Trium CTG Online

Operators Manual

Software Version 2.4

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Trium CTG Online - Operators Manual

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Chapter I

General Information

1 General Information

1.1 Intended Use

Trium CTG Online is designed to acquire, transfer, store, process and display digital CTG signals in real-time via an intranet or the Internet for the purpose of central CTG monitoring.

Trium CTG Online is intended for professional use only for CTG-monitoring of pregnant women.

1.2 Introduction

Trium CTG Online has been developed as a state-of-the-art medical product and certified for use by a notified body, however, as with all technical equipment, a failure or malfunction cannot be completely ruled out. Patient well-being is always the most important consideration, and we therefore highly recommend that, in case of failure, it is essential to continue monitoring the patient via the printouts produced by the fetal monitors.

If the interpretation is carried out at a separate location (e.g. in a consultant's office), steps must be taken to ensure proper patient care is available at all times and that a suitably qualified professional is available locally. It is essential that all warnings and advisories provided in this document are followed.

We recommend that you read the sections in this manual on Trium CTG Online and Data Management Area to help you use Trium more effectively. The section FAQ - Frequently Asked Questions is a collection of the most frequently asked questions. We strongly recommend that system administrators read the **Trium CTG Online - Service Manual** (Part. Nr.: 002001C-05).

The Mozilla Firefox web browser was used for the illustrations in this manual. For a list of web browsers recommended by Trium, see the chapter **Client Requirements** in the **Trium CTG Online - Service Manual**.

1.3 Clinical Benefits

The **benefits** of Trium CTG Online are:

- Web-based central electronic fetal monitoring combined with automated CTG analysis leads to faster reactions on fetal distress.
- Web-based central electronic fetal monitoring combined with automated CTG analysis should lead to reduction of unnecessary operative deliveries.

The **risks** of electronic fetal monitoring and therefore also Trium CTG Online are:

- high false positive alarm rate, which might result in an increased number of unnecessary surgical interventions, in particular C-section.

The assessment of the clinical risks and benefits is part of the Trium CTG Online clinical evaluation report and summarized by Trium as:

"Based on the findings from literature, clinical data as well as risk analysis it can be inferred that the probability of a patient, experiencing a substantial benefit when using Trium CTG Online outweighs the probability of suffering harm due to a residual risk of the device significantly."

1.4 Contraindications

- Using the software on inappropriately operated hardware.
- Using the software against the intended use (in particular as an automated diagnosis system).
- Using the software to substitute medical expertise.
- Using the software without ensuring that at every time when the patients are endangered, immediate help can be initiated.

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1.5 Product Labelling

The supplied software is labelled with the following symbols on the product DVD:

CE2797	CE marking accompanied by the BSI NB number: 2797
	Name and address of manufacturer
	Year of manufacture
	Consult Instruction for Use! This device is delivered with electronic Instructions for Use (eIFU). This electronic IFU can be read with PDF Reader. The latest version of the Instructions for Use is available on Internet at: https://viewpoint-sw.gehealthcare.com. A paper copy of Instruction for Use can be ordered at no additional cost.
MD	Medical device
UDI	Every system has a unique marking for identification. The UDI marking is part of the product labeling which can be found in the About dialog. Scan or enter the information from these labels into the patient health record as required by the governing laws.

Information about the product labelling and further information, e.g. software version and support information, is also available in the software application itself. To view this information, select the sub menu "About" by clicking on the arrow on the ? button in the data management area.

1.6 Certification

Trium Analysis Online GmbH is certified by DIN EN ISO 13485. The software is in conformity with the requirements of the European Medical Devices Directive 93/42/EEC and bear the CE marking:

CE2797

1.7 Abbreviations and Definitions

AROM	Artificial Rupture of Membranes (Amniotomy)
BPM	Beats per minute
BE	Base Excess
CTG	Cardiotocography
DOB	Date of Birth
DOD	Date of Delivery
DST	Daylight Saving Time
EDD	Estimated Date of Delivery
Ext. MHR	External Maternal Heart Rate
FECG	Fetal Electrocardiogram
FHR	Fetal Heart Rate
FIGO	International Federation of Gynaecology and Obstetrics
FMP	Fetal Movement Profile
FSpO2	Fetal Oxygen Saturation
GW	Gestation Week
HIS	Hospital Information System
IUP	Internal Uterine Pressure
LMP	Last Menstruation Period
MECG	Maternal Electrocardiogram
MHR	Maternal Heart Rate
MSpO2	Maternal Oxygen Saturation
NBP	Non-invasive Blood Pressure
PDF	Portable Document Format
PROM	Premature Rupture of Membranes
ROM	Rupture of Membranes
Sec.	Seconds
SROM	Spontaneous Rupture of Membranes
ST	STAN-Analysis
STV	Short Term Variability
Temp	Temperature
TOCO	Uterine Contractions
URL	Unified Resource Locator
UmA. pH	Umbilical Artery pH
US	Ultrasound
WT	Winter Time
WWW	World Wide Web

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- **Baseline**: The base frequency is the mean heart beat rate monitored over a period of at least 10 minutes, regardless of accelerations or decelerations.
- **Acceleration**: This refers to the rapid acceleration of the FHR, followed by a similarly fast drop back to the base frequency, where the amplitude must be 15 bpm during a period of between 15 seconds and 10 minutes. The acceleration is calculated from the difference between the floating line and baseline.
- **Deceleration**: This refers to a decrease of the FHR by more than 15 bpm for a period of at least 15 seconds up to 10 minutes, followed by a return to the base frequency. Decelerations can be divided into the following types:
    - o early deceleration: successive decrease in the heart frequency, at the beginning of a contraction, then a return to the base frequency after the contraction.
    - o late deceleration: successive decrease in heart frequency, starting from the middle to the end of a contraction, then a return to the base frequency after the contraction.
    - o variable deceleration: abrupt decrease followed by an increase in heart frequency, not necessarily associated with a contraction.
    - o prolonged deceleration: prolonged decrease in heart frequency for minimum 2 minutes
- **Oscillation amplitude** (**Variability**): The oscillation amplitude or band width of the FHR measures the heart rate variations within the time interval of two minutes, in which values that were measured during acceleration or deceleration are not considered.
- **Short term variability**: The short term variability is an estimation of the beat-to-beat variability of the FHR.
- **Fetal monitor**: Electronic equipment for recording measurements of CTG parameters of the patient.
- **Data recording**: A device (or software) used to read out the data recorded on the fetal monitor and transfer it to the Trium CTG Online server via an interface.

1.8 Instructions and Warnings

Notice to EU users: Any serious incident that has occurred in relation to the device, should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.

1.8.1 Marking



Note that there is additional information available on this topic.



Describes situations or circumstances that can lead to injuries or health problems. To avoid these, it is essential to follow the instructions given in the warning.

1.9 Technical Support

If you have any questions after reading this manual or when using the software, technical support is available to assist you. The appropriate contact details and hours of operation are supplied with the product.

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Chapter II

Trium CTG Online

2 Trium CTG Online

2.1 Overview and Construction

The application consists of two main areas:

1. **CTG monitoring area**

This area shows all current CTG recordings individually as well as links to access other important Trium CTG Online features. A detailed description of the CTG monitoring area is described in the CTG Monitoring chapter. In addition to this, the data management area is opened in a second window from the CTG monitoring area.

2. **Data management area**

The data management area provides access to the patient and user management, archiving and other program settings. A detailed description is provided in the Data Management Area chapter.

2.2 Configuration Options

Trium CTG Online provides options to adapt the application to the needs of each customer. There are global settings located in a separate configuration area of Trium CTG Online that are restricted for use by system administrators, and there are also per-session settings available to users.

Changes made in the global settings area allow overall appearance and localisation configurations to be adjusted in Trium CTG Online, while per-session adjustments usually apply to current monitoring sessions.

Further customisations can be offered on a per-project basis for some areas such as extended case data or partogram documentation. For more information, contact your local sales representative.

2.3 Access

Trium CTG Online is a web application, and a web browser is required to use it to view data from its central server across your network.

There are several options available to access Trium CTG Online:

- Click on the Trium symbol on the desktop of the computer using a mouse,

or

- Open a web browser and enter the URL of the Trium CTG Online server in the address field (e.g. https://ctg-monitoring).

or

- Select the corresponding bookmark after opening the web browser.



Remember to add the extra “s” to the first part of the address https://... while entering the URL to the Trium CTG Online server.

Once opened, Trium CTG Online will show a prompt for the user to login. The appearance of this initial screen can vary depending on the configuration.



If you are unable to access the system, or an error message appears, please take immediate steps to ensure that the patient's paper CTG printouts are interpreted locally, and inform the system administrator. Possible causes of problems could be authentication errors, web server failure, failure of Trium CTG Online, or the network connection.

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2.4 Login to the System



Standard Login-Window Trium CTG Online

After entering the user name and password into the login page, click on the **Login button**.

User accounts are created by the administrator, as well as profiles, which are used to define the layout and arrangement of the groups in the CTG monitoring page (e.g. the labour & delivery team can be configured to see fetal monitors specifically used my that team (see the chapter Configuration options for more details).

Please keep your password safe and be observant when logging into the system. Your password should not be disclosed to anyone else as it gives you access to patient data that is protected by data privacy laws. Do not - as many people often do - keep it somewhere that can be accessed by others. Shut down Trium CTG Online before you leave the room to ensure that others cannot access the data, and possibly manipulate it in your absence. When using this system, you are responsible for data security. In a worst case scenario, unauthorised use may lead to a misinterpretation of Trium CTG Online data with life-threatening consequences.

Chapter III

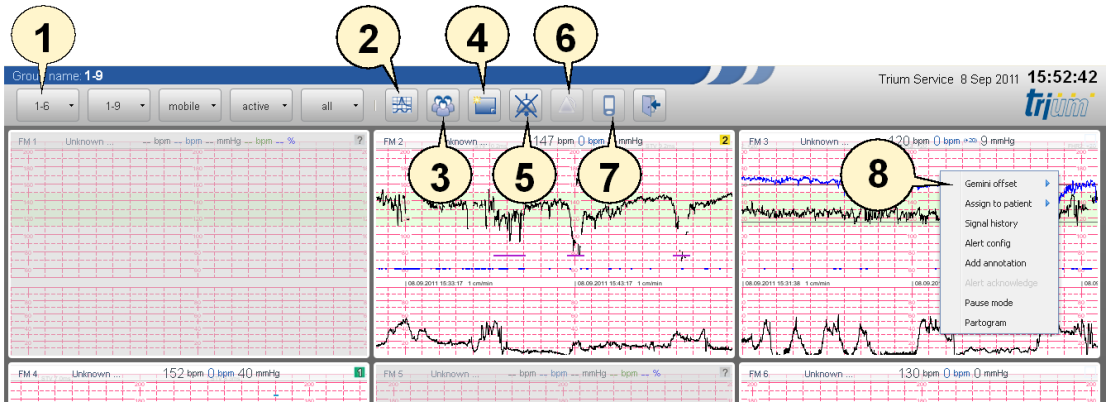
CTG Monitoring

3 CTG Monitoring

Once logged in, the monitoring area is displayed with a single or a group view, depending on the selection and configuration.

3.1 Navigation in the Monitoring Area

Trium CTG Online has the following buttons(see numbers 1-7 below) in the navigation bar above the monitoring area. Further functions can be activated via a context menu (see number 8) in the monitoring area.



Trium CTG Online monitoring area

1 

Sample button of a group labelled "1-6" (The labels and monitors assigned to group buttons can be defined by the system administrator in the configuration tool of Trium CTG Online.)

2 

The "Signal history" button opens a separate window showing the entire signal history of the selected CTG.

3 

The "Patient management" button opens the data management area of Trium CTG Online in a separate window.

4 

The "Add annotation" button opens a window for adding annotations.

5 

The "Audio alert" button allows to switch on or of the audible alert and displays the current status.

6 

The "Technical alert" button displays the status dialogue window for technical alerts.

7 

The "Mobile Connector" button displays the status and CTG recordings from patients who are on a remote location outside of the hospital. These recordings must be acknowledged from the obstetrics department. (Mobile Connector is a software module requiring additional licensing).

8 

Context menu, accessed via right-click of the mouse.

In the next sections, the functions of these buttons and of the context menu are explained and described in detail.

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3.1.1 Group Button



A **group button** represents a group of connected fetal monitors. A group can contain up to 16 connections, and up to seven groups can be defined. These groups can represent certain areas and rooms in the department (for information on configuring groups, please contact your system administrator).

If several groups have been defined, you can switch between different groups quickly and conveniently by using the buttons.

To view the recording of an active fetal monitor within the group view, simply click on the CTG itself within the group view. Alternatively, you can select the fetal monitor via a menu that is available on the right of each group button and marked by an arrow.

To return from this single view to the group view, either click on the group button, or onto the CTG trace.

3.1.2 Signal History



The entire trace of an active CTG recording can be accessed several ways:

1. The **signal history** button allows you to view the entire active CTG recording. If you select this function from a group view, a new window opens allowing you to select the desired fetal monitor. Once you have confirmed your choice with **OK,** another window opens to display the entire recording.
2. If you select this function from the single view, then the entire trace history of the corresponding fetal monitor is displayed in a window. You can close the window again by clicking on  in the upper right-hand corner of the window.
3. or directly in the group view/single view using the context menu, accessible via a right-click



For longer recordings, it may take several seconds for the view of the trace to appear after the window has opened. To view the entire signal history, you can use the scroll bar at the bottom to move the recording to the left or right.



Clicking on the **signal history button** will show of the entire recording history. Please note that the signal history cannot be updated in the open window: no new data will appear in the window from this point on!

3.1.3 Add annotation



The **add annotation** button opens a window to allow adding annotations to an active CTG recording. A detailed description is included in the Annotations chapter.

3.1.4 Patient Management



The **patient management** button opens the data management window, where patients and users of the system are managed, including archiving, configuration settings, and statistics. A detailed description is included in the Data Management Area chapter.

3.1.5 Quit Trium CTG Online



the **Quit Trium CTG Online** button in the monitoring area will close all windows of the Trium CTG Online Application and log off the user. The web browser will then display the login screen.

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3.1.6 Useful Functions in the Context Menu

Trium CTG Online has a context menu in the monitoring area to access additional functions to supplement the navigation bar. Move the mouse pointer to the appropriate trace in either the group view or the single view, and right-click with the mouse to display the menu. It contains the following options:

- **'FHR2 offset'** (only for twin recordings)

  The **FHR2 offset** option allows the FHR symbol of the second sensor (FHR2) to be transferred to offset (+20).

- **Assign to patient / De-assign patient**

  The **assign patient** option allows an active CTG recording to be directly assigned to a patient. The patient must already be in the p**atient list** and have a current pregnancy case. Removing assigned patients can be done via the **de-assign patient** menu option. Alternatively, patients can be assigned in the **data management area**. Completed CTG recordings can only be retrospectively assigned to a patient in the CTG archive.

- **Signal history**

  The **signal history** option opens the entire trace in a new window. Further information is described in the Signal History chapter.

- **Alert configuration**

  The **alert configuration** option modifies an alert respectively alert display for the current trace. This change must be acknowledged with a user name and password. Further information to various alert systems and possible conditions are described in the Alert Management chapter.

- **Add annotation** (possible for active devices)

  The **add annotation** option allows annotations to be added to the current active trace, including the time reference. Further information to this function is described in the Add Annotation chapter.

- **Acknowledge alert** (only for active alert condition)

  The **acknowledge alert** option allows alerts to be acknowledged. An alert condition can be acknowledged directly using the context menu. Further information is described in Acknowledge Alert chapter.

- **Pause mode** (possible only for active devices)

  The **pause mode** is used to interrupt a CTG recording for a short period of time (up to 15 minutes) without closing or ending the record. The recording can be continued by clicking on the pause symbol in the centre of the trace. The recording will automatically continue after the maximum pause duration is reached (up to 15 minutes). If the monitor stops sending data, the recording is ended automatically regardless of whether it is paused or not, as per normal behaviour.

- **Paper mode** (only in the single view)

  The **paper mode** option allows the view to be changed between the digital Trium display and a classic paper strip display.

- **Partogram** (this software module requires a license for documenting the birth process)

  The **partogram** option opens the partogram of the patient in a new window. Further information for this function is described in the Partogram chapter.

Some of the functions in the menu depend on the context of the current trace as well as on software licensing.

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3.2 CTG Alerting

Trium CTG Online provides audio and visual alerts for CTG monitoring to ensure that users react to a possible problem quickly and effectively. Visual alerts can be used alone or together with audible alerts. A complete deactivation of CTG alerting is not allowed and hence not possible (further information on the various alert conditions is in the Alert Management chapter).

Do not rely exclusively on audible alerts, but check the alarm condition regularly by means of visual alarms. The volume of the alarm sound can be adjusted to a low level or even muted.

If a user is colour-blind, a workstation with audible alerting should be set up. For more information, see the Service Manual.

Trium CTG Online itself does not receive any alert conditions or alert signals from fetal monitors. The information received only includes fetal heart rates, uterine contraction activity, and other recorded parameters as configured. These are evaluated by algorithms within the software and potential alert conditions are then derived and displayed to the user.

3.2.1 Visual Alerting

The visual alerting is mandatory. For this, possible alert conditions in Trium CTG Online are highlighted with colours. The user can see at a glance on the screen, when and at what fetal monitor, an alert condition exists, regardless of which group or single view is displayed currently. (For more information on the various alert conditions, see chapter Alert Management)

3.2.1.1 Alert in the Group View



Example for visual alerting in the group view

1. In the group view the corresponding group button in the navigation bar becomes red in colour.

2. Configuration option „Demonstrative alarm coloring“: If this option is enabled, a red bar above the diagram refers to a possible alert condition. For more information about the configuration of this option refer to the Service Manual.

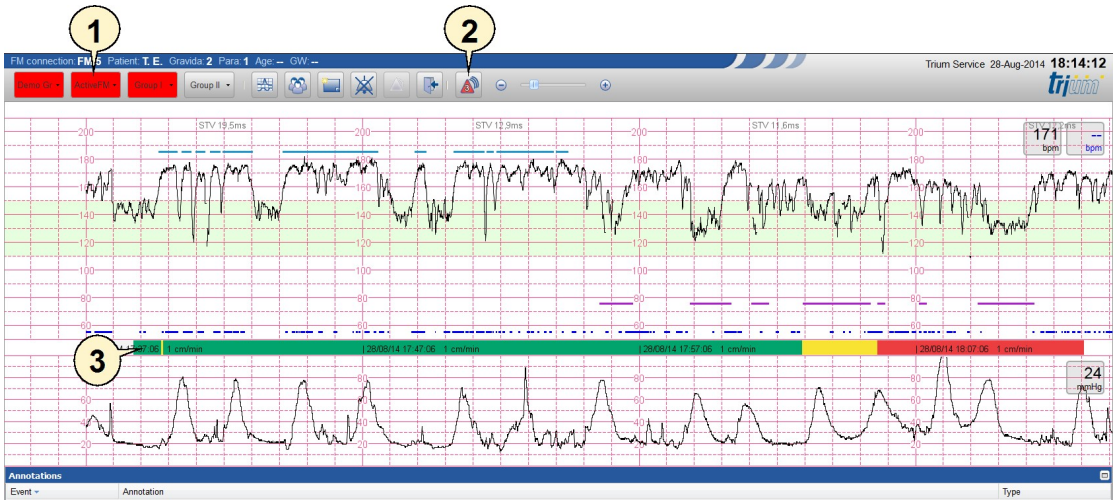
3. In the group view, the most current evaluation is shown as a coloured square in the upper right corner of each trace.

4. Configuration option „Alert history“: If this option is enabled, the alert history (i.e. the change between the individual conditions over time) is shown between the FHR and TOCO. For more information about the configuration of this option refer to the Service Manual. (This software option requires a separate license. For more information, contact your local sales representative.)

For more information on the various alert conditions, see chapter Alert Management.

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3.2.1.2 Alert in the Single View



Example for visual alerting in the single view

1. In the single view the corresponding group button in the navigation bar becomes red in colour.

2. In the single view, the coloured alert symbol in the navigation bar always shows the most current evaluation. To view the information in detail, click on the alert button.

3. Configuration option „Alert history“: If this option is enabled, the alert history (i.e. the change between the individual conditions over time) is shown between the FHR and TOCO. For more information about the configuration of this option refer to the Service Manual. (This software option requires a separate license. For more information, contact your local sales representative.)

For more information on the various alert conditions, see chapter Alert Management.

3.3 Acknowledge Alert

CTG alerts can be acknowledged by the user, which will stop the current alert from being shown until a new alert condition occurs.

Alerts can be acknowledged as follows:

Option 1 - Acknowledge alerts using the context menu

1. In the group view as well as in the single view, move the mouse over the trace.
2. Right-click to open the context menu
3. Select **Acknowledge alert** to open the annotation window showing the current CTG trace.
4. Enter your annotation and save them.
5. The acknowledgement of the alert condition is saved with the date, time and the current CTG evaluation as part of the annotation history.

Option 2 - Acknowledge alerts via the navigation bar in the single view

1. Switch to the single view of the CTG recording which is producing the alert.
2. Click on the CTG alert button (e.g. ) to view the detailed information.
3. Click on the **Acknowledge** button to open the annotation window showing the current CTG trace.
4. Enter your annotation and save them.
5. The acknowledgement of the alert condition is saved with the date, time and the current CTG evaluation as part of the annotation history.

Examples for alert conditions



No Alert



Alert active



Alert acknowledged

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A corresponding annotation must be entered when acknowledging an alert. The user's user name and password are usually configured to be required for this action.



Acknowledged alerts are automatically reactivated after a configurable waiting period (default setting: 30 minutes).

Further information about the different alert systems and possible conditions are described in detail in the Alert management chapter.

3.4 Audio

Audible alerting is optional and can be switched on or off via the audio symbol in the navigation bar of the monitoring area. Audio hardware is required for audible alerting.



Do not rely exclusively on audible alerts, but check the alarm condition regularly by means of visual alarms. The volume of the alarm sound can be adjusted to a low level or even muted.

Depending on situation, the symbol for audible alerting can show the following operating conditions:



Audio on (audible signal is switched on)



Audio off (audible signal is switched off)

A single mouse click is used to switch from one state to the other. The alarm sound can be tested by the user anytime, if 'Audio on' is selected.

To test the alarm sound, click on the arrow on the  button and select the alarm sound. To adjust the volume of the alarm sound use the volume control of the Windows operating system.

This feature can be deactivated globally if desired. To do so, please contact your system administrator.



Audio deactivated (audible alerting is not configured)

3.5 Technical Alert

The technical alarm is activated when a technical problem is detected by the system (e.g. low disk space) and will persist until the problem is resolved. If this alert condition occurs, the user is notified by a blinking graphical symbol in the navigation bar. To get detailed information and further instructions about this alert condition, click on the blinking technical alert symbol. While many issues can be automatically resolved, the system administrator should be informed about persistent problems.

Depending on situation, the symbol for technical alert may appear as follows:



no technical alert



technical alert

Technical problems that refer to individual CTG traces are marked with an additional message "The display is out of date. Verify that the displayed CTG recording is equivalent to the CTG paper strip output on-site. If this problem persists, please notify your system administrator immediately". In this case follow the instructions shown in the message.



Technical alerts may indicate a server problem that may require intervention by the administrator. Click on the technical alert symbol in the navigation bar to see the error. If the error state persists for more than 5 minutes, inform your system administrator.

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3.6 Group View

A group view displays a group of up to 16 fetal monitor connections, and up to seven group views can be defined. These groups can represent certain areas and rooms in the department . Contact your system administrator to configure the groups.

The display in the group view is dependent on whether Trium CTG Online receives data from one or more fetal monitors. If no data is received, the display is greyed out (9). As soon as a fetal monitor is switched on and transmits data, the display will change to show a digital CTG paper updating regularly in the group views.



Always check that an active fetal monitor is displayed in the group as well as the single view of Trium CTG Online. If a fetal monitor is plugged in and switched on but is not detected by Trium CTG Online, make sure that the cables are connected and the IDS2 device (or wireless adapter if used) is working correctly.

In the CTG monitoring window the current date and time (4) of the last update (time of the server) is displayed. The traces are updated regularly, along with blue elements blinking in the title bar (2). Make sure that the blinking elements in the blue title bar, as well as the time and the CTG recordings are updated continuously. Blinking elements in the blue title bar indicate, that the system is online and receiving data.



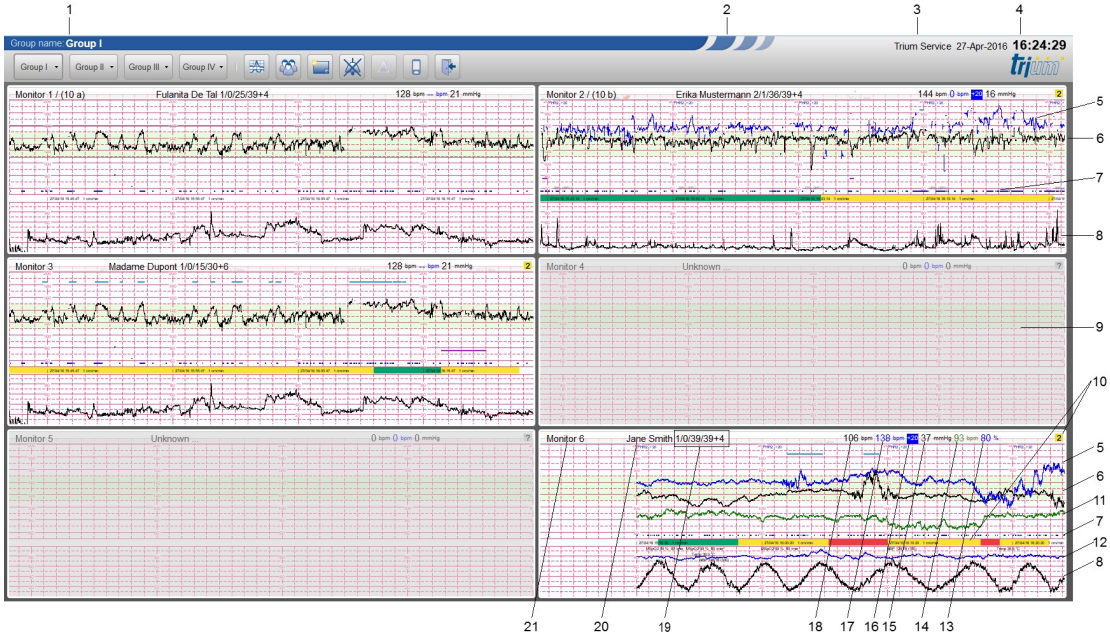
If the time and/or the blue title bar does not update regularly, there is either a network or server error. In this case, check and/or re-establish the connection. If the error cannot be corrected by reloading the page in your browser, please inform your system administrator and initiate a CTG paper strip check on-site.



If the display of one or more active fetal monitors is no longer updated in the screen, this might indicate a server problem. In this case, a message will be displayed on the screen, and CTG paper strips should be checked on-site until this situation is resolved. If this problem persists and the server is not automatically restarted, please inform your system administrator immediately.

The figure below shows a monitoring window with four group buttons, i.e. four groups have been defined and configured. The name of the currently selected group is on the top left (1) in the blue title bar. This group consists of six fetal monitor connections. Each fetal monitor connection has a unique name (21) to ensure that it is clearly identifiable.

If a fetal monitor is assigned, the upper area of the CTG strip shows the fetal heart rate (FHR1) trace and the lower area shows the uterine contraction activity (TOCO) of the mother. If a second fetal heart rate (FHR2) is available, it will be displayed as a blue trace.



Monitoring window displaying a group labelled "Group I"

1	Group name
2	Blinking elements in the blue title bar
3	User name logged in
4	Date and time (last updated)
5	FHR2 trace in blue (device dependent)
6	FHR1 trace in black
7	Fetal movement profile (FMP) as blue dotted line (device dependent)
8	Uterine contractions (TOCO) trace in black
9	No recording/monitoring
10	Alert status icon and visualization (see chapter Alert Management)
11	Maternal heart rate (MHR) trace in green (device dependent)
12	Fetal oxygen saturation (FSpO2) trace in blue (device dependent)
13	FSpO2 as numeric value (device dependent)
14	MHR as numeric value (device dependent)
15	TOCO as numeric value
16	'FHR2 offset' information: +20
17	FHR2 as numeric value (device dependent)
18	FHR1 as numeric value
19	Patient details: gravida / para / age / gestation week
20	Patient details: name or initials or patient ID
21	Name of the fetal monitor connection

The time displayed reflects the time of the server (remote time), not the local time. If the difference is significant, the time on the server should be corrected. Please contact your system administrator to organize this.

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Take care when assigning a fetal monitor or when connecting a patient to the fetal monitor. Wait until the fetal monitor is displayed as free in the monitoring window. Before you can reassign a fetal monitor, you must wait for approximately one minute, otherwise all newly recorded data is assigned to the previous patient. In the worst case scenario, this can lead to a life threatening misinterpretation of the situation of the patient and her unborn child.

Find out first-hand which fetal monitors have been assigned and to whom by going to the patient's location. It is your responsibility to know exactly who is connected to which device. In the worst case scenario, lacking this knowledge can lead to life-threatening mistakes.

3.6.1 Group View with Active Devices

Trium CTG Online provides the option to configure a group with only active devices. This means that only fetal monitors with an active recording are displayed in this group view. In this configuration, the fetal monitors are sorted dynamically from top left to bottom right based on the start time of recording, beginning with the recording that was started first.



Example of a group view displaying only switched on (active) devices

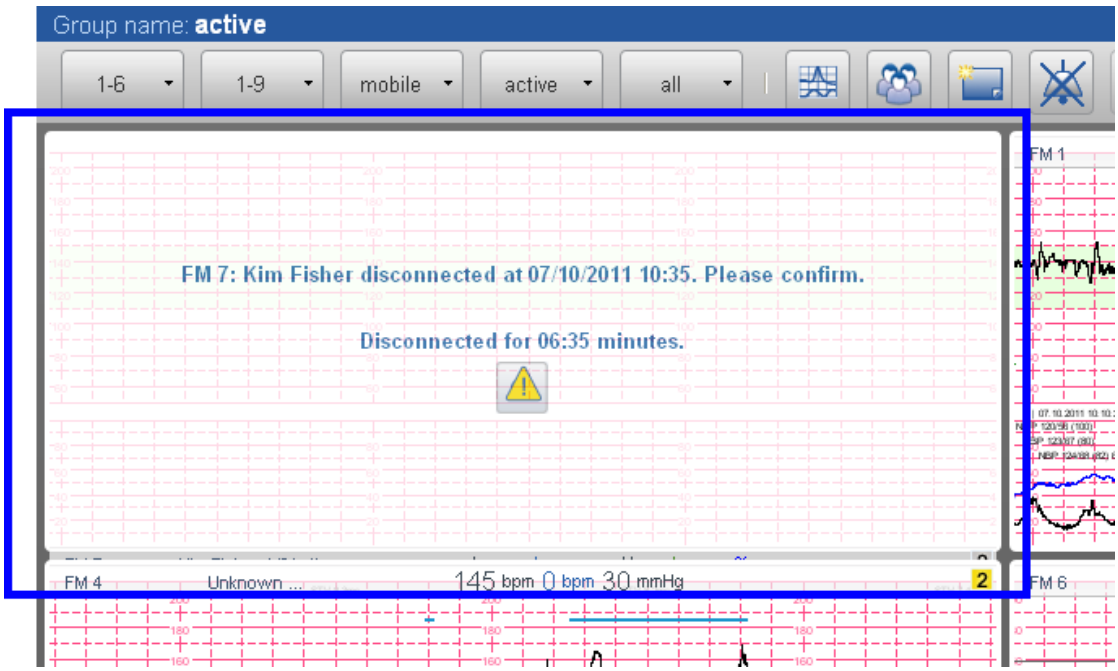
Once the recording of a fetal monitor is stopped (or if configured, the end of the record is confirmed by the user), this fetal monitor connection is removed from the group view, and the remaining active recordings move up one position. When a new recording is started, it will be added at the last position.

Please note, that with this configuration the order in which the fetal monitors are displayed is dynamically adjusted when recordings are started or ended. It is therefore no longer possible to identify a particular fetal monitor only by its location on the screen.

Contact your system administrator if you wish to have a group configured with only active devices.

3.6.2 Confirm End of Recording

The behaviour of Trium CTG Online can be configured in that way to notify a user when the connection from a fetal monitor is interrupted. In this case, a hint appears in the respective fetal monitor's display, which the user has to confirm by clicking on the warning symbol.



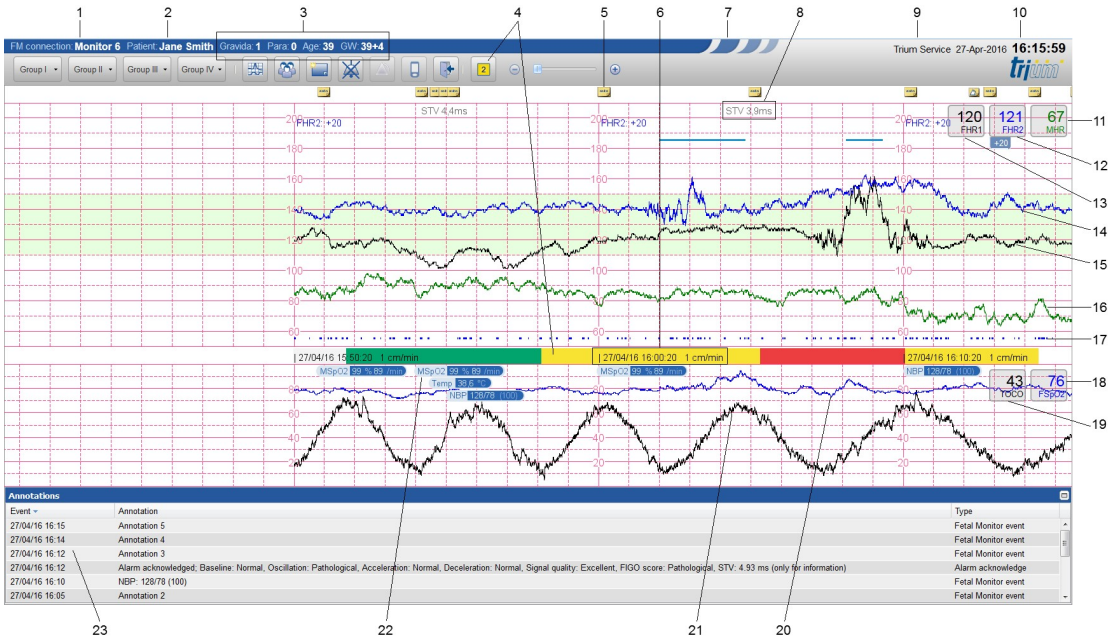
Hint to a disconnection between fetal monitor and server with exact time and duration of the interruption

It is not possible to differentiate between an unwanted disconnection of the fetal monitor (e.g. from intermittent network failures) and from an intentionally switched-off fetal monitor.

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3.7 Single View

The single view is available only for an active fetal monitor. The patient data and fetal monitor information appears in the blue title bar above the navigation bar. Information that can be displayed in the single view depends on the configuration of Trium CTG Online and on the capabilities of the connected fetal monitors.



Single view of a fetal monitor with optional signals

The following table provides an overview of the key details which can be displayed:

1 Name of the fetal monitor connection
2 Patient details: name or initials or patient ID
3 Patient details: gravida / para / age / gestation week
4 Alert status icon and visualization (see chapter Alert Management)
5 Annotation icon (see chapter Annotations)
6 Time stamp & CTG paper speed
7 Blinking elements in the blue title bar
8 Short Term Validation (STV) information as text string (only with FIGO analysis)
9 User name logged in
10 Date and time (last updated)
11 Maternal Heart Rate (MHR) as numeric value (device dependent)
12 FHR2 as numeric value and 'FHR2 offset' information (device dependent)
13 FHR1 as numeric value
14 FHR2 trace in blue (device dependent)
15 FHR1 trace in black
16 MHR trace in green (device dependent)
17 Fetal movement profile (FMP) as blue dotted line (device dependent)
18 Fetal oxygen saturation (FSpO2) as numeric value (device dependent)
19 Uterine contractions (TOCO) as numeric value
20 FSpO2 trace in blue (device dependent)
21 TOCO trace in black
22 Maternal vital parameters: NBP, MSpO2, Temperature (device dependent)
23 Annotations sorted by event time

In the CTG monitoring window the current date and time (10) of the last update (time of the server) is displayed. The traces are updated regularly, along with blue elements blinking (7) in the title bar. Make sure that the blinking elements in the blue title bar, as well as the time and the CTG recordings are updated continuously. Blinking elements in the blue title bar indicate, that the system is online and receiving data.

As soon as a FM monitor is switched on, Trium CTG Online prints a time stamp with the current date, time and the configured CTG paper speed (6) between the FHR and TOCO diagram. This time stamp is updated and printed every 10 minutes. The timestamp begins with the symbol "|". Moreover, all annotations are listed in chronological order in the annotation history (23) below the diagram and are indicated in the diagram above the trace (for more detail, see the Annotations chapter).

All values that are shown as numeric digital displays in the diagram can be hidden temporarily if needed, by enabling **Print mode** via the context menu.

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Always check that an active fetal monitor is displayed in the group as well as the single view of Trium CTG Online. If a fetal monitor is plugged in and switched on but is not detected by Trium CTG Online, make sure that the cables are connected and the IDS2 device (or wireless adapter if used) is working correctly.



If the time and/or the blue title bar does not update regularly, there is either a network or server error. In this case, check and/or re-establish the connection. If the error cannot be corrected by reloading the page in your browser, please inform your system administrator and initiate a CTG paper strip check on-site.



If the display of one or more active fetal monitors is no longer updated in the screen, this might indicate a server problem. In this case, a message will be displayed on the screen, and CTG paper strips should be checked on-site until this situation is resolved. If this problem persists and the server is not automatically restarted, please inform your system administrator immediately.



The values calculated for short-term variability (STV according to Dawes / Redman) are for information only and are therefore not suitable for diagnosis. Despite implementation of this parameter according to the published information from Dawes and Redman, deviations from the implementation produced by Oxford Instruments are possible as different algorithms are used to calculate other important Trium CTG Online components such as baseline, acceleration and deceleration.



The display of the paper strip is configured globally in Trium CTG Online. If the fetal monitor has a different setting for paper speed (1, 2 or 3 cm/min) and paper layout (international or US), there may be a difference between the display of the electronic and paper strip.

3.8 FHR2 Offset

When monitoring two FHRs, Trium CTG Online displays the FHR2 sensor as a blue trace and the numerical value is displayed in the digital form as FHR2 value. Optional offset information provided by the fetal monitor device itself will be ignored in the online view of Trium CTG Online.

For a better differentiation of the FHR traces in Trium CTG Online, the user can interactively apply the 'FHR2 offset' function by using the context menu. The context menu is opened with a right mouse click on the digital CTG display. The change is only visible on the screen of the client PC.

If the 'FHR2 offset' function in Trium CTG Online is activated, the entire FHR2 trace is displayed 20 bpm higher than it really is. For example, if the displayed trace shows 170 bpm, than the true FHR2 value is 150 bpm.

To indicate that the 'FHR2 offset' function is on, "FHR2: +20" in blue letters is displayed every 10 minutes within the diagram. The numerical value in the digital form remains unchanged. The FHR2 is marked with 

symbol additionally.

Heartbeat coincidence detected by the fetal monitor (device dependent) are marked in the CTG recording with  symbol.



The 'FHR2 offset' function is always applied to FHR2 and the whole trace in the online view. The offset indicator is displayed every 10 minutes for the complete trace even for intervals where only one transducer was connected.

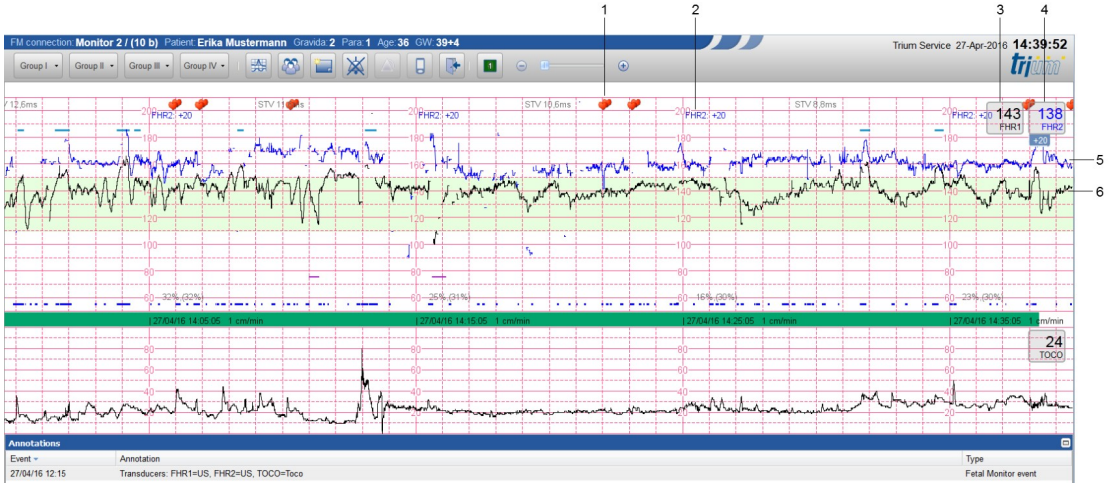


The online view of a CTG trace in Trium CTG Online and the paper printout of the fetal monitor can be different. The appearance in Trium CTG Online is independent from the fetal monitor and its configuration (e.g. different offset sensors and values, visualization in the recording dependent on the activation time).



If it is necessary to change the monitoring mode from US to FECG, the US transducer should be first disconnected and the same fetal sensor socket on the device should be used for the FECG transducer.

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Example for 'FHR2 offset' with FHR2: +20

1 Heartbeat coincidence symbol:

2 Indicator for 'FHR2 offset' function is applied to FHR2: "FHR2: +20"

3 FHR1 as numeric value (last measured value)

4 FHR2 as numeric value and 'FHR2 offset' information +20 (device dependent, last measured value)

5 FHR2 trace in blue is displayed 20 bpm higher than it really is

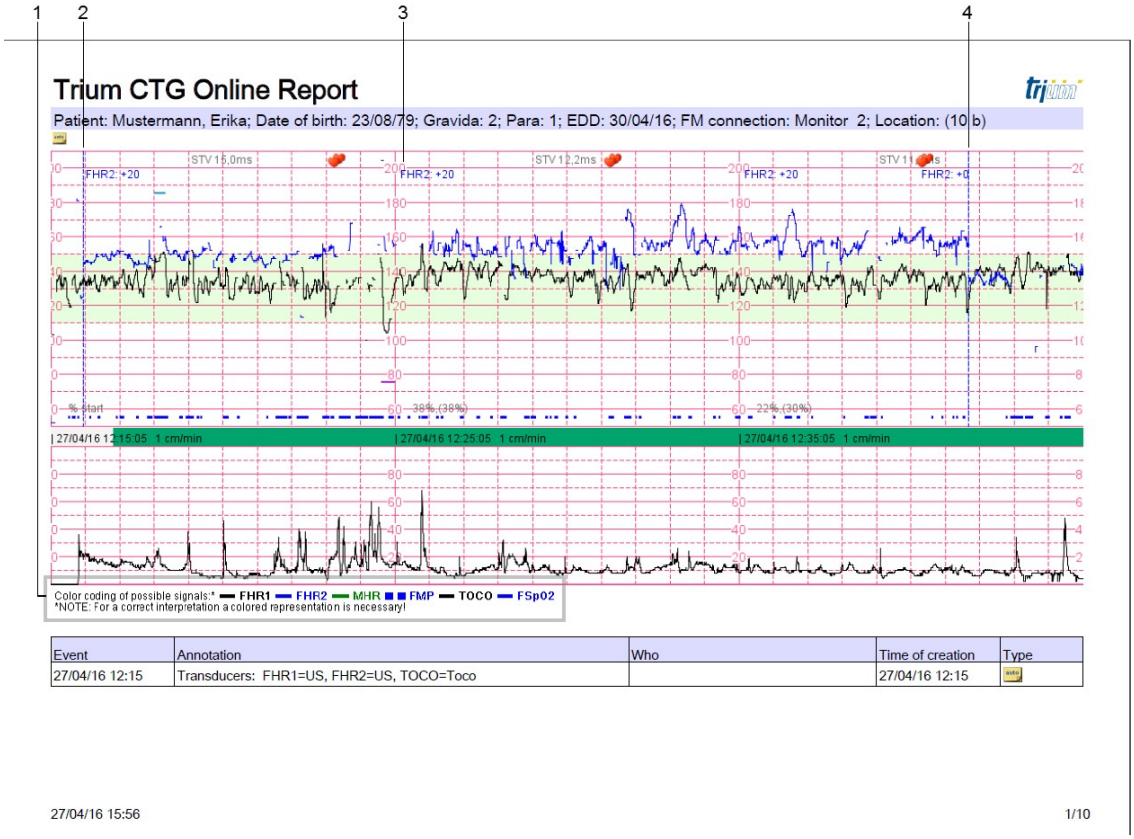
6 FHR1 trace in black

With gemini recordings, the 'FHR2 offset' function is also available in the signal history (see chapter Signal History) and in the HTML view of the archived CTG recording.

3.8.1 Gemini Recording as PDF Report

For the PDF view of the CTG recording the offset information provided by the fetal monitor will be applied to FHR2, if this information is available. Every CTG Report in PDF format includes explanations about possible signals and their color coding. For a correct interpretation of the CTG recording a colored representation is necessary.

If offset is activated on the fetal monitor, the beginning of the offset is indicated by a dashed line and marked with "FHR2: +20" in the trace. If the offset continues, the trace will be marked every 10 minutes with "FHR2: +20". The end of an offset for FHR2 is indicated by a dashed line and marked with "FHR2: +0".



PDF view of gemini recording with 'offset' information provided by fetal monitor.

1 Explanations about possible signals and their color coding

2 Offset for FHR2 activated: a dashed line in the CTG recording marked with "FHR2: +20".

3 Offset for FHR2 continues: "FHR2: +20"

4 Offset for FHR2 stopped: a dashed line in the CTG recording marked with "FHR2: +0".

Not all supported fetal monitors transmit offset information to Trium CTG Online.

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3.9 Annotations

Different types of annotations can be created in Trium CTG Online:

Plain text annotation by the user

Auto annotation (messages sent automatically by the fetal monitor)

ST-event annotation (Message created automatically by the STAN™ device from the company Neoventa)

Alert-related annotation (Alert acknowledgement annotations created by the user)

Pause-Annotation (Annotation to indicate a pause in the diagram)

These different annotations are shown as icons above the trace in the single view, located according to the time when they took place. The content of the annotations are shown below the trace and also in the annotation history (see the Annotation History chapter).

While a recording is taking place, the user can enter any number of annotations with a time reference (see the Add Annotation chapter). It is also possible to add annotations to ended CTG recordings (see the CTG Archive - Patient history chapter).

3.9.1 Add Annotation



Trium CTG Online provides several ways to add annotations:

Option 1 - Click on the symbol in the navigation bar

a) Both in the group view and single view, click on the symbol  to open the annotations window.

b) An annotation can be entered manually or transferred from the template list (see the Manage Annotation Templates chapter).

c) Depending on the context, you must also select the relevant fetal monitor and enter or change the time of the event.

d) Confirm your entries with Save data.

Option 2 - Function "Add Annotation" accessed via the context menu

This option allows context-sensitive annotations to be entered, that recording-related details such as information about the fetal monitor and the time of the event are automatically pre-filled in the annotation form.

a) Both in group view and single view, move the mouse pointer to the position where the annotation is to be added.

b) Open the context menu with a right click.

c) Select the **Add Annotation** menu item to open the annotation window.

d) Enter an annotation in the form. You can enter an annotation manually or transfer one from the template list (see the Manage Annotation Templates chapter).

e) If necessary, it is possible to adjust the time of the event.

f) Confirm your entries with Save data.

Option 3 - Mouse click on the white area above the diagram in the single view or in the signal history window

This option is only possible in the single view. The additional steps are similar to option 2, steps d to f.

All annotations are marked by icons above the trace located at the time of the event, and are listed below the trace in more detail as well as in the annotation history in the single view.



Trium CTG Online provides the option of temporarily changing the user context when annotations are entered. This means that if you are not logged into the system yourself, you can enter your user name and password while saving the annotation to ensure that you are registered as the originator of this annotation. It can also be configured that if the user name and password fields are left empty, the user logged into the system is stored as the annotation's originator.

3.9.2 Edit annotation

All annotations entered by a user can be edited while a CTG recording is taking place:

1. Go to the single view of the respective CTG recording.
2. Select the annotation to be edited with a mouse click in the Annotation history below the diagram, and the Annotation form with the selected annotation opens.
3. Edit the annotation and then click on Save.

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Annotations that are created either by the Trium CTG Online server (e.g. pause annotation) or by a fetal monitor (e.g. automatically measured maternal vital data) cannot be edited.

3.9.3 Annotation History

The Annotation history appears below the single view trace, and it is possible to enlarge or minimise this list as required. In addition, it is possible to show/hide the various columns, and to sort and filter the content.

3.10 Fetal ST-Analysis

Trium CTG Online can show the fetal ST-Analysis of a STAN™ device from Neoventa in the single view. In this case, an additional diagram with the ST-Presentation appears below the TOCO diagram. The T/QRS ratio is marked as an x-like black cross. Biphasic indications are numbers of 0, 1, 2 or 3, of which 1, 2 and 3 are indicated on the bottom of the diagram, in black bold figures. All ST events transmitted by the STAN™ device are imported as annotations in the Trium CTG Online annotation history and are marked with the ST annotation symbol in the FHR diagram.

The T/QRS ratios and biphase indicators of STAN™ are not displayed in the group view

The display of T/QRS ratio differs from the display on the STAN™ device or the STAN™-paper printout as follows: The height of the T/QRS ratio display is doubled compared to the display of Neoventa. This type of display was chosen to preserve the standardized ratio between FHR and TOCO as well as to reflect the difference between TOCO and the T/QRS ratio as it is normally shown by Neoventa.

For further information, please refer to the documentation of the device manufacturer.

3.11 Remote Fetal Monitoring

Trium CTG Online has an optionally available remote fetal monitoring software module - **Mobile Connector**. This module enables to connect a fetal monitor (e.g. used at

patients home) to the central station via a smartphone. If this module is activated a button is displayed in the navigation bar of the monitoring area.

Depending on situation, the button may appear as follows:



Currently no data transmitted via Mobile Connector is available.



The system is receiving new data transmitted via Mobile Connector.



At least one complete CTG recording transmitted via Mobile Connector is available.

Go to CTG archive and acknowledge it (see the Unacknowledged CTGs chapter).

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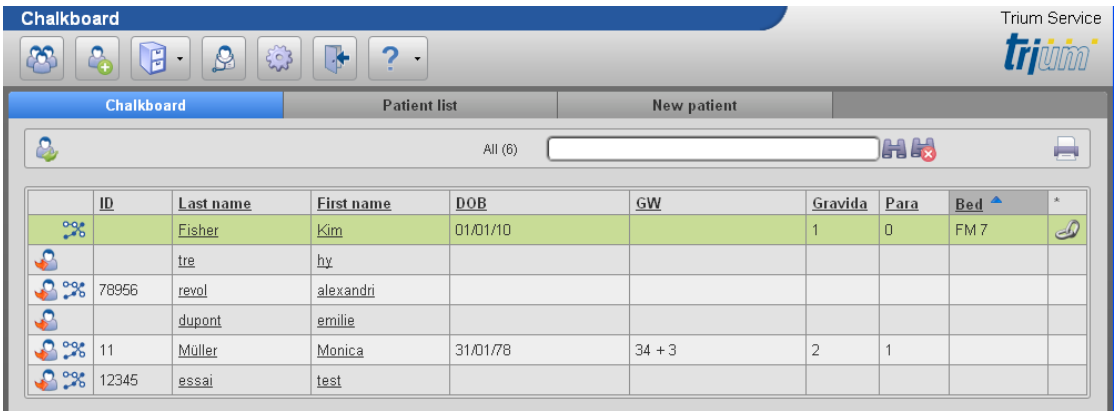
Chapter IV

Data Management Area

4 Data Management Area

Clicking on the **patient management** button will open the data management area in a new window.

The data management area is primarily used to administer patients, view the CTG archive (optional in some installations), and manage users of the system. The archive is used to enable closed CTG recordings to be accessed again at any time.



Example of patient management

4.1 Navigation in the Data Management Area

The navigation bar above the data management area contains the following options:



Patient management



New patient (optional, depending on the configuration)



CTG-Archive (optional, depending on the configuration and on licensing)



Users



Options



Close window



Help

The functions of the buttons are explained in the sections below.

4.2 Patient Management



All patients in Trium CTG Online are managed using the **patient management button**. This area consists of several components:

- Patient list: contains a list of patients who have current case data in Trium CTG Online.
- Patient archive: contains all patients in Trium CTG Online, and allows any record to be easily searched.
- New Patient: allows new patient records to be manually created (optional, depending on the configuration)

The button  clears the search so the original list and view are displayed again.

4.2.1 Patient List

The **patient list** contains a list of patients who have current case data in Trium CTG Online.

The patient list contains the following functions:

- Search patient (within the patient list)
- Add patient into patient list (configuration-dependent)
- Edit patient data
- Discharge patient (configuration-dependent)
- Remove patient from the patient list (configuration-dependent)
- Sort patient list
- Print patient list

4.2.1.1 Search Patient in the Patient List

If you want to search for a patient, proceed as follows:

1. Enter a search parameter in the input field above the list, for example the first few letters of the name or the date of birth and then click on the button  (you can also press the "enter" key on the keyboard).

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a) If there is exactly one match, the corresponding patient's record is opened.

b) In case there is more than one match, the results are shown in a list.

- Click on the last name to open a patient record.
- To reset your search, click on the button .

c) If there are no matches, then the patient archive should be searched (see the Search patient in the patient archive chapter).

2. You may accept or modify the record (see the Edit Patient data chapter).
3. Click on the Save data button (or Cancel) to close the patient's record.

4.2.1.2 Add Patient to Patient List

Patients who are not listed in the patient list, can be added to it.

1. Click on the symbol .
2. Enter a search parameter in the input field above the list, for example the first few letters of the name or the date of birth and then click on the button  (you can also press the "enter" key on the keyboard).

a) If there is exactly one match, the corresponding patient's record is opened.

b) In case there is more than one match, the results are shown in a list. You can also limit the search by clicking on the  button.

- Click on the last name to open a patient record.
- To reset your search, click on the button .

c) If there are no matches, then it is possible to refine the search or to create a new patient (See the New Patient chapter).

3. You may accept or modify the record (see the Edit Patient's Data chapter).
4. Click on the Save data button (or Cancel) to close the patient's record.

4.2.1.3 Edit Patient's Data

Patient records in Trium CTG Online can contain different types on information, including case details, discharge status, and organisational information such as physician in attendance or fetal monitor assignment.

Not all demographic details can be edited, however, depending on whether Trium CTG Online receives patient records from a hospital information system.

Trium CTG online can store the following details as part of a patient record:

- Date of birth
- Gravida, Para, LMP
- Number of fetuses
- Calculated delivery date (based on the LMP, the delivery date can be automatically calculated, see the symbol ).
- Corrected delivery date
- Responsible physician or midwife
- Assignment of fetal monitor and location (a room assignment depends on how the application is configured).
- Permanent assignment of a fetal monitor (permanent assignment means that the assignment of the device is maintained after a CTG recording has ended).
- Whether a patient is listed in the patient list

Some of these options are only available depending on the configuration of the system. Additional items not listed above can also be configured to be shown in the list (such as blood group). Please contact your system administrator if there is a need to customise these options.

To edit any of the details for a patient record, open the patient form:

1. Click on the **First or Last name** of the patient in the list.
2. Edit the patient data.
3. Click on the **Save data** button.

After clicking the **Save data** button, you will be returned automatically to the overview and the edited patient is highlighted in bold. If a fetal monitor was assigned, the patient’s row is also now

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highlighted in the patient list (more information about colours and highlighting are in the Sort patient list chapter).



All changes, including patient demographics, are saved automatically using “Save data”.



Only one fetal monitor connection can be assigned to each patient. It is therefore not possible to 'pre-assign' the same fetal monitor connection to more than one patient.



Patients with a permanent assignment are shown with the symbol in the last column of the patient list.



If you have accidentally assigned the wrong fetal monitor to a patient, and only noticed this in the overview, you can correct this action by following the steps mentioned above.

4.2.1.4 Discharge Patient

If you want to discharge a patient, proceed as follows:

1. Click on the **First or Last name** of the patient in the patient list.
2. Click on the **Discharge** button.
3. Select a discharge reason from the selection list. Date of birth for the new born is suggested automatically at the time of delivery. It is possible to correct the delivery date manually and confirm the details when saving.

If CTG archiving is enabled, the patient is then saved with all recordings. It is possible to search and show all archived patients and their histories both using the **Patient archive** in the patient management window as well as directly in the **CTG archive** (see the patient archive or CTG-Archive chapters). Without the CTG archive, only patient data without CTG recordings can be searched and displayed.

4.2.1.5 Remove Patient from the Patient List

Patients who are no longer needed in the patient list can be removed. Removing a patient from the patient list does not actually delete any patient data. The patient is still present in the database.

1. Click the  symbol.

2. The patient is no longer shown in the patient list.

To add the patient back in the patient list, see the Add Patient chapter). Patients who are assigned to a fetal monitor or location, must be de-assigned first before they can be removed (see the Edit Patient's Data chapter).

4.2.1.6 Sort Patient List

The patient list can be configured to display different details, depending on the requirements.

a) User controlled admission

In this configuration, the user defines which patients with current case data should appear in the list.
Additional information is indicated by coloured rows:

- Rows highlighted in blue indicate patients that are assigned to a fetal monitors which have not yet started to send data. For patients with permanent assignment, an additional  symbol appears in the last column.
- Rows highlighted in green indicate patients with an active CTG recording.
- Rows highlighted in yellow indicate patients who are monitored with Trium CTG Mobile (telemonitoring system, requires a license).
- All remaining patients are highlighted in grey.

b) Fetal monitor controlled admission

In this configuration, a list of patients with assigned fetal monitors is shown, and as soon as the recording is completed, patients are automatically removed.
Exception - permanent assignment: If a fetal monitor is always assigned to a patient, the patient remains in the patient list until this assignment is removed.

This configuration is particularly useful for units with a large number of CTG devices and patients.

The default order of patients in the list is as follows:

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- Initially, all patients with an assignment to a fetal monitor or location appear alphabetically according to the device name or location name.
- All remaining patients appear in the order of assignment to the list, with the most recently added patient highlighted in bold and located at the top of the list.

The sort order can be changed by clicking on a column name, for example "last name". The layout can be set back to default by reopening the patient list by clicking on the patient management button.

4.2.1.7 Print Patient List

The patient list can be printed:

1. Click the symbol .
2. A new page opens in the browser.

Before printing, it may be useful to sort the patient list or filter it so only the most relevant details are printed. The layout can be set back to default by reopening the patient list by clicking on the patient management button.

4.2.2 Patient Archive

The **Patient archive** allows all patient records in Trium CTG Online to be searched.

The user can perform following actions in the patient archive:

- Search Patient
- Edit Patient Data

4.2.2.1 Search Patient in the Patient Archive

If you want to search for a patient in the patient archive, proceed as follows:

1. Enter a search parameter in the input field above the list, for example the first few letters of the name or the date of birth and then click on the button  (you can also press the "enter" key on the keyboard).
    a) If there is exactly one match, the corresponding patient's record is opened.

a) In case there is more than one match, the results are shown in a list.

You can also limit the search by clicking on the  button.

- Click on the last **name of the** patient in the list to open a patient record.
- To reset your search, select the button .

c) If there are no matches, then it is possible to refine the search or to create a new patient (see the New Patient chapter).

3. You may accept or modify the record (see the Edit Patient's Data chapter).
4. Click on the Save data button (or Cancel) to close the patient's record.

4.2.2.2 Edit Patient's Data

(See sub-chapter Edit patient's data in chapter Patient List**)**

4.2.3 New Patients

 The **New patient** button is used to create new patient records. The availability of this function depends on the configuration and whether the patient's data is automatically imported from the hospital information system.

4.2.3.1 Admit New Patient

To admit a new patient manually (without searching for existing matches), proceed as follows:

1. Click on the  button. A new patient record screen is shown.

Alternatively, select **New Patient** within the patient management window.

2. Fill the form fields and click on save.

The following information is mandatory for every patient:

- First name and last name

The following information can be entered for every patient:

- Date of birth
- Gravida, Para, LMP

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- Multiples
- Calculated delivery date

Based on the LMP, the delivery date is automatically calculated and entered, use the  symbol to calculate it.

- Corrected delivery date
- Responsible physician or midwife
- Assignment of fetal monitor and location (location assignment depends on the configuration of the application).
- Permanent assignment of a fetal monitor (the monitor assignment is retained after the end of a recording).

3. Now click on the **Add** button. The patient is now registered in Trium CTG Online and automatically appears in the patient list.



To check if the patient already exists, select the “New patient” function within the table in the patient archive to automatically start searching for similar patients. If the patient is already present, the data can be imported by selecting the name from the results. If another new recording is to be made, click once again on the “New patient” symbol in the table row.

4.3 Partogram

The partogram is used for documenting the birth, and provides information about the birth history and status at a glance (the partogram module requires a license).

4.3.1 Generation of New Partogram

The partogram can be accessed by from two areas in the system:

- In the patient list, click on the **name** of the patient, and then click on the **partogram** tab.

or

- In both the group view/single view, the mouse cursor over the desired trace, open the **context menu** with a right mouse click, and select **partogram**.

If starting a new partogram, an additional dialogue will open to add the start time..

4.3.2 Accessing Existing Partograms

The following options are available to access an existing partogram for an ongoing case:

- In both the group view/single view, move the mouse over the desired trace, open the **context menu** with a right mouse click, and select **partogram**.

or

- In the patient list, click on the **Name** of the patient and then click on the **partogram** tab.

or

- In the patient list, click on the  symbol (Open partogram) in the first column.

In order to open an existing partogram for a completed case, proceed as follows:

1. Search for the appropriate patient in the patient archive.
2. Click on the name of the patient to show the patient's data.
3. Go to the **Patient History** list, and in the Pregnancy table, click on the  symbol (Open partogram), in order to open a PDF record of the partogram.

4.3.3 Navigation

The partogram has several options which are accessed using the navigation bar at the top of the data management window.

4.3.3.1 Table View / Diagram View

There are two ways to display the partogram.

 The **Chart view** contains all partogram data represented graphically. Depending on the current window size, only part of the partogram is visible. To see more of the partogram, drag the partogram to the left or right using the mouse (to drag, move the mouse while pressing

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and holding the mouse button). To adjust the magnification of the partogram, use the slider in the navigation bar at the top of the window.



Make sure that the display of the diagram view is dependent on the individual Partogram configuration.



The **Table view** contains all partogram data in rows and columns. Once the partogram has more than 15 entries, there is an option to scroll horizontally through the entries using the table navigation bar. The column configuration menu, accessed by clicking on the arrow to the right of highlighted columns, allows detailed configuration of the columns including sorting in ascending/descending order, adding and removing columns from the display, and grouping.

4.3.3.2 PDF-View



This button is used to generate PDF documents, which includes both table and chart views of the partogram, as well as additional patient details such as name and date of birth.

4.3.3.3 Update View



Newly created diagnostic findings are imported automatically once a minute (e.g. blood pressure measurements by a fetal monitor) or directly into the related partogram after saving (e.g. manual entry of dilatation). The view can also be manually refreshed by clicking on the **Update view** button.

4.3.3.4 Zoom-Function



These buttons in the **chart view** are used to increase and decrease the magnification of the current partogram. The higher the selected zoom factor, the smaller the visible area of the partogram. Use the first button to select the zoom factor directly, and use second button to increase or decrease the zoom in 25% increments. The maximum visible area of the partogram can be adjusted globally by the system administrator.

4.3.4 Creating and Editing Partogram Details

4.3.4.1 Creation of New Entry

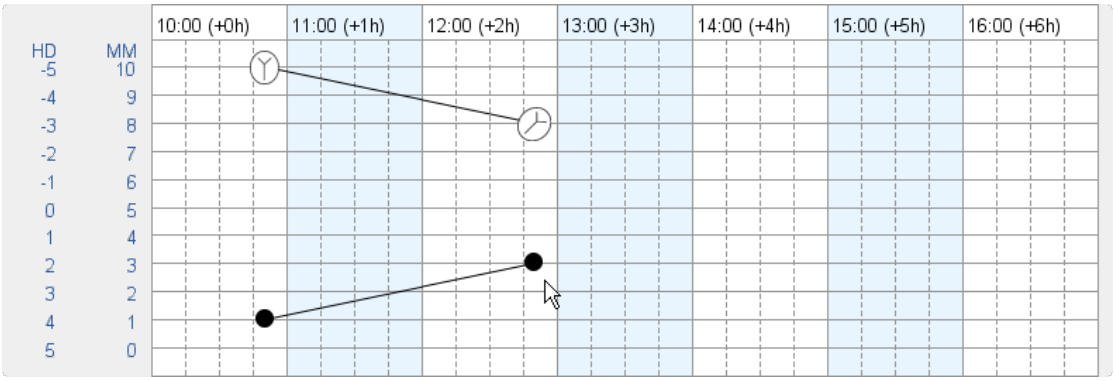
To create a new entry in the partogram in the diagram view, click on the specific time you want to create a new entry, and a dialogue for creating a new entry is opened. A starting time will be entered by default, rounded to 5 minutes, although it can be changed as needed (contact your system administrator if this 5 minute default should be changed).

Then, enter all relevant data and click on **OK** to save. To close the dialogue without saving, click on **Cancel**.

Alternatively, it is possible to click the **Add Examination** button in the table view and select Examination type, in order to open the dialogue to add new details.

4.3.4.2 Editing an Existing Entry

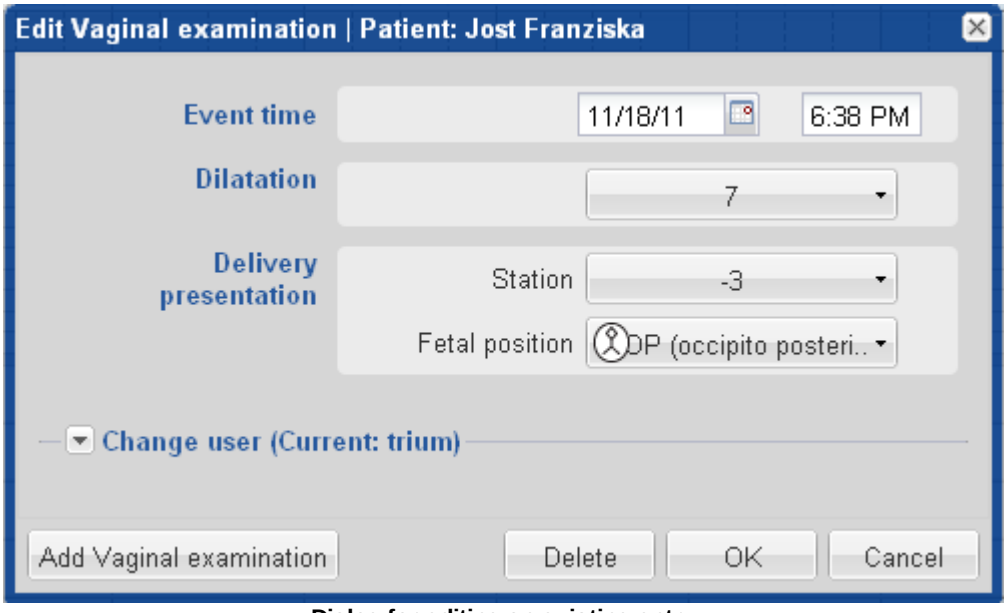
To edit an existing entry in the partogram in the diagram view, click on the starting point of the entry in the diagram.



Click on starting point of the entry for editing

A dialogue will then open for editing the the current values in the existing entry.

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Dialog for editing an existing entry

Then change all relevant data and click on **OK** to save. To close the dialogue without saving the changes, click on **Cancel**.

Alternatively, you can click on the corresponding entry in the table in the table view to open the dialogue for editing an existing entry.

4.3.4.3 Deletion of an Existing Entry

To delete an existing entry in the partogram in the diagram view, click on the starting point time of the entry to be deleted in the diagram. A dialogue will then open for editing the the current values in the existing entry..

Click on **Delete** and confirm the warning message with **OK**. To close the dialogue without saving the changes, click on **Cancel**.

Alternatively, it is possible to click on the corresponding entry in the table in the table view, in order to open the dialogue for deleting an existing entry.

4.3.4.4 Patient Data and Birth Process

Both of the displays – "Patient data" and "Course of labour" for the current patient, are located on the left side of the partogram view.

To edit details in these areas, click on one of these areas to open an edit dialogue. Once the details are changed as desired, click on **OK** to save data. To close the dialogue without saving the changes, click on **Cancel**.



Make sure that changes made to the display of patient data and birth history in the Partogram view for this patient are also updated in the data management window, including extended case data and vice versa.

To hide both of the displays and subsequently maximise the visible area for the partogram, click on the  Symbol in the Patient data area. To show both displays - "Patient data" and "Course of labour" again, click on the  Symbol.

4.3.4.5 Change User

The dialogues to Create, Edit and Delete partogram entries as well as the dialogues for editing patient data and updating case data have the option to prompt for the current user's login credentials to ensure that any edits are logged against the correct person.

To enter a user name and password, the fields can be shown by clicking on the triangle symbol . If the User name and Password fields are left blank, the credentials from the currently logged in user are logged with the changes.

4.3.4.6 Remember me Function

The "**Remember me**" function lets you create documentation for a patient without having to enter credentials for each entry.
Once the function is activated an information panel will be displayed on top of the Partogram, indicating your username, the time until the session expires and a logout button.
The panel is automatically removed when the session expires, you log out, change the patient or close the Partogram.



This option and the timeout setting is configurable.

4.3.5 PartogramApp for Android



PartogramApp is a mobile client running on the android platform as part of Trium CTG Online. It is an alternative interface, which enables the user to document the progress of labour on a tablet device in real time with simple finger gestures. It covers the same sections as in the PC client version. To access the manufacturer details of Trium CTG Online, including the software version and support information, tap the Trium logo at the login page. This software

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extension requires a separate license. For more information, contact your local sales representative.

4.3.5.1 Login

1. Tap  on the desktop of the tablet to open the application.
2. Enter your Trium CTG Online user name and password.

The onscreen keyboard appears automatically anytime you need to type. Tap the text field, to bring up the keyboard. Tab  , to hide the keyboard.

4.3.5.2 Viewing Partogram

To view the entries of an existing partogram, choose a patient. Be aware that you can only view or enter follow up data to partograms, which have been commenced from the PC client. A commenced partogram will be indicated by a yellow highlighted bar in the patient archive.

1. Tap "Please select patient" on the top right corner.
2. Tap on the name, to choose a patient from the list. If necessary, drag your finger along the list down to scroll.

In the diagram view the timeline is restricted to the events of the last 4 hours. The vaginal examination is always visible. The other entries are visible on demand:

1. Touch and hold the area of the "V" (highlighted in blue) to display maternal vital parameters.
2. Touch and hold the area of the"F" (highlighted in green) to display further entries.

To view the entire partogram documentation, tap . If necessary, drag your finger along the list down to scroll.

Add a New Entry

You can add a new entry directly on the tablet. Be aware that you can not delete entries on the tablet. To delete or modify entries use the PC client.

1. Tap 

button to add an entry. The event time will be the actual input time. If you want to add an entry in the past, touch and hold the button, then slide your finger along the timeline up to the respective event time.

2. Tap "Vaginal examination" to enter fetal position, fetal station and cervical status of the fetus:

   a) Tap "Fetal position":

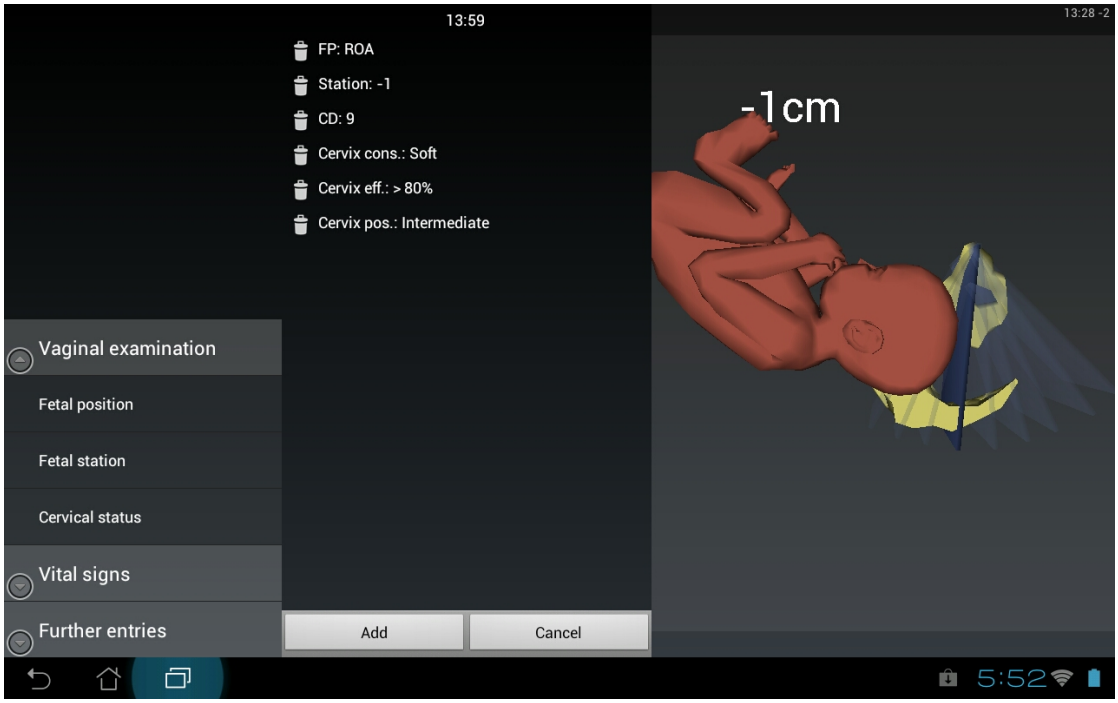
      - Tap within the blue circle to the respective position. To define more precisely the exact position of the fetal head (e.g. palpable fontanels, face) touch and hold the fetal head with your finger and slide to the correct position. For further positions like breech positions etc. tap on the button of the drop down list above the image and select the correct item.

   b) Tap "Fetal station":

      - Touch and hold the fetus and slide to the correct station.

   c) Tap "Cervical status" to define cervical dilatation, cervix consistency, effacement and position:

      - Tap the category and select an entry from the drop down list.



PartogramApp - Enter data about delivery presentation

3. Tap "Vital signs" to enter maternal vital signs:

   - Tap the category
   - Tap on the scale. For the fine tuning tap on the scale the  down or up

4. Tap "Further annotations" to enter further annotations about the progress of labour:

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a) Tap the category. Depending on the type of entry you select an entry from the drop down list

b) Or you enter free text

c) Or you define start/end time.

The onscreen keyboard appears automatically anytime you need to type. Use the keyboard to enter data.

5. All entries will be listed with a timestamp. It is possible to delete single entries before they will be transmitted to the server:

   - To delete a single entry, select 

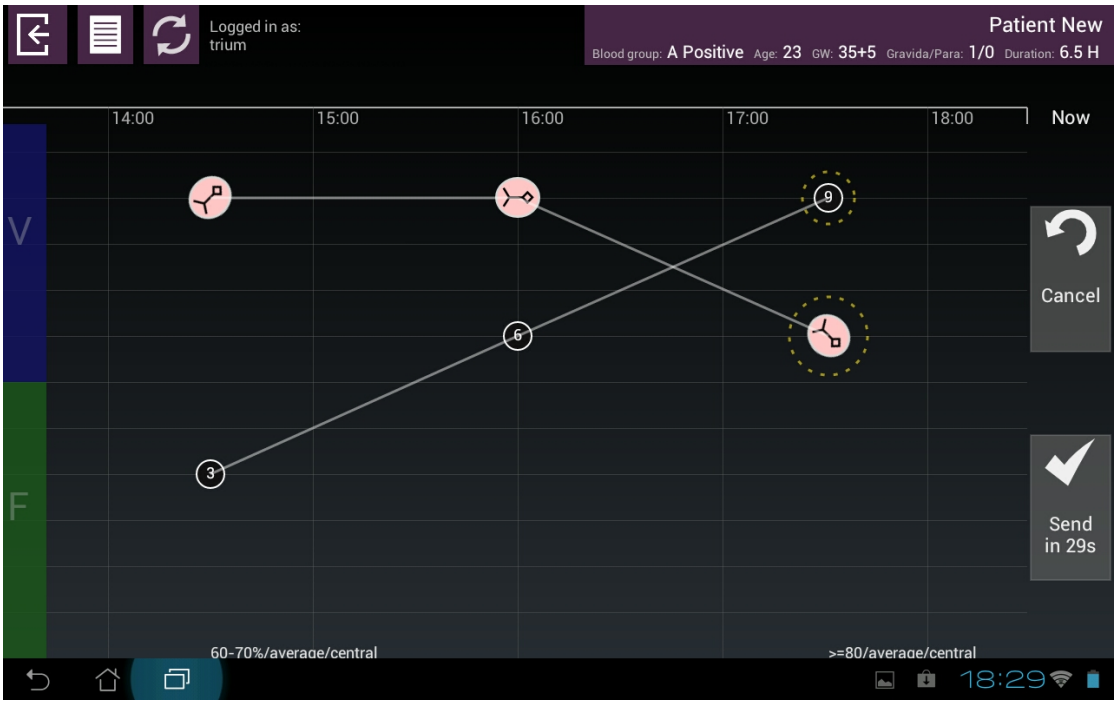
6. Tap the Add button to finish the dialog. All entries will be transmitted after 30 seconds to the Trium CTG Online server.

   a) For immediate transmission tap the 

send button.

   b) To cancel the transmission tap the 

cancel button.



PartogramApp - transmission of data to Trium CTG Online Server

4.3.5.3 Symbol Overview

The following symbols are used in PartogramApp:



Exit the application



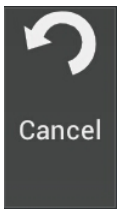
View all events chronologically



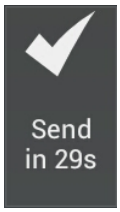
Synchronize partogram data between tablet and server manually.



Add a new entry



Cancel transmission



Send transmission

4.4 CTG Archive



All past CTG Recordings are managed in the **CTG archive** (this module requires a license). The CTG archive contains of several options:

- CTG archive has all the CTG recordings together with patient data, in chronological order.
- Unassigned CTG recordings has all the CTG recordings that have not been assigned to a patient, in chronological order.

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- Unacknowledged CTG recordings used for the CTG recordings transmitted via Trium CTG mobile fleet (remote fetal monitoring module requires a license) or CTG recorded in-hospital when the acknowledge workflow in configuration tool is activated.

4.4.1 CTG Archive

The **CTG archive** contains a chronological list of all CTG-recordings and patient details, which are automatically archived upon completion. The following options are available for every archived CTG:

 shows the selected CTG as a HTML page

 shows the selected CTG as PDF document (User rights required)

 saves the selected CTG locally on the computer as raw data (ASCII format) (User rights required; this file can be played back using the Trium CTG Player e.g. for research and training purposes).

 shows only the annotations for the selected CTG

The system administrator can configure the default behaviour of the archive to display records:

- by year
- by month
- by weak
- unstructured

It is also possible to specify that CTG recordings of a particular length deleted instead of saved to the archive (e.g. CTG recordings shorter than 5 minutes). Please contact your system administrator if this should be configured.



When the process is started, the following message may be displayed: '<folder name> could not be found ...'. In this case the recording has probably been copied to an external backup medium and then deleted from the hard disk. If you want to view this recording, the folder must first be restored. Please contact your system administrator.

4.4.1.1 CTG-Archive Search

The CTG archive provides different possibilities to search for an archived CTG:

a) Display sorted in ascending/descending order by:

- Recording start time
- Recording duration
- Last name
- First name
- Date of birth

To sort the result by a specific column, click on the column heading in the **CTG archive**.

b) By using filters:

- Today
- Yesterday
- Week

Click on a time interval in order to filter the display.

c) By plain text search:

- Recording date
- Patient name (min. 1 Letter required)
- Date of birth
- Gestation week
- Admission number

Enter a search term in the input field, and then click on the  symbol. To remove a search term from the input field, click on the  symbol.

If more results are found than can be displayed on one screen, you can scroll through the entries page by page. 

If you exit the **CTG archive** or click on the label in the **CTG archive** button, the current sort sequence or search result is reverted back to default.

4.4.1.2 CTG-Archive - Patient history

History pertaining to a selected patient contains all data of her pregnancies and the associated CTG recordings available in Trium CTG Online. The patient history can be accessed depending

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on the context related to it as follows:

a) In the **CTG archive** click on the last name of the patient in the overview,

or

b) in **Patient management**, click on the last name of the patient and then select the **Patient history** option.

The following data is included in the patient history:

- an overview with all available case data for the individual pregnancies of a patient
- an overview with all existing CTG recordings for a pregnancy including all annotations

In case there is more than one pregnancy available, first select the respective case to show CTG recordings associated to it.

The case data for a pregnancy can be opened in HTML or PDF document formats by select in the respective column between  or . If a partogram is available for the selected case, it can be also opened in the patient history by clicking on this symbol .

CTG recordings can be opened in HTML, PDF or as ASCII document formats, and any annotations can be opened with this symbol . Moreover, Trium CTG Online also provides a way of subsequently adding further annotations to an already closed CTG recording. Click on the  symbol of the respective CTGs to enter new annotation.

4.4.2 Unassigned CTGs

The **Unassigned CTGs** tab displays a chronological list of completed traces that have not been assigned to any patients. It is possible to view them and then retrospectively assign patients to these completed traces.

Every archived CTG can be displayed in HTML format, and annotations can be viewed separately from the recording.

Depending on his/her user rights, a user can save the CTG recording as a raw data file (ASCII format) to a local computer.

Furthermore, for a clearer overview, it is also possible to specify:

- how many entries should be displayed on each page and

- for how many days the unassigned CTGs should be displayed

These settings can only be modified by the system administrator.

If you exit the **Unassigned CTGs** area or click on the **CTG archive** button, the sort order or search results will be reverted back to default.

4.4.2.1 Unassigned CTGs - Search

Just like **CTG archive**, the **Unassigned CTGs** area offers several different ways to search for archived CTGs:

Display sorted in ascending/descending order by:

- Fetal monitor
- Recording start time
- Recording end time
- Recording duration

To sort the result by a specific column, click on the column heading in the **Unassigned CTGs** area.

a) By using of filters:

- Today
- Yesterday
- Week

Click on a time interval in order to filter the display.

b) By plain text search:

- Fetal monitor name

Enter a search term in the input field, and then click on the  symbol. To remove a search term from the input field, click on the  symbol.

If more results are found than can be displayed on one screen, you can scroll through the entries page by page. 

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4.4.3 Unacknowledged CTGs

The **Unacknowledged CTGs** shows all non-acknowledged CTG recordings which are either recorded in-hospital and have an assigned patient or were transmitted via Trium CTG mobile fleet. In both cases the function allows users having the corresponding acknowledge permission to document and to acknowledge the CTG recording.

To document and acknowledge a CTG recording proceed as follows:

1. Open **Unacknowledged CTGs** tab
2. Use the search field to filter CTG traces you plan to acknowledge and the table sorting functionality to sort the recordings in the desired order.
3. Click  to start acknowledgment.
4. Open the CTG trace in HTML ,  or PDF 
5. Enter an annotation.
6. Confirm your entries by entering your credentials and click Save data & next to continue acknowledging.

Click the button  or  to navigate to the previous / next recording on your unacknowledged recording list.

4.5 Management of CTG Recordings

It is possible to retrospectively assign a completed CTG recording to a patient, change the assignment, or de-assign it.

4.5.1 Assign CTG to a Patient

To assign a CTG recording to a new patient, proceed as follows:

1. In the **Unassigned CTGs** area, search for the CTG recording that you would like to assign to a patient, and then click on the  symbol.
2. Verify the recording data.
3. Enter the first letters of the patient's name in the search field to see a list of patients who match the search criteria. If there are several entries, use the mouse to select the correct patient.

If the patient's name is not one of those displayed, select the option "Show all patients". You will now be shown all the patients stored in the Trium CTG Online database. If the desired patient is still not displayed, this patient needs to first be imported from the hospital information system (HIS) or be admitted manually as new patient in Trium CTG Online.

4. If configured, it is possible to make a room assignment by selecting an entry from the **Location** list (depends on configuration).
5. Click on the **Assign patient** button.

The recording is now assigned to the selected patient and can be accessed both via the patient's history or in the **CTG archive**. Moreover, this change is automatically logged in the annotations list together with a system annotation.

4.5.2 Modify Assignment

To modify an assignment, proceed as follows:

1. Select the CTG recording you wish to modify in the **CTG archive**, and then click on the  icon.
2. Check the data on the form.
3. Enter the first letters of the patient's name in the search field to see a list of patients who match the search criteria. If there are several entries, use the mouse to select the correct patient.

If the patient's name is not one of those displayed, select the option "Show all patients". You will now be shown all the patients stored in the Trium CTG Online database. If the desired patient is still not displayed, this patient needs to first be imported from the hospital information system (HIS) or be admitted manually as new patient in Trium CTG Online.

4. If configured, it is possible to make a room assignment by selecting an entry from the **Location** list (depends on configuration).
5. Click on the **Assign patient** button.

The recording assignment has now been assigned to the patient and can be accessed using both the patient’s history and the **CTG archive**. Moreover, this change is automatically logged in the annotations list together with a system annotation.

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4.5.3 De-assign Patient

To de-assign a patient, proceed as follows:

1. Select the CTG recording you wish to modify in the **CTG archive**, and then click on the  icon.
2. Check the data on the form.
3. Click on the **De-assign patient** button.

The patient assignment of the CTG recording has been removed. In the previously assigned patient's CTG history, the entry is now greyed-out and a system annotation has been automatically created. The CTG recording can still be accessed via the **Unassigned CTGs** area.

4.6 User

 All users in Trium CTG Online are managed in the **User** are, which is accessed by clicking on the User button. The following options are available:

- Search user
- New user
- Edit user data

Click on the column heading in the overview table to change the sort order. If you exit the **User** area or click on **User** button again, the sort order or search results will be reverted back to default.

4.6.1 Search User

If you would like to search for a user, proceed as follows:

1. Enter the search parameter in the input field above the table, e.g. initial letters of the last name and then click on the  button.

    a) If there is an exact match, the user record will be opened.

    b) In case of more than one result, the search result is shown in a list.

    - Click on the **Last name** of the searched user in the list to open the record.

- To reset your search, click on the  icon.

c) If there are no matches, you can refine your search or add a new user (see the New User chapter).

2. Changes can be made to the user account (depending on the user rights, see the Edit User Rights chapter).
3. Click on the **Save Data** button to save and close record.

4.6.2 New User

To create a new user, proceed as follows:

1. Click the  icon to open an empty user account page.
2. Fill out the input fields. The following information is mandatory for each user:
    - First name and last name
    - User name and Password

The following permissions can also be assigned to the user:

- Change password on next login
- Acknowledge in-hospital recordings
- Acknowledge mobile fleet recordings
- Allow download of PDF documents (i.e. to save CTG-recordings as PDF documents on the local computer)
- Allow download of raw data (i.e. to save raw data in ASCII format on the local computer;)
- Allow display of the HIS-Export*
- Manage annotation templates
- Edit own details
- Add user

These rights can also be assigned later (see the Edit User Data chapter).

3. Now click on the **Add** button.



Please note that this data is also subject to data protection laws and must not be disclosed to third parties (particularly not by telephone).

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4.6.3 Edit User Data

It is possible to edit or delete user data retroactively (user rights required).

To edit user data, open the user's record:

1. Click on the **last name** of the user in the list.
2. Edit the user data.
3. Click on the **Save data** button.

After clicking the **Save data** button, the program automatically returns to the overview.

4.7 Options



The **Options** button leads to the following areas:

- Manage templates (this function is user rights dependant)
- Statistics
- Export list (this function is configuration dependant)

The view of this area can be reset to the original display layout by clicking the options button again.

4.7.1 Manage Templates

In Trium CTG Online, it is possible create, edit, delete or group annotations into a predefined and structured list. To perform these actions, select the manage templates tab.

Create new annotation:

1. Click the symbol  to create an empty input row in the template list.
2. Enter the new annotation text in the empty row.

Edit annotation:

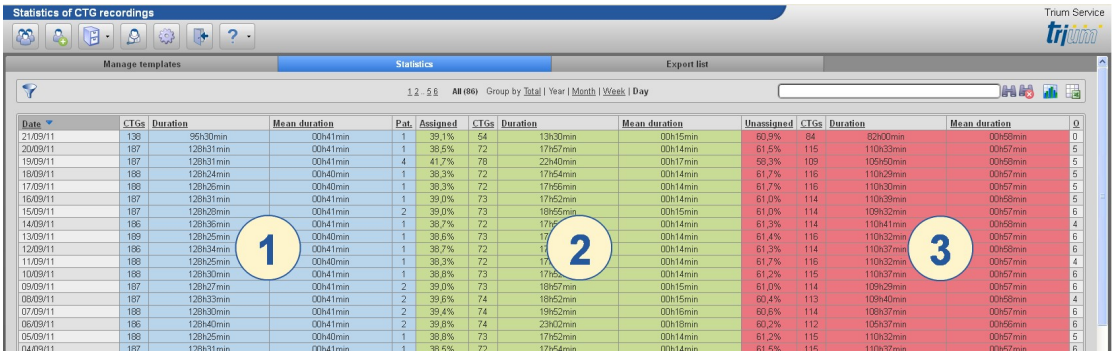
1. Click in the annotation row.
2. Enter the changed text.

Other actions:

- Change order of annotations
- Delete annotations
- Cut an annotation and copy to to the clipboard
- Paste an annotation from the clipboard
- Add a submenu
- Show submenus
- Move one level up

4.7.2 Statistics

The statistics tab contains an analysis of the duration and frequency of all CTG recordings stored in Trium CTG Online. It can be structured according to years, months, weeks, days or by a user defined range.



Example for a tabular display

The statistics results can be displayed as a table or graphically , and contain the following information:

1 **all CTG recordings**

- total number of all recordings
- total duration of all recordings
- mean duration of all recordings
- total number of patients

2 **assigned CTG recordings**

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- percentage of the assigned recordings
- total number of the assigned recordings
- total duration of the assigned recordings
- average duration of the assigned recordings

3 **unassigned CTG-recordings**

- percentage of the unassigned recordings
- total number of the unassigned recordings
- total number of the unassigned recordings
- average duration of the unassigned recordings

The last column in the table layout shows the number of CTG recordings which are overlapping a date range. An overlap may occur if the recording is started before midnight and stopped after midnight.

There are standard filters such as **Total** | **Year** | **Month** | **Day**, or you can define a filter  for a particular time period. Moreover, there is the option to search by plain text  and any results can be exported as a spreadsheet.

4.7.3 Export List

The export list is available only if the HL7 interface for HIS or ViewPoint is configured, and it shows sent HL7 messages with reference to the PDF export of CTG recordings (access to the export list requires special user rights, see User chapter for further details). The export list may contain the following information depending on the system configuration:

Document ID

The document ID refers to the PDF document of a CTG recording. This document ID has been allocated by Trium CTG Online.

Event code

The event code contains one of the following HL7 message types:

- MDM^T01 = New (Document management, export of examination in PDF format)
- MDM^T09 = Update (Document replacement notification)
- MDM^T11 = Cancel (Document cancel notification)

Status

There are three different statuses:

- Queued
- Success
- Failure

Message

In case of an export failure, an error message appears in this column.

Send date

The send date refers to the send date from Trium CTG Online

Visit ID

The visit ID is optional and appears only if connected to a HIS

ID

The column ID contains the patient ID, which is shown in Trium CTG Online. Information pertaining to the management of several patient IDs is found in the **Trium CTG Online - Service Manual**.

Begin

This column contains information pertaining to the start time of the CTG recording.

Duration

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This column contains information pertaining to the duration of the CTG recording.

4.8 Close Data Management Window



The **Quit Trium CTG Online** button in the data management area closes this data management window. The user will remain logged in.



To quit and logout from Trium CTG Online, click the **Quit Trium CTG Online** button in the monitoring area.

4.9 Help



The Trium CTG Online Help can be accessed using the **Online-Help** button.

4.9.1 Manufacturer Information



To access the manufacturer details of Trium CTG Online, including the software version and support information, click on the Help button in the data management area.

Chapter V

Alert Management

5 Alert Management

Trium CTG Online has an optionally available CTG analysis module. This module includes a classification system with an alert, which reacts primarily to changes in the fetal heart rate.



Trium CTG Online itself does not receive any alert conditions or alert signals from fetal monitors. The information received only includes fetal heart rates, uterine contraction activity, and other recorded parameters as configured. These are evaluated by algorithms within the software and potential alert conditions are then derived and displayed to the user.

The alert feature can also refer to technical problems that may occur, such as signal loss or transmission errors.



It is not possible to differentiate between an unwanted disconnection of the fetal monitor (e.g. from intermittent network failures) and from an intentionally switched-off fetal monitor.

Alerts from suspect traces are displayed as different colours, depending on the severity of the detected event. Moreover, detailed alert information is available in the single trace views, and optional audible alerting is also available. Alerts can be acknowledged by adding a respective annotation and are automatically reactivated by the system after a predefined period of time.

Two different configurations of the CTG analysis module are available (CTG pattern analysis or threshold alert), which will be described in more detail in this section.

5.1 CTG Pattern Analysis

This software option requires a separate license. For more information, contact your local sales representative.

5.1.1 FIGO Criteria

The evaluation of a CTG recording based on FIGO criteria differentiates between four components of the CTG:

- Baseline
- Acceleration
- Deceleration
- Oscillation amplitude

Each of these criteria is evaluated and classified as normal, suspicious, or pathological. The last 30 minutes are pivotal for the evaluation. While the analysis is continuously updated, a minimum of 30 seconds, and an average of 1.25 minutes, of trace data is required to produce a potential alert. In exceptional cases, the last evaluation can be delayed for up to 10 minutes.

Trium CTG Online uses the following symbols to indicate the different levels:

	Group view	Single trace view	Group button
normal			-
suspicious			-
pathological			
Acknowledged Alert			-
Evaluation not possible			-

Alert symbols - or colouring in different display areas

The summary evaluation of the CTG recording consists of the evaluation of the four individual components. At the same time, the worst evaluation is pivotal, i.e. the summary evaluation is:

- normal, if all four FIGO criteria are normal;
- suspicious, if minimum one FIGO criteria is suspicious and all others are normal;

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- pathological, if minimum one FIGO criteria is pathological;
- cannot be evaluated, if the duration of the trace is not sufficient or incomplete due to signal loss.

5.1.1.1 Visualization of the Criteria

In the group view, the most current evaluation is shown as a numbered coloured square in the upper right corner of each trace (also see table in the FIGO Criteria chapter). If an evaluation of a CTG recording is not possible (e.g. the recording is not long enough or due to signal loss), this is indicated by a grey square with a question mark. Detailed information about the individual criteria used to make the assessment are available only in the single view.

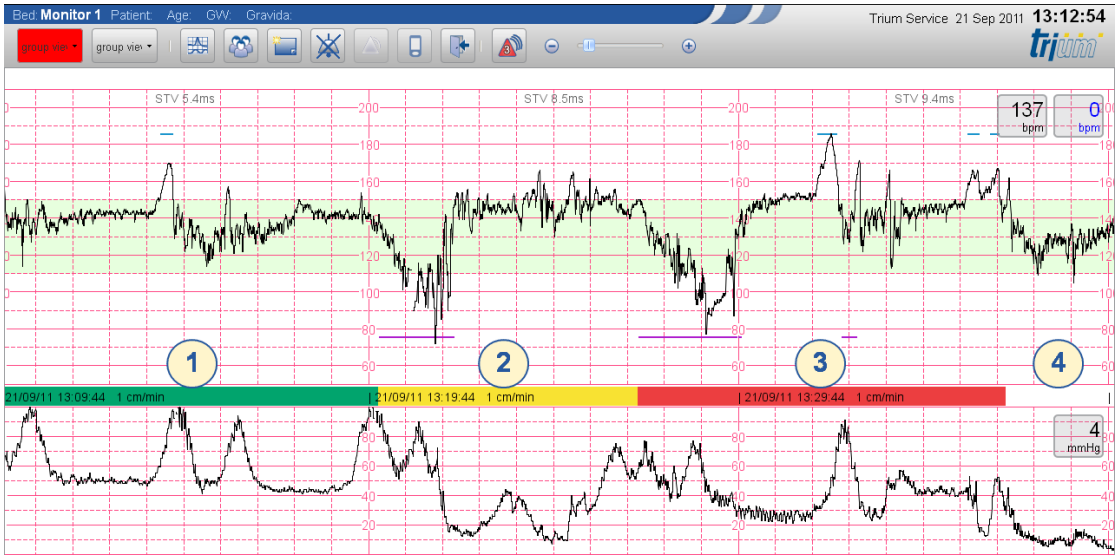
In the single view, the coloured alert symbol in the navigation bar always shows the most current evaluation. Clicking on this symbol open a window showing when the calculation was started, the four individual criteria used to evaluate the trace, and further information such as the short-term variability and an estimate of the signal quality. This summary is, however, only calculated based on the four components of the FHR according to the FIGO specification. The information shown in this window can be added as an annotation to the CTG by clicking on the **Add annotation** button.



Detailed information about the online evaluation of CTG recordings that is displayed in the window is a snapshot from when it was taken, and is not necessarily representative of the actual current situation. The actual condition may improve or worsen during the examination.

The criteria relevant for the evaluation are shown in the FHR diagram. Accelerations and decelerations are marked in the trace with coloured lines above or below the fetal heart rate. Optionally, the estimated baseline can also be displayed.

The alert symbol in the navigation bar always shows the most recent (alert) condition. The history (i.e. the change between the individual conditions over time) is shown between the FHR and TOCO. Note that this does not indicate that the FHR segments above the coloured bars are normal, suspicious or pathological, since the evaluation itself always refers to the preceding 30 minutes (see Figure below). The temporary delay of the evaluation process can be easily read as the coloured bar always reaches up to the time on which the last evaluation was done.



Example for findings with normal (1), suspicious (2), pathological (3) area and not evaluable area (4)

The red bar (3) between the FHR and TOCO diagram at the time of 13:29 indicates that the preceding 30 minutes (i.e. the complete section between 12:59 and 13:29) are classified as pathological. A large part of the same section is still classified as suspicious at a somewhat earlier time period (2). However, since the initially normal FHR trace (1) vanishes from the 30-minute evaluation window and instead deceleration was noted, the evaluation changes to pathological. The last three minutes of the recording (4) were still not considered for the evaluation (no colouring, since deceleration type cannot yet be classified).

The online evaluation of CTG recordings is based exclusively on the 'FHR1' signal. Therefore it is possible (especially in cases of twin monitoring) that the displayed FIGO evaluation may not properly reflect the actual status.

The online evaluation should not and must not replace the physician, but merely serve as a supporting tool.

5.1.2 Configuration Options

It is possible to adjust the alert or alert display for an active CTG recording according. This adjustment must always be acknowledged with a user name and password due to the inherent risk of altering such a setting. The changes are immediately shown into the single views/group views and a system annotation is added automatically. These context sensitive alert configuration options are only applicable to the current ongoing recording and are reset after the end of recording:

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1. Move the mouse indicator to the intended diagram in the group view/single view.
2. Open the context menu with a right mouse click.
3. Select the menu option Alert config.
4. Alert settings window opens.
5. Adjust the alert or the alert display and enter your user name and password.
6. Click on the Save data button (or Cancel).

5.2 Threshold Alert

5.2.1 Threshold Values

In contrast to the CTG pattern analysis, the threshold alert does not evaluate the CTG and instead merely signals that upper or lower limits for the fetal heart rate (bradycardia/ tachycardia) have been exceeded for a period longer than the one preset. As a result, the only possible conditions are **Alert active** (limit exceeded/fallen below) or **No alert** (FHR signal within the set limits). This alert module also includes a warning/alert in the event of signal loss.

The upper and lower alert levels are indicated by a red line in the single trace views and group views.

Trium CTG Online uses following symbols for the visualisation of the conditions:

	Group view	Single trace view	Group button
No alert	-		-
Alert active			
Acknowledged alert			-
Evaluation not possible			-



The online evaluation of CTG recordings is based exclusively on the 'FHR1' signal. Therefore it is possible (especially in cases of twin monitoring) that the displayed evaluation may not properly reflect the actual status.



The online evaluation should not and must not replace the physician, but merely serve as a supporting tool.



No further CTG components such as acceleration, deceleration or variability are taken into account when the evaluation is based thresholds.

5.2.2 Configuration Options

It is possible to adjust the alert or alert display for an active CTG recording according. This adjustment must always be acknowledged with a user name and password due to the inherent risk of altering such a setting. The changes are immediately shown into the single views/group views and a system annotation is added automatically. These context sensitive alert configuration options are only applicable to the current ongoing recording and are reset after the end of recording:

1. Move the mouse indicator to the intended diagram in the group view/single view.
2. Open the context menu with a right mouse click.
3. Select the menu option Alert config.
4. Alert settings window opens.
5. Adjust the alert or the alert display and enter your user name and password.
6. Click on the Save data button (or Cancel).

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Chapter VI

Symbol Overview

6 Symbol Overview

The following symbols are used in Trium CTG Online:


New patients


Add patient to patient list


Remove from patient list


Search


Exact search according to the search term


Clear


Add user


Add annotation


Show CTG recording


Show CTG recording transmitted via Trium CTG mobile fleet


Show CTG recording as printable PDF version (PDF)


Download CTG raw data


Show annotations


Assign new patient


Modify Assignment


Calculate date of delivery


Next page/recording


Previous page/recording


Acknowledge recording


Go to graphical partogram view

 Go to tabular partogram view

 Show partogram as printable version (PDF)

 Update partogram view

 show result in an Excel file

 graphical view

 tabular view

 Set filter

 Shift row above

 Shift a row below

 Delete

 Cut (and paste to clipboard)

 Copy from clipboard

 Add annotation templates

 Form sub-point(s) for annotation templates

 Show sub-point(s)

 a level above

 Continuous assignment

 Annotation

 Auto annotation through fetal monitor

 Alert-related annotation

 ST-Event Annotation

 Pause Annotation

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Chapter VII

FAQ - Frequently Asked Questions

7 FAQ - Frequently Asked Questions

7.1 General

1. On the single view/group view, the clock and the title bar are frozen.



If the title bar and/or the time are not being updated, then CTG data is also no longer being updated. Check whether the error can be corrected through a "refresh" of the page. If this does not solve the problem, contact your system administrator immediately.

2. The time displayed on the clock does not correspond to local time

➔There could be several reasons for this problem. If your connection uses a dial-up line (e. g. modem or ISDN), first check whether the task bar displays the icon indicating an existing connection. If there is no connection, this must first be set up. If the error occurs despite an active connection (you can connect to other computers) please inform your system administrator immediately.

7.2 Network Problems

1. A connection cannot be established to the server.

➔There could be several reasons for this problem. If your connection uses a dial-up line (e. g. modem or ISDN), first check whether the task bar displays the icon indicating an existing connection. If there is no connection, this must first be set up. If the error occurs despite an active connection (you can connect to other computers) please inform your system administrator immediately.

2. The following is displayed: "Browser is unable to locate the server <servername> Please check the server name and try again".

➔Check the spelling of the URL you have entered (e.g. https://ctgdemo.mytrium.com/)

3. Error message: "An error has occurred. If it is a temporary fault, clicking the 'Reload' button on your web browser will resolve it. If this does not resolve the problem, please contact your network administrator immediately!"

➔Click on the 'Reload' button (to do this, move the mouse pointer away from the monitoring area and click on the right mouse button. Then move the mouse pointer to 'Reload' and click

on the left mouse button). The page will then be reloaded. If the error message appears again, check that there is an active network connection between the two computers.

4. Error message: 'JavaScript not activated'

➔This message appears if JavaScript is not activated on your browser.

In Mozilla Firefox, select the menu for **Tools/Options/Content**. Select the check-box 'Enable **JavaScript** and confirm with **OK**.

In Internet Explorer, select menu for **Tools/Internet options/Security**. Select the button **Custom level** and search for the entry "**Active Scripting**". Set this to **Enable** and confirm with **OK**.

5. Connection unusually slow

➔If a greater than usual number of users access the server at the same time, this may strain the system. Inform your administrator, who will briefly stop the CTG Online Server service and then restart it. Bear in mind that stopping the service will interrupt all connections and an error message will appear on all client computers.

6. No system access

➔Check the spelling of your password. Please bear in mind that passwords are case sensitive. If you are unable to access the login screen, please check the network connection to the server (see above).



During the time that you cannot establish a connection to the server, the patient must be monitored via the printout from the local CTG monitor.

7. The following is displayed on the monitoring page: 'Trying to reload CTG Online Server connection.'

➔It is likely that Trium CTG Online has not been started. Inform your system administrator.

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7.3 Recording

1. Recordings are not differentiated by patient (everything is printed out in a single recording).

➔The fetal monitor must be switched off for approximately one minute between the end of one CTG recording and the start of a new CTG recording on the same fetal monitor. A recording has been correctly completed and archived if the fetal monitor is shown as unassigned in the group view.

2. Even though the fetal monitors are plugged in and switched on, the monitor is not displayed in the single view and group view.

➔Check that the cables are connected and IDS2 is working correctly.

7.4 Signal History

1. An empty window opens when signal history is selected.

➔You have probably selected the history of a long recording. It can take several seconds for the view of the trace to appear. Wait a few seconds until the floating trace is correctly displayed.

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Manufacturer address:
Trium Analysis Online GmbH
Hohenlindener Str. 1
81677 Munich
GERMANY
Tel.: +49(0) 89 2060 269 0
Fax: +49(0) 89 2060 269 11
http://www.trium.de

Trium CTG Online 2.4.0
System Requirements

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Issued:	Name:	Role:	Date	Signature:
	C. Harböck	MGR Engineering		
Reviewed:	Name:	Function:	Date:	Signature:
	J. Sefrioui	SW Developer		

I. Revision History

Revision	Date	Reason for Change	Change Reference	Author
A	04-May-07	New Format	All	Ko
A.1	09-Dec-08	Release Version 1.8	All	Ko
A.2	05-Feb-09	Huntleigh BD4000 aufgenommen	6	Harböck
A.3	29-Jan-10	Update Hardwareanforderungen für Version 1.9	2	Harböck
A.4	26-Aug-10	Update Hardware Requirements, Translated into English	All	Harböck
B	15-Sep-11	Updates for Version 2.0: • Updated Server Req. • Added STAN as supported Monitor, Chpt	 Chpt. 1 Chpt. 4	Ko
B.1	22-Mar-12	Server hardware requirements for up to 50 clients added	Chpt. 1	Harböck
B.2	04-Apr-12	Synchronization of Service Manual	All	Gürdal
B.3	06-Aug-12	new Chapter: PartogramApp for Android	new Chap	Gürdal
B.4	27-May-13	Update of AndroidApp requirements Cable P/N added, spelling corrections;	Chap. 4 Chap.5 all	Gürdal
B.5	16-May-14	Add browser compatibility matrix, update WiFi adapter requirements considering new WiFi adapter model: Moxa W2150 A	Chap. 2, Chap. 6	Gürdal
B.6	13-Aug-14	Update browser compatiblity matrix	Chap. 2	Gürdal
B.7	12-Dez-14	Update Trium connection configuration for each FM device, add P/N for lemo socket;	Chap. 5	Gürdal
C	22-May-15	Update of server and client requirements for version 2.1	Chap. 2 and 3	J. Sefrioui
C.1	17-May-16	Update of server and client requirements for version 2.1	Chap. 2 and 3	J. Sefrioui
C.2	28-Sep-16	CTO-930: Added min. Firmware version for Corometrics 170, Removed FF ESR 31	Chap. 2 and 5	D. Gürdal
C.3	05-Dec-16	CTO-909: Removed Adobe Flash from list of additional software for the client. CTO-914: Added Windows 10	Chap. 2	C. Harböck
D	04-Aug-17	CTO-954: Update browser compatibility matrix CTO-966: Clarified Firefox ESR description. Removed 'WEP' from Wifi security CTO-968: Add Edan F9 to list of supported fetal monitors	Chap. 2 Chap. 4 Chap. 6	C. Harböck
E	20-Feb-19	CTO-999: Update browser compatibility matrix CTO-1001: Update supported server OS	Chap. 2	C. Harböck
F	23-Nov-20	CTO-1047: Removed Windows 2008 CTO-1027/CTO-1042/CTO-1048: Updated browser compatibility matrix CTO-1043: Fetal monitor Nemo added	Chap. 1 Chap. 2 Chap. 5	C. Harböck
G	09-Mar-21	CTO-1063: Edan F15 / F15 Air added to the list of supported fetal monitors CTO-1058: note added that browser might need	Chap. 5	M.Saleeva

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Revision	Date	Reason for Change	Change Reference	Author
		policy configuration. CTO-1064: Huntleigh Sonicaid Team 3 added to the list of supported fetal monitors		
H	28-Jun-21	CTO-1072: Support for Windows Server 2019 added; CPU removed as performance is indicated by passmark. Added end of support announcement for fetal monitors using HP8040 protocol	Chap 1 Chap 5.	C. Harböck
I	22-Oct-21	CTO-1085: Updated browser compatibility matrix	Chap. 2	C. Harböck
J	10-Dec-21	CTO-904/CTO-1068: Updated browser compatibility matrix	Chap. 2	C. Harböck

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1. Server Requirements

The Trium CTG Online software must be installed on a dedicated server computer. The minimum hardware requirements for the central server computer are:

Max. # of clients	50
Max. # of Fetal Monitor Connections	64
Passmark CPU Mark http://www.cpubenchmark.net/	6500
RAM	8 GB RAM
Backup	Integration in central backup service
Network	100/1000 Mbit/s (TCP/IP)
Operating System	Microsoft Windows[1] Server 2019 Standard or Datacenter Microsoft Windows Server 2016 Standard or Datacenter Microsoft Windows Server 2012 R2 Standard or Datacenter
Resolution	1024x768 pixels, 256 colours
HD	Minimum: 30 GB free space at the time of installation (uncompressed 350 KB per bed and hour → 2 years continuous CTG monitoring of 6 beds, optionally compressed by CTG Online reducing backup complications)

It is highly recommended to use an uninterruptible power supply (UPS) for the server system as well as a RAID system (e.g. RAID 1). The server computer is NOT a medical device and must not be operated within patient vicinity. Despite Trium CTG Online is installed as a system service it is not possible to use the server computer as a client workstation. It is recommended to operate the server in the customer's computer center under controlled environmental conditions and in order to be integrated in central uninterruptible power supply and central backup and archiving services.

The simultaneous use of the server hardware for further software applications is not permitted. It is possible to install Trium CTG Online on a virtual machine running on VMWare Server. Note that VMWare ESX Version 4 only supports up to 4 virtual cores per virtual machine but for the Intel CPUs mentioned above 8 cores are required since VMWare indicates each hyperthreading core as physical core. As a prerequisite the operator must ensure that the virtual machine has dedicated resources which are compliant to the specification given above.

[1] Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

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2. Client Requirements

The hardware and software requirements for a client workstation are:

Operating System	Windows 7, Windows 8	Windows 10
CPU	1,5 GHz	
RAM	2 GB	4 GB
Min. Resolution[2]	• 1-6 connections[3]: 1024x768, 24 bit or 32 bits colour • 7-12 connections: 1280x1024, 24 bit or 32 bits colour • Up to 16 connections per display: 1400x1050, 24 bit or 32 bits high colour	
Min. Size monitor[2]	15"	
Network Interfaces	Min: 100MBit/s (TCP/IP)	
Audio Hardware	Soundcard, Loudspeaker	
Client Software (Browser)	Microsoft Internet Explorer[4] 11 or higher Microsoft Edge 96 or higher Mozilla[5] Firefox ESR* 91 or higher	

* Firefox ESR is the 'Extended Support Release' version of Mozilla Firefox intended for groups who deploy and maintain the desktop environment in large organizations such as hospitals. For details please visit https://www.mozilla.org/en-US/firefox/organizations/faq/

Note: Audio support may require browser specific configuration of policies at the clients.

Important!
Web browsers on smartphones and touch tablets are only supported by option **Smart Client Accessibility** of Trium CTG Online (see next chapter)!

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[2] For the common use of Trium CTG Online and GE ViewPoint a so-called "dual head" graphics card is recommended. It allows to connect two monitors to one PC.

[3] Connection refers to the licensed number of fetal monitor connections.

[4] Internet Explorer is either a registered trademark or trademark of Microsoft Corporation in the United States and/or other countries.

[5] Firefox is a registered trademark of the Mozilla Foundation.

3. Smart Client Requirements

Trium CTG Online offers an optimized view and navigation workflow for the monitoring of active FM devices on smartphones (**Smart Client Accessibility)**. This software extension requires a separate license. The hardware and software requirements are:

Requirements	
Operating System	Android, iPhone, Windows Phone 7.5
Resolution	800x480 pixels
Network[6]	UMTS, WiFi[7]
Client Software	Web Browser

4. Android Client Requirements

Trium CTG Online offers an alternative interface for the partogram documentation on Android tablets (**PartogramApp**). This software extension requires a separate license. The hardware and software requirements are:

Requirements	
Operating System	Android 4.0.3 or higher
CPU	1 GHz Dual-Core
GPU	3D GPU Processor
RAM	1 GB
Display Size	7"
Aspect Ratio	16:10
Resolution	1280x800 pixel, 1920x1200 pixel
Network	802.11n WiFi

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[6] The hospital must provide access to the Trium CTG Online Server from the network to which the mobile device connects (in most cases: the Internet or a local wireless network infrastructure)

[7] WiFi infrastructure is required.

5. Supported fetal monitors

All fetal monitors must have an operational RS-232 interface.

> **Important!**
> Support for fetal monitors using the **"HP8040" protocol will be discontinued** with software versions released after **September 30, 2022.**

GE Corometrics 120 and 250 Series

Trium FM cable P/N.: 001001B-13 (001002B-13 for FM cable with lemo socket)

Trium connection configuration: Series 50

All devices in the 120 and 250 Series are fitted with three RS-232 ports (J109, J110 and J111). External galvanic isolation is required. All ports can be used, if these have been correctly configured via the Service Menu. For the use with Trium CTG Online, the port settings should be set to **1371 w/Notes** and **1200 baud**.

GE Corometrics 170 Series

Trium FM cable P/N.: 001001B-06 (001002B-06 for FM cable with lemo socket)

Trium connection configuration: Series 50

Corometrics 170 Series devices **require firmware version 3.23** or better.

All devices in the 170 Series are fitted with two RS-232 ports (designated 1 and 2). External galvanic isolation is required. All ports can be used, if these have been correctly configured via the Service Menu. For the use with Trium CTG Online, the port settings should be set to **HP w/Comments** and **1200 baud**.

HP 8040A

Note: Support for this fetal monitor **will be discontinued** with software versions released after **September 30, 2022.**

Trium FM cable P/N.: 001001B-14 (001002B-14 for FM cable with lemo socket)

Trium connection configuration: HP8040

This device is supported if the J01 Option is installed. If the J01 option is installed, you will find a DSUB15 connector labeled **Digital Serial Interface** on the back of the device. This device is not compatible for wireless LAN.

Philips Avalon FM 20, FM30, FM40 and FM50

Trium FM cable P/N.: 001001B-02 (001002B-02 for FM cable with lemo socket)

Trium connection configuration: Series 50

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Devices of this type require the optional **LAN / RS-232 Interface Assembly** (Philips Part No.: M2703-67501). Connecting a cable to the LAN plug disables the RS-232 port! Devices of this type do not send data in DEMO mode!

Philips Serie 50 IX / XM / XMO (M1350A/B/C)

Trium FM cable P/N.: 001001B-02 (001002B-02 for FM cable with lemo socket)

Trium connection configuration: Series 50

Devices of type M1350A/B/C require option J10 (or J12). Devices with a firmware below M1350-6801G have to be updated (Philips Part No. M1360B #S01 option: add latest software).

Philips Serie 50 A / IP / IP2 (M1351A, M1353A)

Trium FM cable P/N.: 001001B-05 (001002B-05 for FM cable with lemo socket)

Trium connection configuration: Series 50

Devices of type M1351A/M1353A require option J10, J13 or J14.

Huntleigh Sonicaid FM800 Series

Trium FM cable P/N.: 001001B-12 (001002B-12 for FM cable with lemo socket)

Trium connection configuration: Series 50

All devices in the FM800 Series are fitted with several RS-232 ports. Use socket labelled **RS-232 S8002**. External galvanic isolation is required. For the use with Trium CTG Online, the port settings must be set to **HP**.

Oxford Sonicaid Team

Note: Support for this fetal monitor **will be discontinued** with software versions released after **September 30, 2022.**

Trium FM cable P/N.: 001001B-11 (001002B-11 for FM cable with lemo socket)

Trium connection configuration: HP8040

All devices are fitted with one RS-232 port. External galvanic isolation is required. For the use with Trium CTG Online, the port settings must be set to **HP** in the service menu. Sonicaid Team Duo and Trend IP devices with a firmware below **8.870 AFA** may require a firmware update to support ULT2/FECG sensors. This device is **not compatible** for wireless LAN.

Huntleigh Sonicaid Team 3

Trium FM cable P/N.: 001001B-11 (001002B-11 for FM cable with lemo socket)

Trium connection configuration: Series 50

All devices are fitted with one RS-232 port. External galvanic isolation is required. Sonicaid Team 3 devices with a system version below **11** may require a firmware update to support transmission of heart rate coincidence information.

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CASMED / Analogic FetalGard Lite

Trium FM cable P/N.: 001001B-03 (001002B-03 for FM cable with lemo socket)

Trium connection configuration: Series 50

All devices are fitted with one RS-232 port. For the configuration, the **Series 50** protocol must be selected. Please note that it is not possible to connect the device in parallel to an external printer.

Neoventa STAN® S31

Trium FM cable P/N.: 001001B-22 (001002B-22 for FM cable with lemo socket)

Trium connection configuration: STAN, Series 50

All devices are fitted with two or three RS-232 ports. External galvanic isolation is required. For the use with Trium CTG Online, the parameter **SURVEILLANCE_PROTOCOL** should be set to **STAN® Protocol (COM2)** in the **Service Setup Menu**.

Trium CTG Online has been validated with STAN monitors using the STAN protocol version **R1B**.

Huntleigh BD4000 Series

Trium FM cable P/N.: 001001B-25 (001002B-25 for FM cable with lemo socket)

Trium connection configuration: Series 50

All devices in the BD4000 Series are fitted with an RS-232 port. Use socket 1. External galvanic isolation is required. For the use with Trium CTG Online, the protocol settings **must be set to 3**.

Bionics BFM900

Trium FM cable P/N.: 001001B-27 (001002B-27 for FM cable with lemo socket)

Trium connection configuration: Series 50

All devices are fitted with a RS-232 port. Please note that the twin options is not supported. Bionics BFM 900 Light devices are not supported.

Edan F9 Express

Trium FM cable P/N.: 001001B-15 (001002B-15 for FM cable with lemo socket)

Trium connection configuration: Series 50

All devices are fitted with one RS-232 port. Serial connection requires a DB15 to DB9 adapter cable (Edan P/N: 01.13.036710-10) that is included with the fetal monitor. Devices with a firmware below V2.9G have to be updated (Edan Firmware upgrade P/N: 02.05.250534). For the use with Trium CTG Online, the parameter Net Version must be set to GET in the Network Setup menu.

Edan F15 / F15 Air

Trium FM cable P/N.: 001001B-30 (001002B-30 for FM cable with lemo socket)

Trium connection configuration: Series 50

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All devices are fitted with one RS-232 port. In some regions a serial connection DB15 to DB9 adapter cable is included with the fetal monitor, which can be used as alternative to the TRIUM connection cable. For the use with Trium CTG Online, the parameter Net Version must be set to GET in the Network Setup menu.

Nemo Fetal Monitoring System

Trium FM cable P/N.: 001001B-02 (001002B-02 for FM cable with lemo socket)

Trium connection configuration: Series 50

All devices are fitted with one RS-232 port.

6. Requirements for the interfacing of fetal monitors with the central station server

Up to 64 fetal monitors can be simultaneously connected over the hospitals own network infrastructure (Ethernet) to the central server.

- In order to connect the fetal monitors a structured network infrastructure based on STP/UTP CAT 5 cabling or higher is mandatory and every network connection must be terminated on a switch port (EN50173 or ISO/IEC 11801). The network has to support TCP/IP protocols.
- For high network traffic departments it is recommended to separate the serial network from the hospital network using VLAN and to implement a quality of service (QoS) policy throughout the path from the CTG "RS-232-to-Ethernet/WiFi adapter" to the server machine.
- All fetal monitors must have an operational RS-232 interface.
- Each "RS-232-to-Ethernet/WiFi adapter" requires a static IP address, a minimum bandwidth of 32 kb/s should be available per adapter
- All hardware components described above can be mounted on the wall or on the device cart. In the first case the monitoring display is fixed to a room (recommended) whereas in the second case the monitoring display is fixed to a fetal monitor.
- Wire based communication: The CTG signals are converted by a "RS-232-to-Ethernet adapter" (e.g. "Isolation Device Server - IDS2") which is connected with a RJ-45 connector to a wall outlet and transmits the signals via the hospitals LAN to the central server. The "IDS2" is a medical device. The IDS2 also isolates the fetal monitors from the network.
- Wireless based communication: The CTG signals are converted by a "RS-232-to-WiFi adapter" which transmits the signals via the hospitals WiFi/LAN to the central server.
  - The adapter is not not a medical device by itself. The provided power supply complies to medical device standards.
  - The optional LAN interface can only be used for configuration purposes.
  - Supported wireless standards are 802.11b and 802.11g
  - Security: WPA2/WPA.
  - For smooth operation of the WiFi adapters a signal strength of at least 80% is necessary. The service technician and operator should make sure that the adapter's signal strength indicators are at least 4 - 5 green LEDs.
  - If the adapter is going to be mounted in proximity to the fetal monitor please refer to the most recent fetal monitor manufacturer's EMI table for the required separation distance.

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