

Bittium

MedicalSuite™ Platform Holter Service

Clinical Guide



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Bittium Biosignals Ltd.
Pioneerinkatu 6
70800 Kuopio
Finland
Phone: +358 40 344 2000
www.bittium.com

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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 Holter service

Bittium MedicalSuite platform Holter service is used for managing and visualizing standard ECG data typical for cardiac-related disorders, such as various arrhythmias.

Bittium MedicalSuite platform Holter service provides a conventional offline solution to manage data from Holter recordings where recording data is uploaded from Bittium Faros™ recorder to MedicalSuite service platform for analysis with Bittium Cardiac Navigator™ software.

1.2 Bittium Faros

Faros device is a wearable, portable, externally applied electrocardiograph (ECG) recorder and wireless transmitter for ECG measurement, R-R interval data measurement and patient motion capturing. The device monitors patient ECG and can be set to generate event markers using the built-in arrhythmia detection algorithms.

More information about the Faros ECG recorder can be found from **Bittium Faros™ Manual**.

1.3 Bittium Cardiac Navigator

Bittium Cardiac Navigator software is a flexible and versatile solution for performing clinical Holter ECG analysis when analyzing recordings with multiple days of ECG data efficiently, thereby speeding up the diagnosis. Cardiac Navigator integrated to MedicalSuite platform enables specialists who are working in remote locations to analyze recordings made by the health centers and clinics. For the specialist, the system provides a complete working environment for signal visualization and analysis.

More information about the Bittium Cardiac Navigator software can be found from Cardiac Navigator™ Software User Guide.

2 BITTIUM MEDICALSUITE ACCOUNTS

Each unit offering a particular type of healthcare services relates to a separate organization entity belonging in a tree type organization structure in Bittium MedicalSuite service platform (Figure 1).

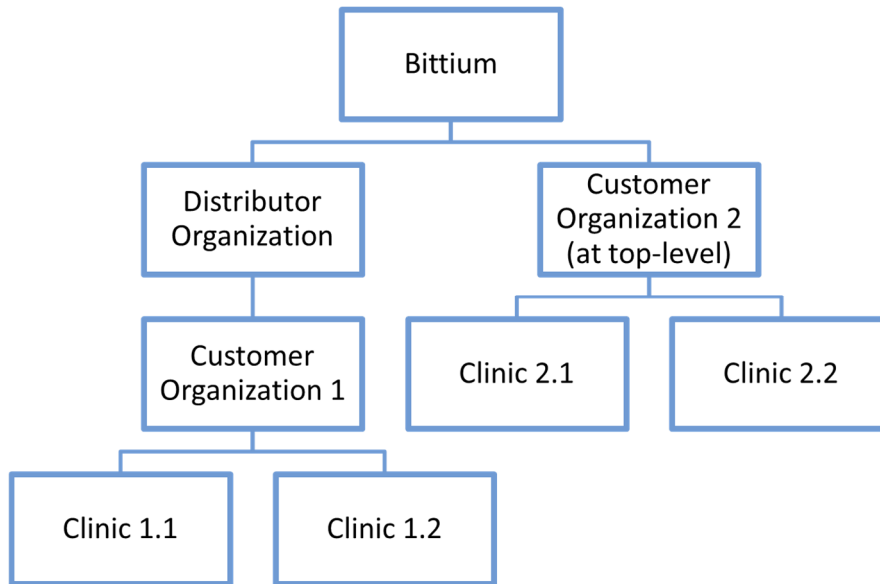


Figure 1 Tree type organization structure

Furthermore, each organization on Bittium MedicalSuite may include multiple users with different functionality access. The structure of MedicalSuite organizations and its' users and their tasks can vary based on the organization process and needs. To access the data of the organization on Bittium 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 devices.
- Has access to web service usage statistics of his/ her own organization and its lower-level organizations.



Clinic

- Prepares a recording with patient details according to the study prescription of the physician.
- Attaches the ECG recorder, electrodes and cables if necessary.
- 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 the ECG recorder, electrodes and cables if necessary.
- Verifies the acquired signal quality using **Quick Preview** feature on Bittium MedicalSuite Center.
- Assigns the recording to a diagnostic user or diagnostic group for analysis and interpretation.
- May perform the ECG data clean-up using Bittium Cardiac Navigator™ analysis software or other relevant analysis software.
- Approves a diagnostic report and thus provides the report with interpretation notes to the lower-level organization.



Diagnostic

- Analyzes the ECG data with Bittium Cardiac Navigator™ or other relevant analysis software.
- Interprets the analysis results and creates a diagnostic report.

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

3 SIGNING IN BITTIUM MEDICALSUITE SERVICE PLATFORM

Management of Bittium Holter recordings throughout the whole study workflow is performed using Bittium MedicalSuite Center. 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 Bittium MedicalSuite accounts of your organization is performed by admin user(s) using Bittium MedicalSuite BackOffice. Contact your Bittium MedicalSuite organization admin user to get user credentials for Bittium MedicalSuite service platform.

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

- 1 Go to Bittium MedicalSuite Center sign in page.

NOTE The recommended browsers for using Bittium MedicalSuite service platform are the latest versions of Google Chrome and Mozilla Firefox.

- 2 Click **Sign in with Microsoft** button (Figure 2).

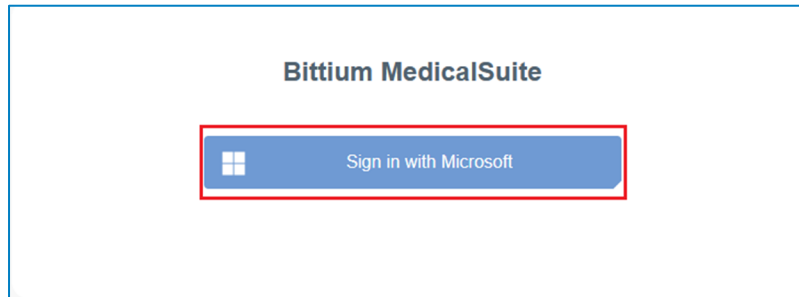


Figure 2 Sign in with Microsoft view

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

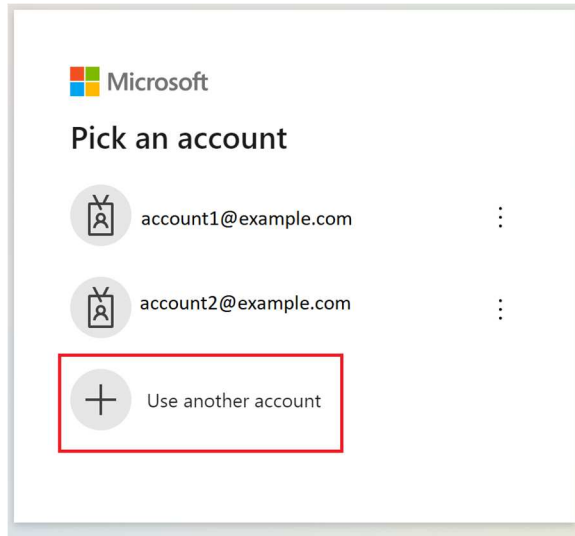


Figure 3 Select earlier saved account or use another account to sign in

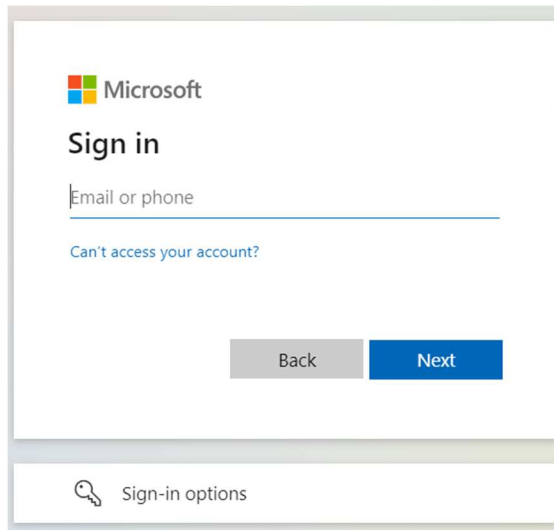


Figure 4 Enter account credentials

4 Enter the password.

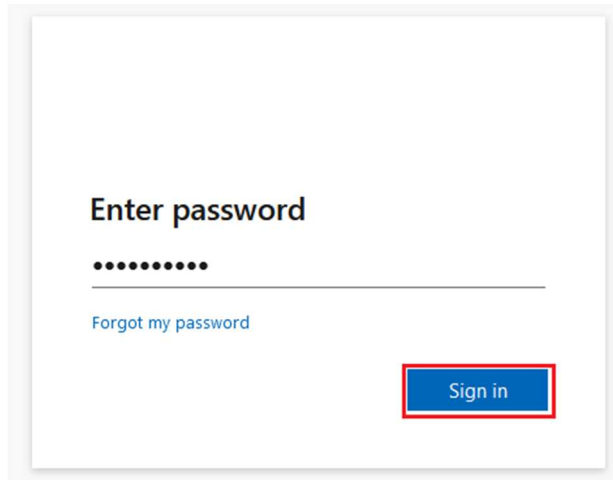


Figure 5 Enter password

- 5 Make sure your phone registered for authentication is nearby and powered on.
- 6 Click on **Sign** button (Figure 5).
- 7 Enter the numbers shown in the Approve sign in request view to the Microsoft Authenticator application. Confirm the sign in request by selecting **Yes** from the Microsoft Authenticator application (Figure 6).

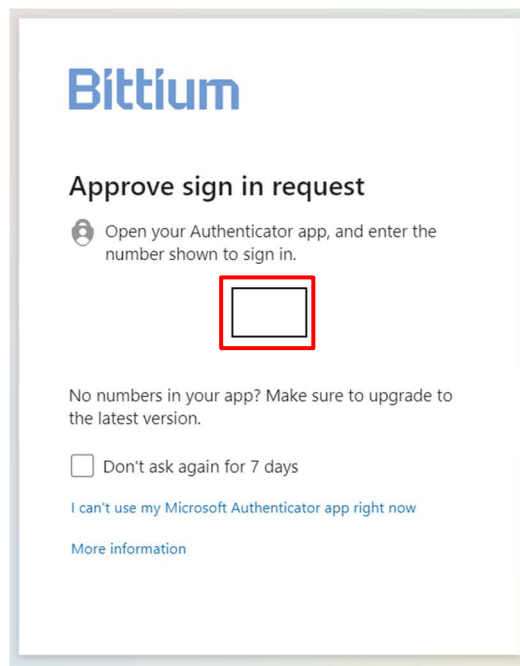


Figure 6 Approve sign in by entering shown number to prompt in Authenticator application

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 page opens (Figure 7).

Dashboard

Create recording - Edit dashboard -

EN - Technician 1 Technician

Active recordings

Recording	Started	Type	Duration
Test	-	Bittium Holter	0 / 0 day(s)
HolterPlus_4	08.08.2020 16:07	Bittium HolterPlus	2 / 30 day(s)
Holter_2	14.02.2018 11:43	Bittium Holter	1 / 1 day(s)
HolterTest2	14.02.2018 11:43	Bittium Holter	1 / 1 day(s)
HolterTest	14.02.2018 11:43	Bittium Holter	1 / 1 day(s)
PID000d3	14.02.2018 11:43	Bittium Holter	1 / 1 day(s)
Offline_Test2	14.02.2018 11:43	Bittium Holter	1 / 1 day(s)

Latest reports

Recording	Organization	Added	Approval
HolterPus_6	DemoClinic1	10.08.2020 10:04 Diagnostic group	Approve [Icons]
HolterPlus_2	DemoClinic2	03.07.2020 16:40 Diagnostic group	Approve [Icons]
Holter_1	DemoClinic1	08.08.2020 09:57 Diagnostic group	Approve [Icons]

Figure 7 MedicalSuite Center Dashboard page

The MedicalSuite Center Dashboard page presents the statistics and highlights the most recent activity on the Bittium MedicalSuite service platform. It adapts to the current user role logged in. You can see the

current user role in the top-right corner of the page. 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.

9 Select **Recordings tab** from the top bar and the Recordings page opens (Figure 8).

Patient ID	Status	Last update	Organization	Created	Recording type	Device	Assignment	Action
Test1234	Created	22.05.2020 14:18	ServiceProvider	22.05.2020 14:18	Bittium HolterPlus	1885069	None	Download
jaakko_demo_test	Active	22.05.2020 12:55	ServiceProvider	22.05.2020 12:53	Bittium Holter	1724459	None	Download
1234Test	Created	22.05.2020 09:36	DemoClinic1	22.05.2020 09:36	Bittium HolterPlus	1867702	None	Download
HolterPlus_ex...	Active	20.05.2020 13:42	DemoClinic1	20.05.2020 13:41	Bittium Holter	1867704	None	Download
Test_1234	Created	19.05.2020 09:29	DemoClinic1	19.05.2020 09:29	Bittium HolterPlus	1885161	None	Download
Trial554	Active	26.05.2020 14:22	DemoClinic1	18.05.2020 16:20	Bittium Holter	1867703	Cardiologist 1	Download
Trial445	Active	26.05.2020 14:22	DemoClinic1	18.05.2020 16:10	Bittium Holter	1867703	Cardiologist 1	Download
Trial556	Active	18.05.2020 15:53	DemoClinic1	18.05.2020 15:53	Bittium Holter	1867703	None	Download
HolterPlus_3_1	Active	22.05.2020 14:30	DemoClinic2	15.05.2020 14:03	Bittium HolterPlus	1874602	Diagnostic group	Download
jaakko_sstest2	Ended	15.05.2020 22:06	ServiceProvider	11.05.2020 21:10	Bittium HolterPlus	1885069	Diagnostic group	Download

Figure 8 Recordings page

If you are logged in as an admin, technician or clinic user, the Recordings page contains a list of all recordings created for your own organization and its lower-level organizations. Respectively, 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 page.

4 BITTIUM HOLTER RECORDINGS

Bittium Holter is a regular, offline ECG recording, in which the cardiac activity of a patient is recorded for a predetermined time period. Once the recording has been completed, the acquired ECG data is manually uploaded to Bittium MedicalSuite service platform for the complete ECG data analysis.

4.1 Introduction to Bittium Holter workflow

Bittium Holter recording workflow is visualized in Figure 9. Bittium Holter is an ambulatory offline recording that is used to record ECG data. Bittium Holter recording can be manually started and stopped by pressing the Faros button. The used settings are selected using Bittium Faros Manager software. Once the recording has been completed, the recording data is manually uploaded to MedicalSuite Center for the complete data analysis.

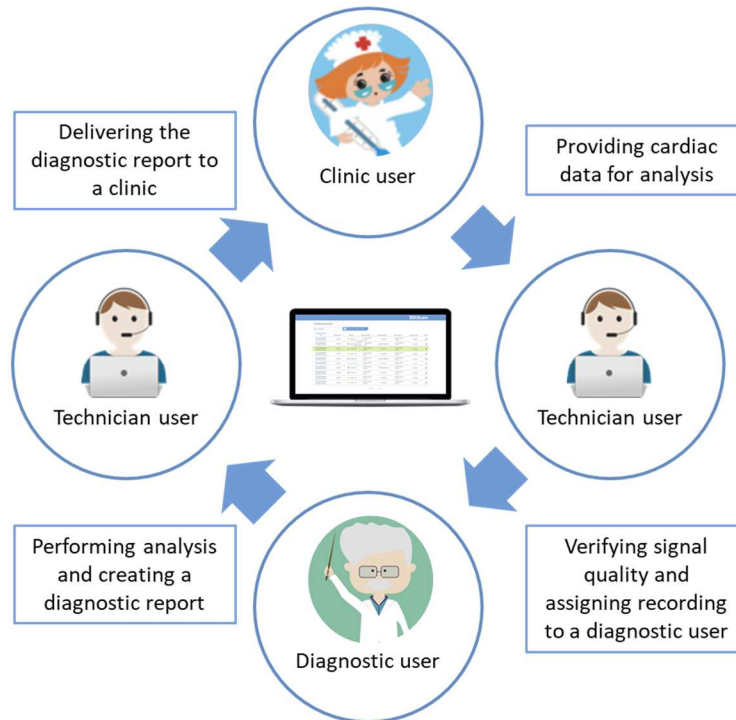


Figure 9 Bittium Holter workflow

4.2 Preparing Bittium Holter recording

The recording equipment needs to be prepared for Holter recording based on the recording needs as instructed in **Bittium Faros Manual**. Bittium Holter recording is created on MedicalSuite Center.

4.3 Creating Bittium Holter recording

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

- 1 Click **Create recording button** either on the Dashboard or the Recordings view on Bittium MedicalSuite Center. A drop-down menu is presented (Figure 10). Select **Bittium Holter**. Create recording view opens.

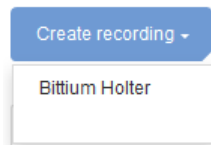


Figure 10 Create recording drop-down menu

- 2 Enter information to all the required fields (*) on the Patient details tab (Figure 11). If desired, other fields can be left unfilled. Note the following:
 - a Patient ID is for identifying the patient. If this field is left blank, the system will generate it.
 - b Do not use the patient's name or social security number as a patient ID!**



CAUTION: Do not enter any patient delicate information (e.g., use the patient's name or social security number as a patient ID) to the Bittium MedicalSuite service platform.

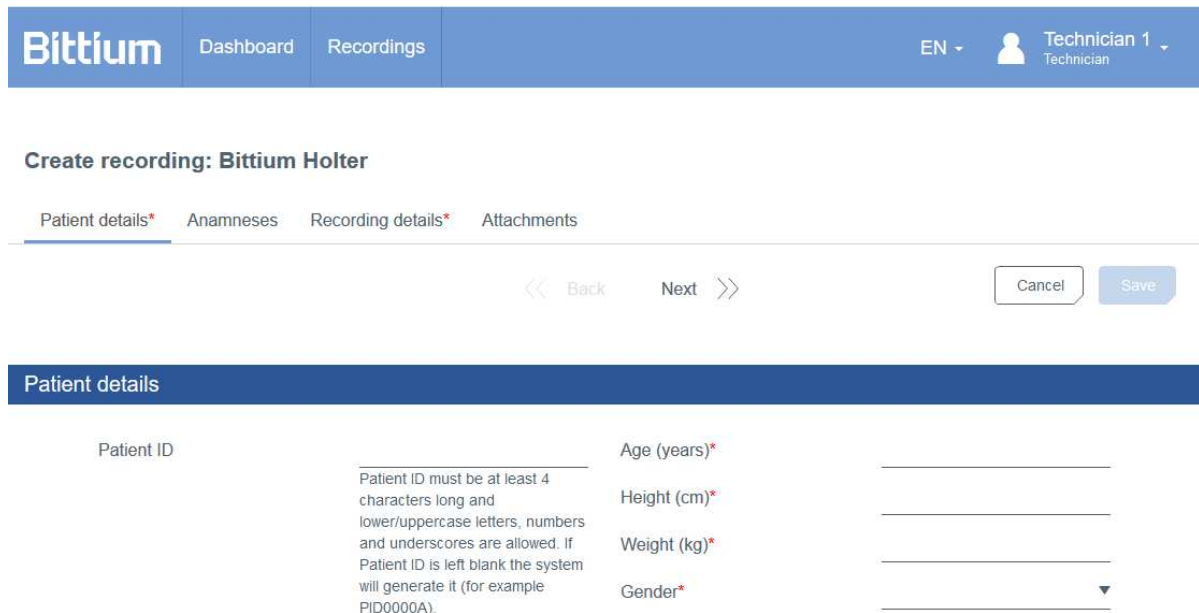
The screenshot shows the Bittium MedicalSuite interface. At the top, there's a navigation bar with 'Bittium', 'Dashboard', and 'Recordings' tabs. On the right, it shows 'EN' and 'Technician 1' with a dropdown arrow. Below this, the main heading is 'Create recording: Bittium Holter'. There are four tabs: 'Patient details*' (active), 'Anamneses', 'Recording details*', and 'Attachments'. Navigation buttons include '<< Back', 'Next >>', 'Cancel', and 'Save'. The 'Patient details' section contains several input 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)*', and 'Gender*' (with a dropdown arrow).

Figure 11 Create recording – Patient details tab

- 3 Click **Next** and enter patient anamneses information on the Anamnesis tab, if necessary (Figure 12, optional step).

The screenshot displays the 'Create recording: Bittium Holter' interface. At the top, there is a navigation bar with 'Bittium', 'Dashboard', and 'Recordings' tabs. The user is logged in as 'EN Technician 1'. Below the navigation bar, the title 'Create recording: Bittium Holter' is shown, followed by a sub-navigation bar with 'Patient details', 'Anamnesis', 'Recording details*', and 'Attachments' tabs. The 'Anamnesis' tab is active, and the form is divided into several sections:

- Medication:** A text input field for 'Medication' and a radio button selection for 'Medication at time of ECG recording' (No/Yes).
- Diseases:** Radio button selections for 'Diagnosed heart disease' (No/Yes) and 'Diagnosed arrhythmias and/ or myocardial diseases (e.g. cardiomyopathy) in the family' (No/Yes).
- Habits:** Radio button selections for 'Smoking' (No/Yes) and 'Alcohol consumption' (No/Sometimes/Often).
- Symptoms:** A list of symptoms with radio button selections for 'No', 'Sometimes', and 'Often':
 - Palpitations
 - Irregular beat
 - Slow pulse
 - Fast pulse
 - Unpleasant feeling in the chest
 - Shortness of breath
 - Dizziness
 - Weakness
 - Fainting/ syncope
- Comments:** A large text input field for additional notes.

Figure 12 Create recording – Anamnesis tab

- 4 Click **Next** and enter recording details and device information (if necessary) on the Recording details tab (Figure 13). The required information includes:
- a Organization arranging the recording
 - b Requested report language

Figure 13

The screenshot displays the Bittium software interface. At the top, there is a navigation bar with the Bittium logo, 'Dashboard', and 'Recordings' tabs. On the right side of the navigation bar, there are options for language (EN), a help icon, and a user profile for 'Technician 1'. Below the navigation bar, the main content area is titled 'Create recording: Bittium Holter'. There are four tabs: 'Patient details*', 'Anamneses', 'Recording details' (which is selected), and 'Attachments'. Navigation buttons for '<< Back', 'Next >>', 'Cancel', and 'Save' are present. The 'Recording details' section contains the following fields:

- Organization: DemoClinic1
- Referring physician: (empty field)
- Requested report language: English
- Reason for recording: (empty text area)

The 'Device information' section includes a 'Recorder S/N' field with the value 'XXXXXXXX' and the instruction 'See back of the device.' Below this instruction is an image of the Bittium FAROS 360 device and its back panel, which shows a QR code and the serial number '11817249'.

Figure 13 Create recording – Recording details tab

- 5 Click **Next** and attach the recording data file (if already available) and additional documents (if necessary) on the Attachments tab (Figure 14). *Figure 13, optional step.*

The screenshot shows the Bittium web interface. At the top, there is a navigation bar with the Bittium logo, 'Dashboard', 'Recordings', 'EN', and a user profile for 'Technician 1'. Below this, the main heading is 'Create recording: Bittium Holter'. There are four tabs: 'Patient details', 'Anamneses', 'Recording details', and 'Attachments' (which is selected). Below the tabs are navigation buttons: '<< Back', 'Next >>', 'Cancel', and 'Save'. There are two main sections for adding files: 'Recording data' and 'Other documents', each with a '+ Add file or drag here' prompt.

Figure 14 Create recording – Attachments tab

- 6 Click **Save** and a confirmation notification will open (Figure 15). Click **Create** to confirm the creation of a new recording.

The screenshot shows a confirmation dialog box. The header is blue and contains the word 'Confirmation'. Below the header, the text asks 'Create a new Bittium Holter recording?'. At the bottom of the dialog, there are two buttons: 'Back' and 'Create'.

Figure 15 Create recording – Confirmation notification

NOTE

If recording data file was not attached to the created Bittium Holter recording at step 5, the recording status will be **Active**, and the recording will appear in the **Active recordings** card on the Bittium MedicalSuite Center dashboard. This indicates that the recording is still ongoing, and the recording data file will be uploaded later.

4.4 Setting up a Bittium Holter recording

After a recording is created on Bittium MedicalSuite Center, desired Faros ECG recorder settings for the recording need to be configured using Bittium Faros Manager software. Instructions to attach the recorder onto a patient according to the selected electrode setup option can be found from **Bittium Faros Manual**.

4.5 Ending Bittium Holter recording

Ending Bittium Holter recording consists of four separate phases that are stopping the data acquisition, uploading recording data from Faros ECG recorder to Bittium MedicalSuite service platform, uploading other documents to the recording and setting the recording to **Ready for analysis**. Detailed instructions for performing these phases are described in the following chapters.

4.5.1 Stopping the data acquisition

When the predetermined recording time has elapsed and sufficient amount of ECG data has been acquired for the analysis, data acquisition can be stopped. Instructions to stop the data acquisition can be found from **Bittium Faros Manual**.

4.5.2 Uploading recording data to Bittium Holter recording

Before Bittium Holter recording can be ended on Bittium MedicalSuite Center, the recording data needs to be uploaded to the recording. Complete recording data can be added in multiple files provided that the files are from the same Faros ECG recorder and acquired using the same electrode setup option. In addition, files uploaded are required to be not more than 31 days apart from one another.

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 described below:

- 1 Open the recording either from the **Active recordings** card on the Dashboard or the Recordings view on the Bittium 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 16)

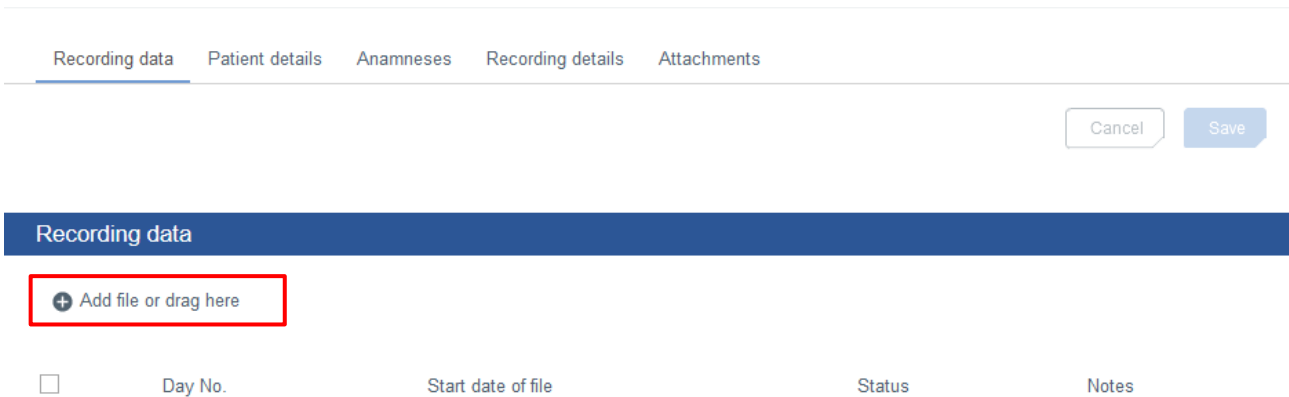


Figure 16 Add file icon on Recording data tab

NOTE

Uploading a long duration recording data to Bittium MedicalSuite service platform directly from Faros ECG recorder using a USB cable might take several minutes. It is recommended to first copy the recording data files from the Faros ECG recorder to a computer local drive, and then upload the files to Bittium MedicalSuite service platform from the computer local drive.

After the files have been selected, the files will be verified. Please wait for the verification spinners (Figure 17) to change to remove icons (Figure 18).

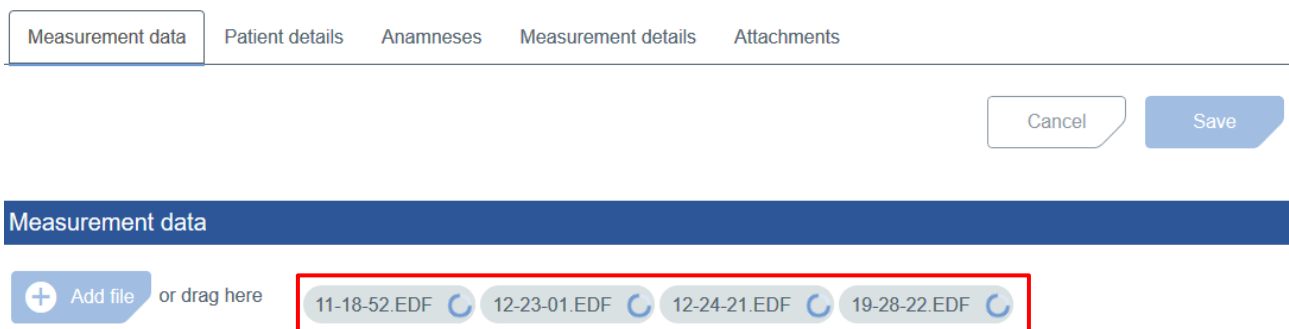


Figure 17 Data files being verified

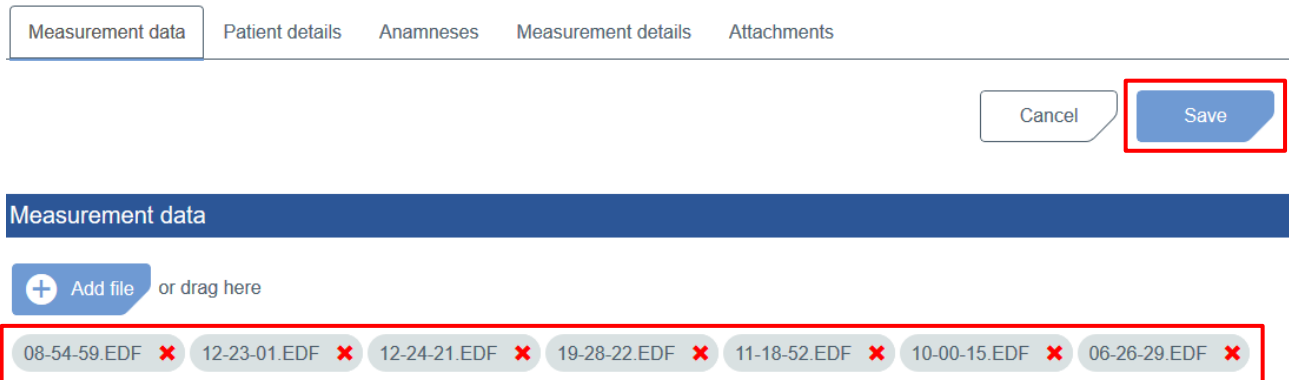


Figure 18 Data files verified for upload

If the files are found to be non-compatible, an error showing which files are non-compatible and for what cause will be displayed.

You can add more files to be uploaded if needed. This will start a re-verification of the given files.

- 4 When all data files to be uploaded are selected and verified, click **Save** (Figure 18) and a confirmation notification will open (**Error! Reference source not found.**). Click **Yes** to confirm the uploading of the recording data files.

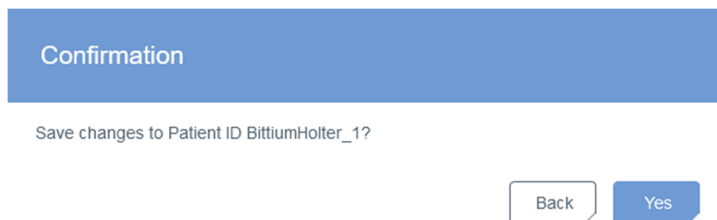


Figure 19 Uploading of recording data files – Confirmation notification

An upload widget will open indicating the progressing of the upload (Figure 20). Do not close or refresh the browser tab while the upload process is running.

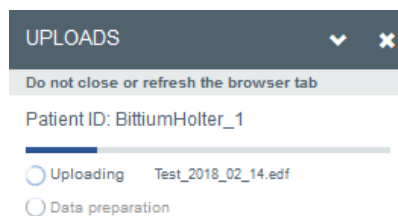


Figure 20 Upload widget indicating the progressing of the upload

While the upload is running, recording status is **Preparing** (Figure 21).

BittiumHolter_1	Preparing 	03.07.2024 12:48	03.07.2024 12:48	DemoClinic1	03.07.2024 11:01	Bittium Holter	1724459
-----------------	---	---------------------	---------------------	-------------	---------------------	----------------	---------

Figure 21 Recording in Processing state on Recordings view

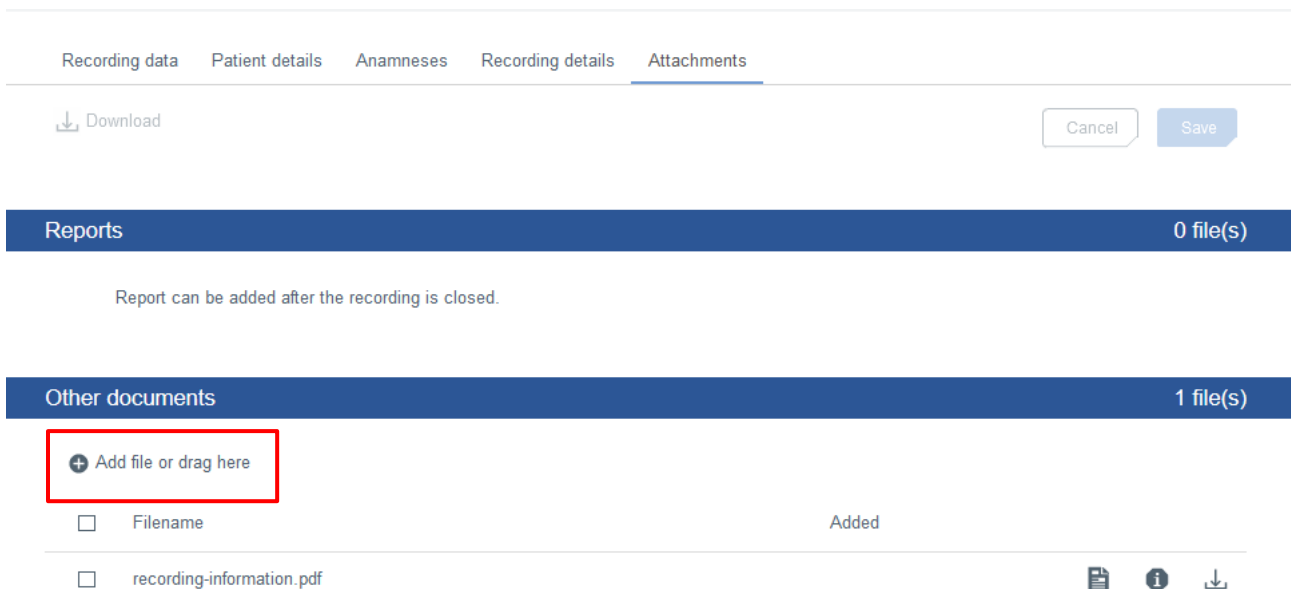
Depending on the size of the uploaded recording data, the processing may take a while. Once the process is done, the status of the recording will change back to **Active**. This indicates that new data files can still be uploaded to the recording by repeating the previous steps.

4.5.3 Uploading other documents to Bittium Holter recording

Along with the recording data, additional patient background information can be uploaded as other documents to Bittium Holter recording. For example, to keep a track of any events occurring during a recording and to help the analysis and interpretation of the acquired ECG data, patients are commonly asked to mark down any felt symptoms and other diary notes that can affect the acquired signal and be important for proper analysis of the ECG data. Such documents can be attached to a recording on Bittium MedicalSuite Center to make them available for the diagnostic user when the ECG data is analyzed.

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

- 1 Open the recording either from the **Active recordings** card on the Dashboard or the Recordings view on the Bittium 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 22)



Recording data Patient details Anamneses Recording details Attachments

Download Cancel Save

Reports 0 file(s)

Report can be added after the recording is closed.

Other documents 1 file(s)

+ Add file or drag here

<input type="checkbox"/>	Filename	Added
<input type="checkbox"/>	recording-information.pdf	

Document Info Download

Figure 22 Add file icon on Attachments tab

The uploaded document will appear in the Other documents section on the **Attachments** tab (Figure 23).

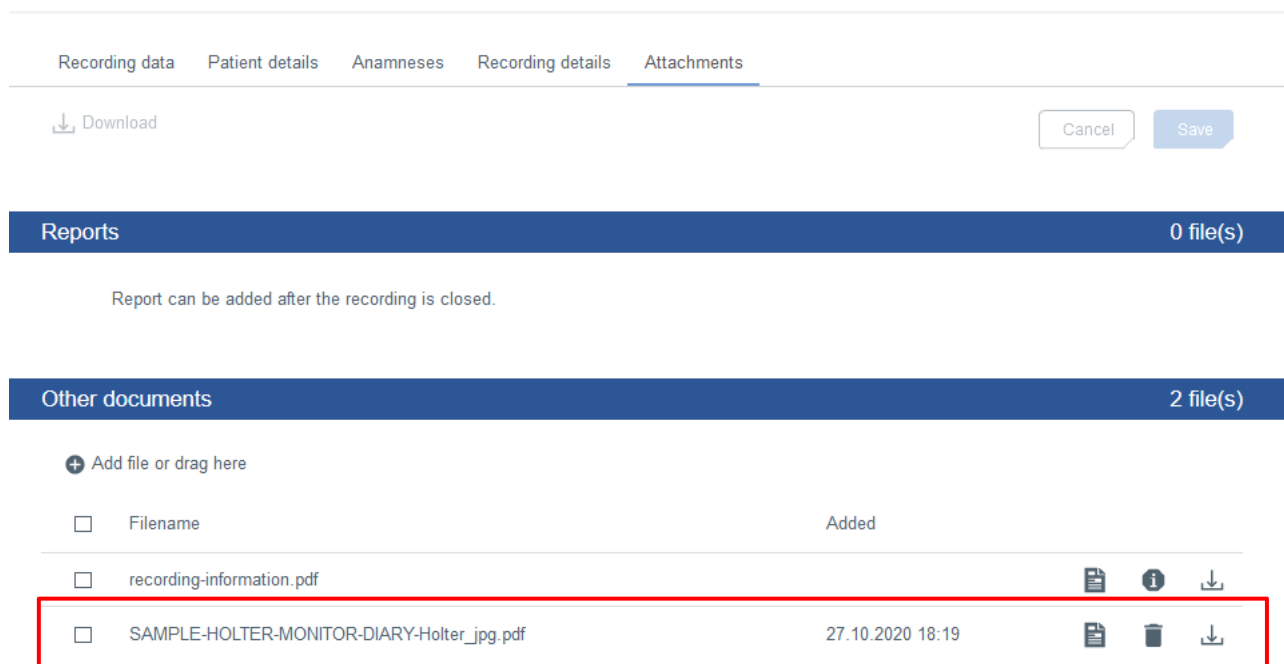


Figure 23 Uploaded document on Attachments tab

NOTE You can only add files of following filetypes to Reports and Other documents sections:
.txt, .pdf, .png, .gif, .rtf, .bmp, .jpg, .xml and .edf.

4.5.4 Setting Bittium Holter recording to “Ready for analysis”

When the complete recording data has been uploaded to a recording, the Bittium Holter recording can be ended to indicate that final analysis can be performed for the recording.

NOTE Bittium Holter recording must have a recording data uploaded as described in chapter 4.5.2 before it can be ended.

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

- 1 Open the recording e.g., from the **Active recordings** card on the Dashboard or the Recordings view on the Bittium MedicalSuite Center by clicking on the recording.
- 2 Click **Ready for analysis button** on the single recording top bar (Figure 24). The same action can also be made by changing the recording status from **Active** to **Ended** either on the single recording top bar (Figure 24), or directly on the Recordings view (Figure 25).

Navigation: < Back Bittium Dashboard Recordings EN - Clinic Demo Clinic

Patient ID: BittiumHolter_1 Bittium Holter **Ready for analysis**

Status	Created	Last update
Active (dropdown menu open showing 'Ended')	27.10.2020 15:51	28.10.2020 09:31
	Started	Duration
	14.02.2018 11:43	1 / 1 day(s)

Recording data Patient details Anamneses Recording details Attachments

Download include all attachments Cancel Save

Figure 24 Setting recording to “Ready for analysis” on the single recording top bar

Navigation: Bittium Dashboard Recordings EN - Clinic Demo Clinic

Recordings

Search Create recording - 10 All -

Patient ID	Status	Last update	Created	Recording type	Device	Action
BittiumHolter_1	Active (dropdown menu open showing 'Ended')	28.10.2020 09:31	27.10.2020 15:51	Bittium Holter	1750044	Download
...		28.10.2020	28.10.2020

Figure 25 Changing recording status to “Ended” on Recordings view

3 Confirm the ending by clicking **Ready for analysis** (Figure 26).

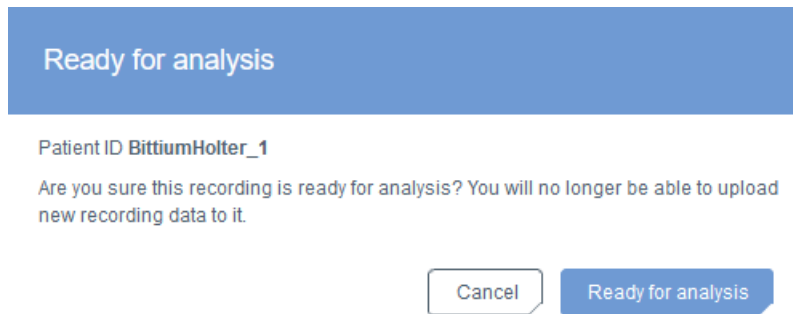


Figure 26 Confirming ending of a recording

The complete recording data is now available on Bittium MedicalSuite service platform for detailed ECG analysis, and the recording appears in **Diagnostic report needed** dashboard card (Figure 27). If Bittium Cardiac Navigator integration is in use, the complete recording data gets automatically transferred to the related Bittium Cardiac Navigator database for further analysis once the recording is assigned to a diagnostic user or diagnostic group. The complete data can also be manually downloaded from Bittium MedicalSuite service platform in EDF format (see chapter 4.8).

Diagnostic report needed				
All Not assigned				
Recording	Assignment	End time	Duration	
● BittiumHolter_1	None	15.02.2018 11:43	1 day(s)	Close Analyze ↓

Figure 27 “Diagnostic report needed” dashboard card

4.6 Verifying signal quality using Quick Preview

The ECG data that has been transferred from Faros ECG recorder to Bittium MedicalSuite service platform can be previewed in Bittium MedicalSuite Center using the **Quick Preview** feature. The feature is available for users to whom the feature has been enabled in MedicalSuite BackOffice. In **Quick Preview**, users can preview and check the quality of the acquired ECG signal.

NOTE

This feature is available only for users to whom it has been enabled in MedicalSuite BackOffice.



CAUTION: This feature is used only for checking the quality of the acquired ECG signal. Any determination of cardiac event occurrences should not be made using the **Quick Preview** feature. Always use proper cardiac analysis software to analyze ECG data.

To check the quality of the acquired ECG signal using **Quick Preview** feature, follow the steps described below:

- 1 Open the recording either from the Dashboard or the Recordings page on Bittium MedicalSuite Center by clicking on the recording.
- 2 Select **Recording data** tab.
- 3 Open **Quick Preview** by clicking the right arrow related to the daily signal data you want to preview (Figure 28).

<input type="checkbox"/>	Day No.	Start date of file	Status	Notes
<input type="checkbox"/>	1/7	22.05.2021 12:07	● Pending ▾	Add notes
<input type="checkbox"/>	2/7	23.05.2021 12:07	● Pending ▾	Add notes
<input type="checkbox"/>	3/7	24.05.2021 12:07	● Pending ▾	Add notes

Figure 28 Right arrow that opens the Quick Preview of the signal

- 4 The ECG signal of the related day is presented on **Quick Preview**. The digital diary markings as well as the Faros recorder button presses are shown on the timeline. You can navigate to the desired time using the timeline on top of the graph. You can also choose the length of the presented signal time range using the related buttons. (Figure 29)

< Back **Bittium** Dashboard Recordings EN ? Technician 1
Technician

Patient ID: BittiumHolter_1 Bittium Holter Ready for analysis

Organization	DemoClinic1	Created	04.07.2024 12:49	Last data transfer	04.07.2024 12:49
Status	● Active	Started	19.12.2023 15:21	Last update	04.07.2024 12:53
Assignment	Diagnostic group	Ready for analysis	No date	Duration	3 / 3 day(s)

Recording data Patient details Anamneses Recording details Attachments

Download Analyze Cancel Save
 Include all attachments

Recording data

+ Add file or drag here

<input type="checkbox"/>	Day No.	Start date of file	Status	To be checked	Notes
▼ <input type="checkbox"/>	1/3	19.12.2023 15:21	● Pending	1d	Add notes

Quick Preview

1 2 4 6 mV/channel 5 10 15 lines 15 30 60 90 seconds/line **ECG1**

19:17:46
 19:18:16
 19:18:46
 19:19:16
 19:19:46

Figure 29 Quick Preview of the ECG data of the selected day

4.7 Assigning recording to a specific diagnostic user or diagnostic group

For final analysis purposes the recording is assigned either to a specific diagnostic user or diagnostic group responsible for the analysis of the patient recording. If Bittium Cardiac Navigator MedicalSuite edition is in use and a database is set up for the selected diagnostic user or diagnostic group, the assignment triggers an automatic data transfer from Bittium MedicalSuite service platform to the related Bittium Cardiac

Navigator MedicalSuite edition database. At first place, assigning a recording to a specific diagnostic user or diagnostic group can be made by a technician user by selecting the desired diagnostic user or diagnostic group from the drop-down list of the recording assignment field (Figure 30).

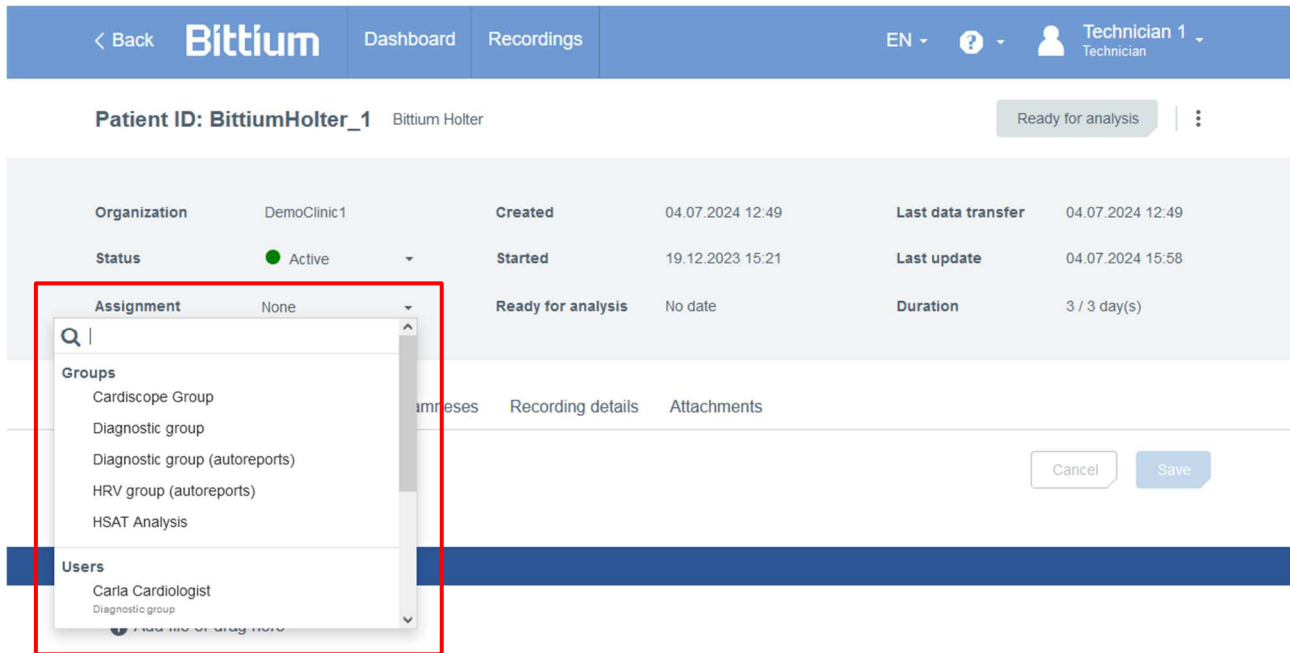


Figure 30 Assigning a recording

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 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 such that a diagnostic user can only change the assignment inside the diagnostic group or, alternatively, remove the whole assignment from the recording.

4.8 Downloading data from Bittium MedicalSuite service platform

For storing the recorded data or further analyzing it with non-integrated analysis software, the recorded ECG data can be manually downloaded from Bittium MedicalSuite service platform in EDF format.

To download data from Bittium MedicalSuite service platform, follow the steps described below:

- 1 Open the recording either from the Dashboard or the Recordings view on the Bittium MedicalSuite Center by clicking on the recording.
- 2 Select **Recording data** tab.

- Select the days you want to download the data of. To download the complete ECG recording as one file, place a checkmark on the top box as shown in the Figure 31. If you wish to download also the related attachments e.g., the recording information PDF file that contains patient details, check also the box of “Include all attachments” (Figure 31).

The screenshot shows the Bittium interface for a patient named BittiumHolter_1. The top navigation bar includes 'Back', 'Bittium', 'Dashboard', and 'Recordings'. The patient's status is 'Ready for analysis'. Below this, a table displays patient details:

Organization	DemoClinic1	Created	03.07.2024 11:01	Last data transfer	03.07.2024 12:48
Status	Active	Started	11.10.2019 11:43	Last update	03.07.2024 12:49
Assignment	None	Ready for analysis	No date	Duration	29 / 29 day(s)

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

The 'Recording data' section shows a table with columns: Day No., Start date of file, Status, To be checked, and Notes. The first row's checkbox is highlighted with a red box.

Day No.	Start date of file	Status	To be checked	Notes
1/29	11.10.2019 11:43	Open	1d	Add notes
2/29	12.10.2019 11:43	Open	1d	Add notes
3/29	13.10.2019 11:43	Open	1d	Add notes
4/29	14.10.2019 11:43	Open	1d	Add notes

Figure 31 Selecting the days for download

- Click **Download** (Figure 31).

The recorded data of the selected days is downloaded as a zip file that contains the recording ECG 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 ECG analysis software for further analysis.

4.9 Analyzing ECG data in Bittium Cardiac Navigator and creating a diagnostic report

Final analysis of the acquired ECG data is performed by a specific diagnostic user or a member of the diagnostic group to whom the recording is assigned. Evaluation of cardiac event occurrences is performed

using proper cardiac analysis software. If Bittium Cardiac Navigator MedicalSuite edition is in use and a database is set up for the diagnostic user or diagnostic group who is responsible for the analysis of the patient recording, changing the recording status to **Ended** triggers an automatic complete data transfer from Bittium MedicalSuite service platform to the related Bittium Cardiac Navigator database. When a recording is finished, the complete recorded ECG data appears in one instance in Bittium Cardiac Navigator MedicalSuite edition marked with an indication of “Ended”. Final analysis of a recording is performed to this “Ended” data instance in Bittium Cardiac Navigator MedicalSuite edition. Also, the diagnostic report including interpretation notes written using the narrative tool is added to this “Ended” data instance to get the report automatically transferred from Bittium Cardiac Navigator MedicalSuite edition to Bittium MedicalSuite Center once the recording is closed.

NOTE This feature is available only for technician and diagnostic users who are linked to the related Bittium Cardiac Navigator™ MedicalSuite Edition user account in MedicalSuite BackOffice.

To perform final analysis of a recording and to create a diagnostic report in Bittium Cardiac Navigator MedicalSuite edition, follow the steps described below:

- 1 Find the recording from Bittium MedicalSuite Center e.g., from the **Diagnostic report needed** card on the Dashboard.
- 2 Open the complete recorded ECG data in Cardiac Navigator MedicalSuite edition by clicking **Analyze** (Figure 32). The same icon can also be found from the Recording data tab on a single recording view in MedicalSuite Center (Figure 33).

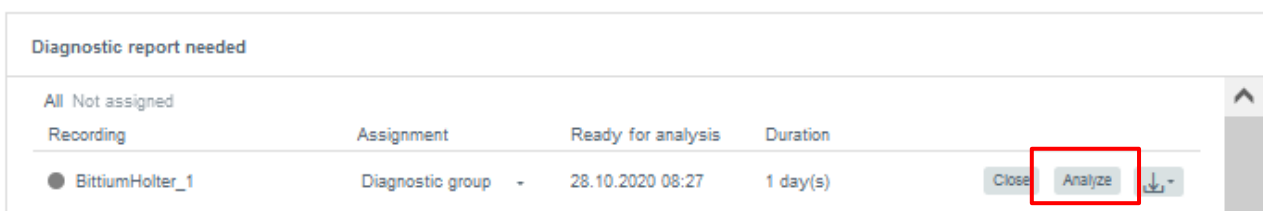


Figure 32 Navigation to the complete recorded ECG data in Cardiac Navigator MedicalSuite edition

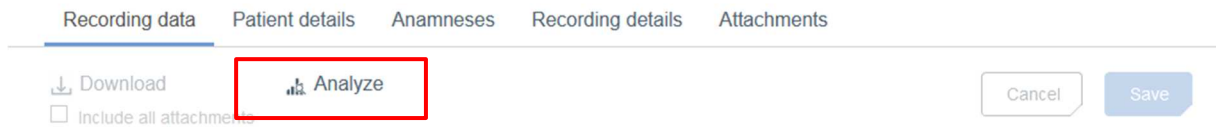


Figure 33 Navigation to the complete recorded ECG data in Cardiac Navigator MedicalSuite edition from the single recording view

If you are using Bittium Cardiac Navigator Online, click **Analyze button** to open a new window for logging in to Bittium Cardiac Navigator with your user credentials. Otherwise, open Bittium Cardiac Navigator desktop version. Once you have Bittium Cardiac Navigator MedicalSuite edition open, click **Continue**. The related recording data opens in Bittium Cardiac Navigator MedicalSuite edition.

Analyze the complete recording for cardiac event occurrences using different data tabs in Bittium Cardiac Navigator MedicalSuite edition. **More detailed instructions for the use of Bittium Cardiac Navigator can be found on separate Bittium Cardiac Navigator user manual.**

4.10 Closing Bittium Holter recording and attaching diagnostic report

When final analysis of a recording is performed, the recording can be closed. Attaching a diagnostic report to a recording removes the recording from the **Diagnostic report needed** dashboard card. If Bittium Cardiac Navigator MedicalSuite edition is in use and a database is set up for the diagnostic user or diagnostic group to whom the recording is assigned, changing the recording status to **Closed** triggers an automatic report transfer from the related Bittium Cardiac Navigator database to Bittium MedicalSuite service platform. After the diagnostic report is attached to the recording in Bittium MedicalSuite service platform, the recording will appear on the Latest reports dashboard card.

NOTE

This feature is available only for technician and diagnostic users who are linked to the related Bittium Cardiac Navigator™ MedicalSuite Edition user account in MedicalSuite BackOffice.

To close a recording, follow the steps described below:

- 1 Find the recording from Bittium MedicalSuite Center e.g., from the **Diagnostic report needed** card on the Dashboard or by searching by the patient ID or the recorder S/N on the Recordings view.
- 2 Click **Close button** related to the recording that you want to close either directly from the **Diagnostic report needed** card on the Dashboard (Figure 34) or on the single recording top bar (Figure 35, 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 35), or directly on the Recordings view (Figure 36).

Diagnostic report needed				
All Not assigned				
Recording	Assignment	End time	Duration	
● HolterPlus_2	Diagnostic group ▾	08.09.2020 04:59	5 day(s)	Close Analyze ↓

Figure 34 Close button on “Diagnostic report needed” dashboard card

< Back Bittium
Dashboard
Recordings
EN ▾
? ▾

 Technician 1 ▾
Technician

Patient ID: BittiumHolter_1 Bittium Holter Close

Organization	DemoClinic1	Created	04.07.2024 12:49	Last data transfer	04.07.2024 12:49
Status	<div style="border: 1px solid gray; padding: 2px;"> Ended ▾ Closed </div>	Started	19.12.2023 15:21	Last update	04.07.2024 17:50
Assignment		Ready for analysis	04.07.2024 17:50	Duration	3 / 3 day(s)

Recording data
Patient details
Anamneses
Recording details
Attachments

↓ Download
📊 Analyze
Cancel
Save

Figure 35 Closing recording on single recording top bar

HolterPlus_2	<div style="border: 1px solid gray; padding: 2px;"> Ended ▾ Closed </div>	07.10.2020 17:24	DemoClinic2	03.09.2020 13:07	Bittium HolterPlus	1874602 ▾	Diagnostic group ▾	
...		01.09.2020	...	01.09.2020

Figure 36 Changing recording status to “Closed” on Recordings view

3 Confirm the closing by clicking **Close** (Figure 37).

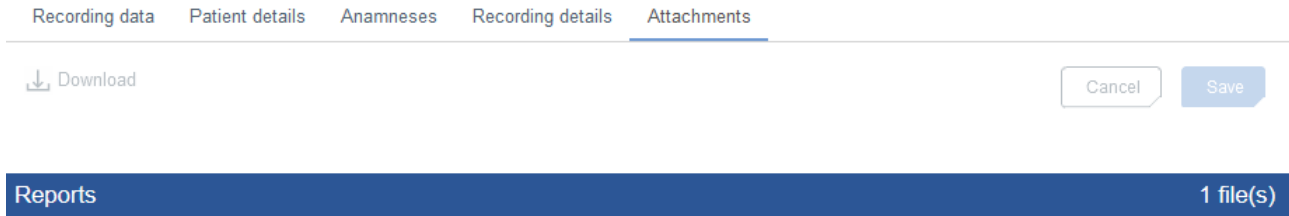
Close recording

If a report is attached to the recording in Cardiac Navigator, it will be imported to the recording. Please verify that you created a report in Cardiac Navigator according to the instructions provided by your service provider.

Cancel
Close

Figure 37 Confirming closing of a recording

If Bittium Cardiac Navigator MedicalSuite edition is in use, all diagnostic reports saved to the recording in the related Bittium Cardiac Navigator database get automatically transferred to Bittium MedicalSuite service platform when the recording is closed. You can trigger the report transfer also manually by clicking **Import reports icon** on the **Attachments** tab of the recording (Figure 38).



+ Add file or drag here

Import reports

Figure 38 Import reports icon on Attachments tab

A diagnostic report can also be uploaded manually to a recording on Bittium MedicalSuite Center.

To manually upload a diagnostic report to a recording, follow the steps described below:

- 1 Click **Add report button** related to the recording that you want to upload a diagnostic report to, from the **Diagnostic report needed** card on the Dashboard (Figure 39) and click **Add file icon** (Figure 40).

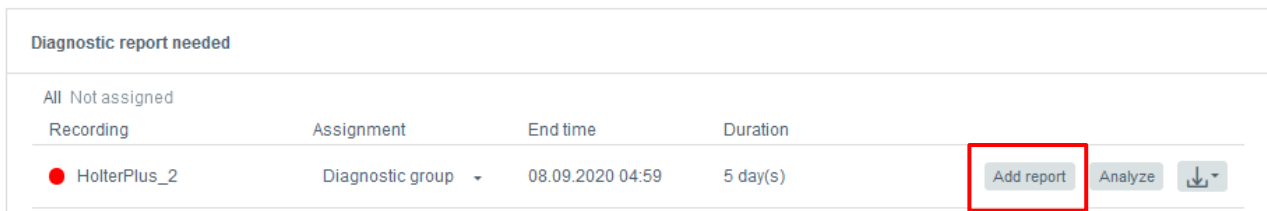


Figure 39 Add report button on "Diagnostic report needed" dashboard card

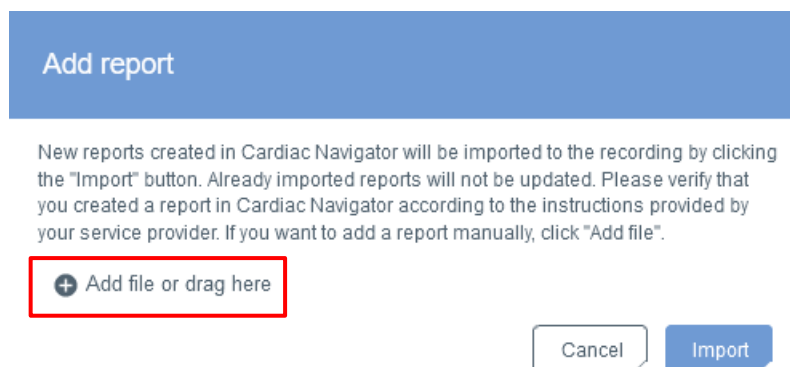


Figure 40 Adding report manually to recording from "Diagnostic report needed" dashboard card

- 2 Select a file or multiple files to be added. Click **Open**. Alternatively, you can drag the file to the prompted area.
- 3 Click **Upload** to perform the uploading of the selected file(s) (Figure 41).

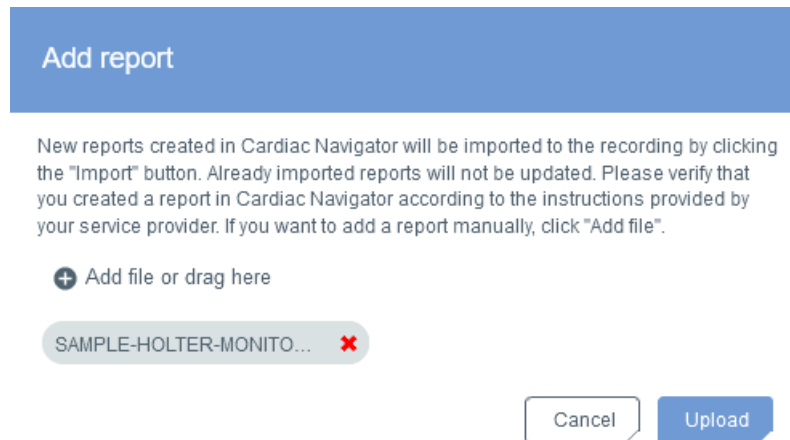


Figure 41 Uploading report manually to recording from “Diagnostic report needed” dashboard card

The same action can also be made by clicking **Add file icon** under Reports section on the **Attachments** tab of the recording (Figure 42, open first the recording by clicking it).

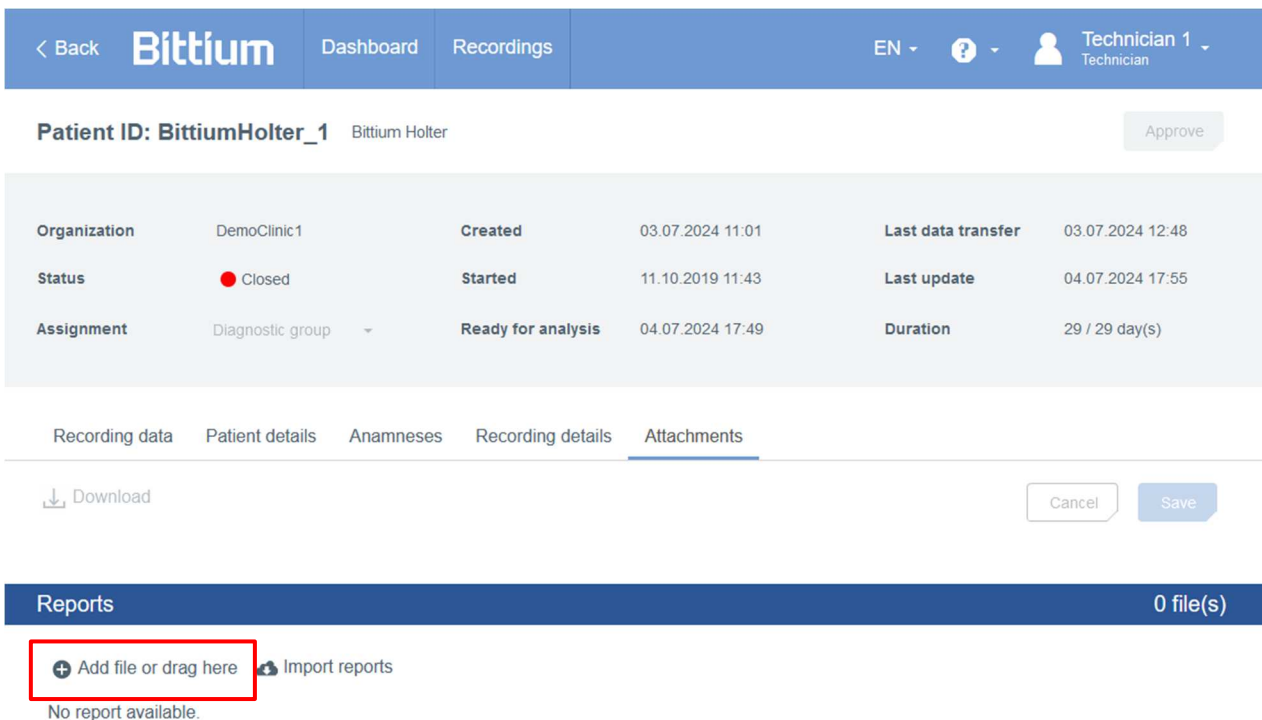


Figure 42 Add file icon on Attachments tab

The uploaded report(s) will appear in the Reports section on the **Attachments** tab (Figure 43).

Navigation: < Back | Bittium | Dashboard | Recordings | EN | ? | Technician 1 (Technician) | Approve

Patient ID: BittiumHolter_1 | Bittium Holter

Organization	DemoClinic1	Created	04.07.2024 12:49	Last data transfer	04.07.2024 12:49
Status	● Closed	Started	19.12.2023 15:21	Last update	04.07.2024 17:53
Assignment	Diagnostic group ▾	Ready for analysis	04.07.2024 17:50	Duration	3 / 3 day(s)

Recording data | Patient details | Anamneses | Recording details | **Attachments**

Download | Cancel | Save

Reports 1 file(s)

+ Add file or drag here | Import reports

<input type="checkbox"/>	Filename	Added	
<input type="checkbox"/>	SAMPLE-DIAGNOSTIC-REPORT.pdf	04.07.2024 17:53	📄 🗑️ ⬇️

Figure 43 Uploaded diagnostic report on Attachments tab

When a diagnostic report is attached to the recording on Bittium MedicalSuite service platform, the recording appears on the **Latest reports** card on the Bittium MedicalSuite Center dashboard.

4.11 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 Bittium MedicalSuite Center to get the diagnostic report(s) delivered to the associated lower-level organization. When a report is attached to a recording on Bittium MedicalSuite service platform, 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.

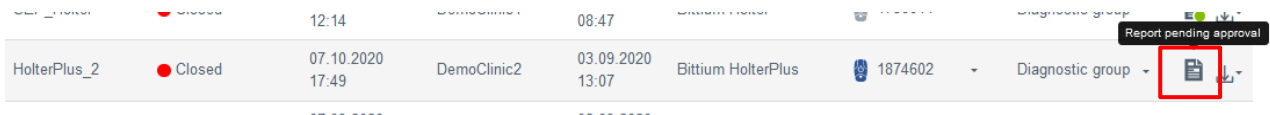
To preview a diagnostic report, follow the steps described below:

- 1 Find the recording from Bittium 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 44) or on the Recordings view (Figure 45).



Recording	Organization	Added	Approval
HolterPlus_2	DemoClinic2	07.10.2020 21:02 Diagnostic group	Approve 

Figure 44 Preview icon on “Latest reports” dashboard card




Recording	Organization	Added	Approval
HolterPlus_2	DemoClinic2	07.10.2020 17:49	Approve 

Figure 45 Preview icon on Recordings view

If you clicked the preview icon on the Recordings view (Figure 45), 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 described below:

- 1 Click **Approve button** related to the recording whose report(s) you want to deliver to the associated lower-level organization either directly from the **Latest reports** card on the Dashboard (Figure 46) or on the single recording top bar (Figure 47, open first the recording by clicking it).

Latest reports			
Recording	Organization	Added	Approval
● HolterPlus_2	DemoClinic2	07.10.2020 17:49 Diagnostic group	Approve

Figure 46 Approve button on "Latest reports" dashboard card

< Back Bittium Dashboard Recordings EN ? Technician 1
Technician

Patient ID: BittiumHolter_1 Bittium Holter Approve

Organization	DemoClinic1	Created	04.07.2024 12:49	Last data transfer	04.07.2024 12:49
Status	● Closed	Started	19.12.2023 15:21	Last update	04.07.2024 17:53
Assignment	Diagnostic group	Ready for analysis	04.07.2024 17:50	Duration	3 / 3 day(s)

Recording data Patient details Anamneses Recording details Attachments

Download Cancel Save

Reports 1 file(s)

+ Add file or drag here Import reports

<input type="checkbox"/>	Filename	Added	
<input type="checkbox"/>	SAMPLE-DIAGNOSTIC-REPORT.pdf	04.07.2024 17:53	📄 🗑️ ⬇️

Figure 47 Approve button on single recording top bar

- 2 Confirm approving by clicking **Approve** (Figure 48).

Confirmation

Are you sure you want to approve the reports of Patient ID: HolterPlus_2? After approval, reports will be visible for the clinic.

Cancel Approve

Figure 48 Confirming approving of a recording

When a recording is approved (Figure 49), the related diagnostic reports imported to Bittium MedicalSuite service platform are delivered to the associated lower-level organization, and the related preview icons have a green dot indicating the delivery (Figure 50).

The screenshot shows the Bittium interface with a navigation bar at the top containing 'Back', 'Bittium', 'Dashboard', and 'Recordings'. On the right, it displays 'EN', a help icon, and a user profile for 'Technician 1'. Below the navigation bar, the patient ID is 'BittiumHolter_1' with the name 'Bittium Holter'. A green 'Approved' button is highlighted with a red box. Below this, a table provides details for the recording:

Organization	DemoClinic1	Created	04.07.2024 12:49	Last data transfer	04.07.2024 12:49
Status	● Closed	Started	19.12.2023 15:21	Last update	04.07.2024 17:58
Assignment	Diagnostic group ▾	Ready for analysis	04.07.2024 17:50	Duration	3 / 3 day(s)

Figure 49 Recording approved

Latest reports



Recording	Type	Organization	Updated	Approval	
● BittiumHolter_1	Bittium Holter	DemoClinic1	04.07.2024 17:53 Diagnostic group	04.07.2024 17:58	 

Figure 50 Preview icon with a green dot indicating report delivery

4.12 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 Bittium 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 Bittium 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 described below:

- 1 Find the recording from Bittium 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 51) or on the Recordings view (Figure 52).

Latest reports					
Recording	Organization	Added		Approval	
● HolterPlus_2	DemoClinic2	07.10.2020	17:49	07.10.2020	17:54

Figure 51 Preview icon on “Latest reports” dashboard card

Bittium		Dashboard	Recordings	EN	Clinic Demo 2	
Recordings		Search	Create recording	10	All	
Patient ID	Status	Last update	Created	Recording type	Device	Action
HolterPlus_2	● Closed	07.10.2020 18:31	03.09.2020 13:07	Bittium HolterPlus	1874602	

Figure 52 Preview icon on Recordings view

If you clicked the preview icon on the Recordings view (Figure 52), 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 described below:

- 3 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 53) or on the Recordings view (Figure 54) and select the document you want to download.

Latest reports					
Recording	Organization	Added		Approval	
● HolterPlus_2	DemoClinic2	07.10.2020	17:49	07.10.2020	17:54

Recording data

- ↓ Recording data 5 day(s)

Reports

- ↓ HOLTERPLUS_2__HolterPlus_2_01-01-1993_26-06-2020-2_-_General_long-term_ECG_report.pdf

Other documents

- ↓ recording-information.pdf

Figure 53 Download icon on “Latest reports” dashboard card

Recording data Patient details Anamneses Recording details Attachments

Download Cancel Save

Reports 1 file(s)

<input type="checkbox"/>	Filename	Added	
<input type="checkbox"/>	HOLTERPLUS_2__HolterPlus_2_01-01-1993_26-06-2020-2_-_General_long-term_ECG_report.pdf	07.10.2020 17:49	

Other documents 1 file(s)

+ Add file or drag here

<input type="checkbox"/>	Filename	Added	
<input type="checkbox"/>	recording-information.pdf		

Figure 54 Download icons on Attachments tab of a recording

Store the downloaded document(s) to the desired location.

MANUFACTURER

Bittium MedicalSuite Service Platform



Bittium Biosignals Ltd
Pioneerinkatu 6
70800 Kuopio
Finland

WEBSITE

You can find up-to-date product information, documents, and updates by visiting the Bittium website at www.bittium.com

SALES

Please contact your sales representative for any questions that you may have about Bittium products.

Bittium Biosignals Ltd.	Tel.: +358 40 344 2000
Pioneerinkatu 6	Email: bbs@bittium.com
70800 Kuopio	Web: https://www.bittium.com
Finland	

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