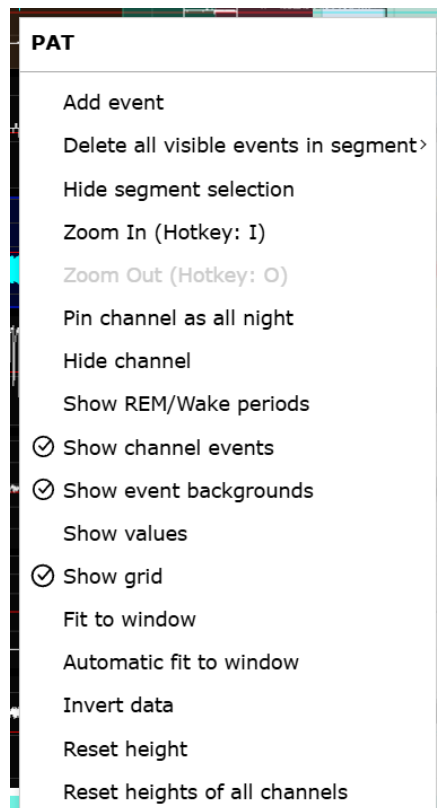
When a segment is selected, events within the selected segment can be deleted according to the available menu options. If the pointer is positioned on a specific event, all events of that type within the selected segment can be deleted. If the pointer is not positioned on a specific event, events on the active signal within the selected segment can be deleted. Additional options may be available to delete applicable events in the selected segment from the active channel, or all channels.

To replace an event with a different event type, right-click the event and choose “Replace with.” If a segment is selected and the pointer is positioned on a specific event, all events of that type within the selected segment can be replaced according to the available menu options.



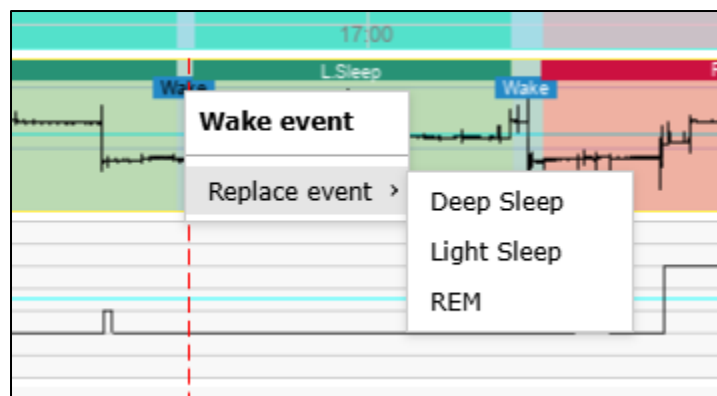
Right-clicking an event

The “Replace with” command is available for A/H and respiratory events in studies with the RESBP sensor, and for sleep-stage events.

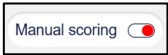


Right-clicking a selected segment

If Manual Scoring is enabled, sleep stages can be edited manually. Right-click a sleep-stage event and choose the replacement sleep stage from the “Replace with” menu.



Replacing a sleep-stage event

To edit sleep stages and CSR times with the mouse, enable “Manual scoring” () and then enable “event dragging with mouse” () from the top toolbar. When this option is enabled, the selected event can be dragged or resized.

Note: Adding or deleting respiratory or desaturation events, or editing sleep stages, changes the report results. When this occurs, a note is added to the footer of the Sleep Report indicating that the Automatic Analysis was changed manually by the user.

3.3.3. Add event

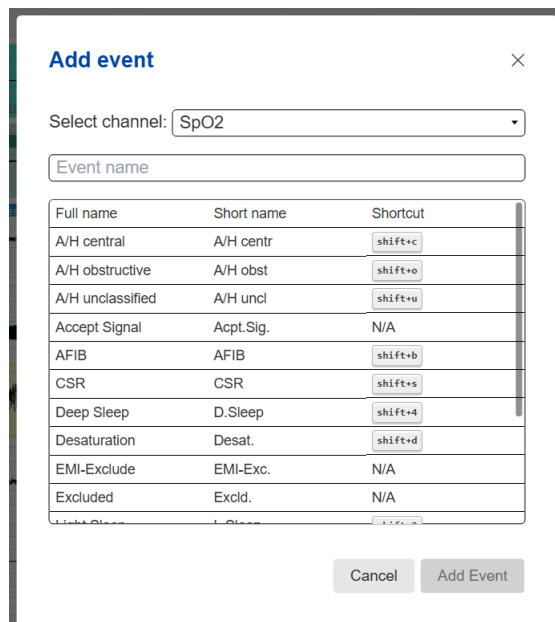
Users can add many event types to a study. Manual Scoring must be enabled from the top toolbar before events can be added.

To add an event:

- Click the point where you want to insert the event.
- Right-click that location and select “Add Event,” or use the Insert hotkey. The Add Event dialog box opens.

The Add Event dialog box includes the following options:

- Select Channel lets you choose the channel on which the new event will appear. By default, the event is added to the active channel unless another channel is selected.
- To add the event, double-click the required event type in the list, or select the event type and choose “Add Event.” Click OK to continue.
- Free-text events can also be added by using the Free Text entry box. Free-text items appear on the signal display as events, but they do not appear in the report.



Add event [X]

Select channel: SpO2 [v]

Event name []

Full name	Short name	Shortcut
A/H central	A/H centr	shift+c
A/H obstructive	A/H obst	shift+o
A/H unclassified	A/H uncl	shift+u
Accept Signal	Acpt.Sig.	N/A
AFIB	AFIB	shift+b
CSR	CSR	shift+s
Deep Sleep	D.Sleep	shift+4
Desaturation	Desat.	shift+d
EMI-Exclude	EMI-Exc.	N/A
Excluded	Excl.	N/A

[Cancel] [Add Event]

Add Event dialog box

To save your changes to the database and avoid losing your work, click the Save Analysis Results button in the top toolbar:



or use Ctrl/Command+S.

Note: In patients with a pacemaker, the physician should manually mark event segments as “reject” when the PAT pulses appear to be paced; that is, when they show very low or near-stable pulse-rate variation.

3.3.4. Undo and redo

Users can undo or redo event actions such as add, delete, move, resize duration, replace event, and multi-event actions such as batch deletion or replacement. Use the Undo/Redo buttons in



the top toolbar, or use Ctrl/Cmd+Z and Ctrl/Cmd+Y.

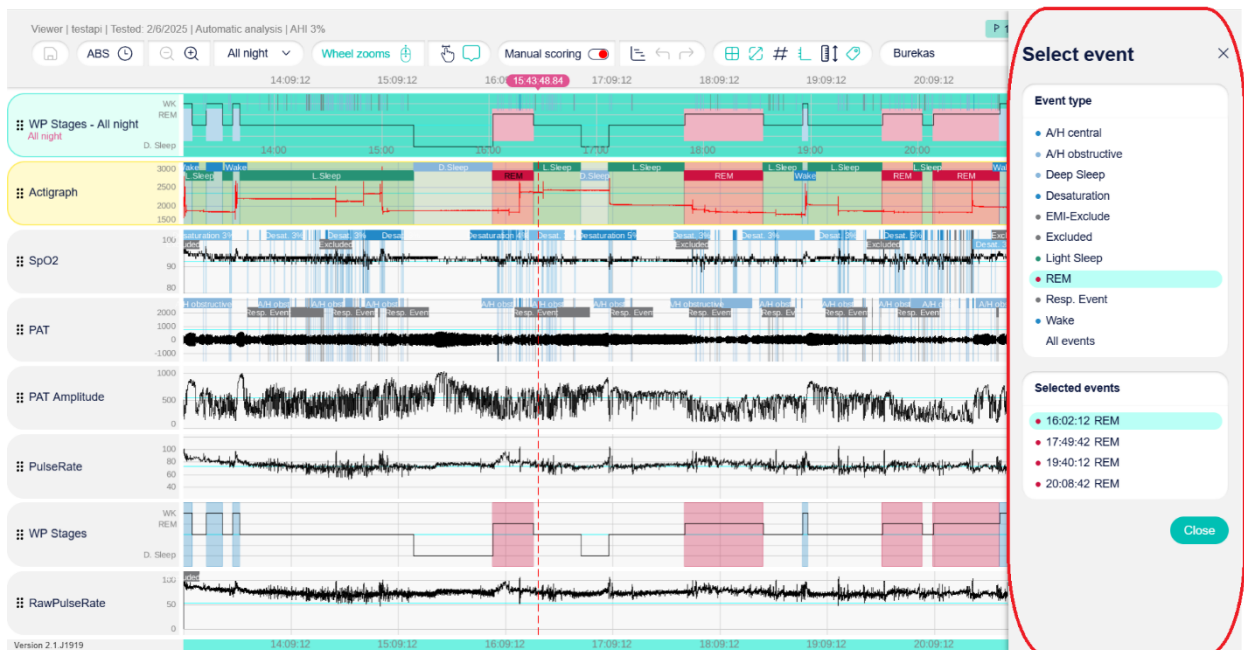
The undo history is cleared when the user saves and exits the Viewer.

The undo history is retained when the user switches between manual analysis and automatic analysis.

3.3.5. Select event

Use the Select Event button in the top toolbar  to jump to a specific event. Events are listed by type and start time, and selecting an event moves the display to the corresponding location. The Selected Events field in the Select Event window updates to show the page containing the chosen event.

Users can also delete any removable event directly from the Select Event side panel by clicking the trash icon.



The Select Event side panel

3.3.6. Traversing/panning the study

When the study is zoomed in, you can move through it in several ways:

- Scroll bar at the bottom of the channels
- Range Indicator Mask in the pinned channel
- Mouse wheel when the cursor is in “Mouse Scrolls” mode

- Alt + mouse click and drag
- Left and Right arrow keys
- Page Up and Page Down keys

3.3.7. Changing event colors

Users can customize the display color for any event type by choosing from nine available colors. The event background follows the selected event color.

To change an event type color:

1. Double click any event of the type you want to change to open “Event Properties”
2. Choose the required color
3. The new color is applied to all events of that type

If no color is selected when the dialog is saved, the default color for that event type is used.

4. Appendix A: License Agreement

This License Agreement represents the complete and exclusive understanding between you and Itamar Medical. The document can be viewed at

<https://www.itamar-medical.com/wp-content/uploads/2025/02/License-Agreement-February-2025.pdf>.

Should you have any questions concerning this License Agreement, or if you desire to contact Itamar Medical for any reason, please write to:

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5. Appendix C: Hotkeys / Keyboard Shortcuts

Special Keys:

Up/Down arrows	Change Timebase – cycle time window dropdown
I/O	Zoom in/ Zoom out
Ctrl/Command+Z	Undo
Ctrl/Command+Y	Redo
Ctrl/Command+Left arrow	Previous Event
Ctrl/Command+Right arrow	Next Event
Shift+Left arrow	Previous event in same group of current active event
Shift+Right arrow	Next event in same group of current active event
Ctrl+Home/Command+Shift+Home	First Event for active channel
Ctrl+End/Command+Shift+End	Last Event for active channel
Shift+D	Add Desat event
Shift+U	Add Unclassified AHI event
Shift+C	Add Central AHI event
Shift+O	Add Obstructive AHI event
Shift+R	Add Resp event
Shift+P	Add Premature Beats event

Up/Down arrows	Change Timebase – cycle time window dropdown
Shift+B	Add AFib event
Shift+S	Add CSR event
Shift+4	Add Deep Sleep event
Shift+5	Add REM event
Shift+2	Add Light Sleep event
Shift+0	Add Wake event
ALT + '-' / ALT + '+'	Change Y-scale of active signal – channel gain
PageDown	Next Page
PageUp	Previous Page
Ctrl/Command+F	Active Channel Fit to Window
Ctrl/Command+S	Save Analysis Results
Shift+F	All Channels Fit to Window
Del	Delete Event – delete active event and, if exists, jump to the next event of type and make it the active event
INSERT	Opens Add event window