



Operating Manual

Cardiac Rehabilitation

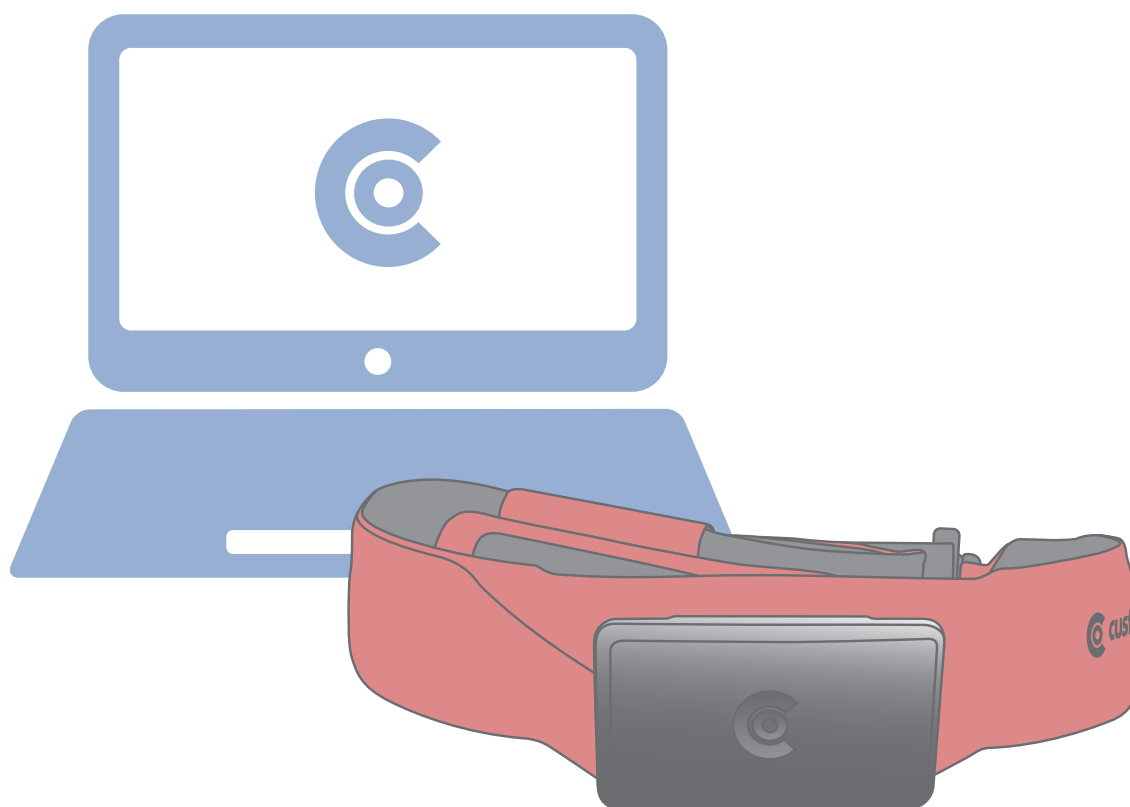
1 Safety

2 Hardware

3 Software

4 Hygiene

Part 3: custo diagnostic software for rehab with custo guard 1/3



Operating characteristics:
custo diagnostic 5.4
and higher
for Windows®

MHW 0049 – DK 1853
Version 001 – 11/08/2020

CE 0123

 **custo·med**
EXCELLENCE IN DIAGNOSTICS



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CAUTION:

This Operating Manual is part of a modular system, consisting of four parts. All four parts must be downloaded from the Internet or from a CD to ensure the Operating Manual is complete.



Cardiac Rehabilitation

1 Safety

2 Hardware

3 Software

4 Hygiene

Part 3: custo diagnostic software for rehab with custo guard 1/3

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3.1 Symbols used in this Operating Manual

ACTIONS THAT ARE PROHIBITED

or not allowed under any circumstances!



WARNING

used to indicate situations which, if not avoided, could result in personal injury or property damage



NOTE

provides important information which must be observed



TIP

contains practical information to assist you with your work



Words highlighted in colour indicate buttons or click paths to the corresponding program point, e.g. Examination, Settings, ...

Words highlighted
in colour...

3.2 custo diagnostic program structure

The custo diagnostic program is divided into three areas – **User**, **Patient** and **Examination**. This structure ensures that you can always recognise who (which user) is carrying out what type of examination with whom (which patient). The main menus of each area can be reached by clicking on **User**, **Patient** or **Examination**.

In the **User** ① main menu, the user of the system can be selected. The administration of users takes place in the custo diagnostic service centre (creating users, allocating user rights, user-specific settings).

The **Patient** ② main menu is used for patient management. Its most important functions include **Search for patient**, **Add new patient** and **Search Evaluation**.

The **Examination** ③ main menu lists all of the examination types which are possible with custo diagnostic. Modules already purchased are active (black font), all other modules are inactive (light grey font).

This menu is also linked to the **Settings** area. This area is for making cross-program, examination-related and user-specific settings.



3.3 Configuring the rehab facility in custo diagnostic

Precondition for initial operation

custo diagnostic is installed on your PC and ready for operation. The custo med devices and components may only be connected to the PC after custo diagnostic has been installed. The required device drivers are installed on the PC via the custo diagnostic standard set-up or via targeted selection during the custo diagnostic set-up.



The installation of the custo med rehab facility, as well as the connection and configuration of all devices, will be carried out by your authorised custo med dealer. The final commissioning steps are briefly explained in this chapter. This concerns the required settings in custo diagnostic.

After custo diagnostic has been set up...

- Connection and configuration of the exercise devices
- Connection and configuration of custo com RF radio receiver units
- Connection of custo guard ECG transmitters
- Configuration of the exercise stations
- Creation of training profiles
- Configuration of workflows and control elements in the software interface.



3.3.1 Configuring the exercise devices

The exercise devices (both those connected, and not connected, to the PC) are configured in custo diagnostic on the **Examination, Settings, Interfaces, Devices** screen. This step is necessary to ensure that the devices are available later when the exercise stations are configured.

PC-controlled ergometers and treadmills:

In the left side of the window, select the device, e.g. **Ergometer, No. 1**. Make the device settings in the right half of the window. If the device type is known, select the **Device** option and the device type. If the device type is not known, select the **Protocol** option and the protocol of the connected device. In the "Options" selection list, set the device options. Details about the device connection are entered in the "Interface" area.

Use the **Test** button to check whether the connection between the device and the PC is working. If the connection is working, "Status: O.K. started" will appear.

Manual devices (not connected to the PC, for manual control):

In the left side of the window, select the **Manual device** entry and its number, e.g. **No. 1**. In the right half of the window, set the device parameters: Device type, name and device units (e.g. watts, km/h, % or level). **Save** your input and close the screen with **End**.

IMPORTANT: Activate manual device control!

On the Examination, Cardiac Rehab, Settings, Device, Manual devices screen, manual device control must also be enabled. Save your input and close the screen with End.



3.3.2 Configuring the custo com RF radio receiver units

One custo com RF is needed for each custo guard ECG transmitter, plus an additional custo com RF radio receiver unit. Example: For the operation of eight custo guard ECG transmitters, nine custo com RF are needed.

The function check takes place in custo diagnostic on the Examination, Settings, Interfaces, custo com RF screen. All available custo com RF are displayed in the upper table. On the Examination, Cardiac Rehab, Settings, Device, Device Connection screen, all available custo com RF are also displayed in the table at the bottom left.

3.3.3 Labelling and configuring the custo guard ECG transmitters

Label the custo guard ECG transmitters on the front with numbers to enable them to be clearly allocated to patients and exercise stations later on. In custo diagnostic, enter the marked number for each custo guard ECG transmitter (this is a one-time preparation).

Open the Examination, Cardiac Rehab, Settings, Device, Device Connection screen. Use the custo guard labelling button (at the bottom right) to open the "Labelling of custo guards" dialogue. The ECG transmitters can be clearly identified via the custo guard serial numbers in custo diagnostic and on the type plates of the ECG transmitters. Enter the numbers allocated by you into the "Labelling" field. Click on Save to apply your input (the dialogue remains open). Click on Confirm to apply your input and close the dialogue.

3.3.4 Configuring the exercise stations

- Open the following page in custo diagnostic
Examination, Cardiac Rehab, Settings, Device, Device Connection ①.
- Enter the number of exercise stations ②.
- Select the type of exercise, that is, the basic procedure for entering and placing patients ③:
Rehab groups with/without automatic placement¹⁾,
Groups with a chip card²⁾ or manual patient selection

Specifying which devices are used for each exercise station:

- Select the Exercise station ④.
- Click on a device category, e.g. Exercise device ⑤, in the "Device list of exercise station" table.
- Select the device, e.g. No. 1, ec5000 ⑥ in the "Type" selection list.
- Set the options³⁾ for the selected device ⑦.
- Repeat these steps for all device categories and for all exercise stations.

Adjusting and allocating the custo guard ECG transmitters:

- Click on ECG ⑧ in the "Device list of exercise station" table.
- Select custo guard in the "Type" selection list.
- Activate the Fixed Allocation option. Save these settings.
- Click on custo guard allocation.
- The "Exercise station allocation of the custo guards" dialogue is opened.
- There, select the custo guard ECG transmitter for each exercise station (ES), which is to be used there in the future.
- Click on Confirm to save the allocation.
- Set the ECG resolution ⑨ in the "custo guard ECG" area.
- Save ⑩ these settings.

1) Rehab groups:

In a rehab group it is possible to save up to 16 patients. The advantage of working with rehab groups is that you can call the complete rehab group in custo diagnostic at the start of an exercise session, instead of selecting all patients individually. This option is recommended if you are working with patient groups whose composition does not change.

With "Automatic placement", each patient is automatically assigned an exercise station at the first exercise session (this option is useful for identical exercise stations). This assignment is maintained during the entire rehab period.

With "Manual placement", each patient in the group must be manually assigned an exercise station before the first exercise session (e.g. if there are differently configured exercise stations). This assignment is also maintained during the entire rehab period.

2) Groups with chip card:

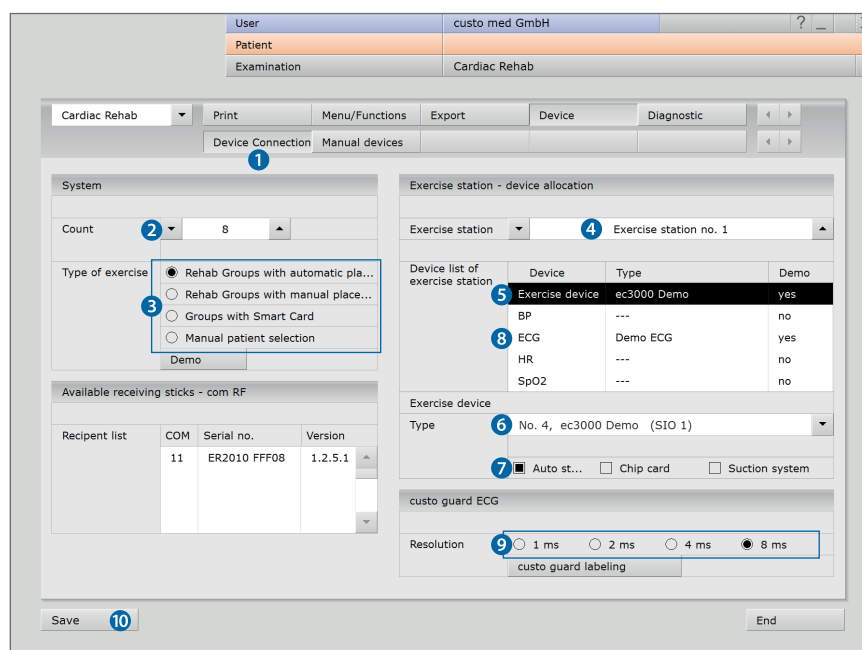
When using chip cards (an option for custo ec5000), one chip card containing patient master data and the desired exercise profile is prepared for each patient. If the patient inserts the chip card into an ergometer before the exercise session, the saved patient master data and the exercise profile will automatically be transferred to the software. Therefore, there is no need for a manual selection of patients and exercise profiles.

3) Notes on the options (7)

"Auto start" option:
PC-controlled exercise devices are automatically connected to custo diagnostic when the rehab software is called [this is the recommended standard setting].
During the connection process the PC-controlled devices are stopped – risk of injury if the devices are already in operation!

"Controlled by profile" option for manual exercise devices:

If this option is selected, it is possible to exercise on exercise stations with manual devices on the basis of a previously defined exercise profile. The exercise profile settings for the manual device have to be set by the patient or the therapist directly on the exercise device. The settings can be transmitted e.g. via the wallboard (see chapter 3.3.8 Optional: Wallboard) or verbally. The stored profile makes it possible to see which settings were used for exercising later. If this option is not selected, it is alternatively possible to document the current exercise load during the exercise session.



3.3.5 Creating exercise profiles

We recommend defining some exercise profiles as a work basis. This only needs to be carried out once. An exercise is not specific to one patient and can be assigned to any patient. An exercise profile can be subsequently adapted for a patient.

- Start custo diagnostic and open the **Examination, Cardiac Rehab, Create Exercise** screen.
- In the **New** ① menu, specify the type of exercise profile. The following profile types are available: **Ergometer: Load (static)** ②, **Load (interval)** ③, **HR-E (static)** ④, **HR-E (alternating)** ⑤, **HR-E (interval)** ⑥; **Treadmill: Speed (interval)** ⑦, **HR-T (static)** ⑧.
The input mask changes depending on the profile type.
- Define the Warmup ⑨, Exercise ⑩ and Recovery phases ⑪.
- Tip: For the profile types **Ergometer, Load (interval)** and **Ergometer, HR-E (Interval)**, the exercise phases can be created with relative data, as **% of max. load** or **watt/kg**. For training type **Ergometer, Load (interval)** the creation of the exercise phase is facilitated by an input assistant (**Assistant** button at the bottom of the screen)
- Exercise profiles for manual, not connected devices¹⁾:
In the **New** menu ①, select the profile type according to the device and requirement, e.g. **Load** for a watt controlled device. For devices with level control select the profile type **Ergometer, Load (Interval)** and **Level** as unit during the exercise phase. Basically, all profile types can be used for all devices if the combination makes sense.
- **Save** ⑫ the new exercise profile.
- In the Protocol selection list ⑬ exercise profiles that have been created can be selected, edited again or deleted (**Delete** button ⑭).
- Click on **End** ⑮ to close the screen.

1) If manual devices with profile control were set during the configuration of the exercise stations, create exercise profiles for the manual devices. Later, before the exercise session these can be assigned to the patient and the exercise station with a manual device. Profile settings can be transmitted verbally or via the wallboard and they must then be set on the manual device.

3.3.6 Optional: Automatic standard exercise

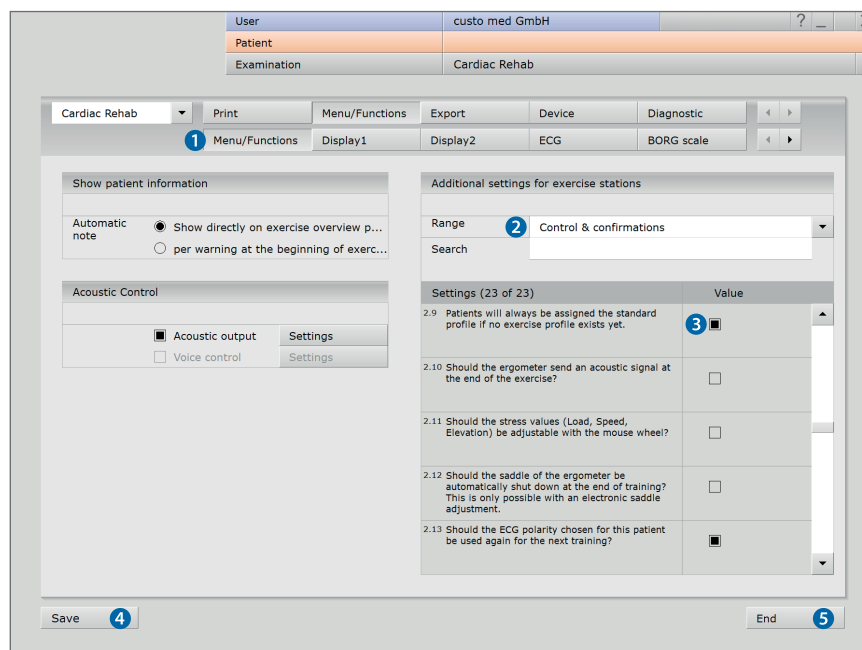
A standard exercise can be created for both ergometer and treadmill exercise stations. The standard exercise is automatically assigned to all patients for whom no exercise exists yet at the start of a session. The type of standard exercise (ergometer/treadmill) depends on the exercise device used at the exercise station. During the session the automatically assigned standard exercise can be customised for the patient and saved with all the changes made for the patient's next session. In order that the standard exercises for the ergometer and treadmill can be used, they must be defined in advance and set to be used automatically.

Defining standard exercises

- Open the following page in custo diagnostic:
Examination, Cardiac Rehab, Create Exercise.
- Open the "Protocol selection" list (at the top) and select **Standard exercise** for ergometer or **Standard treadmill exercise.**
- Define the Warmup, Exercise and Recovery phases.
- **Save** your input.
- Click on **End** to close the screen.

Activating the automatic assignment of standard exercises

- In custo diagnostic, open the **Examination, Cardiac Rehab, Settings, Menu/Functions, Menu/Functions ①** screen.
- In the "Range" selection list, select **Control & confirmations ②.**
- Activate the option:
"Patients will always be assigned the standard profile..." ③
- **Save ④** your input.
- Click on **End ⑤** to close the screen.



3.3.7 Adjustment of the rehab software with configuration assistant

The configuration assistant offers the possibility of configuring basic workflows and the most important operating elements of the rehab software conveniently and in one go, according to individual requirements. The configuration assistant contains a clear selection of basic settings. Detailed settings can be found in the corresponding custo diagnostic submenus, [see next page](#).

The configuration assistant can also be called up at any time after the system has been commissioned in order to make further adjustments.

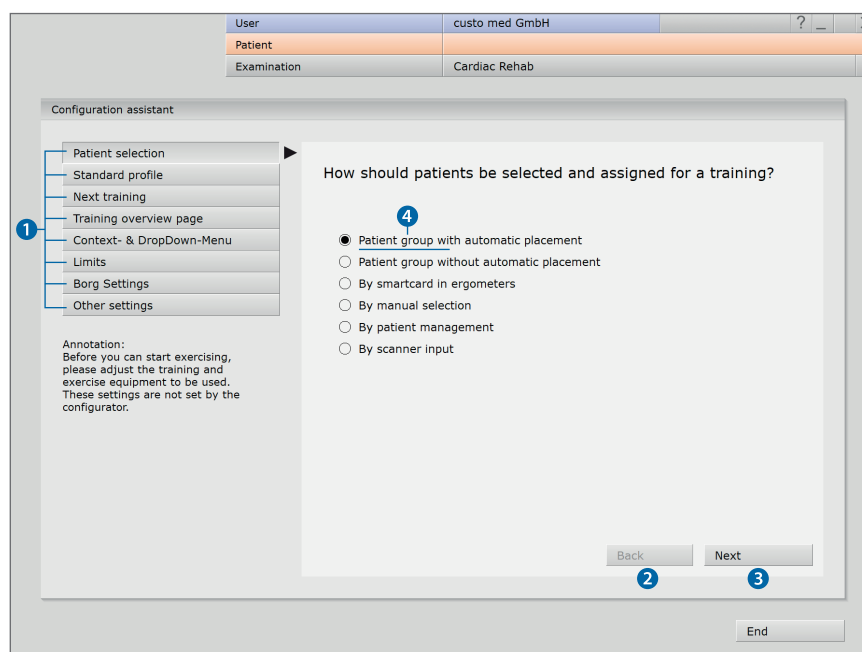
ALSO
SUITABLE FOR
USERS!
QUICK AND
EASY

IMPORTANT:

Exercise devices and exercise profiles cannot be set in the configuration assistant, but must first be set on the corresponding screen pages.



- To open the wizard, click on **Examination, Cardiac Rehab, Configuration assistant**.
- The different categories of settings are shown on the left **1**.
The categories can be edited in any order.
- With **Back 2** and **Next 3** you can browse between the categories.
- For some items, the complete scope of the setting can be displayed with the **Further settings** button, [see next page](#).
- Changes in the configuration assistant are automatically applied.
- Some settings require further work steps.
For example, if you want to work with patient groups (rehab groups) **4**, these must be put together accordingly, [see chapter 3.4.2 Creating rehab groups](#).



Further links in the configuration assistant, display of submenus

The configuration assistant displays contents from the navigation path **Examination, Cardiac Rehab, Settings, Menu/Functions** in simplified form. If this information is not sufficient, the respective submenu with detailed information can be called up for the categories listed here via the button **Further settings**. To transfer settings from the submenus, click on **Save** (bottom left). Submenus are closed with the **End** button (bottom right). The configuration assistant is then displayed again.

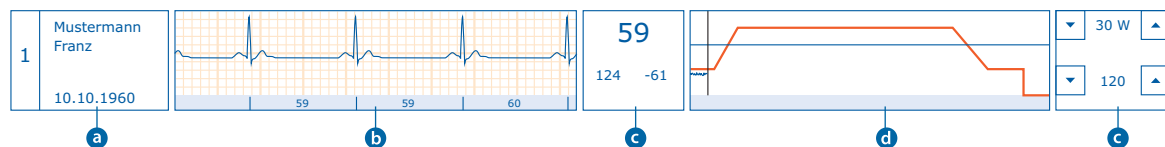
- **Training overview page:** patient button, first and second line
(corresponds to submenu: **Examination, Cardiac Rehab, Settings, Menu/Functions, Display 2**)
- **Training overview page:** display field to the right of ECG strip
(corresponds to submenu: **Examination, Cardiac Rehab, Settings, Menu/Functions, Display 1**)
- **Training overview page:** display field to the right of the training profile
(corresponds to submenu: **Examination, Cardiac Rehab, Settings, Menu/Functions, Display 1**)
- **Context and drop-down menu:** context menus of the training overview page
(corresponds to submenu: **Examination, Cardiac Rehab, Settings, Menu/Functions, Context menus**)
- **Context and drop-down menu:** drop-down menu of am exercise station
(corresponds to submenu: **Examination, Cardiac Rehab, Settings, Menu/Functions, Drop-down menu**)

Example: Configuration assistant, context and drop-down menu

Context menu¹⁾: This refers to the context menus on the training overview page. Each element of an exercise station (patient button/field **a**, ECG strip **b**, minimal view/display fields **c**, exercise field **d**) has a context menu.

The configuration assistant allows a comprehensive design of the context menus according to the criteria "training relevant" (reduced scope in the context menus) or "complete" (maximum scope). A detailed list of the possible functions can be found in the submenu of the setting, accessible via the button **Further settings**:

1) Context menus are opened by right-clicking on a screen area and offer functions that are relevant to the content or further features for the previously clicked area.



- On the **Examination, Cardiac Rehab, Settings, Menu/Functions, Context menus** screen, the context menus of the four display- and control elements of an exercise station can be configured **individually**.
- To do this, use the **arrow keys** to open the pop-up menus of the areas Patient button, ECG strip, training data and info view and set the desired range of functions.
- **Save** your entries.
- Click **End** to close the page.

Example: Configuration assistant, context and drop-down menu

Drop-down menu²⁾: This refers to the pop-up menu in the training place view of a patient (clicking a **patient button** in the training overview). The pop-up menu provides access to functions for managing patients and training profiles as well as device and interface configuration.

The configuration assistant allows you to design the pop-up menu according to the criteria "training relevant" (reduced scope) or "complete" (maximum scope). A detailed list of the possible functions can be found in the submenu of the setting, accessible via the button **Further settings**:

- On the **Examination, Cardiac Rehab, Settings, Menu/Functions, Drop-down menus** screen, the scope of functions of the drop-down menu can be configured **individually**.
- Select the desired options on or off.
- **Save** your entries.
- Click **End** to close the page.

Overview of all functions in the drop-down menu

The drop-down menu is divided into three columns – Patient, Exercise, Miscellaneous.

Patient

Patient information	For entering a comment that is automatically displayed during the next session
Patient demographics	Viewing and correcting patient data
Search patient	Patient search mask for selecting another patient at the current exercise station
Insert patient	Input mask for adding new patients
Worklist	Calling the HL7 waiting room list

Training

Training view	Stress curve and ECG, measured values and alarms from the current session
Definition of training	For selecting and modifying the current exercise profile
Definition of next training	For selecting and modifying the next exercise profile
Profile history	Tabular listing of previous exercises, each with load curve and profile input mask.
Last exercises	Reduced evaluation view of a previous exercise session
Exercise alarms	A list of all alarms with additional information
ECG full view	Full-page ECG of the current exercise

Miscellaneous

Settings	For configuring the rehab interface, ECG display, exercise devices and menus
Devices	For checking the connected devices and their state

3.3.8 Optional: Wallboard

Wallboard is a non-platform specific interface for displaying rehab parameters in the entire network on any end device (smartphone, tablet, TV, PC, custo router, ...). In the case of mobile end devices, the wallboard is accessed via a link in the Internet browser. When it is used on a Windows PC, it is also possible to use the wallboard software directly. For information on the link or the installation, contact your authorised custo med dealer or custo med.

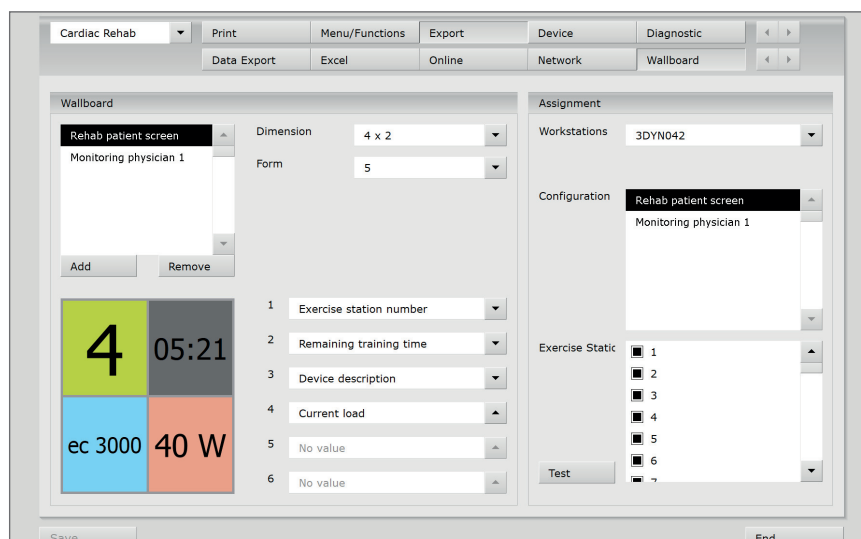
The end devices on which a wallboard is to be displayed must be connected to custo diagnostic via the network. From the start of a rehab exercise, the exercise data are sent to the connected end devices with wallboard and displayed there, according to the configuration.

Configuring wallboards in custo diagnostic:

- Open the **Examination, Cardiac Rehab, Settings, Export, Network** screen. Network monitoring must be **activated**. **Save** your input.
- Open the **Examination, Cardiac Rehab, Settings, Export, Wallboard** screen. The different wallboards and their contents are created here. Wallboards that have already been defined are assigned to the workstations. **Save** your input.

Application examples:

- For monitoring exercises by a physician in another room.
- For displaying patient-oriented values on a large screen in the rehab facility: e.g. for transmitting load settings for manual devices which must then be set by the patient on the device. Or for displaying general exercise information for each exercise station.
- As a PC control replacement for unconnected exercise stations, e.g. tablet on an unconnected ergometer, with wallboard to display all the exercise data (load settings, exercise HR, ...).



Wallboard full screen mode
used on Windows systems:
Call full screen: **F11 key**
Exit full screen: **Esc key**

1	09:37	2	09:37	3	09:37	4	09:37
ec3000e	150 W	ec3000e	150 W	ec3000e	150 W	ec3000e	150 W
5	09:37	6	09:37	7	11:14	8	12:21
ec3000e	150 W	ec3000e	150 W	ec3000e	58 W	er2100	---

Petra Mustermann	Otto Mustermann
159/105	136/94
60	59
150 W	150 W
Clara Mustermann	Susanne Mustermann
145/98	178/112
59	59
150 W	150 W

3.4 Working with the Patient Master Database, preparations for exercise

3.4.1 Adding new patients

- Start custo diagnostic and open the **Patient, Add new patient** screen.
- Enter the patient data.
The fields marked with an asterisk are mandatory.
- Click on **Save** to add the patient to the database.



*Tip for entries
in the patient menu:*

*Press the tab key
to move the cursor
to the next input field.*

3.4.2 Creating rehab groups

In a rehab group¹⁾ it is possible to save up to 16 patients. The advantage of working with rehab groups is that the complete rehab group can be called in custo diagnostic at the start of an rehab exercise session, instead of selecting all patients individually. This option is recommended for groups whose composition does not change during the rehab period.

When a rehab group starts an exercise session for the first time, each patient is automatically or manually assigned an exercise station, depending on the configuration. This assignment is permanently maintained, unless a different setting is selected.

- Open the following screen in custo diagnostic:
Patient, Add new Patient Group.
- Enter a name in the patient group name field (top right), confirm with **Enter**.
- Select the newly created group.
- Select **Rehab Group** as the type and enter the **Group size**.
- Use the patient search mask in the left side of the window to select the patients for the new rehab group.
To add a patient, double-click on the name in the selection list or click on the **Add Patient to Group** button.
- If a patient does not yet exist in your database, click on **New Patient**.
- Your input will be saved automatically.
Click on **End** to exit the screen.

1) custo diagnostic settings for working with rehab groups:
Open the **Examination, Cardiac Rehab, Settings, Device, Device Connection** screen. On the left, in the "System, Type of exercise" area, select the **Rehab Group with automatic placement** or **Rehab Group with manual placement** option.

With automatic placement, the software automatically distributes the patients to the exercise stations (this option is useful for identical exercise stations).
With manual placement, the therapist assigns the exercise stations before a rehab group starts an exercise session for the first time.

Editing functions:

- The following functions are available during the creation of rehab groups:
Remove Patient from Group,
Empty Patient Group,
Delete Patient Group
- You can subsequently edit an existing rehab group via **Patient, Edit Patient Group.**

3.5 Performing the exercise

3.5.1 Opening the rehab interface, preparing and starting the exercise

- Start custo diagnostic and open the Examination, Cardiac Rehab, New Exercise screen ¹⁾.

Workflow for "Rehab group with automatic placement":

- The screen for selecting a rehab group is displayed.
Select the Patient Group and click on Select Patient Group.
The training overview is opened and the patients are automatically assigned to the exercise stations in custo diagnostic ①.
The assignment can be modified on the Patient management ② screen.

Workflow for "Rehab group with manual placement":

- The screen for selecting a rehab group is displayed.
Select the Patient Group and click on Select Patient Group.
The training overview is opened. Each patient needs to be assigned to an exercise station. The assignment takes place on the Patient management ② screen. The assignment is maintained for all further exercise sessions.

Workflow for "Manual patient selection":

- The training overview is opened. To be able to start the exercise, each exercise station in custo diagnostic must indicate the patient who is to exercise on the corresponding exercise station in your rehab facility. The selection and assignment of patients is performed on the Patient management ② screen ²⁾, see next page.

1) Depending on which workflow has been configured for the selection and assignment of patients, different processes take place after calling up the rehab interface. The three most common processes are shown on this page. When using chip cards or scanners, some work steps take place automatically, e.g. the scanner captures the patient data.

2) To select a patient directly in the training overview, right-click on the exercise station button of the exercise station on which the patient is to be placed. In the context menu, choose Search patient. The patient search screen appears.

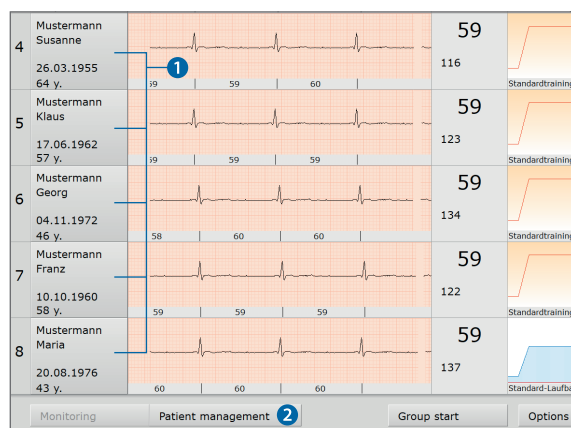


Figure on the left:

Rehab interface with selection and assignment of patients already made, e.g. for workflow "Rehab groups with automatic placement". The training can be started.

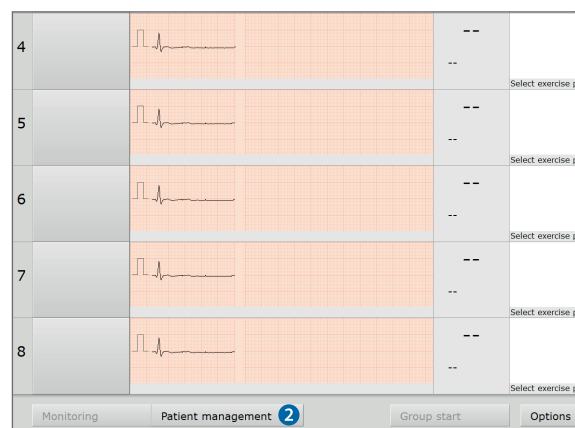


Figure on the right:

Rehab interface before starting an exercise. Selection and assignment of patients have not yet taken place (workflow "Manual patient selection"). Execution e.g. with the patient management.

Working with Patient Management

- To open the screen, click **Patient Management** ①.
This screen allows to quickly find patients and an easy assignment of the patients to the exercise stations.
- In the menu "Patient list search criteria" ② the search for a patient can be limited and shortened by selecting a criterion ③.
Only patients who meet the previously selected criterion are displayed in the results list. For example when the criterion **New patients** is selected only patients are displayed, who have been added in the last five days ④.
- The patient list can be limited with an additional input in the field above the list ③.
- Optionally, the conventional custo diagnostic search masks can be opened with the **Search Patient** ④ and **Search patient group** ⑤ (below the patient list) button.
- The patients can be assigned to the exercise stations as follows:
 - Select the patient in the list ⑥ and click on **Place patient** ⑦ or **double-click** on the patient. The patient is placed on the active exercise station (highlighted in dark grey) ⑧.
 - You can change the active exercise station by choosing another free exercise station with the left mouse key.
 - **Right-click** on the patient and select the desired exercise station in the context menu (e.g. Station 1).
 - Selection of the patient in the list ⑥ and keyboard input of the **exercise station number**.
- Patients can be removed by clicking on the cross ⑨, e.g. if someone does not appear or was assigned incorrectly.
- The **Monitoring** ⑩ button takes you back to the overview.

3) Some patient data or characteristics are automatically stored by the system, e.g. time-related data (new patient, last trained). Other data must be entered manually, e.g. membership of a group (ambulatory cardiac sports group, orthopaedic patient group, ...) or training appointments. The affiliation to a group can be entered on the **Patient information** screen, to open via training overview (Monitoring), patient button, drop-down menu (on the right at the top of the screen), **Patient information**. Select the desired option (bottom right). The entry is automatically accepted and can then be used as a selection criterion on the **Patient management** screen.

4) The ranges of the time-related selection criteria can be adjusted via the **Settings** button (on the **Patient management** screen below the patient list).

Note on the selection criterion "Scheduled patients":
Appointments can be assigned in the training overview (Monitoring) via **Options, Exercise plan** for all present patients, or for individual patients in the open exercise station of the respective patient (**patient button, Options, Exercise plan**).
An appointment can no longer be assigned for the current day. Earliest possible appointment on the next day. Appointments cannot be deleted, only corrected. The specified times in the dialogue for assigning appointments can be adjusted in the custo service center if required. Contact your authorized custo med dealer.

Alarms before exercise & profile selection

Fix the alarms before starting the exercise session. The first steps are always the same: Open exercise station with alarm by clicking on the **exercise station button** and click on the **alarm button**. If necessary, a screen will be opened in the right half of the window to solve the respective problem.

Example: Alarm "No training" (selection of a training profile)

- If a patient has not yet been assigned an exercise, an alarm will appear at the corresponding exercise station **1**.
An exercise station without an exercise profile cannot be started ⁵⁾.
- Select an exercise profile for each patient and customise it.
To do this, left-click on the **exercise station button** **2** and then on the **No exercise** **3** alarm button. The exercise profile selection is opened.
- In the "Profile selection" area, select an exercise **4** and set the **alarms** and **markers** (bottom right) **5**. With the **Apply for next Exercise** **6** button you can permanently assign the exercise to the patient ⁶⁾.
- The protocol selection can also be accessed via the regular navigation within an exercise station: in the open exercise station, click on the **drop-down menu** **7** and then on **Definition of training**.

5) If an automatic standard exercise has been defined and custo diagnostic has been configured in such a way that patients to whom no exercise has yet been assigned will automatically receive the standard exercise, each exercise station with a PC-controlled exercise device will have the corresponding standard exercise. The alarm no longer appears. For a description, see chapter 3.3.6 Optional: Automatic standard exercise

6) The defined exercise is maintained as the next exercise for the patient until a new exercise is assigned to the patient.

The first screenshot shows the 'Training view' for patient Mustermann Florian. It displays a list of patients on the left, each with a heart rate monitor trace. The right panel shows the 'No exercise' alarm button (3) and the 'Start Exercise' button. The 'Training HR' is 59 and 'Blood pressure' is 111.

The second screenshot shows the 'Definition of training' screen (7) for the same patient. It displays the 'Profile selection' area with a list of exercises (4) and the 'Recovery Phase' settings. The 'Current exercise' is 4. The 'Apply for next Exercise' button (6) is visible at the bottom.

Start Group

- With the **Group Start** ❶ button all exercise stations are started at the same time. If not all patients are present during the group start, you can start individual exercise stations at a later time.
- For all started exercise stations, a light green bar ❷ appears over the stress curve after the start. The **Group Start** button changes to **Group Stop** ❸.

Starting an exercise individually:

- Left-click on the **exercise station button** and then on **Start Exercise** in the open exercise station. The current exercise station is started.

CAUTION: Allocation of the ECG transmitters

Before starting, make sure the correct ECG display is shown. If ECG transmitters were exchanged or incorrectly allocated, an ECG signal (and therefore a HR) that does not belong to the patient(s) will be displayed on the respective exercise stations in custo diagnostic. HR values that are incorrect or do not belong to the patient can lead to erroneous stress or misinterpretation.

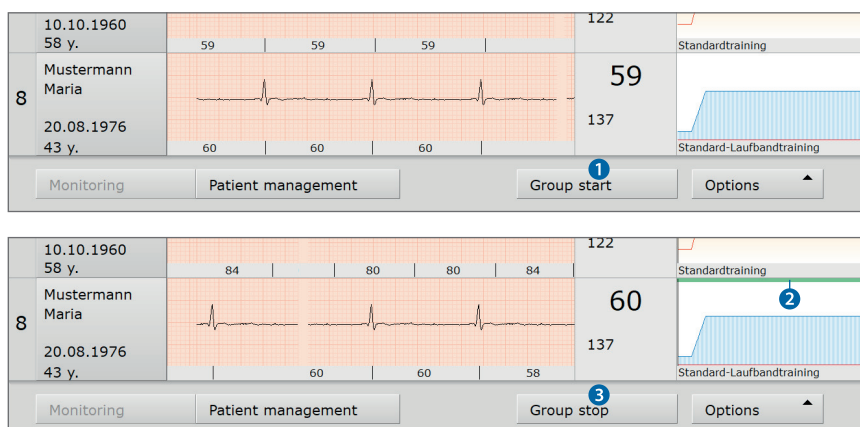
Test possibility: If the patient knocks on his ECG transmitter or if he lifts the electrode belt off his skin, this will cause interference in the ECG signal. This can be observed in the ECG display of the exercise station. If there are no interferences at the exercise station where the ECG transmitter is controlled, correct the allocation of the ECG transmitter!

**Always pay attention to the ECG quality during the exercise.****The individual heartbeats must be easy to read.**

A poor ECG quality can lead to the heart rate being calculated and displayed incorrectly. Especially during heart rate exercises, an incorrect heart rate calculation can lead to incorrect application of load.

To improve the ECG quality, use contact spray or saline solution and adjust the fit of the electrode belt if necessary.

To check this, show the calibration signal (Options, ECG Calibration Signal).



3.5.2 Monitoring, customising the exercise

Exercise station overview, monitoring:

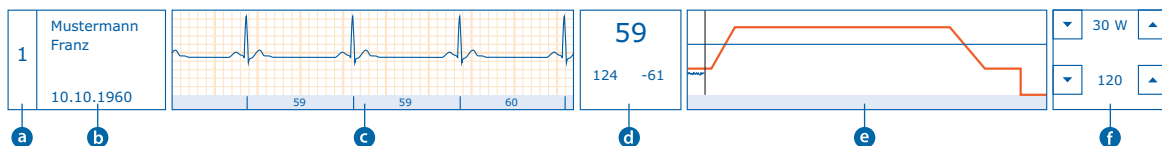
The exercise station overview (**Monitoring**) shows the most important information on all exercise stations:

- a Exercise station number
- b Exercise station button¹⁾, to open the exercise station
- c Patient's ECG signal
- d Info display¹⁾: current HR, HR limit value, HF difference
- e Stress profile²⁾, predefined exercise HR (dark blue), patient's heart rate, current time (black cursor)
- f Info display¹⁾: Current load and predefined exercise HR, arrow buttons to change the load and exercise HR

1) The contents of this element can be individually adjusted. If factory settings are used, the adjustability of the adjustable elements must first be activated. Contact your authorised custo med dealer or custo med.

2) To better distinguish between the different stress profiles they are marked in different colours. The background colours of the profiles vary depending on the type:

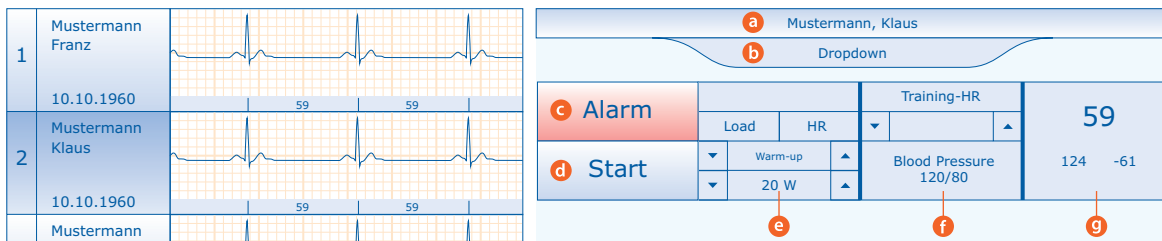
load-controlled = orange
 HR-controlled = light blue
 freely set load exerc = green
 treadmill = white
 manual devices = yellow



Opened exercise station, single view:

The single view of an exercise station can be opened by clicking on the **exercise station button** in Monitoring. In the open exercise station, patient-specific settings can be made (alarms, exercise profile) and ECG as well as measured values can be viewed in more detail. There are also functions available for patient administration.

If an exercise station is opened, all the other exercise stations are still visible in a reduced strip display. The open exercise station is displayed in the right half of the screen and contains the following elements:



- a Patient
- b Drop-down menu with all functions for the open exercise station
- c Alarm button with alarm information and for switching off the alarm
- d Exercise control (Start Exercise, Cool Down...)
- e Load control
- f Exercise HR, blood pressure
- g Info display (content can be configured)

ECG display and functions

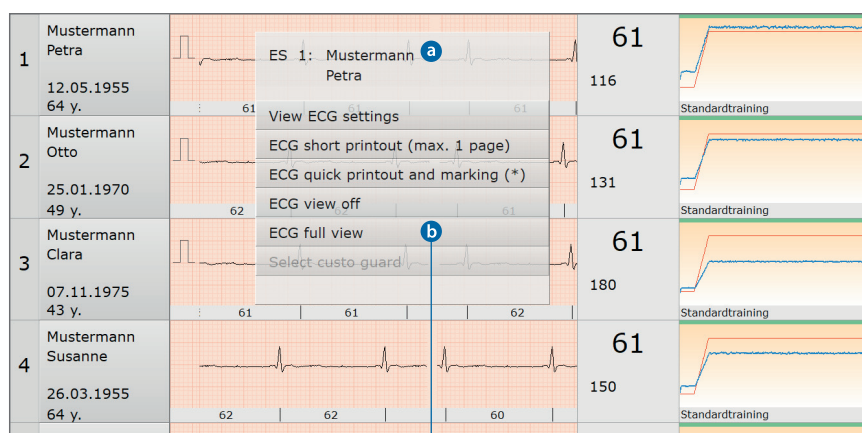
In the exercise station overview (monitoring), a small ECG strip is displayed for each patient. Right-clicking on the ECG strip opens the context menu **a**. The top line in the context menu always displays the current exercise station and the patient's name.

Contents of the ECG context menu with factory settings:

- **View ECG settings:** channels, mm/s, mm/mV ...
- **ECG short printout:**
1 page in A4 format, approx. 1 min. ECG at 25 mm/s and 10 mm/mV
- **ECG full view **b**:** full-page display

Additional functions for the ECG context menu (adjustable):

- **ECG short printout and marking**
- **ECG view on/off:** e.g. for ECG transmitters that are not used
stop and hide the ECG recording
- **Select custo guard**



Viewing and fixing alarms

If limit values are not reached or exceeded or technical problems occur during the exercise, alarms are triggered in custo diagnostic. If there is an alarm present at an exercise station, the field with the corresponding exercise station number will flash red.

There is also the option of outputting an acoustic alarm. This has to be switched on and configured in the settings. For this, open the Examination, Cardiac Rehab, Settings, Menu/Functions, Menu/Functions screen. Select the Acoustic Output option. Use the Settings button to define the cases in which an acoustic alarm is to be output. The abbreviations in curly brackets, e.g. {ES_NUMBER}, are text modules that are automatically supplemented with the correct value during output. Confirm and Save your input.

If acoustic alarms are to be output, we recommend that the therapist uses a headset.



- To fix an alarm...
click on the corresponding exercise station button.
The cause of the alarm is displayed in the top right of the red alarm button.
Carry out the measures to remedy the problem,
e.g. reduce the load if the heart rate is too high.
- Switch the alarm off by clicking on the Alarm button.

Setting limit values for alarms and markers

The limit values for the output of alarms and for the automatic setting of markers can be changed and supplemented for each patient during the exercise:

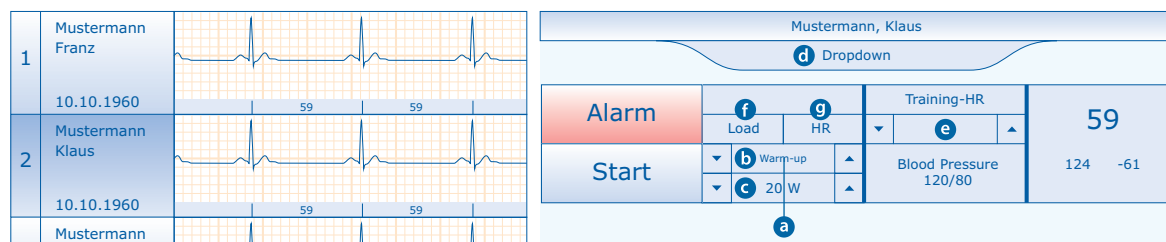
- Open the exercise station by clicking on the exercise station button.
- Open the drop-down menu (at the top right of the screen) and select Training view. Click on Alarms at the bottom right.
- Activate the values in the table for which an alarm should be output if they are not reached or exceeded and enter the limit values.
- The limit values for the automatic setting of markers are set in the same way. To do so, click on the Marker button (to the right of Alarms, above the input table).
- The entries are permanently applied to the current patient.

Setting manual markers

- Open the exercise station by clicking on the exercise station button.
- Open the drop-down menu (at the top right of the screen) and select Training view.
- Click on the Marker button below the load profile.
- Enter a text for the marker and Confirm it.
- The marker is displayed later in the daily protocol (evaluation).

Load change, customising the exercise in the open exercise station

- Open the exercise station by clicking on the **exercise station button**.
- At the top right of the exercise control **a** the load of the remaining exercise segments can be changed.
- Use the **arrow keys b** to select the exercise segment and set the load **c** (this can also be entered by keyboard).
- For a detailed setting, open the **drop-down menu d** at the top right of the screen and then select **Definition of training**.
- Exercise stages that have already elapsed can no longer be changed.
- To apply the changes permanently, click on the **Apply for next exercise**³⁾ button at the bottom right.



3) custo diagnostic can also be set to automatically save and apply all changes made to an exercise simultaneously to the next exercise (without the Apply to next exercise button). You will find this setting on the Examination, Cardiac Rehab, Settings, Menu/Functions, Menu/Functions screen, on the right half of the screen. Additional settings for the exercise stations, area: Procedures, option: Which profile should automatically be selected as the next exercise profile for a patient during an exercise? Profile at the end. Save your input.

Changing heart rate exercise to load exercise

During the heart rate exercise, the load is increased constantly during the load increase stage until the patient has reached the predefined **exercise HR e**. The stress stage only starts once this has happened. In order to keep the exercise HR constant during the stress stage, automatic load control is triggered by custo diagnostic⁴⁾.

If the ECG quality is too low during the exercise, the patient's heart rate cannot be determined accurately and a correct load control by the system is not possible. It may be that the stress stage cannot be started because without an accurate heart rate indication it is not clear whether the predefined exercise heart rate has been reached.

In this case, start the stress stage manually (**Start exercise phase** button in the open exercise station) or change the heart rate-controlled exercise to a load-controlled exercise. To do so, click on the **Load f** button in the open exercise station. The **Load f** and **HR g** buttons are only active during the load increase stage (after the warm up stage).

A HR-controlled exercise can also be changed to a load-controlled exercise in monitoring. To do so, change the load manually using the **arrow buttons**.

Documenting exercise states on manual devices

In the case of manual devices without profile control it is possible to document the loads which were applied during the exercise session and the respective times. This means that a stress profile is available later in addition to the recorded ECG.

A quick input of the applied load is possible in the training overview. To do so, use the arrow buttons for load control (last box at the end of an exercise station strip). Alternatively, the input mask can be used for all exercise stations with manual devices without profile control (**Options, manual device selection**). Click on **Confirm** to apply your input.

4) During HR exercises, the "Load maximum" value (= maximum permissible ergometer load) must be specified. Otherwise it will not be possible to start the exercise.

Make sure that the "Load maximum" limit value is set correctly.

If the value is too low, the patient might not reach the predefined exercise heart rate and the stress stage cannot be started. If the "Load maximum" value is set too high, the patient could be overstressed in case of poor quality of ECG and an incorrect heart rate indication.

Viewing the measured values of a patient

- Open the exercise station by clicking on the **exercise station button**.
- In the **drop-down menu** at the top right of the screen click on **Training view**.
- Click on the **Values** button at the bottom right.
- A selection of measured values is displayed to the left of the button.
- The determined measured values can be changed manually.
- Changes are automatically applied to the exercise table (F8).
- The ECG recording is displayed again with the **ECG** button (bottom right).

Extended measured value display with the exercise table "F8"

If the measured value table described above is not sufficient, the freely configurable values table⁵⁾ can be called.

- The values table is opened in the **exercise station overview** via **Options**, **values table** or **F8 key** (display of all exercise stations in the table).
In the open exercise station of a patient it is opened via the **F8 key** (display of all exercises of the patient).
- In the open "Values table" dialogue, use the **Settings** button to select the measured values to be displayed.
- Confirm your selection with **OK**.
- Measured values can be adjusted or entered manually.
Confirm your input with **Enter**.
- Click on **End** or press the **F8 key** to close the table again.
- All functions in the rehab interface can be carried out even if the values table is open.

5) Explanations of the **Intensity**, **PWC** and **Tc** measured values can be found in the appendix.

Manual entry of blood pressure and SPO2 values

- Open the exercise station of the respective patient by clicking on the **exercise station button**.
- In the **Options** menu, select **Enter BP** (blood pressure) or **Enter SPO2**.
- Click on **Confirm** to apply your input.

Condition according to the Borg scale (subjective perception during the exercise)

It is possible to enter Borg values⁶⁾ during an exercise session. These values are used to evaluate a patient's perceived exertion.

- To do so, click on **Options**, **subjective perception** in the exercise station overview or within an exercise station.
- In the "Subjective perception" dialogue, enter the appropriate value for each patient, e.g. "1" = light, no effort.
- Press **Enter** to confirm your entry and go to the next input field.
- Use the **Confirm** button to adopt the values.
- Multiple entries are possible during an exercise session.

6) Before the function can be used, it first needs to be configured in custo diagnostic. Configuration is carried out on the **Examination**, **Cardiac Rehab**, **Settings**, **Menu/Functions**, **Borg Scale** screen or with the configuration assistant on the screen **Examination**, **Cardiac Rehab**, **Configuration assistant**. There you can set the Input of the subjective perception according to your way of working.

3.5.3 Cool down and ending the exercise

Recovery stage, cool down

The recovery stage can be triggered as follows:

- automatically following the stress stage.
- Or simultaneously at all exercise stations via the **Group cool down** button (at the bottom of the screen).
- For individual patients, in an open exercise station, via the **exercise station button** and the **Cool Down** button (top right, available only during the stress stage)
- For individual patients in the exercise station overview, by **right-clicking** on the corresponding **exercise profile** and selecting the **Cool Down** function in the context menu.

Ending the exercise

An ongoing exercise can be ended as follows:

- Automatically, after it has been completely run through.
- Premature termination via the open exercise station: **exercise station button**, **Options**, **Termination**.
- For an individual patient via the open exercise station: **exercise station button**, **Stop exercise** (top right, available only during the recovery stage).
- Simultaneously at all exercise stations via the **Group Stop** button (at the bottom of the screen).
- You can close the rehab interface using the **End** button (bottom right). The **End** button can only be activated after all exercises have ended.
- At the end of an exercise session, the contents of the rehab interface can be defined on the **Examination**, **Cardiac Rehab**, **Settings**, **Menu/Functions**, **Menu/Functions** and **ECG** screen (maintain patient and ECG or remove them from the rehab interface).

END

3.6 Working with the evaluation

3.6.1 Opening an evaluation via the evaluation search

- To open the evaluation search¹⁾ right-click on the **Patient** button ①.
- With factory settings, the **Search** screen ② is displayed.
Here you can search for evaluations with previously defined and saved search criteria, so called filter sets. Filter sets can be created on the **Advanced search** screen ③.
- Depending on the default setting of the system, a filter set is already active and the search results are displayed here full-screen as a list ④.
- If no filter set is active, select a set ⑤.
- Open an evaluation by double-clicking on the corresponding line or via the **Show evaluation** button ⑥.

1) The evaluation search can be configured in the custo diagnostic settings, see *Examination, Settings, Database, Eval. search*.

Configuring the list of search results

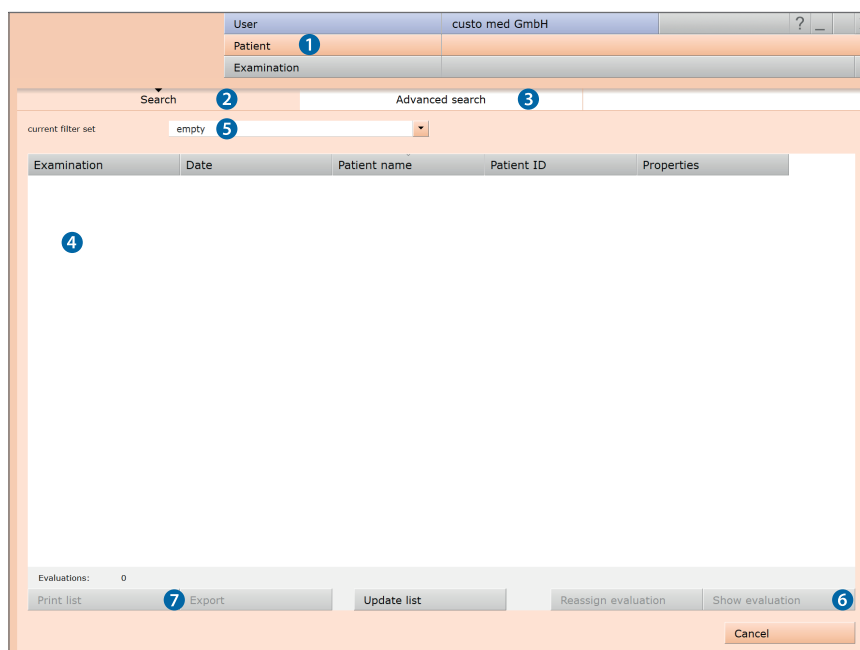
- Right-click on the screen to open the **context menu**.
There click on **Select columns** and set the required columns.
Click on **Confirm** to apply your changes.
- Clicking on a **column header** sorts by this column and sorting within the column can be reversed.
- The list can be printed and exported in various formats ⑦.

Renaming filter sets, deleting filter sets

- Right-click on the screen to open the **context menu**.
There click on **Rename filter** set or **Delete filter sets**.
- Follow the instructions.

Editing filter sets

- Open the **Advanced search** screen ③, *see next page*.



Advanced search, creating filter sets

- The **Advanced search** screen **8** is used for creating filter sets and for quick selection of search criteria (e.g. examination, properties, period) **9**.
The search is limited by setting certain search criteria.
- The search results are displayed in the lower half of the screen as a list **10**.
- An evaluation can be opened by double clicking on the corresponding entry in the list of search results or with the **Show evaluation** **11** button.
- The previously selected search criteria can be saved for later use as a filter set with the appropriate name. Enter the name into the input field **12** and click on **Save current search as set** **13**.

Editing filter sets

- The filter set to be edited must be selected, see line "Current filter set".
- Adapt the search parameters (e.g. examination, properties, period).
- Click on the **Save current search as set** **13** button to overwrite the previous set.
- If a new name is assigned beforehand, a new set will be created.

Configuring the list of search results

- Right-click on the screen to open the **context menu**.
There click on **Select columns** and set the required columns.
Click on **Confirm** to apply your changes.
- Clicking on a **column header** **14** sorts by this column and sorting within the column can be reversed.
- Use the **arrow button** **15** at the bottom right of the list to increase or decrease the size of the list.
- The list can be printed and exported in various formats **16**.



Reference between the end dialogue and the evaluation search

In order to make proper use of the evaluation search, the status of the evaluation must be set correctly in the end dialogue when you exit an evaluation.

Example:
An evaluation can only be found in the evaluation search with the property confirmed "No" if the status "Evaluation confirmed" is NOT selected in the end dialogue.

3.6.2 Opening an evaluation via the examination main menu

- Open the examination main menu via **Examination, Cardiac Rehab.**
- Click there on **Show Evaluation** ①.
- The patient search mask appears. In this screen, select the patient whose evaluation you want to open. Enter the patient's name into the input fields in the search mask ②.
- Select the patient from the list below the input fields ③ and confirm your selection with the **Select Patient** button ④ or by double-clicking on the name.
- A list containing all the patient's evaluations is displayed. Select the required evaluation from the list and open it by double-clicking on it or using the **Show evaluation** button.



*Tip for entries
in the patient menu:*

*Press the tab key
to move the cursor
to the next input field.*

User
Patient
Examination
New Exercise
Prepare Patient Exercise
Show Evaluation ①
Show Comparison
Show Trend
cardiac events
Create exercise
Clean suction device
Configuration assistant
Settings
Cancel

User			
Patient			
Examination			
Last name	Mustermann ②		
First name	Franz		
Patient ID			
Patient Group	All patients		
Assignment	Physician		
	Physician ID		
Last name	First name	Date of birth	Pat. ID
Mustermann	Franz	10.10.19...	0000000001
1 of 1 patient			
Select Patient ④	Edit Patient		
New Patient			
Cancel			

3.6.3 Structure and contents of a rehab evaluation

When a rehab evaluation is opened, the **daily protocol** is displayed first. The buttons for opening additional evaluation pages, such as **ECG** and **Process**, are located at the bottom of the screen. The button for the currently opened view is pressed.

Daily protocol

Tabular summary, stress profile,
ECG recording, optional additional values
such as blood pressure, SPO2...

Comparison

of two daily protocols, based on
stress profile, ECG and measured values

ECG

Full-page ECG display
with various ECG viewing and
editing options

Process

Graphical and numerical representation
of performance and health development during the
entire rehab period:

Trend curves

Measured values

Exercise success

Daily protocol



- a Exercise values for the position of the red cursor in the graphic
- b Exercise data – type, duration, condition, the most important measured values
- c Stress profile (orange) with heart rate curve (blue)
- d Display of further curves in the coordinate system, e.g. HR/Load/RPM
- e Display of automatically and manually generated markers
- f Additional information on the marking (only in the case of manual markings)
- g Go to previous or next marker
- h ECG for the current position of the red cursor
- i Buttons for showing further curves and values
(in the exercise protocol all alarms, markers, user inputs and system messages are documented)
- j Direct comparison of two daily protocols
- k Arrow buttons to display further exercise sessions
- l Full-page ECG display
- m Graphical and numerical representation of performance and health development during the entire rehab period
- n Options, e.g. print menu, export functions, comments, ECG before/after the exercise, **Active for Trend**¹⁾
- o Printout as per system settings
- p Button for closing the evaluation

¹⁾ By selecting this option, the currently opened daily protocol is transferred to the process (m) and displayed there.

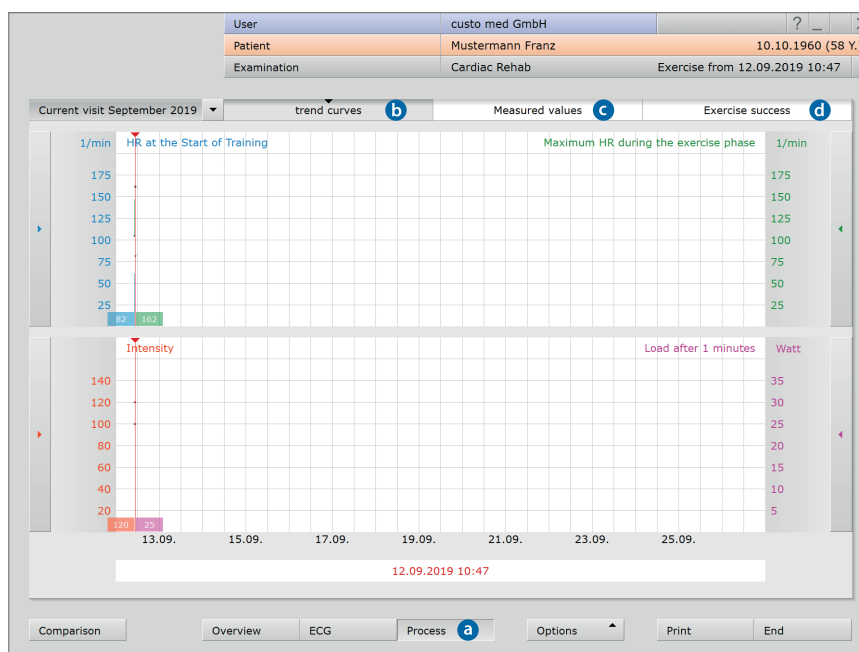
Process with trend curves, measured values and exercise success

The **Process** **a** area contains various representations in which the patient's performance and health development are documented during the entire rehab period. The process representations are opened with the **Trend curves** **b**, **Measured values** **c** and **Exercise success** **d** buttons.

In the **Trend curves** **b** view, the two coordinate systems show the development of up to four exercise values. You can select the measured values which should be displayed in the coordinate system in the **foldout menus**, on the left and right next to the coordinate systems. To read individual measured values from a trend curve, drag the **red cursor** to the appropriate location.

The measured value table is opened with the **Measured values** **c** button. It is a tabular representation of all the exercise days with the respective measured values determined. The contents of the table can be customised. To set the measured values, click on **Options**, **Set column**. The "Column selection" dialogue is opened. Select the measured values here and **confirm** your selection. The sequence of the columns can be changed by clicking on the **header of a column** and dragging it to the desired position in the table with the mouse button pressed down. The width of the columns can be changed by dragging the vertical table lines.

The **Exercise success** **d** page is an overview, consisting of three parts, with data on the initial examination, rehab process and final examination. An initial and final examination constitute a stress ECG. The three parts are each displayed with a stress profile, a heart rate curve and a measured value table.



3.6.4 Printout

- The printer was configured during the system was put into operation on the Examination, Cardiac Rehab, Settings, Print, Print screen and can be changed there if necessary. Save your input.
- For a printout, click in the rehab evaluation on the Print button (bottom right).
- The current page of the evaluation is printed.

3.6.5 Excel export

Settings for the excel export

- Open the **Examination**, **Cardiac Rehab**, **Settings**, **Export**, **Excel** page.
- In the "Excel export" area you can set which contents on the **Daily protocol** evaluation page should be exported.
- In the "Excel export of progress" area you can set which contents on the **Process**, **Measured values** evaluation page should be exported.
- Specify the **directory** where the exported files should be saved and define the **file name** (see tip).
- Select the **file format** (.xls).
- **Save** your input (left bottom button).

Tip: Dynamic file names using text modules

Export elements such as the patient's name, date of birth, patient number, date of evaluation etc. can be used as placeholders (in the form of text modules) in directory and file names. Instead of the placeholder, the actual value is automatically used during the export.

Example:

E:\rehab-export\{P_NAME}-{AKT_DAT}, result via **Test**:

E:\rehab-export\Mustermann-Franz-25_04_2016.xls

A list of all the export elements can be found in custo diagnostic on the screen:

Examination, **Cardiac Rehab**, **Settings**, **Diagnostic**, **Reports**, **List of export elements**

Exporting a daily protocol or measured value table

- To export a daily protocol, click in the **Daily protocol** view on **Options**, **Export**.
- To export a measured value table, click in the **Daily protocol** on **Process**, **Measured values** and then on **Options**, **Export**.
- Select **Excel** as the file format and click on **Confirm**.
The Excel file is stored in the specified directory.

3.6.6 Confirming the evaluation

Unconfirmed report and report

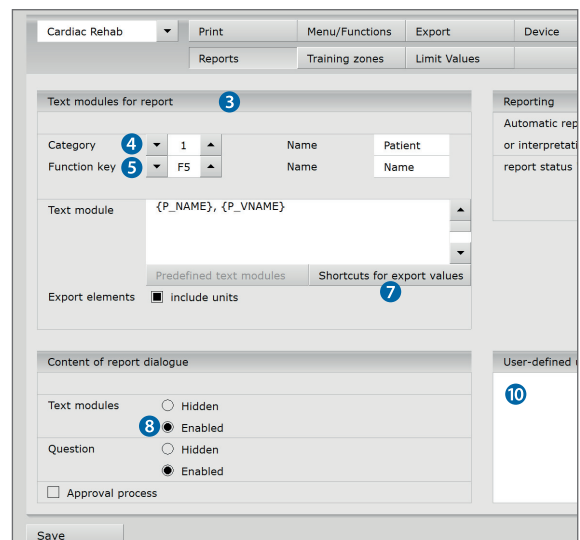
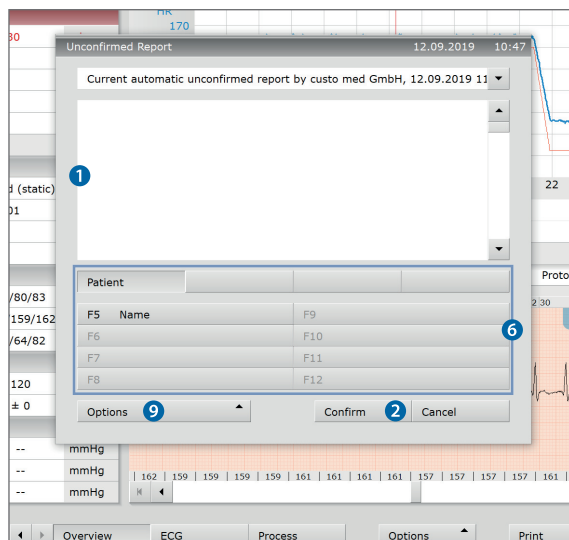
To open the unconfirmed report, right-click on the **evaluation interface**. In the context menu, select **Report**. Enter your data in the text field **1**. If the **Unconfirmed report or Interpretation** option is selected in the system settings, an automatic system unconfirmed report is already present in the text field. If necessary, older reports can be displayed via the report history (collapsible list above the text input field). When you click on **Confirm** **2** your input is saved and the unconfirmed report becomes a (preliminary) report, depending on the report rights of the current user. If your (unconfirmed) report is not yet complete but you want to save it nevertheless without reaching the "Evaluation (pre)confirmed" status, reset the report status upon ending (**End**) the evaluation.

Text modules – an aid for writing reports

On the **Examination**, **Cardiac Rehab**, **Settings**, **Diagnostic**, **Reports** screen you can create text modules for confirming an evaluation **3**. A total of four groups **4** can be stored with up to eight text modules **5**. The text modules are called in the unconfirmed report dialogue using the keyboard (F5 to F12) **6**.

A text module can be created from normal text as well as variables. When you use a text module in the unconfirmed report, the actual value from the evaluation is inserted in the report text instead of a variable. The structure of a variable is {VARIABLE} (e.g. duration of exercise: {TRNG_LENGTH}). The **Shortcuts for export values** **7** button provides you with a list containing all the variables. If the text modules should be shown in the unconfirmed report dialogue, make sure that the **Enabled** **8** option is activated. Alternatively, the text modules can be shown in the unconfirmed report dialogue via **Options**, **Textmodules on** **9**.

You also have the option of entering a text, which will be automatically shown in each unconfirmed report **10**. The text can be changed later in the unconfirmed report dialogue. **Save** your input.



3.6.7 Ending the evaluation

The evaluation is closed with the **End** button (bottom right). Optionally, the end dialogue can be displayed upon ending¹⁾. This is used to determine the status of an evaluation²⁾ **1**.

2 **Evaluation preconfirmed**: active if a user with the reporting right "Preconfirm evaluations" has confirmed the unconfirmed report of an evaluation.

3 **Confirmed**: active if a user with the reporting right "Confirm evaluations" has confirmed the unconfirmed report. The "confirmed" status can be reset if required.

4 **Printed**: indicates if the evaluation has been printed.

5 **Indelible**: can be selected after reporting has been completed.

The evaluation can now only be viewed and can no longer be changed.

Click on **Confirm** **6** to close the evaluation.

1) The end dialogue is activated in custo diagnostic on the **Examination, Cardiac Rehab, Settings, Menu/Functions, Menu/Functions** page in the "Additional settings for the exercise stations" area, in the "Work processes" category. Select the "The end dialogue is shown when exiting the evaluation" option. **Save** your input.

2) The assignment of properties (status of evaluation) in the End dialogue makes it easier to find evaluations in the evaluation search.

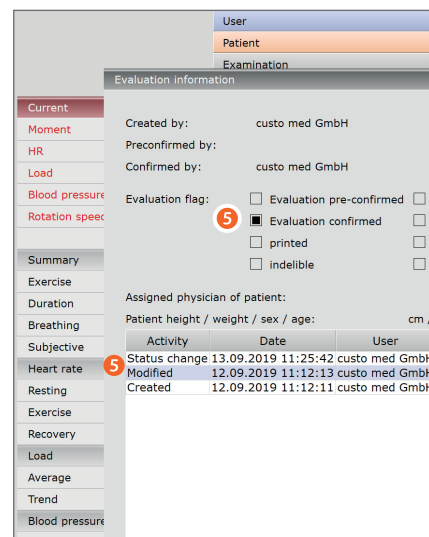
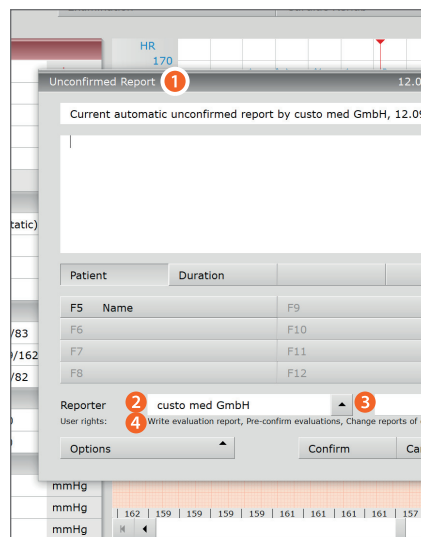
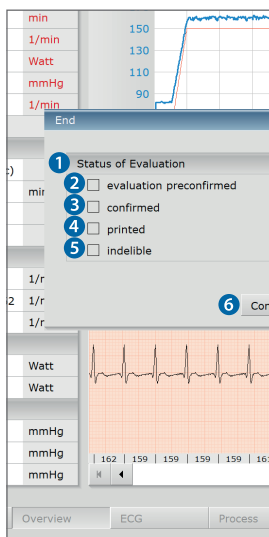
3.6.8 Optional: Reporting with approval process

If custo diagnostic is used with **approval process**, then authorised persons with the corresponding user rights can save pre-reports of other persons as a report, without having to close the evaluation which was opened previously (shortened workflow) or enter pre-reports/reports directly if the evaluation was created by a person without reporting rights.

The **approval process** is visible in the unconfirmed report dialogue **1** of an evaluation. The user or reporter can be changed there (**Reporter** **2**, **Password** **3**, **Enter**). During the logon process, the user rights of the respective user are checked and the software interface is adapted accordingly **4**. The reporting is documented in the **evaluation information** **5** (context menu).

The **approval process** must be activated user and project-related in the settings and in the custo service centre. The user rights must be set according to the workflow²⁾. Contact your authorised custo med dealer or custo med.

3) Note: Pre-reporting physicians must have the user right **Preconfirm evaluations**, reporting physicians must have the user rights **Confirm evaluations** and **Change reports of other users**.



3.7 Appendix

3.7.1 Explanations of the measured values

Intensity, load intensity/HR/speed/inclination

In the "Intensity" table column, the maximum setpoint that is predefined in the exercise protocol is specified, e.g. **Load intensity**: 100 watts (load exercise with a maximum predefined load of 100 watts).

If several exercise types are running in parallel (HR exercise, load exercise, treadmill exercise), a separate table column would be required for the display of the intensity values for each exercise type, that is, multiple columns for multiple exercise types. In order to reduce the table columns, the general value **Intensity**, can be selected, e.g. instead of **HR intensity** and **Load intensity**. The exercise setpoints for HR and Load are each displayed with the respective unit in the "Intensity" table column (= a common table column for different exercise types).

PWC max. (physical working capacity)

The **PWC max.** value describes a patient's physical performance at the maximum exercise load reached. The **PWC max.** value is specified in watts/kg (body weight).

Example: If a patient who weighs 100 kg has reached a maximum exercise load of 60 watts, the **PWC max.** value will be calculated as follows:

$$PWC \text{ max.} = 60 \text{ W} : 100 \text{ kg} = 0.6 \text{ W/kg}$$

Exercise coefficient, specific exercise coefficient

The **exercise coefficient** expresses the work performed per heartbeat. This value allows the direct comparison of a patient's performance during different exercise types (heart rate exercise, load exercise, treadmill exercise) and also exercises of a different duration. The calculation of the exercise coefficient is the same for each exercise type and for each exercise duration. The general exercise coefficient includes the cardiac output for the other body functions, such as breathing, sitting, sweating, etc., in the calculation.

The **specific exercise coefficient** value only considers the actual cardiac output for the physical activity during the rehab exercise. The patient's cardiac output determined for the resting state is deducted from the general exercise coefficient.

3.7.2 Keyboard navigation and shortcuts in custo diagnostic

Use the quick links in the main navigation, the keyboard navigation and the keyboard shortcuts to enable fast and convenient working.

Quick links in the main navigation

User	custo med GmbH	1	?	-	
Patient		2	2		
Examination		3	3		

LEFT-CLICK

- 1 Change user's password
- 2 Call last patient
- 3 Examination main menu

RIGHT-CLICK

- 1 Evaluation search
- 2 Call last patient
- 3 Most recently opened evaluation

User	custo med GmbH	4	?	-	
Patient	Mustermann Franz	5	4	10.10.1960 (58	
Examination	Cardiac Rehab	6	5	Exercise from 25.10.2018 10:41	

LEFT-CLICK

- 4 Change user's password
- 5 Patient master data
- 6 Menu for the current examination

RIGHT-CLICK

- 4 All evaluations for the patient
- 5 Most recently opened evaluation for this examination

Keyboard navigation

When you press the Alt key, the initial letter of all the buttons on a screen is underlined. Pressing an initial letter again triggers the corresponding button.

User	custo med GmbH	?	-	×
Patient				
Examination				▼
Holter				
ABPM				
Resting ECG				
Stress ECG				
Cardiopulmonary Exercise Testing				
Spirometry				
Telemetry				
Cardiac Rehab				
Mobile Cardiac Telemetry				
Blood glucose				
ECG Streaming				
Task Manager				
Worklist				

Generally valid keyboard shortcuts

Esc	End, cancel
Enter	Confirm, continue
Ctrl I	Program information
Ctrl H	User main menu
Ctrl P	Patient main menu
Ctrl U	Examination main menu
Ctrl S	Patient master data for the selected patient
Ctrl A	All examinations belonging to the selected patient
Ctrl G	List of the most recently opened evaluations (same as clicking on the arrow button at top right)
Ctrl F	List of the most recently opened evaluations
Ctrl L	Evaluation search
Ctrl W	Waiting room list
Ctrl Q	Device list
Ctrl M	Switch to Metasoft
Ctrl F1	Create system report, service e-mail

Keyboard shortcuts during rehab exercise

0 to 9	Enlarged exercise station display of the entered exercise station number (two-digit numbers must be typed in quick succession). When you re-enter the number, the strip display is displayed again.
Tab	The Tab key switches to the enlarged display of the next exercise station (starting with exercise station 1).
Ctrl + Tab	Switches to the next function within the drop-down menu within an enlarged exercise station display.
Ctrl + Shift + Tab	Switches back to the previous function within the drop-down menu within an enlarged exercise station display.
Enter	Used to confirm the input.
Esc	Use to cancel the input.



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