

Bittium

MedicalSuite™ Platform HSAT Service

Clinical Guide

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Summary of Changes

Version	Date	Changes Between Releases	Status
2.0	2024.06.14	New layout. References to Respiro and Respiro Analyst added.	Approved.

Table of Content

1	General	5
1.1	Bittium MedicalSuite platform for Home Sleep Apnea Testing service	5
1.1.1	Bittium Respiro	6
1.1.2	Bittium Respiro Analyst	6
2	Using MedicalSuite service platform	7
2.1	MedicalSuite accounts	7
2.2	Sign in to MedicalSuite Center	9
2.3	Using MedicalSuite Center	11
2.3.1	Dashboard view	12
2.3.2	Recordings view	14
2.3.3	Single recording view	18
3	Bittium HSAT service platform	19
3.1	Introduction to Bittium HSAT workflow	19
3.2	Preparing for Bittium HSAT recording	19
3.2.1	Creating recording on MedicalSuite Center	20
3.2.2	Setting up Bittium Respiro	24
3.3	Performing Bittium HSAT recording	25
3.3.1	Completing recording	25
3.3.2	Uploading and validating recording data	27
3.3.2.1	Uploading and validating recording data file in MedicalSuite Center	27
3.3.2.2	Validating recording data quality on MedicalSuite service platform	30
3.3.2.3	Uploading other documents to MedicalSuite Center	32
3.3.3	Setting recording ready for analysis (ending)	33
3.3.4	Assigning recording to diagnostic user or diagnostic group	35
3.4	Processing Bittium HSAT recording	36
3.4.1	Analyzing recording data in Bittium Respiro Analyst and creating a diagnostic report	37
3.4.2	Closing recording and attaching diagnostic report	37
3.4.2.1	Automatic closing and attaching diagnostic report	37
3.4.2.2	Manual closing and attaching diagnostic report	39
3.4.3	Approving recording and delivering diagnostic reports to lower-level organization	41
3.4.4	Previewing and downloading diagnostic reports and other documents	44

Bittium

3.4.5	Rejecting and deleting recording data in MedicalSuite Center.....	47
3.5	Downloading recording data from MedicalSuite Center	49
3.6	Troubleshooting	50

1 GENERAL

Bittium MedicalSuite is a web-based remote monitoring service platform that enables the management and analysis of various data recorded in healthcare. The service platform facilitates secure information and data sharing and allows hospitals, clinics, and healthcare professionals to work together regardless of their locations, permitting faster examination, diagnosis, and treatment of a patient. Bittium MedicalSuite enables wireless data transfer, intelligent data analysis, and handy reporting and management modules that can be optimized individually for each user according to their needs.

1.1 Bittium MedicalSuite platform for Home Sleep Apnea Testing service

Bittium MedicalSuite platform for Home Sleep Apnea Testing (HSAT) service is used for managing and visualizing standard polygraphy (PG) level data typical for sleep-related breathing disorders, such as obstructive sleep apnea, central sleep apnea, mixed sleep apnea, hypopnea, and Cheyne-Stokes breathing.

Bittium HSAT service platform provides a conventional offline solution to manage data from HSAT recordings where recording data is uploaded from Bittium Respiro™ recorder to MedicalSuite service platform for analysis with Bittium Respiro Analyst™ software. (Figure 1)



Figure 1 Bittium Home Sleep Apnea Testing service



1.1.1 Bittium Respiro

Bittium Respiro is an ambulatory recording device for overnight polygraphy, which is always carried out by doctor's prescription. Respiro provides reliable recordings of selected sleep apnea-related bio signals in home sleep apnea testing (HSAT). Respiro polygraphy recording can be carried out as an HSAT™ recording with three sensor configurations. Bittium HSAT recording is configured using **Bittium Respiro™ Device Manager** software.

Check Respiro™ notes and warnings from **Respiro Operating Instruction for healthcare professionals** or from the **Notes and warnings** which is included in the Respiro's carry case.

More detailed instructions for the use of Bittium Respiro™ can be found on a separate Bittium Respiro Operating Instructions for healthcare professionals. The latest documentation can be found on: <https://www.bittium.com/medical/support>.

1.1.2 Bittium Respiro Analyst

Bittium Respiro Analyst™ is a web application that enables sleep specialists to make polygraph analyses for Bittium Respiro™ recordings. Respiro Analyst provides accurate medical information on patients (polygraphy signals and preliminary analysis).

Respiro Analyst enables sleep specialists who are working in remote locations to analyze recordings made by the health centers and clinics. For the sleep specialist, the system provides a complete working environment for signal visualization and analysis. The sleep specialist can write a statement based on the analysis using integrated Statement Tool.

Check Respiro Analyst™ notes and warnings from **Bittium Respiro Analyst User Guide**.

More detailed instructions for the use of Bittium Respiro Analyst™ can be found on a separate Bittium Respiro Analyst User Guide. The latest documentation can be found on: <https://www.bittium.com/medical/support>.

2 USING MEDICALSUITE SERVICE PLATFORM

MedicalSuite service platform support following Web-browsers:

- Google Chrome
- Mozilla Firefox
- Microsoft Edge (chromium based)

2.1 MedicalSuite accounts

Each unit offering a particular type of healthcare services relate to a separate organization entity belonging in a tree type organization structure on MedicalSuite service platform (Figure 2).

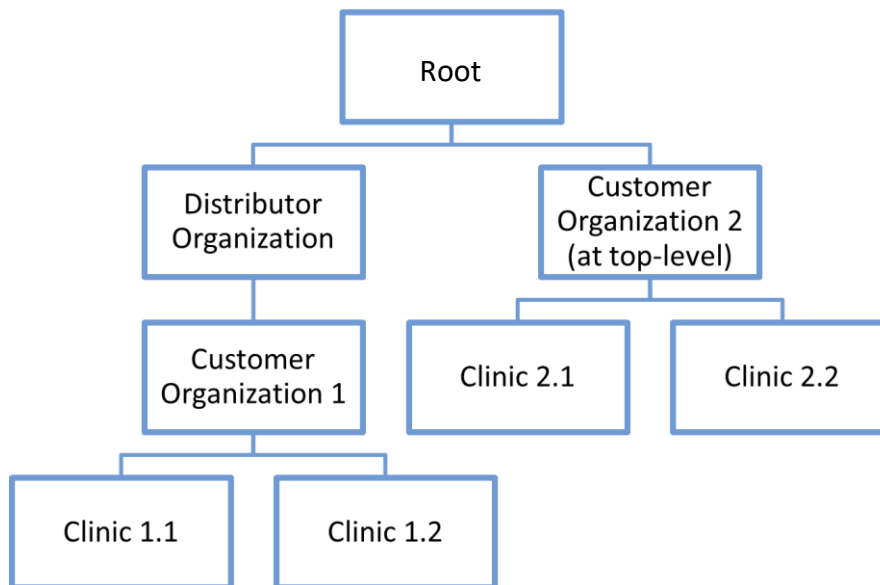


Figure 2 Tree type organization structure

Furthermore, each organization on MedicalSuite may include multiple users with different functionality access. The structure of MedicalSuite organizations, their users and tasks can vary based on the organization process and their needs. To access the data of the organization on MedicalSuite service platform, each user needs to log in with their personal user account. According to the required user functionality access, a role (admin, clinic, technician, or diagnostic) is set for each user account. In addition to user role, each user has its own customizable dashboard that includes task list of the user and can be configured based on the user's needs. The following user roles are available:



Admin

- Manages the organization structure, its users, diagnostic groups, and recorders/devices.
- Has access to service platform usage statistics of his/ her own organization and its lower-level organizations.



Clinic

- Prepares a recording with patient details according to service type and prescription of the physician.
- Attaches Respiro recorder, pulse oximeter, sensors, electrode, and cables if necessary.
- Uploads (Bittium HSAT) and validates the recording data.
- May end (set ready for analysis) recording.
- Gets the diagnostic report when it is approved.



Technician

- May prepare a recording with patient details according to the study prescription of the physician.
- May attach Respiro recorder, sensors, and cables if necessary.
- May upload and validate the recording data.
- Assigns the recording to a diagnostic user or diagnostic group for analysis and interpretation.
- May end (set ready for analysis) the recording.
- May perform the data clean-up using Bittium Respiro Analyst analysis software.
- Approves a diagnostic report and thus provides the report with interpretation notes to the lower-level organization.



Diagnostic

- Analyzes the HSAT data with Bittium Respiro Analyst.
- Interprets the analysis results and creates a diagnostic report.

Management of MedicalSuite accounts of your organization is performed by admin user(s) using **Bittium MedicalSuite BackOffice**. Contact your MedicalSuite organization admin user to get user credentials for MedicalSuite service platform.

2.2 Sign in to MedicalSuite Center

Management of Bittium HSAT recordings throughout the whole workflow is performed using **Bittium MedicalSuite Center** (see also chapter 2.3) that is a part of MedicalSuite service platform. Users can create and manage recordings of their own organization or its lower-level organizations according to the functionality access of the user role (admin, clinic, technician or diagnostic) of their user account.

NOTE

The management of your organization's MedicalSuite accounts is performed by admin user(s) using Bittium MedicalSuite BackOffice. Contact your MedicalSuite organization admin user to get user credentials for MedicalSuite service platform.

To create and manage Bittium HSAT recordings, sign in to MedicalSuite Center by following the steps below:

- 1 Go to MedicalSuite Center **sign in page**.
- 2 Click **Sign in with Microsoft**.

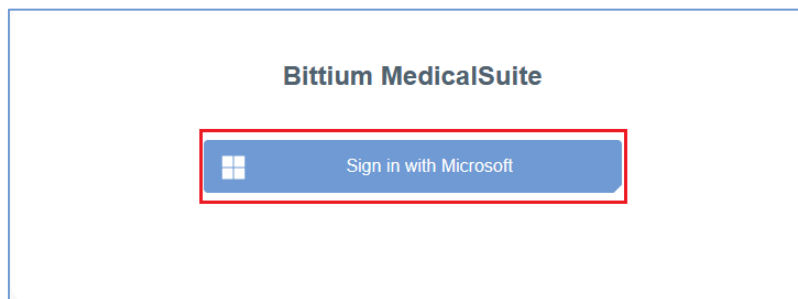


Figure 3 Sign in window

- 3 Pick the wanted account from the list OR click **Use another account** option and enter the user credentials.

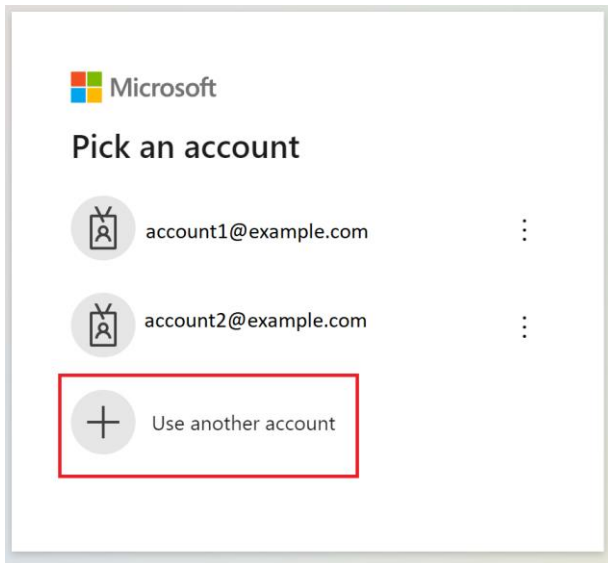


Figure 4 Pick or use another account

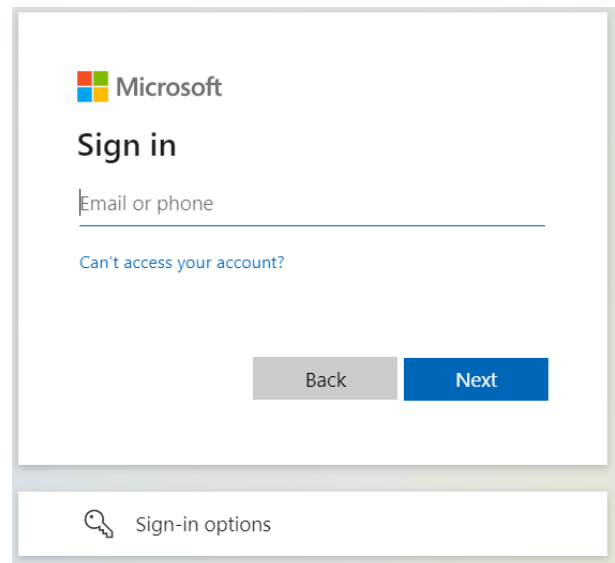


Figure 5 Enter credentials

4 Enter password.

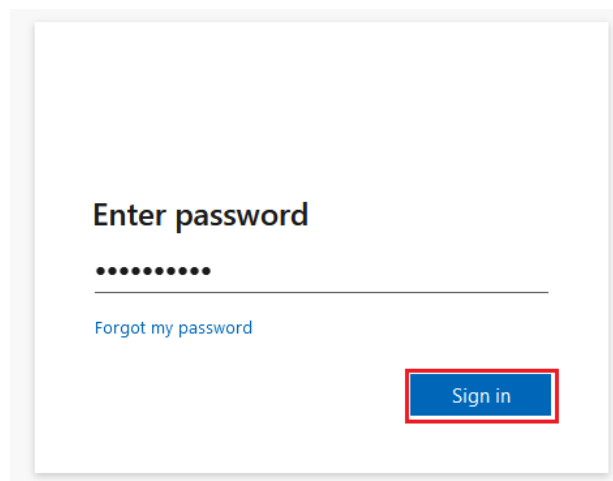


Figure 6 Password entering

5 Make sure your phone registered for authentication is nearby and powered on.

6 Click **Sign in** button (Figure 6).

- 7 Enter the **numbers** shown in the Approve sign in request view to the Microsoft Authenticator application. Confirm sign in request by selecting **Yes** from the Microsoft Authenticator application.

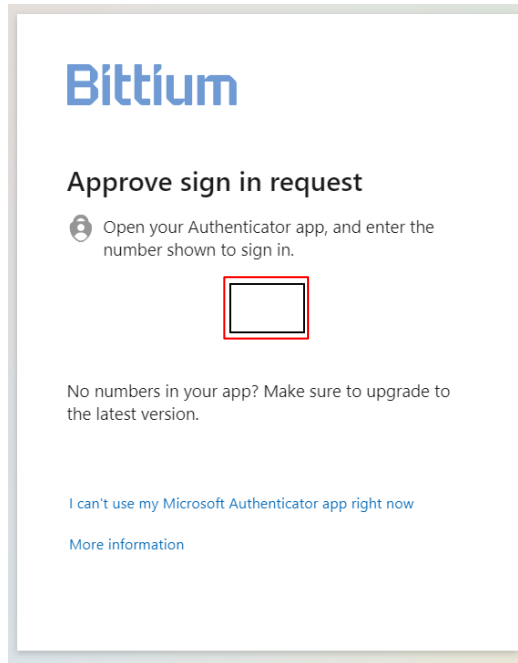


Figure 7 Sign in approval

NOTE

If “*We didn't hear from you*” view is displayed, select **Send another request to my Microsoft Authenticator app** and proceed according to instructions in the application and sign in view.

NOTE

Depending on your Microsoft Authenticator application settings, your personal verification code may be requested by the application. If requested, enter your personal verification code.

- 8 MedicalSuite Center Dashboard view opens (Figure 8).

2.3 Using MedicalSuite Center

MedicalSuite service platform provides access to **Bittium MedicalSuite Center** that enables effective recording management for hospitals, clinics, and healthcare professionals. MedicalSuite Center allows organization and role-based configurations that makes possible to easily tailor the service for different kind of organizations. It consists of personalized dashboards for a clinic user (nurse), technician and specialists that help medical professionals to view only the issues they need. MedicalSuite Center has three main views: **Dashboard**, **Recordings** and **Single recording views**.

2.3.1 Dashboard view

MedicalSuite Center Dashboard view presents the statistics and highlights the most recent activity on the MedicalSuite service platform (Figure 8). It adapts to the current user role.

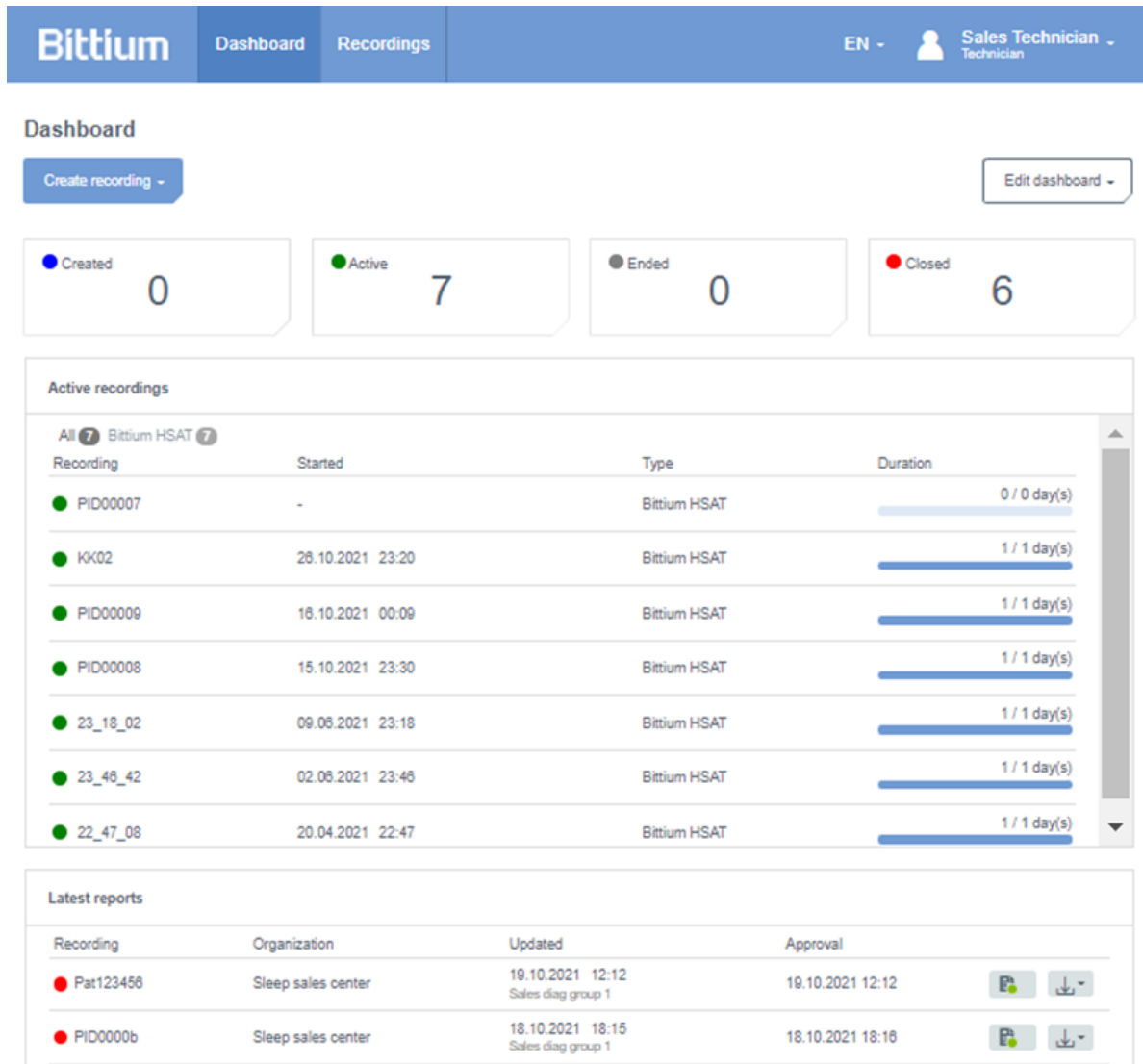


Figure 8 MedicalSuite Center Dashboard view

You can select a **language** you want to use in Dashboard view (Figure 9).



Figure 9 Selecting language in Dashboard view

You can see the current **user role** in the top-right corner of the view. By clicking the **role name** (Technician 1 in Figure 10) you can **log out** from the service platform when needed (Figure 10).

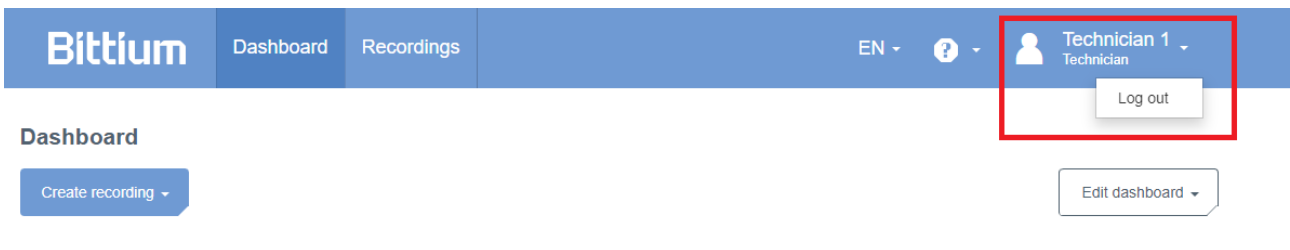


Figure 10 Logging out in Dashboard view

A recording is created in **Dashboard** view or **Recordings** view. Select **Bittium HSAT** recording (Figure 11).

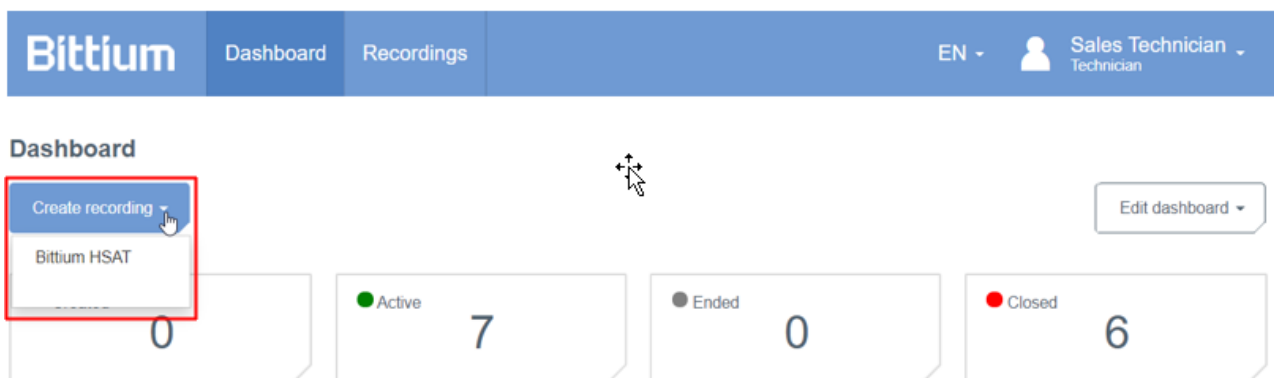


Figure 11 Starting to create a recording in Dashboard view

Using **Edit dashboard** button, you can select the dashboard cards that are presented and change their order by dragging and dropping them in the drop-down menu (Figure 12).

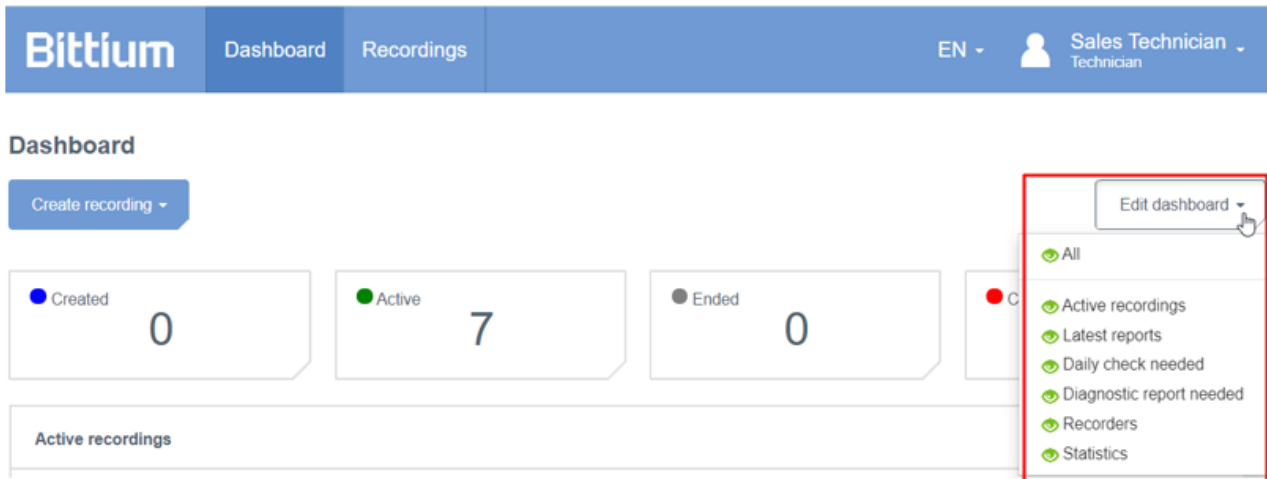


Figure 12 Editing dashboard in Dashboard view

2.3.2 Recordings view

The Recordings view shows recordings with details such as patient ID, status, last data transfer, last update, organization, created recording time, service type, device serial number, assignment, and action. If you are logged in as an admin, technician or clinic user, the Recordings view contains a list of all recordings created for your own organization and its lower-level organizations. If you are logged in as a diagnostic user, a list of recordings that are assigned to you or your diagnostic group is shown on the Recordings view (Figure 13)

Patient ID	Status	Last data transfer	Last update	Organization	Created	Type	Device	Assignment	Action
KK02	Active	28.10.2021 15:25	28.10.2021 15:46	Sleep sales center	28.10.2021 15:23	Bittium HSAT	0000568	Sales diag group 1	Download
Pat123456	Closed	19.10.2021 11:41	19.10.2021 12:12	Sleep sales center	19.10.2021 11:40	Bittium HSAT	0000673	Sales diag group 1	Download
PID0000b	Closed	18.10.2021 17:48	18.10.2021 18:16	Sleep sales center	18.10.2021 17:47	Bittium HSAT	0000673	Sales diag group 1	Download
PID0000a	Closed	18.10.2021 16:19	18.10.2021 16:15	Sleep sales center	18.10.2021 16:18	Bittium HSAT	0000536	Sales diag group 1	Download
PID00009	Active	16.10.2021 08:30	09.11.2021 10:16	Sleep sales center	16.10.2021 08:29	Bittium HSAT	0000536	Sales diag group 1	Download
PID00008	Active	16.10.2021 08:25	16.10.2021 09:04	Sleep sales center	16.10.2021 08:25	Bittium HSAT	0000568	Sales diag group 1	Download
Test008	Closed	15.10.2021 19:01	18.10.2021 15:26	Sleep sales center	15.10.2021 19:00	Bittium HSAT	0000673	Sales diag group 1	Download
TEST007	Closed	15.10.2021 18:46	15.10.2021 19:14	Sleep sales center	15.10.2021 18:43	Bittium HSAT	0000673	Sales diag group 1	Download
PID00007	Active	No date	14.10.2021 17:22	Sleep sales center	14.10.2021 17:18	Bittium HSAT	1234567	Sales diag group 1	Download
23_45_08	Closed	01.10.2021 16:17	14.10.2021 17:19	Sleep sales center	01.10.2021 16:16	Bittium HSAT	0123456	Sales diag group 1	Download

Figure 13 MedicalSuite Center Recordings view

The **Search** field helps you to find recordings from MedicalSuite Center. You can use for example **patient ID** or **device serial number** to find the recording you want. (Figure 14)



Figure 14 Searching recording in Recordings view

From the menu of the right corner, you can select the number of **visible recordings** at a time (10, 50 or 100) (Figure 15).

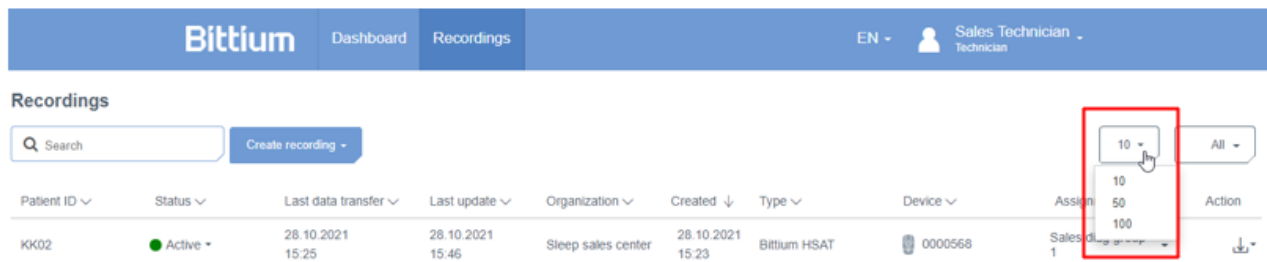


Figure 15 Selecting visible recordings in Recordings view

From the menu of the right corner, you can also select the recordings with the desired **status** (all, active, ended, closed, error) (Figure 16).

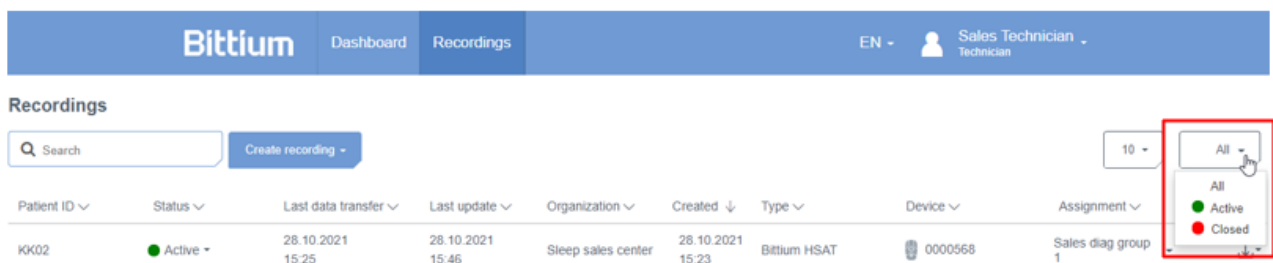


Figure 16 Selecting recordings with desired status in Recordings view

Clicking the **icon** beside **Patient ID** means that you can order patient IDs alphabetically. When you click the **icon** next to **Created** or **Last update**, you can see the oldest or the newest recordings the first (Figure 17).

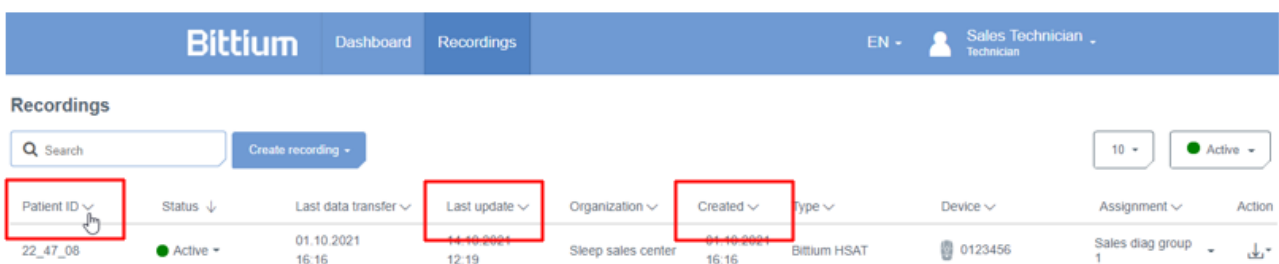


Figure 17 Sorting recordings in Recordings view

A recording can be assigned to diagnostic user or diagnostic group from assignment list (Figure 18). When a recording is assigned for the user or group, the user or group can see a recording in the own dashboard view after a recording is set ready for analysis. If there are many users or groups in the list, you can also search the user or group using a search field of the assignment list.

The screenshot shows the Bittium Recordings interface. At the top, there are navigation tabs for 'Bittium', 'Dashboard', and 'Recordings'. The user is logged in as 'Technician 1'. Below the navigation, there is a search bar and a 'Create recording' button. A table lists recordings with columns for Patient ID, Status, Last data transfer, Last update, Organization, Created, Type, Device, Assignment, and Action. A dropdown menu is open for the 'Assignment' column of the first row, showing a search bar and a list of groups: 'Cardioscope Group', 'Diagnostic group', 'Diagnostic group (autoreports)', 'HRV group (autoreports)', and 'HSAT Analysis' (which is selected). Below the groups, it lists 'Users in HSAT Analysis' with 'Dr. Hanna HSAT'.

Figure 18 Recording assignment in Recordings view

If there are recording data, reports, or other documents in a recording, they can be downloaded from the **action** menu by clicking on the item (e.g., recording-information.pdf) (Figure 19). The **report symbol** beside the action menu indicates if approved report is viewable.

The screenshot shows the Bittium Recordings interface. At the top, there are navigation tabs for 'Bittium', 'Dashboard', and 'Recordings'. The user is logged in as 'Sales Technician'. Below the navigation, there is a search bar and a 'Create recording' button. A table lists recordings with columns for Patient ID, Status, Last data transfer, Last update, Organization, Created, Type, Device, Assignment, and Action. A dropdown menu is open for the 'Action' column of the first row, showing a 'Download' button and a list of items: 'Recording data', 'Recording data 1 day(s)', 'Reports', '6169a6099ec5e8000acd5a02_statement.pdf', and 'Other documents', 'recording-information.pdf'.

Figure 19 Downloading recording data and documents in Recordings view

2.3.3 Single recording view

The Single recording view presents recordings details such as recording data, patient details, anamnesis, patient diary, recording details and attachments on own tabs. You can find a single recording view for example by clicking a single recording in Dashboard view or Recordings view (Figure 20).

Patient ID: PID0a74a Bittium HSAT Approved

Organization	Sleep sales center	Created	19.10.2021 11:40	Last data transfer	19.10.2021 11:41
Status	● Closed	Started	18.10.2021 23:30	Last update	19.10.2021 12:12
Assignment	Sales diag group 1 ▾	Ready for analysis	No date	Duration	1 / 1 day(s)

Recording data **Patient details** Anamneses Patient diary Recording details Attachments

Cancel Save

Patient details

Patient ID	Pat123456	Age (years)	55
	<small>Patient ID must be at least 4 characters long and lower/uppercase letters, numbers and underscores are allowed. If Patient ID is left blank the system will generate it (for example PID0000A).</small>	Height (cm)	175
		Weight (kg)	80
		BMI	26.12
		Gender	Female ▾

Figure 20 MedicalSuite Center Single recording view

3 BITTIUM HSAT SERVICE PLATFORM

3.1 Introduction to Bittium HSAT workflow

Bittium HSAT workflow is visualized in Figure 21. Bittium HSAT is an ambulatory offline recording that is used to record standard PG level data. Bittium HSAT recording can be set to automatically start and stop at a predefined time, or the recording can be manually started and stopped by pressing the Respiro button. The used operating mode is selected using Bittium Respiro Device Manager software. Once the recording has been completed, the recording data is manually uploaded to MedicalSuite Center for the complete data analysis.

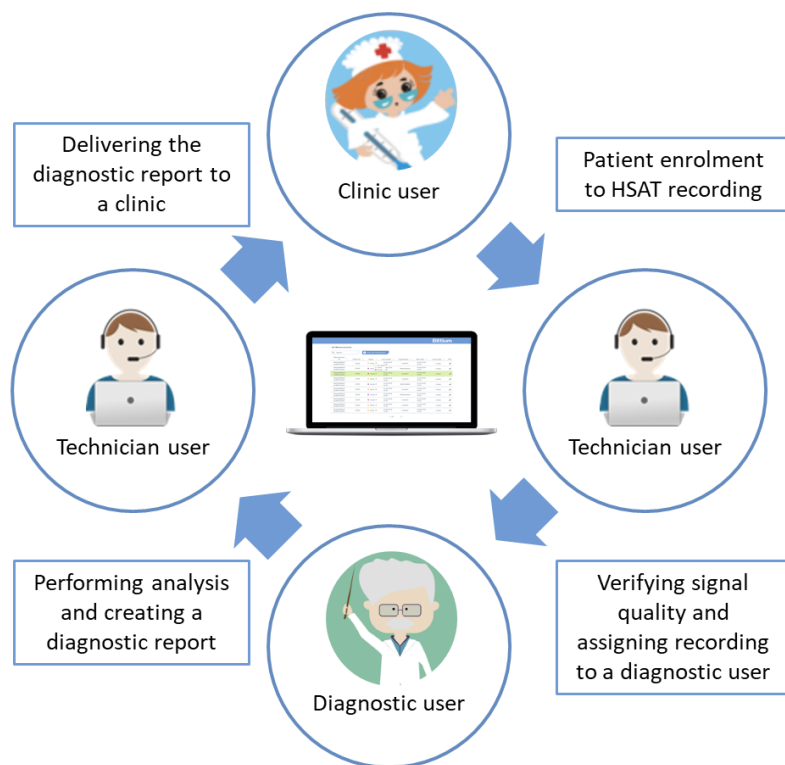


Figure 21 Bittium HSAT service workflow

3.2 Preparing for Bittium HSAT recording

The recording equipment needs to be prepared for HSAT recording based on the recording needs as instructed in **Respiro Operating Instructions for healthcare professionals**. Bittium HSAT recording is created on MedicalSuite Center.

3.2.1 Creating recording on MedicalSuite Center

To create a Bittium HSAT recording on MedicalSuite Center, follow the steps below:

- 1 Click **Create recording button** either on the Dashboard or the Recordings view on MedicalSuite Center. A drop-down menu is presented (Figure 22). Select **Bittium HSAT**. Create recording page opens.

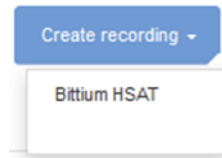


Figure 22 Create recording drop-down menu

- 2 Enter information to all the required fields (*) on the **Patient details** tab (Figure 23). If desired, other fields can be left unfilled.

NOTE Patient ID is for identifying the patient. If this field is left blank, the system will generate it. Do not enter any patient delicate information (e.g., use the patient's name or social security number as a patient ID) to the MedicalSuite Center.

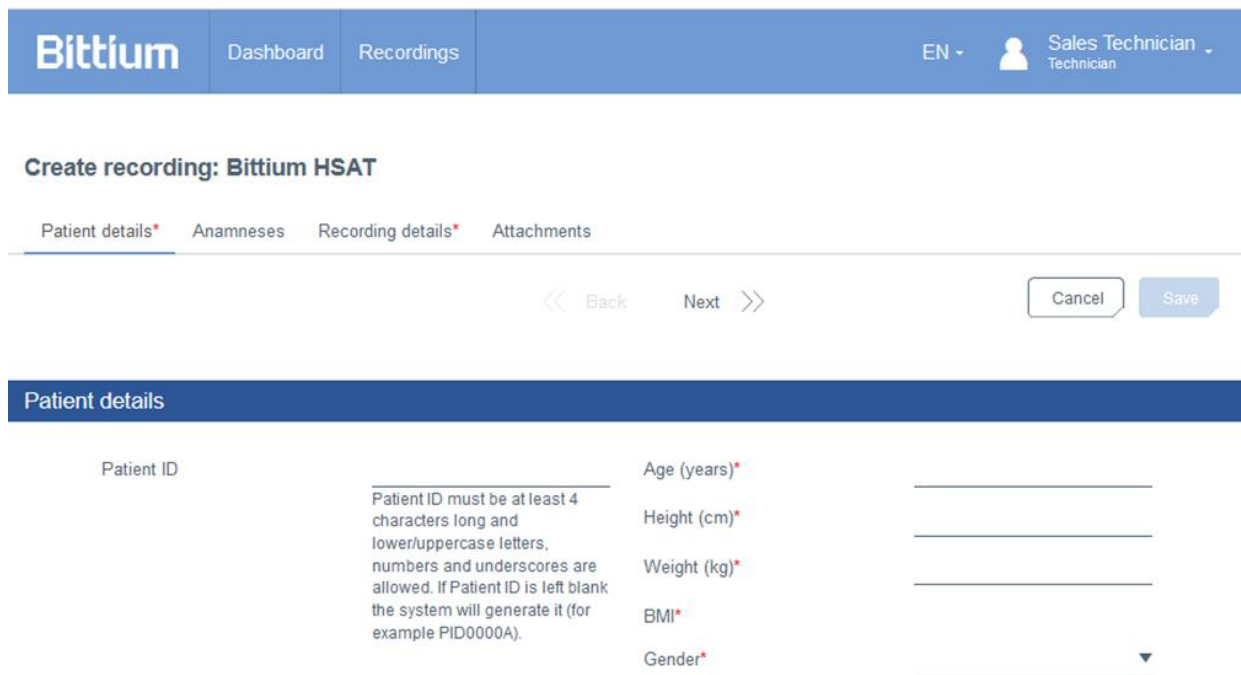
A screenshot of the 'Create recording: Bittium HSAT' form. The top navigation bar includes the Bittium logo, 'Dashboard', 'Recordings', and user information 'EN - Sales Technician Technician'. The form title is 'Create recording: Bittium HSAT'. Below the title are tabs for 'Patient details*', 'Anamneses', 'Recording details*', and 'Attachments'. Navigation buttons include '<< Back', 'Next >>', 'Cancel', and 'Save'. The 'Patient details' tab is active, showing a form with the following fields: 'Patient ID' (with a note: 'Patient ID must be at least 4 characters long and lower/uppercase letters, numbers and underscores are allowed. If Patient ID is left blank the system will generate it (for example PID0000A)'), 'Age (years)*', 'Height (cm)*', 'Weight (kg)*', 'BMI*', and 'Gender*'. Each field has a corresponding input area.

Figure 23 Create recording – Patient details tab

- 3 Click **Next** and enter patient anamnesis information on the **Anamneses** tab, if necessary (Figure 24 and Figure 25, optional step).

Create recording: Bittium HSAT

Patient details Anamneses Recording details Attachments

<< Back Next >>

Cancel Save

Medication

Medication

Medication during the recording

No Yes

Medical history

Close family members diagnosed or treated for a sleep disorder

No Yes

Hypertension No Yes

Diabetes No Yes

Asthma No Yes

Hypothyroidism No Yes

Stuffy nose No Yes

Enlarged tonsils No Yes

Depression No Yes

Life

Smoking No Yes

Professional driver No Yes

Driving license class _____

Figure 24 Create recording – Anamnesis tab (1/2)

Chance of dozing off or falling asleep in the following situations

Sitting and reading	<input type="radio"/> Never	<input type="radio"/> Slight	<input type="radio"/> Moderate	<input type="radio"/> High
Watching TV	<input type="radio"/> Never	<input type="radio"/> Slight	<input type="radio"/> Moderate	<input type="radio"/> High
Sitting, inactive in a public place (e.g. a theatre or a meeting)	<input type="radio"/> Never	<input type="radio"/> Slight	<input type="radio"/> Moderate	<input type="radio"/> High
As a passenger in a car for an hour without a break	<input type="radio"/> Never	<input type="radio"/> Slight	<input type="radio"/> Moderate	<input type="radio"/> High
Lying down to rest in the afternoon when circumstances permit	<input type="radio"/> Never	<input type="radio"/> Slight	<input type="radio"/> Moderate	<input type="radio"/> High
Sitting and talking to someone	<input type="radio"/> Never	<input type="radio"/> Slight	<input type="radio"/> Moderate	<input type="radio"/> High
Sitting quietly after a lunch without alcohol	<input type="radio"/> Never	<input type="radio"/> Slight	<input type="radio"/> Moderate	<input type="radio"/> High
In a car, while stopped for a few minutes in the traffic	<input type="radio"/> Never	<input type="radio"/> Slight	<input type="radio"/> Moderate	<input type="radio"/> High

Sleep history

Morning headache	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Dry mouth in the morning	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Daytime fatigue or snoring	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Daytime napping	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Heartburn	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Loss of concentration	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Memory loss	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Cramping at night	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Difficulties falling asleep	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Breathing breaks while sleeping	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Pain during night	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Snoring or snorting during sleep	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Waking up during the night or restless sleep	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
A strong urge to move your feet or an uncomfortable sensation in your feet related to this urge during sleep	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
Urinary urgency during sleep	<input type="radio"/> Never	<input type="radio"/> Rarely	<input type="radio"/> Sometimes	<input type="radio"/> Often	<input type="radio"/> Almost always
If yes, how many times per night?	<input type="radio"/> Once	<input type="radio"/> Twice	<input type="radio"/> More often		
Average amount of sleep	_____ Hours				

Figure 25 Create recording - Anamnesis tab (2/2)

Click **Next** and enter recording details and device information on the **Recording details** tab (Figure 26). The required information includes:

- a Organization that arranges the recording
- b Requested report language (English)
- c Referring physician (optional)
- d Reason for recording (optional)
- e Recorder serial number (S/N), e.g., 0000528, can be found from the side of the recorder.

NOTE Recorder serial number (S/N) is entered for device management purposes and to ensure the recording data is uploaded for the correct patient.

Create recording: Bittium HSAT

Patient details* Anamneses **Recording details** Attachments

<< Back Next >> Cancel Save

Recording details

Organization Referring physician

Requested report language

Reason for recording

Device information

Recorder S/N (21) 19 XXXXXXXX

See the side of the device. **Please add numbers after "19"**.




Figure 26 Create recording – Recording details tab

- 4 Click **Next** and attach the **recording data file** (if already available) and **other documents** (if necessary) on the **Attachments** tab (Figure 27, optional step).

Create recording: Bittium HSAT

Patient details Anamneses Recording details* Attachments

<< Back Next >>

Cancel

Save

Recording data

+ Add file or drag here

Other documents

+ Add file or drag here

Figure 27 Create recording – Attachments tab

- 5 Click **Save** and a confirmation notification will open (Figure 28). Click **Create** to confirm the creation of a new recording.

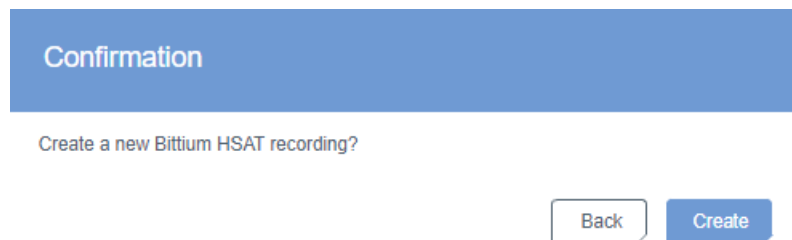


Figure 28 Create recording – Confirmation notification

NOTE

If recording data file was not attached to the created Bittium HSAT recording at step 5, the recording status will be Active, and the recording will appear in the Active recordings card in MedicalSuite Center Dashboard view. This indicates that recording data can still be uploaded.

3.2.2 Setting up Bittium Respiro

After creating HSAT recording on MedicalSuite Center, desired Respiro recorder settings need to be set up using Bittium Respiro Device Manager software. More detailed instructions for the use of Bittium Respiro™ can be found in a separate **Bittium Respiro Operating Instructions for healthcare professionals**.

3.3 Performing Bittium HSAT recording

After preparing the recording, a Bittium HSAT recording is performed at patient's home, and finalized at a clinic. This stage consists of several separate phases such as attaching the recording equipment, starting a recording, running a recording, stopping a recording, completing a recording, uploading and validating the recording data, setting recording ready for analysis, and assigning a recording to a specific diagnostic user or diagnostic group. See the recording configuration specific **Quick Guide** and **Respiro Operating Instructions for healthcare professionals** for more detailed information on attaching recording equipment, recording configurations and Respiro LED indicators.

3.3.1 Completing recording

Just after waking up in the morning and stopping the HSAT recording, it is recommended that a patient writes down the sleep details (see below) about according to the given instructions.

For proper HSAT data analysis, answering to the following **relevant questions** available for a recording in MedicalSuite Center is needed:

1. In your estimation, when did you fall asleep?
2. What time did you wake up in the morning?

Additional questions available for a recording in MedicalSuite Center include:

3. When did you go to bed?
4. In your estimation, how many hours did you sleep?
5. How did you sleep (bad, ok, good)?
6. Did you get out of the bed during the recording (yes, no)?
7. How did you sleep compared to usual (worse, normal, better)?

In addition, patient can also write down the **details of events** (time, duration, and reason for awakenings) occurred during the recording period. These patient-marked events can later be added to the recording data in MedicalSuite Center (Figure 29).

Patient ID: **PID0a74a** Bittium HSAT

Ready for analysis | ⋮

Organization	Sleep test center	Created	29.12.2021 12:06	Last data transfer	29.12.2021 12:20
Status	● Active	Started	09.09.2021 23:30	Last update	29.12.2021 12:21
Assignment	None	Ready for analysis	No date	Duration	2 / 2 day(s)

[Recording data](#)
[Patient details](#)
[Anamneses](#)
[Patient diary](#)
[Recording details](#)
[Attachments](#)

Patient diary - 09.09.2021, 23:30 (06h 59m)

Please, ask the patient to answer the following questions about the recording.

When did you go to bed?	<input type="text" value="hh:mm"/>	In your estimation, when did you fall asleep?	<input type="text" value="hh:mm"/>
What time did you wake up in the morning?	<input type="text" value="hh:mm"/>	In your estimation, how many hours did you sleep?	<input type="text" value="hh:mm"/>
How did you sleep?	<input type="text"/>	Did you get out of bed during the recording?	<input type="text"/>
How did you sleep compared to usual?	<input type="text"/>		

Other comments

If the patient woke up during the recording, please write down the events.

Event			<input type="button" value="✖"/>
Time	<input type="text" value="00:51"/>	Duration	<input type="text" value="hh:mm"/>
Event	<input type="text" value="Recorder button pressed"/>		

Figure 29 Adding patient marked events in MedicalSuite Center

3.3.2 Uploading and validating recording data

When the recording equipment and other documents are returned to a clinic, the recording data needs to be uploaded and validated on MedicalSuite service platform. The recording data goes through two separate validation rounds. First, the recording data file is validated in MedicalSuite Center. If the first validation is successful, the recording data is sent to Respiro Analyst for data quality validation. Recording data validations help a clinic to evaluate whether data can be used for further analysis, or if a new recording is needed. After validation also other documents such as a scanned patient diary can be uploaded to a recording to help in analysis.

3.3.2.1 Uploading and validating recording data file in MedicalSuite Center

The recording data file(s) is manually uploaded from Respiro to the **Active** recording and automatically validated in **MedicalSuite Center**. Respiro is put in the charging dock that is connected to a computer, and the upload process is carried out in MedicalSuite Center.

NOTE Recording status must be **Active** to be able to upload recording data to it.

To upload recording data to a recording, follow the steps below:

- 1 Open the recording either from the **Active recordings** card on the **Dashboard** or the **Recordings** view on the MedicalSuite Center by clicking on the recording.
- 2 Select **Recording data** tab.
- 3 Click **Add file** and select a file or multiple files to be added. Click **Open**. Alternatively, you can drag the file to the prompted area (Figure 30). After adding files, they start to be uploaded (Figure 31).



Figure 30 Add file icon on “Recording data” tab

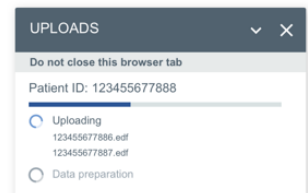
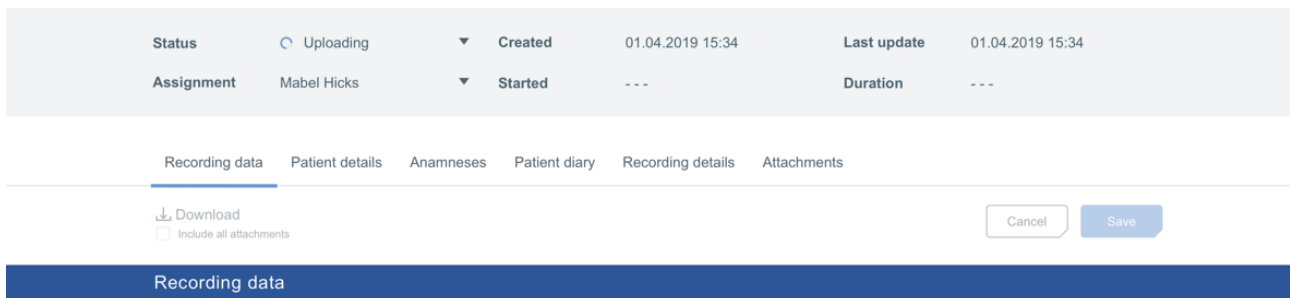


Figure 31 File upload ongoing in Bittium HSAT recording

When the file(s) is validated, the validation spinner change to **remove icons**. If the file(s) is found not to be valid, an error text shows which files are not valid and for what reason (see below) will be displayed. You can remove the file(s) which is not valid. You can also add more files to be uploaded if needed. This will start a re-validation of the given files. Selected file(s) are saved to MedicalSuite Center when you click **Save**. (Figure 32).



Figure 32 Data file validation in Bittium HSAT recording

NOTE

One EDF-file means one night. Usually there is only one EDF-file in one recording.

The recording data file can be **not valid** for following reasons:

- The file size and duration can be insufficient.
- The used recorder does not match with the selected recorder.
- The file is not from Respiro recorder.

An upload widget will open to indicate the upload progress. Do not close or refresh the browser tab while the upload process is running. While the upload is running, recording status is **Active** (Figure 33). Depending on the size of the uploaded recording data, the upload may take a while. Once the upload is done and the data is processed/analyzed, the recording status will change from **Active** to **Preparing**.

Organization	Clinic A	Created	01.04.2019 15:34	Last data transfer	13.04.2019 12:00
Status	Preparing	Started	10.04.2019 12:00	Last update	13.04.2019 12:00
Assignment	None	Ended	No date	Duration	2 days

Day no.	Start time	Duration	Status	Quality	Notes
1 / 2	10.04.2019 22:00	08h 05m	Open	Fair	Add notes
2 / 2	11.04.2019 22:00	07h 50m	Open	Good	Add note

UPLOADS

Patient ID: 123455677888

- Uploaded
123455677886.edf
123455677887.edf
- Preparing data - 2 / 2

Figure 33 Recording in Preparing state during data upload in Single recording view

3.3.2.2 Validating recording data quality on MedicalSuite service platform

When the recording data file(s) is validated and saved on MedicalSuite Center, the recording data is transferred to **Respiro Analyst** for automatic data quality validation. After data quality validation the quality information is sent back to **MedicalSuite Center**, and a clinic can check from the **Single recording view** if the recording data quality is **good**, **fair**, or **poor**. This helps a clinic to evaluate whether data can be used for further analysis, or if a new recording is needed. **Error! Reference source not found.**

NOTE The recording data quality is automatically validated in Respiro Analyst after data upload.

NOTE Recording data can be analysable if data quality is good or fair. A doctor makes a final decision if data can be analysed (fair data quality). If the recorded data is not valid for some reason, the recording can be repeated for example next night.

More detailed criteria for data quality validation are found on a separate Bittium Respiro Analyst User Guide.

After the recording data has been validated, the **recording data status** informs whether the data can be used in further analysis. Select **Unusable** and write down a reason(s) if a recording is Unusable. If the recording data is selected as unusable, it cannot be used for final data analysis and a new recording needs to be taken. If the data usability is not clear, the data can be assigned to diagnostic user for checking and then the status changes automatically from **Open** to **Pending** except for the status has been changed to **Done** when all stages have been done. (Figure 34, Figure 35)

NOTE Unusable status can also be set automatically by the system if major error(s) occurred during data validation and in that case unusable status cannot be changed by the user.

NOTE At the discretion of the user, recording data that has not been fully transferred and validated may be used. This allows for the analysis of records that, for some technical reason, are not complete but still contain enough information for successful analysis.

Recording data Patient details Anamneses Patient diary Recording details Attachments

Download
 Include all attachments

Cancel Save

Recording data

<input type="checkbox"/>	Day No.	Start date of file	Duration	Status	Quality	Notes
<input type="checkbox"/>	1/3	14.12.2021 23:42	04h 30m	Done	Fair	Add notes
<input type="checkbox"/>	2/3	14.12.2021 23:42	05h 00m	Open	Good	Add notes
<input type="checkbox"/>	3/3	14.12.2021 23:42	00h 15m	Unusable	Poor	Add notes

Marked as "Unusable"

- Corrupted recording data
- Not enough analyzable data due to noisy signal or unattached recorder
- Not enough sleep to write a statement
- Other (trs)

Figure 34 Selecting recording data status

Unusable recording data

Patient ID: [patient_id], 10/04/2019, 22:00 (08h 20m)

Why the recording data of this night is unusable?

Corrupted recording data

Not enough analyzable data due to noisy signal or unattached recorder

Not enough sleep to write the statement

Other

Cancel Mark as Unusable

Figure 35 Selecting reason for unusable recording data

When the complete recording data has been uploaded and validated successfully, the Bittium HSAT recording is **ended** (set "Ready for analysis") to indicate that final analysis can be performed for the recording (see chapter 3.3.3)

3.3.2.3 Uploading other documents to MedicalSuite Center

A scanned patient diary or additional patient background information can be uploaded as other documents to Bittium HSAT recording. For example, patients are commonly asked to mark down the awakenings and other events occurring during a recording which can be important for proper analysis of the recording data.

Such documents can be attached to a recording on MedicalSuite Center to make them available for the diagnostic user when the recording data is analyzed.

To add a document to a recording, follow the steps below:

- 1 Open the recording either from the **Active recordings** card in the Dashboard or the Recordings view in the MedicalSuite Center by clicking on the recording.
- 2 Select **Attachments** tab.
- 3 Click **Add file** and select a file or multiple files to be added. Click **Open**. Alternatively, you can drag the file to the prompted area. (Figure 36)

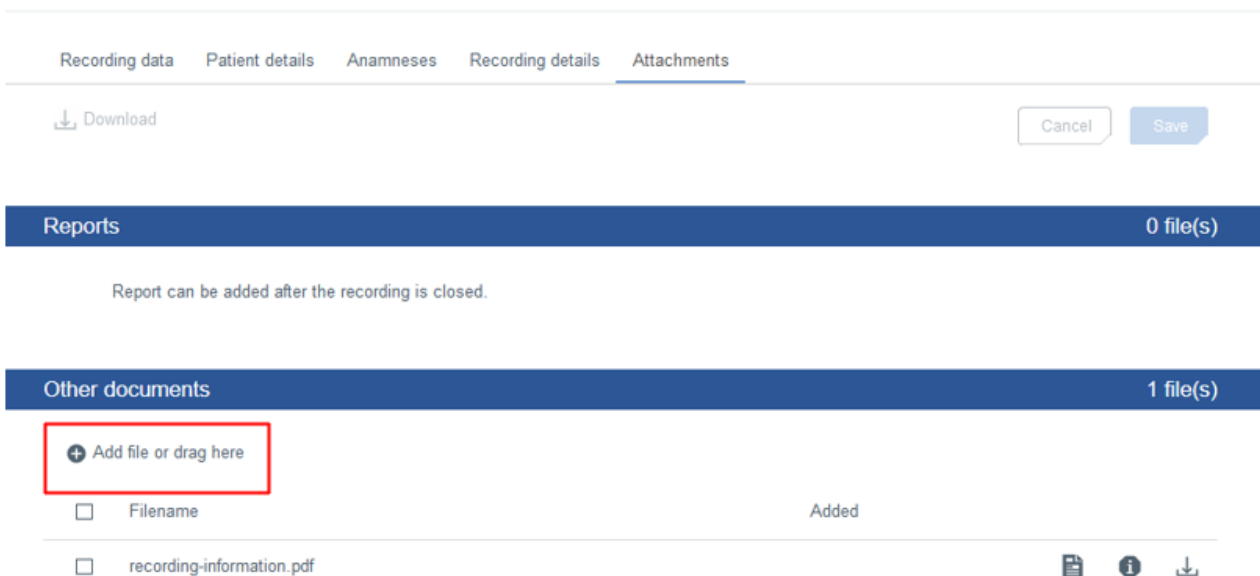


Figure 36 Add file icon on "Attachments" tab

The uploaded document will appear in the Other documents section on the **Attachments** tab (Figure 37).



Figure 37 Uploaded document on “Attachments” tab

3.3.3 Setting recording ready for analysis (ending)

When the complete recording data has been uploaded and validated successfully, the Bittium HSAT recording is **ended** to indicate that the final analysis can be performed for the recording.

NOTE Bittium HSAT recording must have a recording data uploaded as described in chapter 3.3.2 before it can be ended.

NOTE In Bittium HSAT recording Respiro recorder is released automatically after setting a recording “Ready for analysis” so that the recorder can be used in other recordings.

To end a recording, set the recording **Ready for analysis** or change the recording status from **Active** to **Ended** by following the steps below:

- 1 Open the recording e.g., from the **Active recordings** card in the Dashboard or the Recordings view in the MedicalSuite Center by clicking on the recording.
- 2 Click **Ready for analysis** button on the single recording top bar (Figure 38). The same action can also be made by changing the recording status from **Active** to **Ended** either on the single recording top bar (Figure 38), or directly on the Recordings view (Figure 39).

The screenshot shows the Bittium interface for a specific recording. At the top, there is a navigation bar with 'Back', 'Bittium', 'Dashboard', and 'Recordings'. The user is identified as 'Sales Technician'. The patient information is 'Patient ID: PID0a74a' and 'Bittium HSAT'. A red box highlights the 'Ready for analysis' button. Below this, there is a table with recording details:

Organization	Sleep test clinic A	Created	24.03.2022 15:55	Last data transfer	24.03.2022 15:58
Status	Active	Started	14.12.2021 23:42	Last update	05.05.2022 13:15
Assignment	None	Ready for analysis	No date	Duration	2 / 2 day(s)

Below the table, there are tabs for 'Recording data', 'Patient details', 'Anamneses', 'Patient diary', 'Recording details', and 'Attachments'. A 'Download' button is present with an option to 'Include all attachments'. A 'Cancel' and 'Save' button are also visible.

The 'Recording data' section shows a table with columns: Day No., Start date of file, Duration, Status, Quality, and Notes. A single recording is listed:

Day No.	Start date of file	Duration	Status	Quality	Notes
1/2	14.12.2021 23:42	04h 30m	Open	Fair	Add notes

Figure 38 Setting recording “Ready for analysis” on the single recording top bar

The screenshot shows the 'Recordings' view in the Bittium interface. At the top, there is a search bar for 'PID' and a 'Create recording' button. The user is identified as 'Sales Technician'. Below the search bar, there is a table with columns: Patient ID, Status, Last data transfer, Last update, Organization, Created, Type, Device, Assignment, and Action. A red box highlights the status dropdown menu for the first recording (PID023d3), which is currently set to 'Active'. The dropdown menu shows 'Active' and 'Ended' options.

Patient ID	Status	Last data transfer	Last update	Organization	Created	Type	Device	Assignment	Action
PID023d3	Active	No date	10.05.2022 14:24	Sleep test clinic A	10.05.2022 14:24	Bittium HSAT	0000780	None	Download
PID023c4	Active	No date	10.05.2022 12:29	Sleep test center	10.05.2022 12:29	Bittium HSAT	Add recorder S/N	None	Download

Figure 39 Changing recording status to “Ended” in Recordings view

3 Confirm the ending by clicking **Ready for analysis** (Figure 40).

Ready for analysis

Patient ID **PID0a870_013696**

Are you sure this recording is ready for analysis?

- Please make sure the patient diary is filled or it is attached to "Other documents" section
- You will no longer be able to upload new recording data to it.

Cancel

Ready for analysis

Figure 40 Confirming ending of a recording

The complete recording data is now available on MedicalSuite service platform for detailed analysis, and the recording appears in **Diagnostic report needed** dashboard card (Figure 41). Once the recording is assigned to a diagnostic user or diagnostic group (see chapter 3.3.4), the associated user(s) can analyze the recording in **Respiro Analyst**. The complete recording data gets automatically transferred to the related Respiro Analyst for further analysis. The complete data can also be manually downloaded from MedicalSuite service platform in EDF+ format (see chapter 3.5).

Diagnostic report needed

Recording	Assignment	Ready for analysis	Duration	
● PID0a74a	Test diag group 1	24.11.2021 09:10	1 day(s)	Analyze

Figure 41 "Diagnostic report needed" dashboard card

3.3.4 Assigning recording to diagnostic user or diagnostic group

For final analysis purposes a recording is assigned either to a specific diagnostic user or diagnostic group responsible for the analysis of the patient recording. An assignment can be made before, during or after a recording period.

Primarily, the technician can assign a recording to a specific diagnosis user or diagnosis group by selecting the desired diagnosis user or diagnosis group from the drop-down menu of the recording assignment field (Figure 42). When selecting a diagnosis group for recording, the drop-down menu will display all diagnosis users belonging to that selected diagnostic group. One diagnostic user can belong to several diagnostic groups. If a specific diagnostic user is selected for recording, also the diagnostic members of the associated diagnostic group can see the recording in the Bittium Respiro Analyst analysis software.

If option "None" is selected from the drop-down menu, all the diagnostic groups and diagnostic users are visible. Recordings can also be assigned to a certain group automatically according to predefined settings.

The screenshot shows the Bittium software interface. At the top, there is a navigation bar with a back arrow, the Bittium logo, and tabs for Dashboard and Recordings. On the right, there is a language dropdown (EN), a help icon, and a user profile for 'Technician 1'. Below the navigation bar, the patient information is displayed: 'Patient ID: PID00298' and 'Bittium HSAT'. A 'Ready for analysis' button is visible. The main content area shows a table with recording details:

Organization	DemoClinic1	Created	30.05.2023 13:56	Last data transfer	30.05.2023 14:01
Status	Active	Started	23.11.2021 23:42	Last update	25.01.2024 14:08
Assignment	HSAT Analysis	Ready for analysis	No date	Duration	1 / 1 day(s)

A dropdown menu is open for the 'Assignment' field, showing a search bar and a list of groups:

- Cardioscope Group
- Diagnostic group
- Diagnostic group (autoreports)
- HRV group (autoreports)
- HSAT Analysis (selected)

Below the groups list, there is a section for 'Users in HSAT Analysis' with 'Dr. Hanna HSAT' listed. The interface also includes tabs for 'Businesses', 'Patient diary', 'Recording details', and 'Attachments', along with 'Cancel' and 'Save' buttons.

Figure 42 Assigning the recording

Assignment can also be made on the Recordings view by selecting the desired diagnostic user or diagnostic group from the drop-down list of the related field on the assignment column. In addition, the **Diagnostic report needed** card on the Dashboard includes the assignment feature.

NOTE This feature is available only for technician and diagnostic users.

NOTE This feature is fully available only for technician users. For diagnostic users, the feature is limited in such a way that a diagnostic user can only change the assignment inside the diagnostic group or, alternatively, remove the whole assignment from the recording.

3.4 Processing Bittium HSAT recording

After stopping the recording and returning the recording equipment and a possible diary to a clinic or hospital the HSAT recording data needs processing. This stage consists of several separate phases such as analysing the recording data, closing and approving the recording, and rejecting and/or deleting the recording data. Detailed instructions for performing these phases are described in the following chapters.

3.4.1 Analyzing recording data in Bittium Respiro Analyst and creating a diagnostic report

Final analysis of the acquired HSAT data is performed by a specific diagnostic user or a member of the diagnostic group to whom the recording is assigned. Analysis of HSAT events is performed using **Bittium Respiro Analyst**. When a recording is set **Ready for analysis**, the recording data is in Bittium Respiro Analyst analysis software for the associated diagnostic user or members of the diagnostic group.

After the recording data is analyzed, a diagnostic report including the statement notes is created and finally accepted in Bittium Respiro Analyst analysis software to be attached to the recording on MedicalSuite Center.

NOTE

This feature is available only for technician and diagnostic users who have access to Bittium Respiro Analyst.

To perform final analysis of a recording and to create a diagnostic report in Bittium Respiro Analyst check separate **Respiro Analyst User Guide**.

3.4.2 Closing recording and attaching diagnostic report

Closing HSAT recording means that a diagnostic report is shown on the diagnostic user's Dashboard if it has been attached to a recording. A recording can be closed **automatically** or **manually** as well as attaching a diagnostic report.

3.4.2.1 Automatic closing and attaching diagnostic report

Bittium HSAT recording is closed automatically when final analysis of a recording is performed, and a diagnostic report accepted. If a recording is assigned to a diagnostic user or diagnostic group, the recording appears on the diagnostic user's Dashboard. Accepting a diagnostic report in **Respiro Analyst** attaches the report to the recording and closes it.

NOTE

This feature is available only for technician and diagnostic users who have access to Bittium Respiro Analyst.

To close a recording automatically by accepting a diagnostic report, follow the steps below:

- 1 Find the recording from MedicalSuite Center e.g., from the **Diagnostic report needed** card on the Dashboard.
- 2 Open a recording in Bittium Respiro Analyst by clicking **Analyze** (Figure 43). If you need to go back to MedicalSuite Center, use **Back** button in Bittium Respiro Analyst.

Diagnostic report needed

Recording	Assignment	Ready for analysis	Duration	
● PatientZero	Test diag group 1	24.11.2021 09:10	1 day(s)	Analyze

Figure 43 Analyze button on “Diagnostic report needed” dashboard card

- Click **Accept** report in Bittium Respiro Analyst to attach the already created diagnostic report to the recording on MedicalSuite Center (Figure 44).

Summary and statement
Analysis
Report

Accept report

1 of 3
Automatic Zoom

Patient

Patient ID: 23-30-48	Height: 185cm	Weight: 85kg
BMI: 24.8	Age: 58 years	Gender: Male

Summary

Apnea-hypopnea index: 8.7/h (Supine: 15.4/h, Non-supine: 2.1/h)	Oxygen Desaturation Index (ODI3): 8.7/h
--	---

AHI

ODI3

Recording date	15/10/2021	Recording: TRT	08h 36m (23:30 - 08:07)
Evaluation period	08h 16m (23:43 - 08:00)		

Apnea-hypopnea index (AHI) displayed here is the total number of respiratory events (Apneas + Hypopneas) divided by Evaluation period. Evaluation period was determined based on measured signals and patient diary

Statement

Findings
Nearly all occurrences of respiratory events are in the supine position. The recording was technically successful and of high quality.

Conclusion
The recording findings are consistent with mild obstructive sleep apnea. Avoiding sleeping in a supine position (positional therapy), for example by placing a tennis ball in the back of the pajamas or wearing a sleep apnea belt, might be sufficient treatment. It is recommended to confirm the treatment outcome with a new recording.

23/02/2022
Dr. Sleep Apnea

This report is the consulting doctor's opinion based on the monitoring and the available background information. The final conclusions are always made by the patient's attending doctor who has the best

Figure 44 Report view in Respiro Analyst

- Confirm the accepting by clicking **Accept** (Figure 45).

Accept the report

Once you accept the report, the recording will be closed. Are you sure you want to accept the report?



Figure 45 Confirming accepting of a diagnostic report

After accepting a report, a recording is automatically closed, and a diagnostic report created to the recording in Bittium Respiro Analyst are available in MedicalSuite Center.

Attaching a diagnostic report to a recording removes the recording from the **Diagnostic report needed** dashboard card. After a diagnostic report is attached to the recording on MedicalSuite service platform, the recording will appear on the **Latest reports** dashboard card.

3.4.2.2 Manual closing and attaching diagnostic report

Bittium HSAT recording can also be closed, and diagnostic report attach to it **manually**, if the closing is not done automatically. Manual closing can be performed without analyzing the recording or attaching a report to it. If a recording is assigned to a diagnostic user or diagnostic group, the recording appears on the diagnostic user's dashboard.

To close a recording manually, follow the steps below:

- 1 Find a recording from MedicalSuite Center e.g., by searching it by the patient ID or the recorder S/N in the **Recordings view**.
- 2 Click **Close** button related to the recording that you want to close directly from the single recording top bar (Figure 46), open first the recording by clicking it. The same action can also be made by changing the recording status from **Ended** to **Closed** either on the single recording top bar (Figure 46), or directly in the Recordings view (Figure 47).

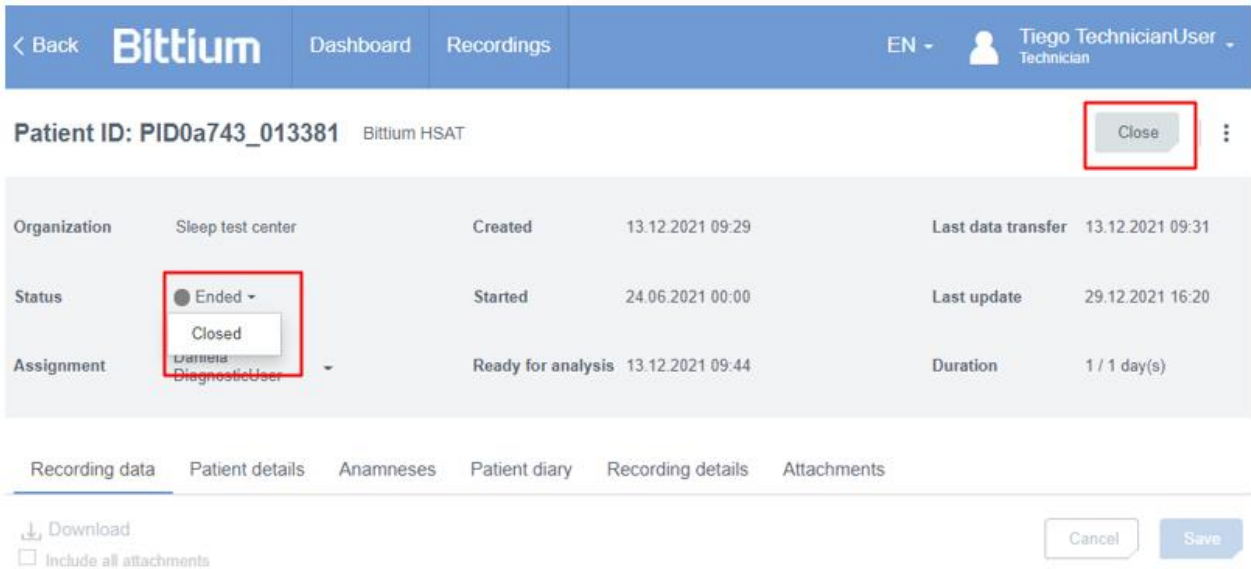


Figure 46 Closing recording in Single recording view

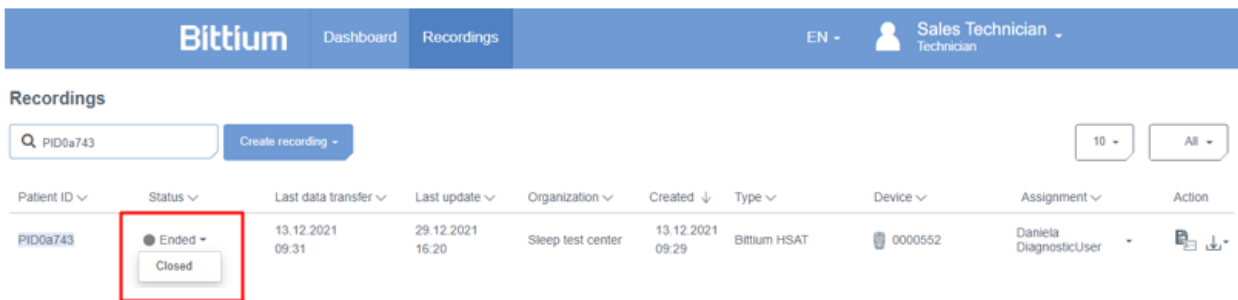


Figure 47 Changing recording status to "Closed" in Recordings view

- 3 **Add file** to select a report or **drag-and-drop a file** from your computer in Single recording view if needed (Figure 48)

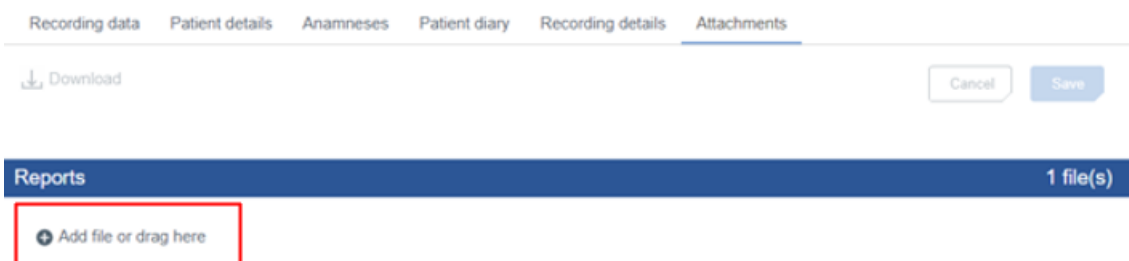


Figure 48 Add file icon on Attachments tab

- 4 Confirm closing by clicking **Close** (Figure 49).

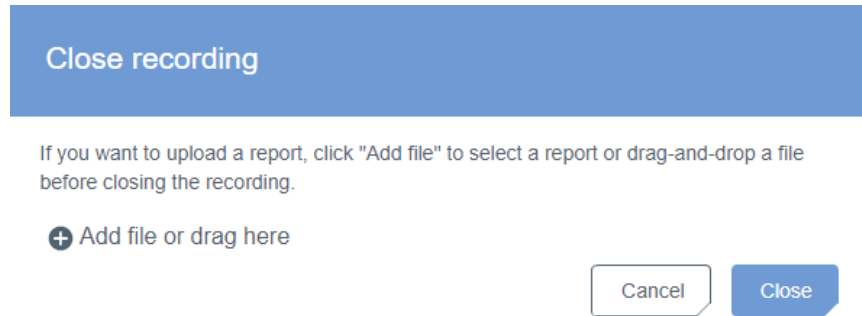


Figure 49 Confirming closing of a recording

If a diagnostic report is created to the recording in Bittium Respiro Analyst, it will be available in MedicalSuite Center when the recording is closed. After a diagnostic report is attached to the recording on MedicalSuite service platform, the recording will appear on the **Latest reports** dashboard card.

3.4.3 Approving recording and delivering diagnostic reports to lower-level organization

Recording needs to be approved by a technician user of the upper-level organization on MedicalSuite Center to get the diagnostic report(s) delivered to the associated lower-level organization. When a report is attached to a recording on MedicalSuite Center, a technician user of the upper-level organization first previews it and verifies that the report contains all the necessary information. After previewing, the technician user finally approves the recording to deliver the diagnostic report(s) to the associated lower-level organization.

NOTE This feature is available only for technician users.

To preview a diagnostic report, follow the steps below:

- 1 Find the recording from MedicalSuite Center e.g., from the **Latest reports** card on the Dashboard or by searching by the patient ID or the recorder S/N on the Recordings view.
- 2 Click **preview icon** related to the recording whose report you want to preview either directly from the **Latest reports** card on the Dashboard (Figure 50) or on the Recordings view (Figure 51).



Latest reports				
Recording	Organization	Added	Approval	
● PID0a74a	DemoClinic2	07.10.2020 17:49	07.10.2020 17:54	 

Figure 50 Preview icon on Latest reports dashboard card



Recordings									
<input type="text" value="PID0a74a"/> Create recording -		10 - All -							
Patient ID	Status	Last data transfer	Last update	Organization	Created	Type	Device	Assignment	Action
PID0a74a	● Closed	14.12.2021 15:47	17.12.2021 15:22	Sleep test center	14.12.2021 15:47	Bittium HSAT	0123456	None	 

Figure 51 Preview icon in Recordings view

If you clicked the preview icon in the Recordings view (Figure 51), the **Attachments** tab of the recording will open. Click **preview icon** related to the report you want to preview.

To approve a recording to deliver the diagnostic report(s) to the associated lower-level organization, follow the steps below:

- 3 Click **Approve** button related to the recording whose report(s) you want to deliver to the associated lower-level organization directly from the **Latest reports** card on the Dashboard (Figure 52) or on the single recording top bar (Figure 53, open first the recording by clicking it).





Latest reports				
Recording	Organization	Updated	Approval	
● PID023d3	Sleep test center	16.12.2021 09:46 Not assigned	16.12.2021 09:48	 
● PID0a74a	Sleep test center	15.12.2021 15:16 Not assigned	Approve	 

Figure 52 Approve button on "Latest reports" dashboard card

The screenshot shows the Bittium interface for a recording. At the top, there is a navigation bar with 'Back', 'Bittium', 'Dashboard', and 'Recordings'. The user is identified as 'Sales Technician'. The main content area displays 'Patient ID: PID0a74a' and 'Bittium HSAT'. A red box highlights the 'Approve' button in the top right corner. Below this, a table provides details about the recording:

Organization	Sleep test center	Created	14.12.2021 15:47	Last data transfer	14.12.2021 15:47
Status	● Closed	Started	24.02.2021 00:00	Last update	17.12.2021 15:22
Assignment	None	Ready for analysis	14.12.2021 15:49	Duration	1 / 1 day(s)

Below the table, there are tabs for 'Recording data', 'Patient details', 'Anamneses', 'Patient diary', 'Recording details', and 'Attachments'. At the bottom, there is a 'Download' button and a checkbox for 'Include all attachments', along with 'Cancel' and 'Save' buttons.

Figure 53 Approve button on single recording top bar

4 Confirm approving by clicking **Approve** (Figure 54).

The screenshot shows a confirmation dialog box with a blue header 'Confirmation'. The text inside asks: 'Are you sure you want to approve the reports of Patient ID: 01-10-56? After approval, reports will be visible for the clinic.' At the bottom, there are two buttons: 'Cancel' and 'Approve'.

Figure 54 Confirming approving of a recording

When a recording is approved (Figure 55), the related diagnostic reports available on MedicalSuite service platform are delivered to the associated lower-level organization, and the related preview icons have a green dot indicating the report delivery (Figure 56).

< Back **Bittium** Dashboard Recordings EN Sales Technician Technician

Patient ID: PID0a74a Bittium HSAT Approved

Organization	Sleep test center	Created	14.12.2021 15:47	Last data transfer	14.12.2021 15:47
Status	● Closed	Started	24.02.2021 00:00	Last update	31.12.2021 10:13
Assignment	None	Ready for analysis	14.12.2021 15:49	Duration	1 / 1 day(s)

Recording data Patient details Anamneses Patient diary Recording details Attachments

Download Cancel Save
 Include all attachments

Figure 55 Recording approved

Latest reports

Recording	Organization	Updated	Approval	
● PID023d3	Sleep test center	16.12.2021 09:46 Not assigned	16.12.2021 09:48	📄 ↓
● PID0a74a	Sleep test center	15.12.2021 15:16 Not assigned	16.12.2021 09:48	📄 ↓

Figure 56 Preview icon with a green dot indicating report delivery

3.4.4 Previewing and downloading diagnostic reports and other documents

When a recording is approved by a technician user of the upper-level organization, the related diagnostic report(s) transferred to MedicalSuite service platform are available also for the associated lower-level organization users. Previewing and downloading a diagnostic report or some other attached document (e.g., recording information PDF file) from MedicalSuite Center can be done directly from the **Latest reports** card on the Dashboard or from the **Attachments** tab of the recording.

To preview a diagnostic report or some other document, follow the steps below:

- 1 Find the recording from MedicalSuite Center e.g., from the **Latest reports** card on the Dashboard or by searching by the patient ID or the recorder S/N on the Recordings view.
- 2 Click **preview icon** related to the recording whose report or some other document you want to preview either directly from the **Latest reports** card on the Dashboard (Figure 57) or on the Recordings view (Figure 58).

Latest reports





Recording	Organization	Updated	Approval	
● PID023d3	Sleep test center	16.12.2021 09:46 Not assigned	16.12.2021 09:48	 
● PID0a74a	Sleep test center	15.12.2021 15:16 Not assigned	16.12.2021 09:48	 

Figure 57 Preview icon on “Latest reports” dashboard card



Patient ID	Status	Last data transfer	Last update	Organization	Created	Type	Device	Assignment	Action
PID02522	● Ended	17.12.2021 16:05	17.12.2021 16:06	Sleep test center	17.12.2021 15:32	Bittium HSAT	0000102	None	 
PID02521	● Closed	16.12.2021 09:27	28.12.2021 09:26	Sleep test center	16.12.2021 09:05	Bittium HSAT	0000516		 





Figure 58 Preview icon in Recordings view

If you clicked the preview icon on the Recordings view (Figure 58), the **Attachments** tab of the recording will open. Click **preview icon** related to the report you want to preview.

To download a diagnostic report or some other document, follow the steps below:

- 1 Click **download icon** related to the recording whose report or some other document you want to download either directly from the **Latest reports** card on the Dashboard (Figure 59) or on the Recordings view (Figure 60) and select the document you want to download.
- 2 Store the downloaded document(s) to the desired location.

Latest reports

Recording	Organization	Updated	Approval	
● TC58807	Sleep test center	27.06.2022 08:36 Test diag group 1	27.06.2022 08:37	  Download
● TC58807	Sleep test center	21.06.2022 13:57 Test diag group 1	21.06.2022 13:58	 
● PID023d3	Sleep test center	21.06.2022 12:52 Test diag group 1		
● PID023c4	Sleep test center	03.06.2022 13:36 Test diag group 1		
● PID0255b	Sleep test center	31.05.2022 14:30 Test diag group 1		

Recording data

- ↓ Recording data 1 day(s)

Reports

- ↓ TC58807_Diagnostic_Report_16_12_2021.pdf

Other documents

- ↓ recording-information.pdf


Figure 59 Download icon on Latest reports dashboard card

Recording data Patient details Anamneses Patient diary Recording details **Attachments**

↓ Download Cancel Save

Reports 1 file(s)

+ Add file or drag here

<input type="checkbox"/>	Filename	Added	
<input type="checkbox"/>	statement_61baee370453ef000a0b05a8_1639640683.207618.pdf	16.12.2021 09:44	

Other documents 3 file(s)

+ Add file or drag here



<input type="checkbox"/>	Filename	Added	
<input type="checkbox"/>	recording-information.pdf		
<input type="checkbox"/>	Document_1.txt	19.12.2021 14:53	

Figure 60 Download icons on "Attachments" tab of a recording

3.4.5 Rejecting and deleting recording data in MedicalSuite Center

Recording data can be manually rejected and deleted in MedicalSuite Center if the data cannot be used for further analysis or no data have been recorded. Both rejecting and deleting actions can be performed in single recording view of MedicalSuite Center (Figure 61, Figure 62, Figure 63).

NOTE

A recording that contains recording data can only be rejected. A recording without recording data or with Error status can be rejected and deleted.

The screenshot displays the Bittium MedicalSuite Center interface. At the top, there is a navigation bar with 'Back', 'Bittium', 'Dashboard', and 'Recordings' tabs. The user is identified as 'EN - Sales Technician'. The patient ID is 'PID0a870_013696' and the patient name is 'Bittium HSAT'. The recording details section shows the following information:

Organization	Sleep test center	Created	21.12.2021 13:38	Last data transfer	21.12.2021 13:39
Status	Ended	Started	23.05.2021 22:53	Last update	23.12.2021 13:41
Assignment	None	Ready for analysis	21.12.2021 13:42	Duration	1 / 1 day(s)

Below the recording details, there are tabs for 'Recording data', 'Patient details', 'Anamneses', 'Patient diary', 'Recording details', and 'Attachments'. The 'Recording data' tab is active, showing a table with the following columns: Day No., Start date of file, Duration, Status, Quality, and Notes. The table contains one row of data:

Day No.	Start date of file	Duration	Status	Quality	Notes
1/1	23.05.2021 19:53	08h 00m	Open	Poor	Add notes

A red box highlights the 'Close' and 'Reject' buttons in the top right corner of the recording details section.

Figure 61 Rejecting recording in Single recording view

< Back **Bittium** Dashboard Recordings EN Sales Technician Technician

Patient ID: PID020c5_005914 Bittium HSAT

Organization	Evismo test center	Created	07.09.2021 15:04	Last data transfer	No date
Status	<input type="radio"/> Rejected	Started	No date	Last update	22.09.2021 14:37
Assignment	None	Ready for analysis	No date	Duration	

Figure 62 Deleting recording in Single recording view

When rejecting a recording, a **reason for rejection** is needed. A reason can be selected from a category, or it can be specified with free text. **After rejecting the recorder will be released, and this action cannot be cancelled** (Figure 63). **When deleting a recording, it is informed that the recorder will be released, and this action cannot be cancelled** (Figure 64).

Reject recording

Patient ID: **PID023d3**

The recorder 0000780 is currently in use in the selected recording. It will be released when the recording is rejected. Are you sure you want to reject the recording?

This action cannot be undone.

Why do you want to reject the recording?

- Corrupted recording data
- Not enough analyzable data due to noisy signal or unattached recorder
- Not enough sleep to write a statement
- Other

Cancel Reject

Figure 63 Note when rejecting recording

Delete recording

Patient ID: **PID023d3**

The recorder 0000780 is currently in use in the selected recording. It will be released when the recording is deleted. Are you sure you want to delete the recording?

This action cannot be undone.

Cancel Delete

Figure 64 Note when deleting recording

You can inspect rejected recording(s) with reasons and other details from Recordings view or Single recording view on MedicalSuite Center (Figure 65, Figure 66).

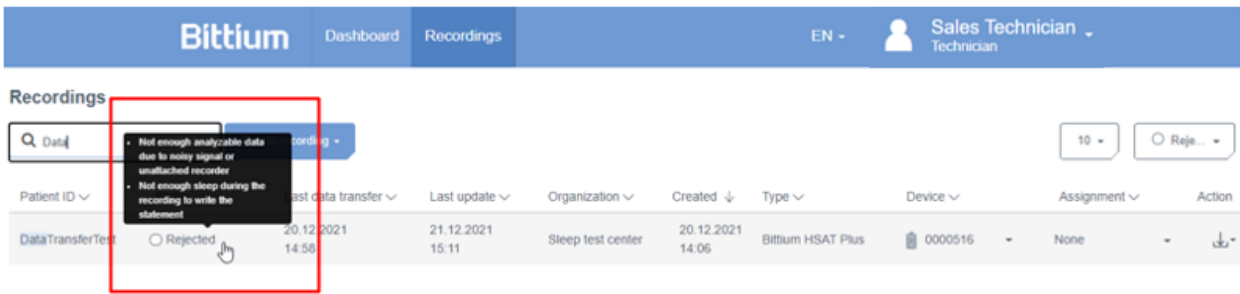


Figure 65 Inspecting rejected recordings in Recordings view

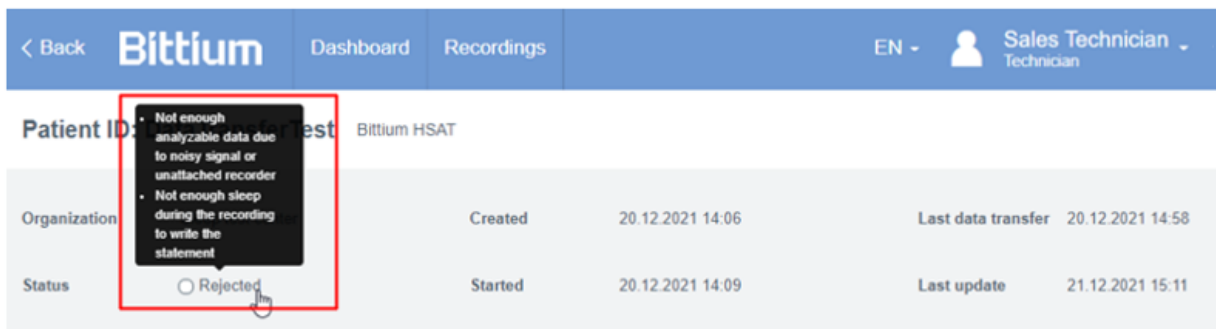


Figure 66 Inspecting rejected recording in Single recordings view

NOTE

Before starting a new HSAT recording, the data of the previous recording needs to be deleted for privacy reasons from Respiro recorder by using Bittium Respiro Device Manager. See details from **Respiro Operating Instructions for healthcare professionals**.

3.5 Downloading recording data from MedicalSuite Center

For storing Bittium HSAT recording data for further analyzing with non-integrated analysis software, the data can be manually downloaded from MedicalSuite Center in EDF+ format.

To download data from MedicalSuite Center, follow the steps below:

- 1 **Open the recording** either from the **Dashboard** or the **Recordings view** on MedicalSuite Center by clicking on the recording.
- 2 **Select Recording data** tab.
- 3 **Select the recording nights** you want to download the data of. Every EDF-file relates to one recording night. If you wish to also download the related attachments e.g., the recording information PDF file that contains patient details, also check the box of "Include all attachments". (Figure 67)

The screenshot shows the Bittium patient recording interface. At the top, there is a navigation bar with 'Back', 'Bittium', 'Dashboard', and 'Recordings'. The user is identified as 'Sales Technician'. The patient information is 'Patient ID: PID0a74a' and 'Bittium HSAT'. Below this, a table displays recording details:

Organization	Sleep test center	Created	16.12.2021 15:27	Last data transfer	16.12.2021 16:24
Status	Closed	Started	16.12.2021 15:36	Last update	21.12.2021 13:58
Assignment	None	Ready for analysis	17.12.2021 14:24	Duration	2 / 2 day(s)

Below the table, there are tabs for 'Recording data', 'Patient details', 'Anamneses', 'Patient diary', 'Recording details', and 'Attachments'. A 'Download' button is highlighted with a red box, along with an 'Include all attachments' checkbox. To the right are 'Cancel' and 'Save' buttons.

The 'Recording data' section contains a table with the following data:

<input type="checkbox"/>	Day No.	Start date of file	Duration	Status	Quality	Notes	
<input type="checkbox"/>	1/2	16.12.2021 15:36	00h 29m	Open	Poor	Add notes	Download
<input checked="" type="checkbox"/>	2/2	17.12.2021 10:01	03h 00m	Open	Poor	Add notes	Download

Figure 67 Selecting the day(s) for download

4 Click **Download** (Figure 67).

The recorded data of the selected nights is downloaded as a zip file that contains the recording data file in EDF+ format and the attachments if selected to be included. Store the downloaded data to the desired location or extract the recording data file and import it to analysis software for further analysis.

3.6 Troubleshooting

If you have other troubles with the recording equipment, please see details from the **Respiro Operating Instructions for healthcare professionals**.

MANUFACTURER

Bittium MedicalSuite Service Platform



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