

Geratherm[®]

Respiratory

Blue Cherry

User Manual

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1. General information about Blue Cherry

Blue Cherry™ is a registered trade mark of Geratherm Respiratory and forms an easy to learn and intuitive user interface for Microsoft Windows®. Blue Cherry™ also contains a powerful SQL database and optional interfaces to allow connection to various different hospital information systems.

1.1 Installation



Do not install Blue Cherry if your computer does not meet the minimum requirements set out in the technical data section of this manual.

The medical devices from Geratherm Respiratory consists of hardware components as well as the software Blue Cherry. The following actions must be taken before being able to run spirometry tests:

- connect the device to the USB port of the computer
- Install and configure the Software Blue Cherry

1.2 Connecting the equipment to the computer

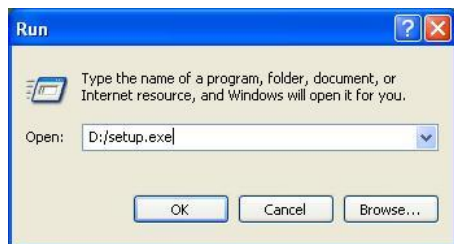
Connect the devices to a free USB port of your computer. Microsoft Windows® will automatically recognize the device and install the appropriate windows driver.



The devices use a standard driver provided by Microsoft Windows®. No additional drivers are required in order to use the devices on a computer meeting the required specification.

1.3 Installing the software

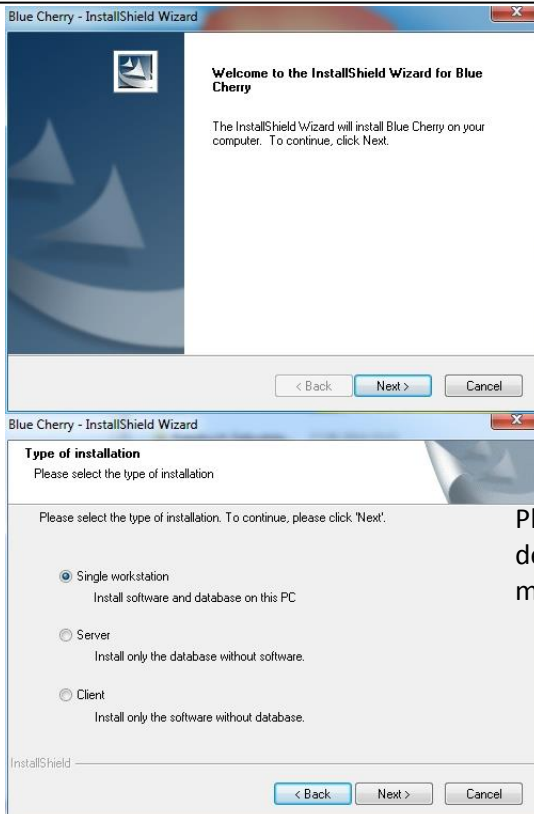
Insert the Blue Cherry Installation CD into an available CD drive on the computer. The installation software will start automatically. Should the Installation procedure not start automatically, press the windows **“START”** button, select **“RUN”** and type the command D:\setup.exe (where D is the CD drive containing the software).



After that the InstallShield Wizard will start. Please follow the instructions in the installation wizard by selecting the **“Next”** Button in the subsequent installation screens.



Please choose the language of the installation wizard



Please choose the
desired installation
method

The installation wizard supports the following setup options:

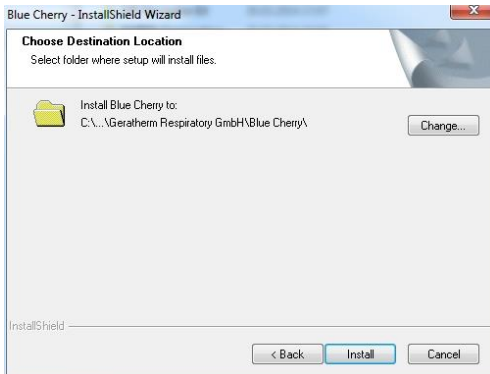
Installation method	Description
Single workstation	Blue Cherry works with a local Database which is only used by this computer.
Server Installation	On this computer a database server is installed, which is to be used by other workstations on the network. Only the database server will be installed.
Client Installation	The database server already exists. Only the Blue Cherry Software is going to be installed as well as information of the database server which will be used.



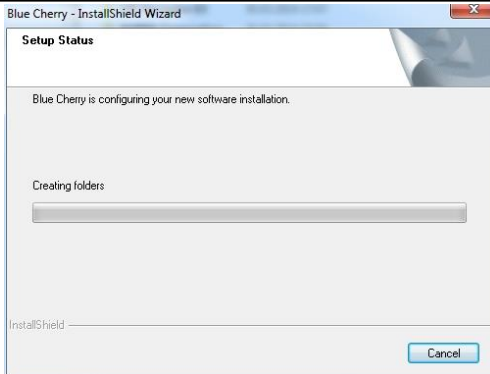
You'll find more informations on that in the database installation description.



Before the actual installation begins, you must agree to the terms of the agreement.



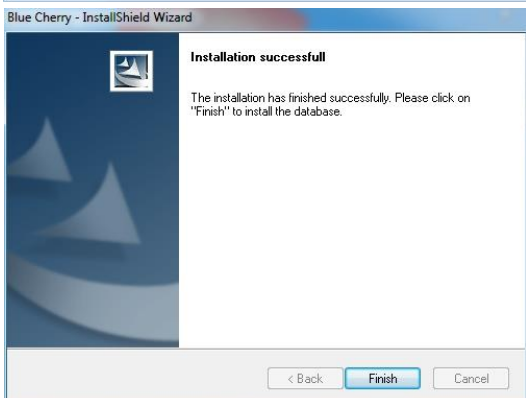
By using the „change“-Button you can change the installation path. It is recommended to accept the default directory.



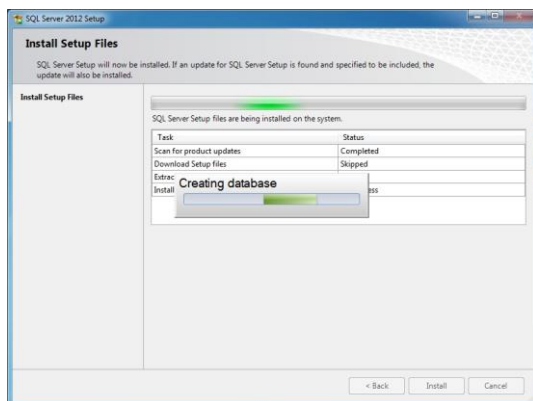
The necessary program files are being copied.



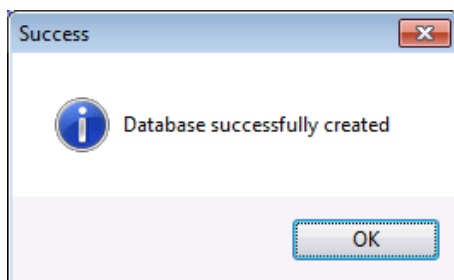
If you did select single workstation or server installation additional information concerning the SQL server are required. It is recommended to accept the default settings.



The installation of the Blue Cherry software has been finished. After selecting the „Finish“-Button the installation of SQL database will start.



The SQL Server and database will be installed.



After successful installation this window will appear. Please confirm by selecting the OK button.

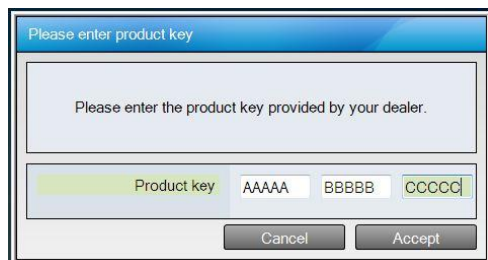
The installation procedure will place an Icon  on the desktop to allow the user to launch the Blue Cherry application. Alternatively it is also possible to start Blue Cherry from the Windows[®] start menu by selecting **START – PROGRAMS – GERATHERM RESPIRATORY GMBH – BLUE CHERRY**.



The following screen will be shown:



During first start of Blue Cherry the following window will appear. The product key can be found inside the CD cover which you did receive together with the product. This key determines which options will be installed. Please ensure the key is entered completely and correctly.



1.4 Software Registration

The Blue Cherry software installation must be registered. The following window will appear during the first start of the software:

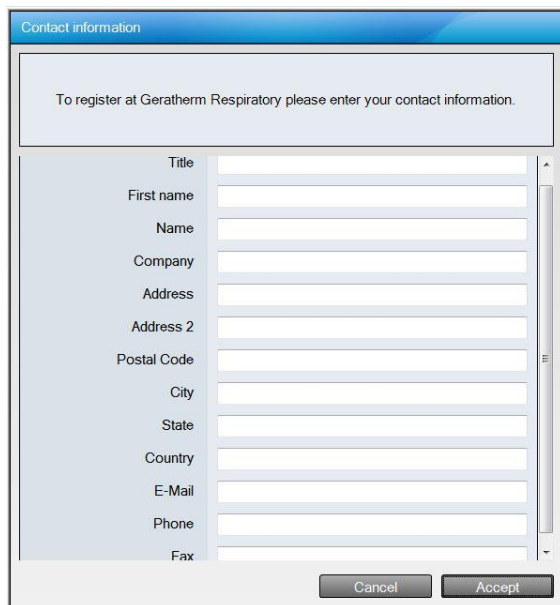


The registration must take place within 30 days after the installation. If in this period no successful registration is completed, Blue Cherry can no longer be started. Clicking the close button allows the registration window to be closed for registration to be completed later.

The registration can be performed either online if an internet connection is available or off line by the manual input of a registration key.

1.4.1 Online Registration

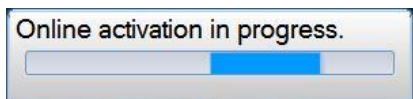
Clicking the online Registration button opens the following window:



The window is titled "Contact information" and contains a message: "To register at Geratherm Respiratory please enter your contact information." Below the message is a list of input fields for contact details. The fields are: Title, First name, Name, Company, Address, Address 2, Postal Code, City, State, Country, E-Mail, Phone, and Fax. At the bottom of the window are two buttons: "Cancel" and "Accept".

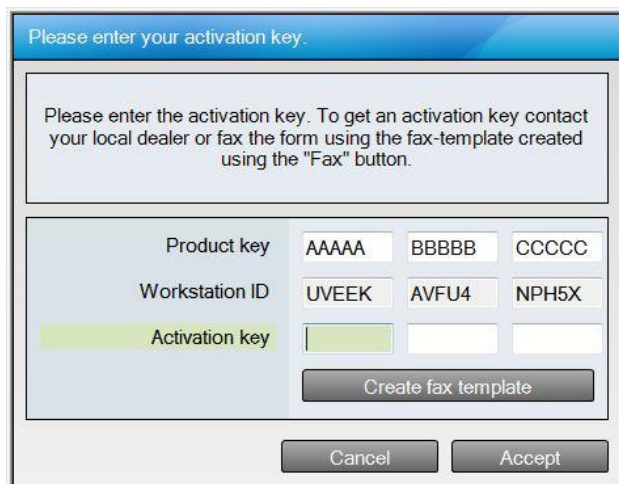
Field	Input
Title	
First name	
Name	
Company	
Address	
Address 2	
Postal Code	
City	
State	
Country	
E-Mail	
Phone	
Fax	

Complete the registration form and click the accept button. The entered data together with the product key and the machine code of the computer are sent to the registration data base at Geratherm Respiratory. The following window is shown:



1.4.2 Offline Registration

After clicking the button “enter code” the following window will appear:



The window titled "Please enter your activation key." contains a text box with instructions: "Please enter the activation key. To get an activation key contact your local dealer or fax the form using the fax-template created using the 'Fax' button." Below this is a table for data entry:

Product key	AAAAA	BBBBB	CCCCC
Workstation ID	UVEEK	AVFU4	NPH5X
Activation key			

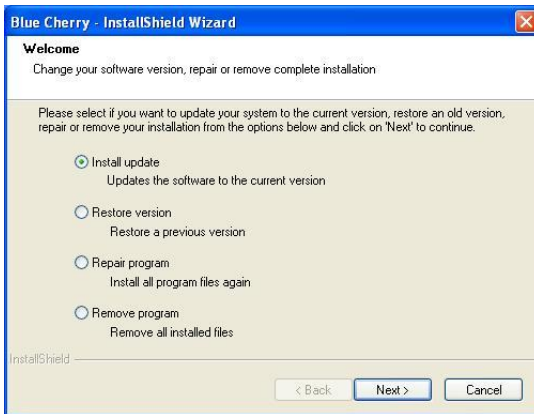
Below the table is a button labeled "Create fax template". At the bottom of the window are "Cancel" and "Accept" buttons.

Please type in the activation key, which you got from your local dealer, correctly and completely and confirm your entries by using the “apply” button.

After successful registration the Blue Cherry user interface will be started. The Chapter “Blue Cherry user interface” provides a detailed description of the buttons, the different display areas and the possibilities of Blue Cherry.

1.5 Blue Cherry update, restore, repair and remove

Blue Cherry has an integrated manager for update, restore, repair and remove the software. In order to perform one of these functions simply run the setup program as described in one of the previous sections. Click the “**NEXT**” button to continue and Follow the instructions given on the screen to complete the installation of the Blue Cherry Software:



Function	Description
Install update	Update Blue Cherry to the new version
Restore version	Remove the update and restore one of the previous installed versions.
Repair program	Install again all the features from the latest update.
Remove programs	Remove Blue Cherry from this computer. Please note, the database will not be removed.

2. Blue Cherry User Interface

The following section describes the different screen areas of the Blue Cherry software.



Title Bar

The title bar shows the name of the software. The buttons in the top right corner allow the user to minimize, maximize or close the program. The following section describes the different screen areas of the Blue Cherry software.

Settings Bar

The settings bar includes a drop-down menu for the selection of a patient as well as the buttons for “patient file” (show or change patient data), “print”, “BTPS” (show or change the environmental conditions for temperature, air pressure and humidity), “setup” (calling up the Blue Cherry configuration settings), “Audit trail” and “help”.

The print symbol in the settings bar offers a so called smart report function which allows the user to configure a summary report which could be printed with just a single click. The configuration of the report will be found in the setup of Blue Cherry.

Info Bar

The info bar shows information about the current patient. Left clicking the info bar will display the patient file together with the set header.

Left Selection Area

In the left selection area it is possible to choose one of the following buttons: Patient, Calibration or Blue Cherry Options. The buttons available in this section will vary depending upon the options purchased with the system.

Right Selection Area

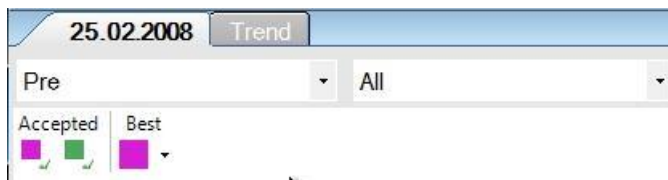
Depending on the measurement or calibration selection additional possibilities will be available in the in the right selection area. This menu section may also vary depending upon configuration or software options.

Button	Description
	Start new measurement
 	Print measurements Moving the mouse pointer over this button opens the print options sub menu, allowing choice of Print immediately, Print, Print preview, Save as .pdf or Page setup
	Start ATS manager
	Switch into post mode with medication selection menu
	Switch into provocation mode with selection of provocation stage menu.
	Switch to the next step of provocation stage
	Enter volume of calibration syringe
	Enter the character string for the calibration factors

Graph area

The graph area shows the measurement graphs. The scale of the graph can be changed using the scroll wheel on the mouse.

At the top of the Graph area some further drop-down menus are available:



Button	Description
	Date selection. For each test date a tab will be available to select.
	Phase selection to select between Pre or Post stages.
	Measurement view selection. Allows for determination of which graphs are shown in the Graph area.
	Show the acceptability criteria of ATS/ERS. For each test a square will be shown. Click with the right mouse button will alter between acceptable and not acceptable.
	Selection which test is the best in the graph area. Each colour square represents the test graph in the same colour.

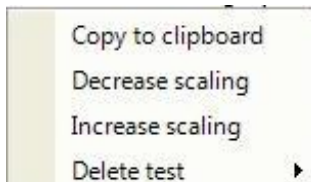
Help Text

Help text is available throughout the Blue Cherry software; if the mouse is left over a button a help text box will appear to describe the buttons purpose.

Popup-Menu

Blue Cherry contains popup menus with important functions in some areas. The popup menus appear after clicking the right mouse button. Popup menus are context sensitive and only the relevant possibilities for the selected area will be displayed.

For example after right clicking in the graph area the following options will appear:



Copy to clipboard allows the graph to be copied to the windows clipboard for use in other compatible software.

By clicking “Delete test” the test which should be deleted has to be selected. For safety there is a confirmation query. Please note, by confirm with “Yes” the test will be irrevocably removed from the database.

Status Bar

The status bar displays the current ambient conditions values and also informations about the connected hardware.

Comment line

Left clicking the comment line opens a new window which allows the user to access the footer, comment and interpretation.

Table area

The table area show the numeric results of the measurements. In the predicted column the reference of the selected author from the predicted set will be shown. For example (1) represents the use of ECCS 1993 predicted set.

The Mouse scroll button can be used to scroll through the table to view results.

Clicking the right mouse button over the table area opens a popup menu with additional useful functions like



“Copy to clipboard” Allows the graph to be copied to the windows clipboard for use in other compatible software.

“Change table direction” Automatically exchanges the Rows and Columns in the table to give an alternative view.

“Open setup: Tables” Opens the setup menu at Viewing – Tables to allow parameters in the table to be changed.

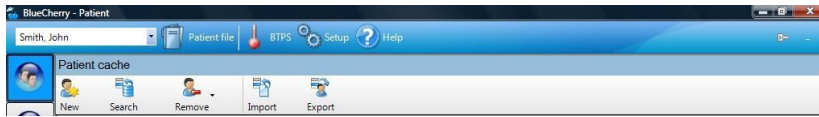
“Open setup: Parameters” Opens the setup menu at Parameters - Definitions to allow alteration of parameter setup.

“Open setup: References” Opens the setup menu at Parameters – Reference Values to allow alteration of Reference value sets.

“Select Parameter” Opens a window where the user can change the displayed parameter of one table row.

2.1 Enter new patient data

Selecting the **“Patient”** button in the left selection area, will display an alternative icon menu in the Info Bar area.



“New” Opens the patient data window for the input of new patient details. When entering new patient details it is important to ensure the values are correct to ensure the correct predicted values are calculated. **“Accept”** button will store the entered data. Empty required fields will be marked with a red exclamation mark as shown in the picture below.

“Additional” and **“Address”** allow entry of further patient information. All fields in these screens can be configured from the setup menu, where it is also possible to define new data fields for use in these sections:

Patient file	
General Additional Address	
Patient ID	6
Case number	
Name	Smith
First Name	John
Sex	☒ male ☐ female
Date of birth	12 04 64 M/D/YYYY
Age	46
Height	186 cm
Weight	kg
BMI	kg/m²
BSA	m²
Cancel Accept	

2.2 Search for a patient

“**Search**” Opens the patient search window with the facility to search for patients using either the ID number or the patient surname. The displayed list will be changed as information is entered into the search criteria box. So called wildcards help searching for patient-ids or names, which are not exactly known. These are placeholders for other characters. The following wildcards are allowed:

Wildcard	Function
*	Any match search
?	Exact match search

The following are examples of the Wildcards:

After input of “M?ier” in the field name all patients with variants of the surname are shown, e.g. Meier and Maier.

After input of “*son” all patients with this ending in the surname will be shown e.g. Jacksonson, Andersonson, Petersonson.

Once the desired patient is found using the search, clicking on the “Accept” button will open this patient file to begin testing. Clicking the button “New” will open the screen form for entering of new patient data.

The screenshot shows a window titled "Search patient". It has two input fields: "Patient ID" and "Name". Below them is a "Search results" section showing "10 / 10 results shown". A table displays the results with columns: Patient ID, Name, First Name, Date of birth, and Sex. The table contains 10 rows of patient data. At the bottom of the window are four buttons: "New", "HL7 query", "Cancel", and "Accept".

Patient ID	Name	First Name	Date of birth	Sex
1	Demo	James	1/1/1985	M
1000000017	Demo	James	6/23/1951	M
1000000018	Geratherm	Demo	11/17/1983	M
1109	Schrauth	Christoph	11/9/1983	M
2	Asthma	Patient	4/12/1986	M
3	Normal	Patient	12/1/1982	M
345678	Sauro	Serardini	1/6/1955	M
4	Demo	Edward	2/23/1956	M
5	CPET	Patient	1/1/1964	M
986754	James	Tredicini	1/31/1947	M

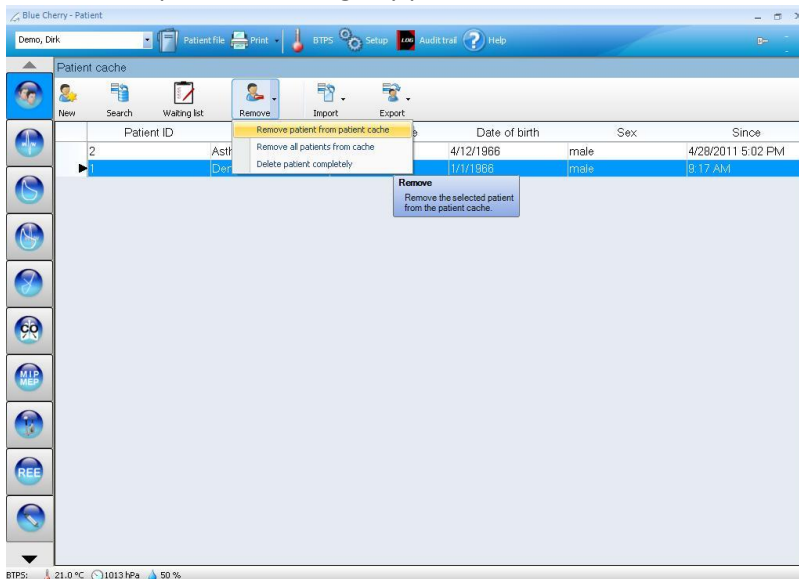
2.3 Remove patient from waiting list or database

“Remove” will remove the highlighted patient from the ‘waiting list’. Clicking on the right hand side of the remove button opens a drop down menu allowing the user to choose if he will delete only the marked patient or the whole waiting list as well as the additional possibility of deleting the patient from the database.



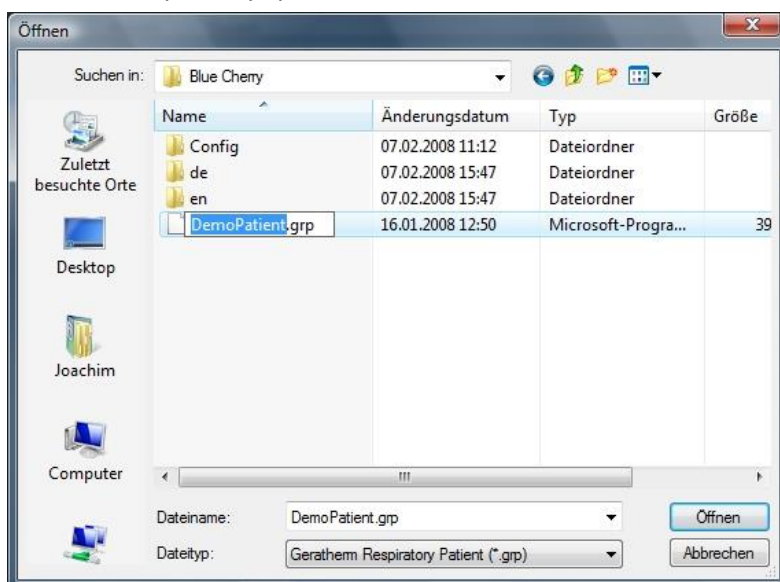
Deleting from the waiting list will only remove the patient from the screen list. All patient data remain in the database.

Whereas “Delete patient completely” means the patient will be removed from the database. This operation would be followed by a request for confirmation prior to deleting any patient from the database.



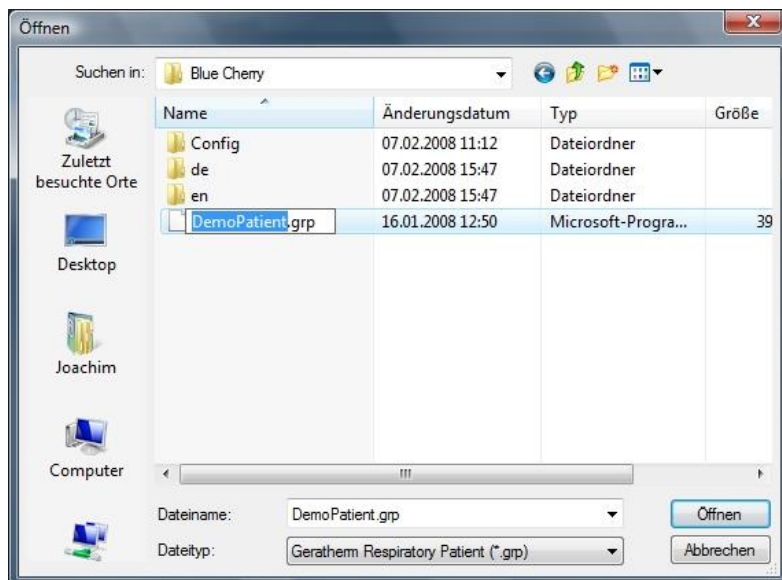
2.4 Import patient data

Clicking **“Import”** in the patient symbol bar opens a new windows explorer window. From this window the patient file for import can be selected. Selecting **“Open”** at the bottom right of this window will read the information from the selected file and open the patient within Blue Cherry. It is only possible to import files of the data type GRP (*.grp). GRP is a Geratherm Respiratory specific file format.



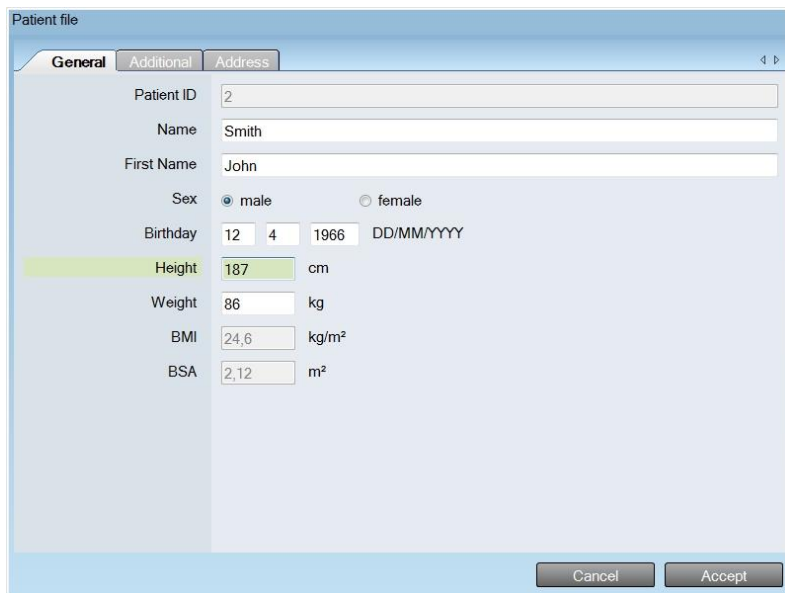
2.5 Export patient data

Clicking **“Export”** will open a similar Explorer window allowing the user to select the destination folder and name for the exported patient file. After selecting **“Save”** from the bottom right corner of the window the export file will be generated. The exported file will have the Geratherm Respiratory specific format *.GRP.



2.6 Modify patient data

Clicking the button **“Patient file”** or double click at any point on a patient file within the patient file list will open that file for editing. From the opened screen it is possible to change the details within the patients’ actual file. Changing any of the patient fields’ sex, birth date, height, weight or race will immediately change the predicted values for the actual day.



The screenshot shows a 'Patient file' dialog box with the following fields and values:

Field	Value	Unit
Patient ID	2	
Name	Smith	
First Name	John	
Sex	male	
Birthday	12 / 4 / 1966	DD/MM/YYYY
Height	187	cm
Weight	86	kg
BMI	24,6	kg/m²
BSA	2,12	m²

At the bottom of the dialog box are 'Cancel' and 'Accept' buttons.

2.7 Set Ambient conditions

Clicking the button “**BTPS**” in the settings bar will open the ambient conditions window where it is possible to adjust the current values for ambient conditions of temperature, pressure and humidity. From these data, the so-called BTPS-Factor (Body Temperature Pressure Saturated) is calculated. It is needed for the conversion of ambient conditions (ATPS) to body conditions.



All Parameters measured by the Spirostik will be specified under BTPS conditions. In order to adjust measurements correctly it is very important to enter the correct ambient conditions. 2°C error in the temperature would cause a measurement error of 1%. The absolute pressure must be entered in the field ambient pressure.

BTPS

Ambient temperature (°C)

18,5

Ambient pressure (hPa)

994

Ambient humidity (%)

51

Use Ambistik

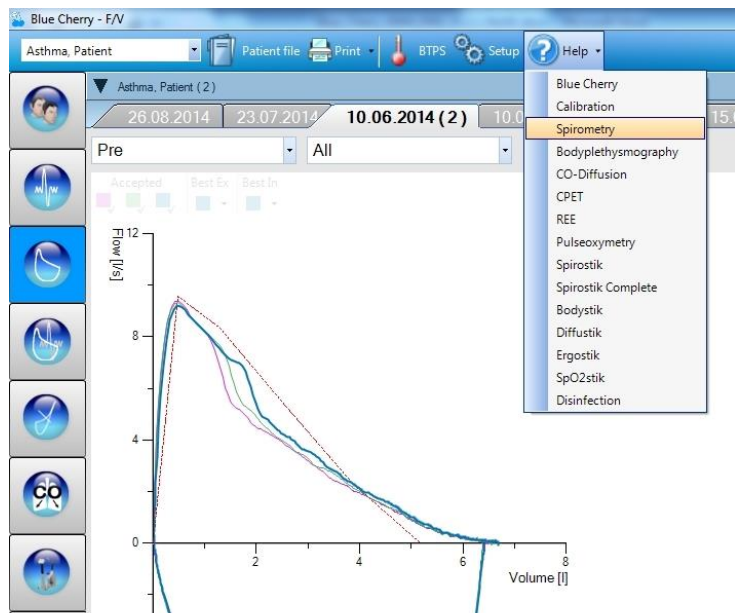
☒ Use Ambistik

Cancel

Accept

2.8 Help Menu

Selecting the button **“Help”** will open a list of available user manuals for your device. The selected User manual will be shown in PDF viewer.



2.9 Blue Cherry setup

Clicking the button **“Setup”** opens the configuration window for the Blue Cherry software. The setup screen allows the user to customise the appearance and performance of the Blue Cherry Suite.

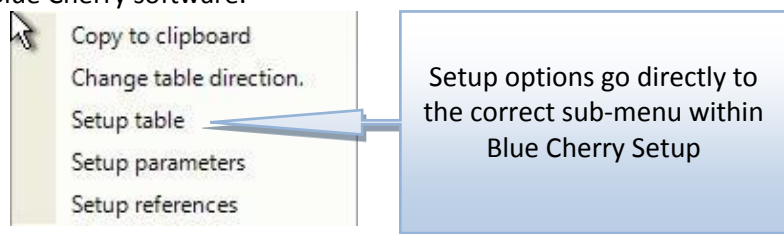


Only experienced users should change the default settings of Blue Cherry.

Common buttons from the Setup Menu:

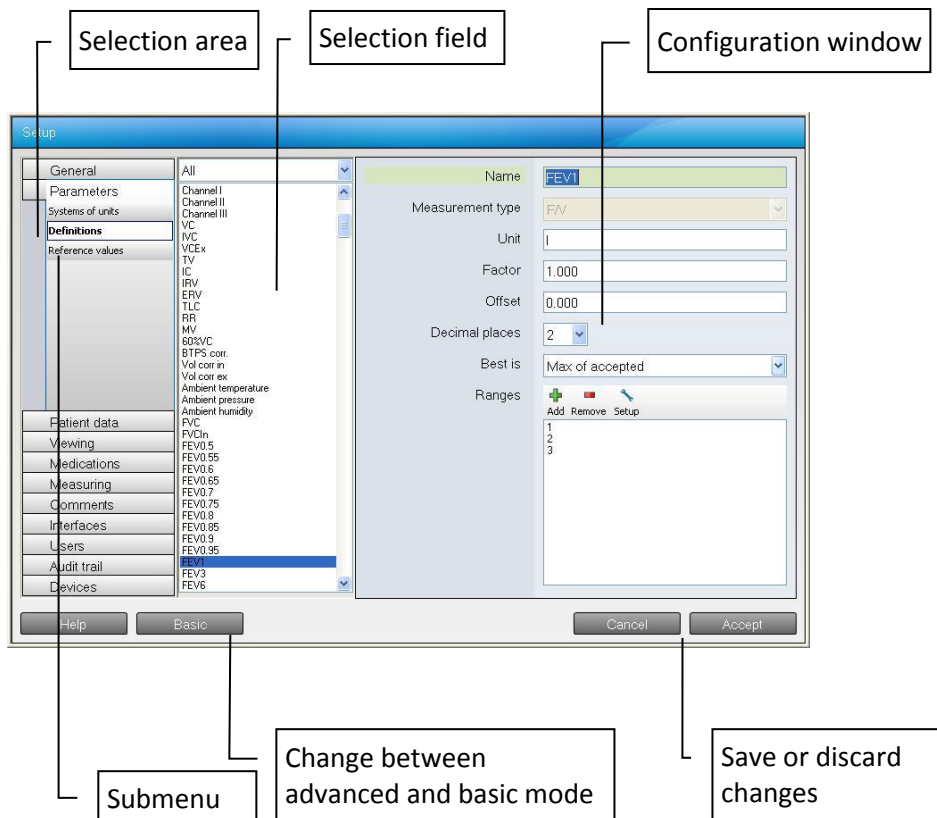
Button	Function
	Add parameter or table
	Remove parameter or table
	Change order of parameter move up
	Change order of parameter move down
	Setup, configure parameter values

The Setup menu is split into multiple sub-menus. The correct sub-menu is accessed automatically if setup is selected from within a test area of the Blue Cherry software.



3. Setup Menus

In this section the user interface of the Blue Cherry Setup will be explained.



3.1 General

Clicking the **“Setup”** button will open the following display. The screen shows the version number of Blue Cherry and the contact details for Geratherm Respiratory.

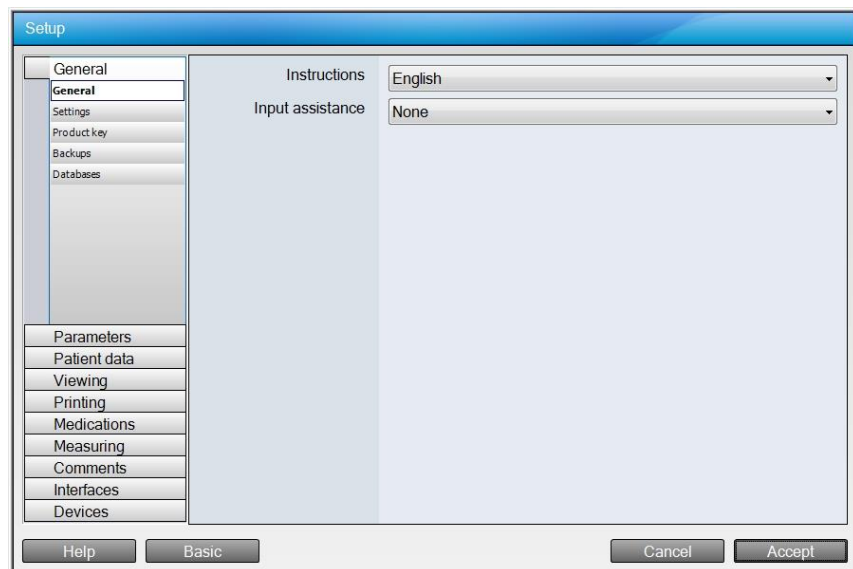


After opening the setup it will be displayed in the Basic mode, which allows changing the main settings of Blue Cherry. After clicking the **“Advanced”** button the advanced mode will open and offers the possibility to change all settings.

The following explanations for the setup program will only show the advanced mode.

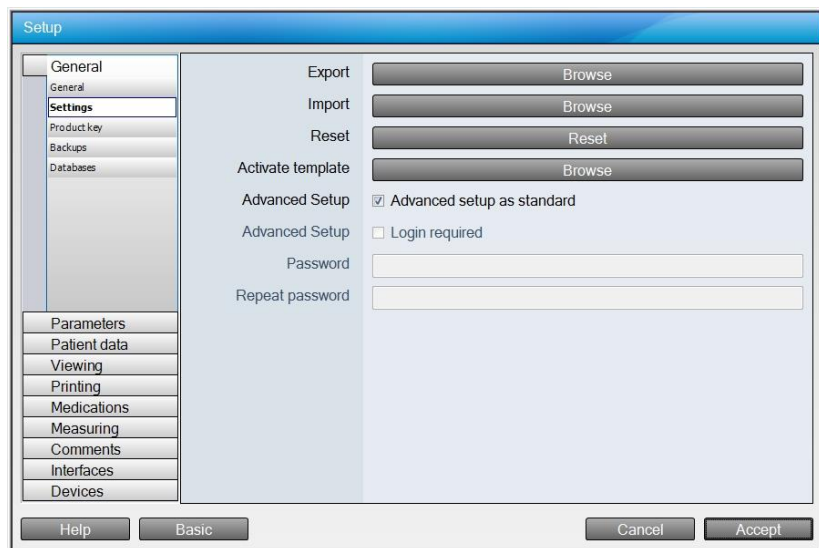
3.1.1 General – General

The General setup menu allows changing global settings of Blue Cherry and to view or change, by entering a new product key, the installed options. Subsequently the submenu will be explained.



Settings	Function
Instructions	Change the language for Blue Cherry
Input assistance	It is possible to activate an input assistance for Blue Cherry (useful with Tablet PC's or touch screens) The User can choose between: - None - Built in on-screen keyboard - External on-screen keyboard

3.1.2 General – Settings

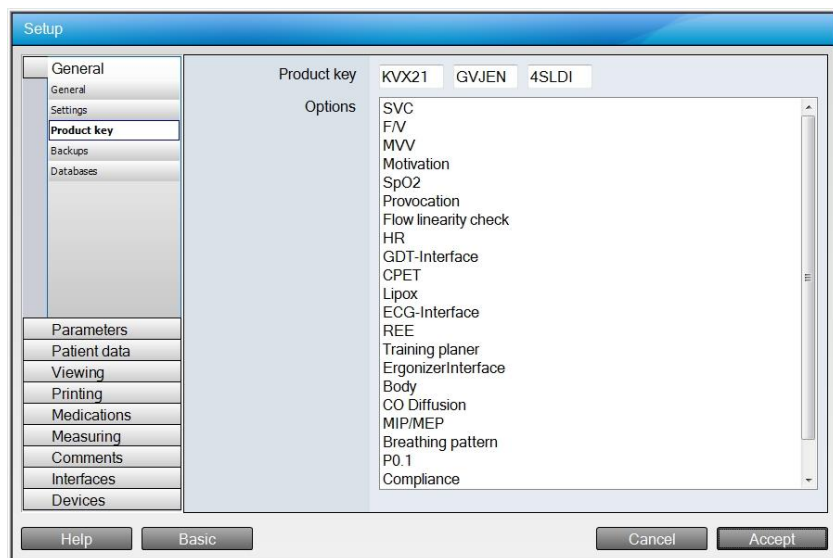


Settings	Function
Export	Choose a path and a name for the Export of all configuration settings of Blue Cherry. It is only possible to export files of the type GRS (*.grs). GRS is a Geratherm Respiratory specific format.
Import	Choose a path and a name for the Import of configuration settings. It is only possible to import files of the type GRS (*.grs). GRS is a Geratherm Respiratory specific format.
Reset	Reset all changes of Blue Cherry to the standard configuration.
Activate template	Choose a path and a name to activate a template with country-specific settings. It is only possible to activate files of the type GRS (*.grs). GRS is a Geratherm Respiratory specific format.
Advanced Setup	If selected, the setup will be started immediately in the advanced mode after clicking the setup button.

Advanced Setup	If selected, a password key has to be entered in order to activate the advanced mode.
Password	Password to activate the advanced mode.
Repeat password	Repeat the password to activate the advanced mode.

Selecting the **“Import”** or **“Reset”** button will open a security question that has to be confirmed by clicking **“Yes”** in order to perform the changes.

3.1.3 General – Product Key

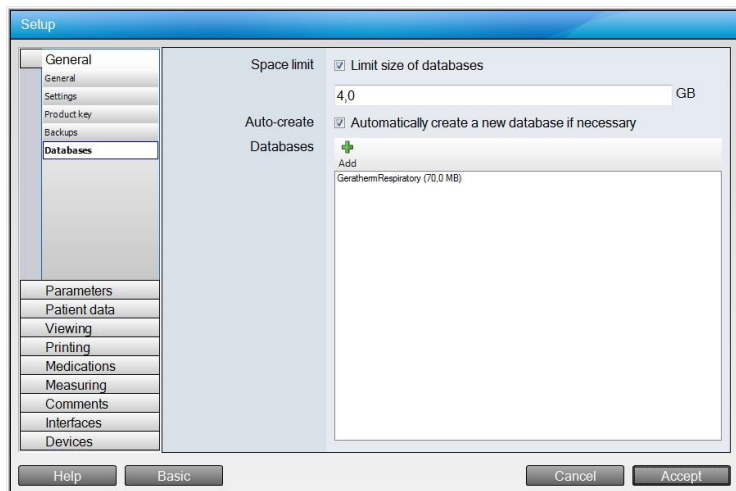


In the configuration field the product key as well as the corresponding software options for Blue Cherry will be displayed. This key can be changed to include further options; a new product key is available from the local Geratherm Respiratory partner.

3.1.4 General – Backups

Settings	Function
Automatic backups	If activated, automated backups will be done
Backup interval	Backup interval for the automated backups
Incremental backups	If selected only files will be stored that had been changed or added after the last backup
Backup folder	Path to the backup file
Backup file	Name of the backup file
Contained backups	List of done backups
Create backup	Button to start the manual backup

3.1.5 General – Databases

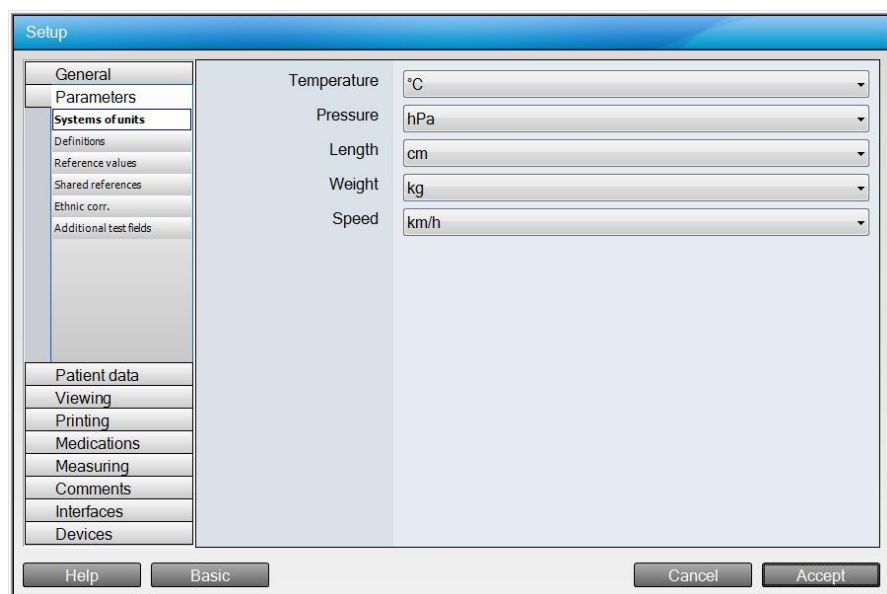


Settings	Function
Space limit	If activated the size of database will be limited tot he entered value. Please note, the database size for SQL Express installations is in general limited to 4GB.
Auto-create	If activated a new database will be created if the entered limit has been reached.
Datenbanken	The currently used databases as well as their size will be displayed. If Space limit has not been activated it's possible to add a new database manually. This database will only be used for ECG raw data.

3.2 Parameters

In the menu section Parameter general settings for parameters as well as for the nominal values are possible. Subsequently the corresponding sub menu will be explained.

3.2.1 Parameters – System of Units



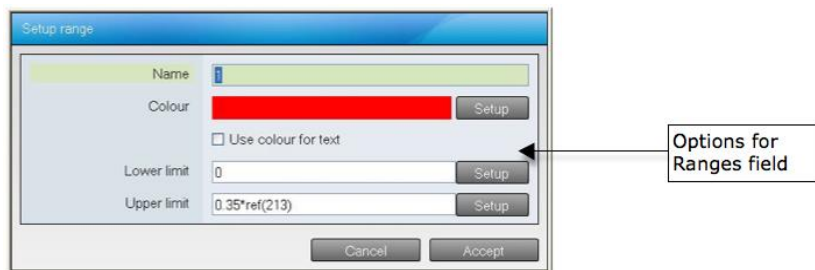
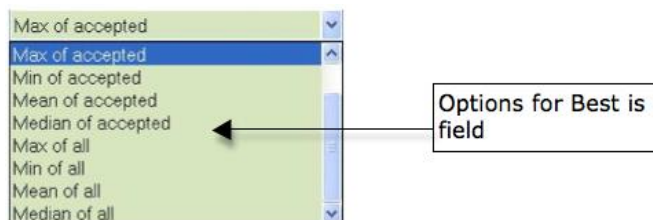
Field	Description
Temperature	Set the unit for temperature
Pressure	Set the unit for pressure
Length	Set the Unit for length
Weight	Set the Unit for weight
Speed	Set the Unit for speed

3.2.2 Parameters – Definitions

The screenshot shows the 'Setup' window for defining parameters. The 'Definitions' tab is active, showing a list of parameters. 'FEV1' is selected. The configuration for 'FEV1' is as follows:

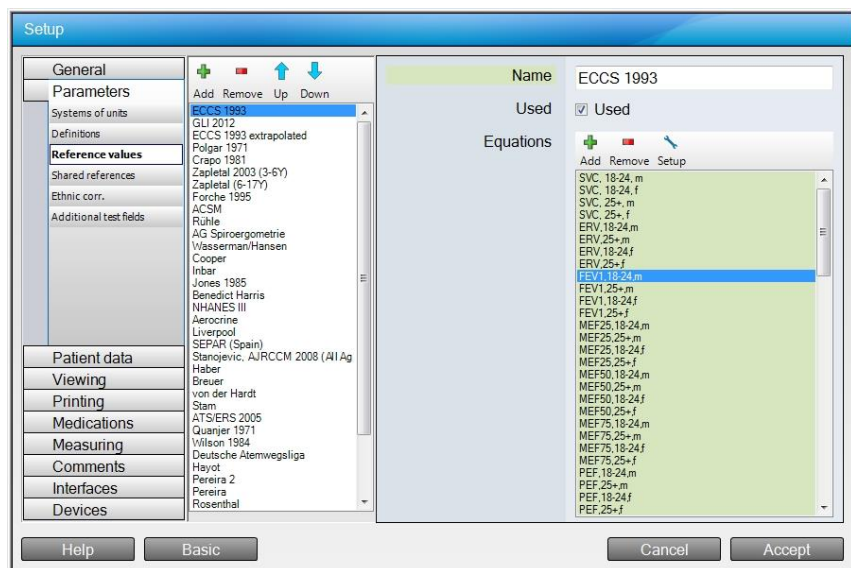
- Name:** FEV1
- Measurement type:** F/V
- Unit:** l
- Factor:** 1,000
- Offset:** 0,000
- Decimal places:** 2
- Best is:** Max of accepted
- Ranges:** A section with 'Add', 'Remove', and 'Setup' buttons, and a list of three ranges (1, 2, 3).

Field	Description
Name	Parameter Name
Measurement Type	Shows which measurement the parameter is associated with
Unit	Unit value used for parameter
Factor	Adjustment multiplication factor (this is usually required if the unit need to be changed)
Offset	Adjustment of an additive factor
Decimal places	Number of Decimal places to display
Best Is	Indicates how the best value is determined
Ranges	Allows to configure a bar graph with multiple colour areas similar to the FEV1 meter



Settings	Function
Name	Area name
Colour	Colour selection for the area
Lower limit	Value or formula for the lower limit of the area. The button "Setup" opens a powerful formula editor.
Upper limit	Value or formula for the upper limit of the area. The button "Setup" opens a powerful formula editor.

3.2.3 Parameters – Reference Values



In the selection range the list of authors appears. The first author in the list has the highest priority. By using the Up or Down button it is possible to change this priority. Any author unused will be shown in italics and greyed out in the list.



Field	Description
Name	Shows Authors Name
Used	Indicates if this author value set is used. In this system ticked box show the author is used.
Equations	Set the formulas for the nominal values.

Clicking the Setup button whilst having an equation selected will open the configuration window for that equation. The example shows the FEV1 value from the ECCS equation set for males with age higher than 25.

Reference set

Name	FEV1,25+,m	
Parameter	FEV1	Setup
Age (Min / Max)	25	70
Height (Min / Max)	0	999
Weight (Min / Max)	0	999
Sex	male	
Ethnic group	Caucasian	Setup
Condition		Setup
Reference value	$4.30 * (\text{height} / 100) - 0.029 * \text{age} - 2.49$	Setup
RSD	0.51	Setup
ULN	$\text{ref}(213) + 0.84$	Setup
LLN	$\text{ref}(213) - 0.84$	Setup
L-Value		Setup
S-Value		Setup

Cancel
Accept

Field	Description
Name	Name of the equation
Parameter	Parameter name
Age (Min / Max)	Age group for this equation
Height (Min / Max)	Height range for this equation
Weight (Min / Max)	Weight range for this equation
Sex	Selects the sex group for this equation Male, Female or Both
Ethnic Group	Selects the Ethnic group for this equation Caucasian, Black, Asian or all Ethnic groups
Condition	A condition for the use of this formula can be configured here.
Reference value	The formula for the reference equation
RSD	Shows the standard deviation from the desired middle value
ULN	Upper limit of Normal calculation (Normally + 1,64*SD)
LLN	Lower Limit of Normal calculation (Normally - 1,64*SD)

Clicking on the Setup keys will open a formula editor for each of the values.

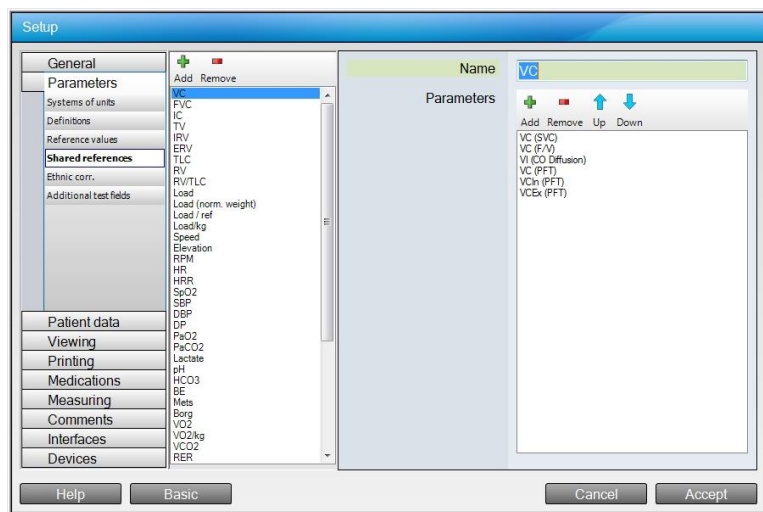
Equation

Equation $4.30 \cdot (\text{height}/100) - 0.029 \cdot \text{age} - 2.49$

Keypad buttons:

- Numeric: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, ., %
- Arithmetic: +, -, *, /, (,)
- Functions: Power, Exp, Sqrt, Ln, Log, Abs, Min, Max
- Physiological: Age, Height, Weight, Smoker, Active, Pred., LLN, ULN, RSD, Day, Best, Effort
- Clear
- Cancel, Accept

3.2.4 Parameters – Shared references



Field	Description
Name	Name of Parameter
Parameters	List of parameters which should use the same calculation for predicted value.

3.2.5 Parameters – Ethnic corr.

The screenshot shows the 'Setup' window for 'Ethnic corr.'. The left sidebar contains a tree view with 'Ethnic corr.' selected. The main area is divided into sections: 'Name' (Caucasian-Asian: Lung volumes), 'Convert from' (Caucasian), 'Convert to' (Asian), 'Parameters' (a list of lung volume parameters), and 'Reference factor' (0.940). The 'Parameters' list includes VC (SVC), TLC (SVC), VCEx (SVC), PVCEX (F/V), PVOx (F/V), FEV0.5 (F/V), FEV0.55 (F/V), and FEV0.6 (F/V). The 'Reference factor' is set to 0.940. The 'LLN factor' is set to 0.940, the 'ULN factor' is set to 0.940, and the 'RSD factor' is set to 0.940. The window has 'Help', 'Basic', 'Cancel', and 'Accept' buttons at the bottom.

Field	Description
Name	Name for the correction
Convert from	Select from which ethnic group you would like to convert
Convert to	Select into which ethnic group you would like to convert
Parameters	Select which parameters need to be converted
Reference factor	Correction factor to calculate reference value
LLN factor	Correction factor for Lower Limit of Normal
ULN factor	Correction factor for Upper Limit of Normal
RSD factor	Correction factor for standard deviation

In the above shown example the predicted value for Asian population for all parameters shown in the list will be calculated by multiplying the predicted value for Caucasian population by 0.94.

3.2.6 Parameters – Additional test fields

Field	Description
Name	Name of test field
Data type	Data type of test field

3.3 Patient Data

The section patient data allows changes in multiple settings for the patient data, patient cache, anonymisation and patient ID. Subsequently the corresponding sub menu will be explained.

3.3.1 Patient Data – Patient ID

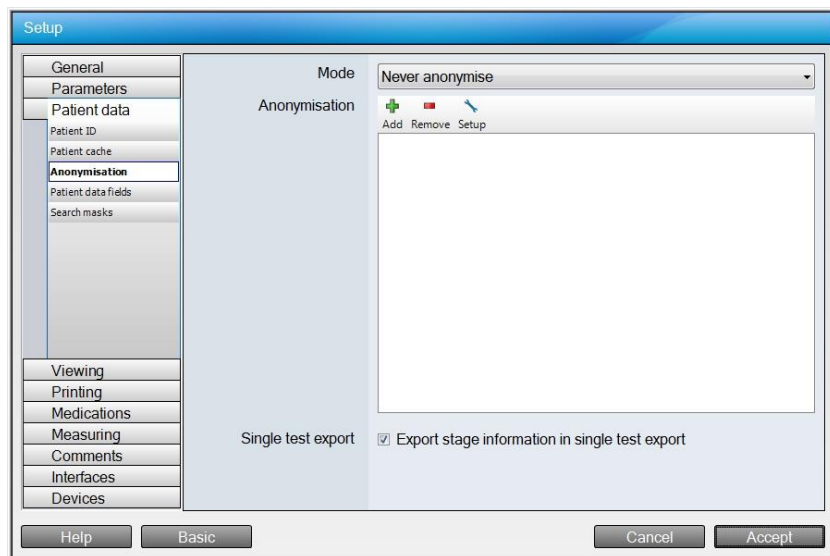
The screenshot shows the 'Setup' window with the 'Patient ID' tab selected. The 'Creation' dropdown menu is set to 'Manual'. The 'Length (max. 64)' field is set to '20'. The 'Leading zeros' checkbox is unchecked. The left sidebar contains a list of settings: General, Parameters, Patient data, Patient ID (selected), Patient cache, Anonymisation, Patient data fields, Search masks, Viewing, Printing, Medications, Measuring, Comments, Interfaces, and Devices. At the bottom of the window are buttons for 'Help', 'Basic', 'Cancel', and 'Accept'.

Settings	Description
Creation	Determines how the ID number is created: - Manual – User enters number for each subject - Sequential Number – Creates a sequential ID number - Patient informations – Automatic number created using characters from patient data: 3 from name, 3 from first name and all date of birth.
Length (max. 64)	Length of the Patient ID number. A maximum of 64 points is possible.
Leading zeros	If activated, the ID number will be filled up with leading zeros.

3.3.2 Patient Data – Patient Cache

Settings	Function
Cache mode	Select if the patient cache settings depend on user or workstation ID
Max. search results	Max. number of rows in the search results list
Clear cache	If activated the cache will be cleared if Blue Cherry is closed.
Limit patients	If activated, the number of opened patients will be set to the number defined in the row “Max. count”.
Max. count	Max. number of opened patients
Clear cache	Clicking the “Perform” button clears the patient cache.

3.3.3 Patient Data – Anonymisation



Settings	Function
Mode	Choose the anonymisation mode
Anonymisation	Shows how the patient files will be anonymised.



Options for the
field **Mode**

Settings	Function
Always anonymise	The patient files configured in the area “Anonymisation” will be anonymised before the export
Ask for anonymisation	Before anonymisation a question appears at export
Never anonymise	No anonymisation will be done

Patient data anonymisation

Element	First Name
Value	YYYYYYYY

Cancel Accept

Options for the area
Anonymisation

Settings	Function
Element	Choose which patient files should be anonymised
Value	Define the way of anonymisation. In the shown example the string “YYYYYYYYYYYY” will be shown instead of the first name.

3.3.4 Patient Data – Patient data fields

Setup

General

Parameters

Patient data

Patient ID

Patient cache

Anonymisation

Patient data fields

Search masks

Viewing

Printing

Medications

Measuring

Comments

Interfaces

Devices

Add Remove Up Down

Patient ID

Case number

Name

First Name

Sex

Date of birth

Age

Height

Weight

BMI

BSA

IBW

Date of last change

LastChangeDateDay

LastChangeDateMonth

LastChangeDateYear

Race

Smoker

Ex-Smoker

Cigarettes/day

Smoking years

Pack years

Active

Address

Address 2

City

ZIP

State

Name: Patient ID

Description:

Store to: Patient

Show in: General

Mandatory: ☒ Mandatory

Data type: Text

Max. length: 64

Help Basic Cancel Accept

Settings	Description
Name	Name of the patient data field
Description	Description of the patient data field
Store to	Determines where the data is saved - Patient – store to the patient file - Test date – stores specifically to the test date
Show in	Determines where the data is shown in the patient record: - None – Data is not shown - General – Shown under general tab - Additional – Shown under additional tab - Advanced – Shown under advanced tab - Address – Shown under address tab
Mandatory	Determines if the user is forced to complete this field.
Data type	Determine data type Select between; Boolean, Value, List and Text

Dependent upon which data type is selected further options may be available:

Data type Boolean

The data type Boolean sometimes known as the *logical data type*, is a data type having one of two values: for example on or off.

Examples of Boolean data type:

Smoker ☐ Smoker
Ex-Smoker ☐ Ex-Smoker

Data type Value

Minimum

Maximum

Unit

Decimal places

Field	Description
Minimum	Adjustment of the lower limit of the input value
Maximum	Adjustment of the Upper limit of the input value
Unit	Unit of input value
Digit	Number of decimal places for input value
Decimal places	Numer of decimal places

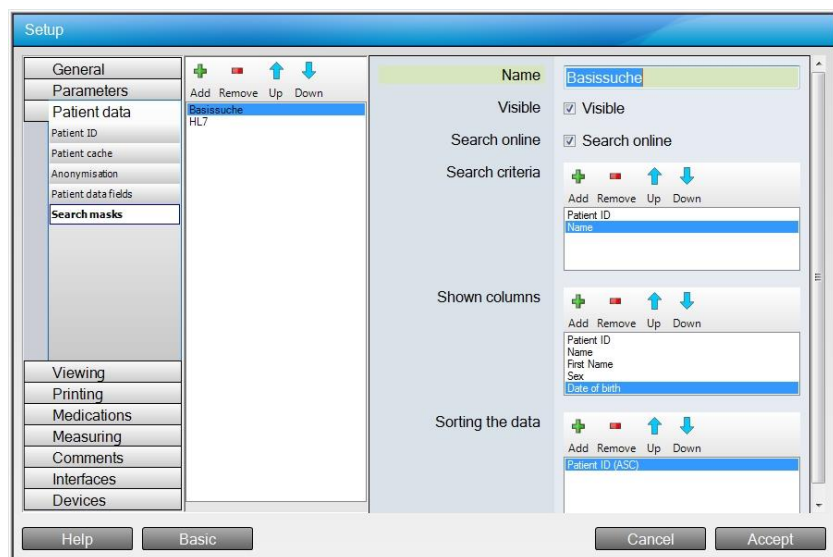
The screenshot shows a software interface for configuring data types. On the left, under 'Data type', the 'List' option is selected from a dropdown menu. Below this, there are 'Add' and 'Remove' buttons with corresponding plus and minus icons. A modal dialog titled 'Enter new list item' is open in the foreground. It contains a text input field labeled 'Name' and two buttons at the bottom: 'Cancel' and 'Accept'.

The data type list allows the creation of a data type in the form of a selection list. Clicking on the 'ADD' button will allow entry of items to be included in the list.

This screenshot shows the 'Data type' configuration window with the 'Text' option selected in the dropdown menu. Below the dropdown, there is a text input field labeled 'Max. length' with the value '-1' entered.

Selection of the data type text allows a simple text field to be created; with the field **Max. length** the maximum allowable length of this field may be adjusted.

3.3.5 Patient Data – search masks

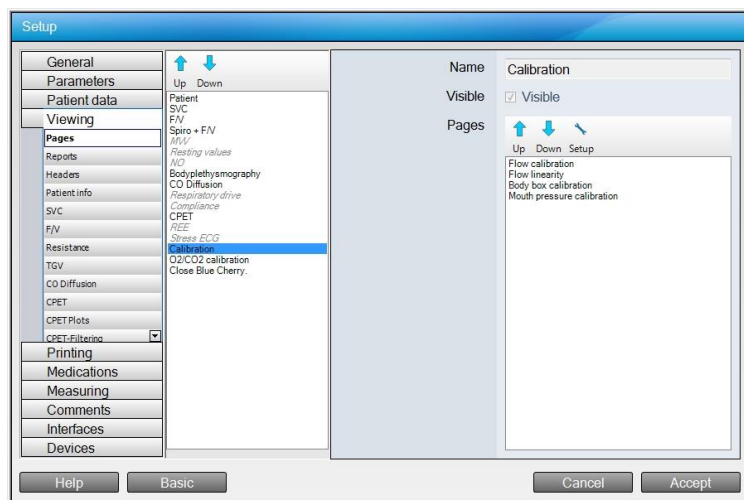


Field	Description
Name	Name of the search mask. For each name a selectable search mask will be shown in the patient search window
Visible	If activated, this search mask will be available
Search online	If activated, the results of the search will be shown immediately.
Search criteria	Configuration of the criteria shown in the patient search window
Shown columns	Configuration of the columns shown in the patient search window
Sorting the data	Configuration of the sort sequence

3.4 Viewing

The viewing setup allows the configuration of the left selection area, the header and footer as well as the parameter tables and measurement options.

3.4.1 Viewing – Pages



In

In the selection area there is a list of available buttons shown on the left side of Blue Cherry. By using the **Up** and **Down** button their position can be changed.

Field	Description
Name	Name of the button
Visible	If this box is not ticked then the relevant button will <u>not</u> appear in the left selection area of Blue Cherry.
Pages	Button for adjustment of submenu order



Using the **Up** and **Down** buttons it is possible to change the order of the sub menu. The button **Setup** opens a new configuration window where the selected sub menu can be made visible or invisible.



3.4.2 Viewing – Reports

The screenshot shows the 'Setup' dialog box for configuring a report. The left pane lists various report types under 'Reports', with 'Wasserman 9 (CPET)' selected. The right pane shows the configuration for 'Wasserman 9':

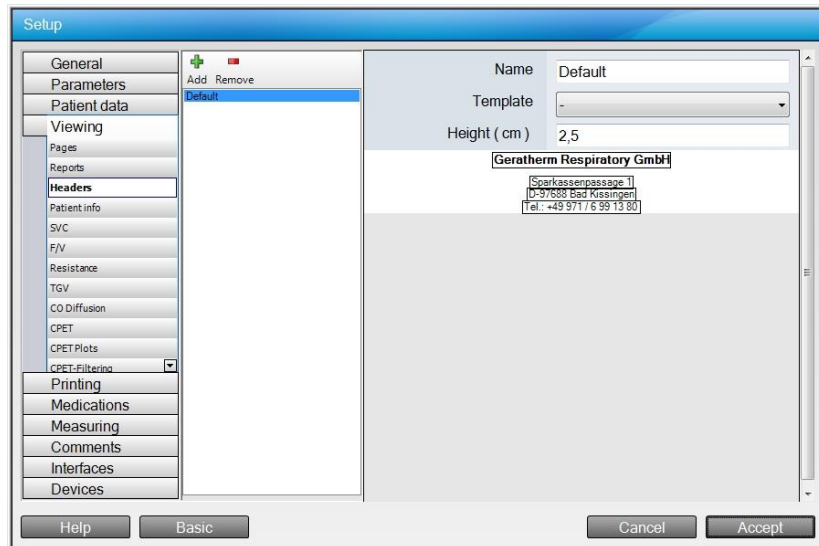
- Name:** Wasserman 9
- Caption:** Wasserman 9
- Measurement type:** CPET
- Shown procedures:** SingleTest, PrePost, Prox (with a 'Setup' button)
- Structure:** A grid showing row counts for various measurements:

Row count		
Wasserman n 1	Wasserman n 2	Wasserman n 3
Wasserman n 4	Wasserman n 5	Wasserman n 6
Wasserman n 7	Wasserman n 8	Wasserman n 9
- Print comment:** ☒ Print comment

Buttons at the bottom: Help, Basic, Cancel, Accept.

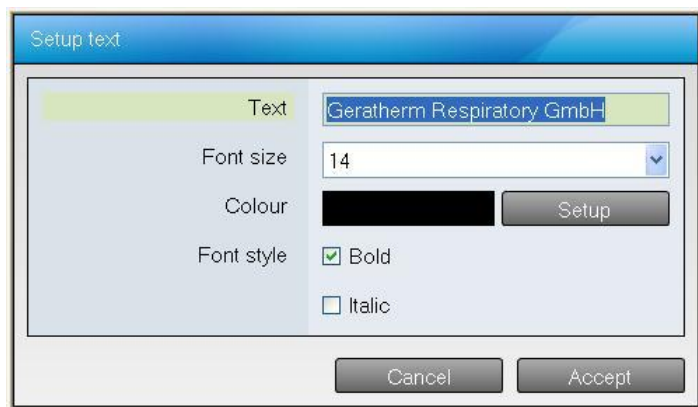
Field	Description
Name	Name of the report
Caption	Caption of the report shown on the top
Measurement type	Configuration of the measurements where this report will be available
Shown procedures	Configuration of the test procedures where this report will be available
Structure	Configuration of the report itself.
Print comment	If activated the comment will appear on the report

3.4.3 Viewing – Headers



Field	Description
Name	Name of the header
Template	Template selection for the header
Height (cm)	Determines the height of the header in cm

The text fields displayed in the header file can be individually selected for editing, the following window will open:



Field	Description
Text	The Open text field
Font size	Determines the font size used
Colour	Determines the colour of the text; Setup button will open a colour palette for choice.
Font style	Determines the style of font to be used

3.4.4 Viewing – Patient Info

Setup

General
Parameters
Patient data
Viewing
Pages
Reports
Headers
Patient info
SVC
F/V
Resistance
TGV
CO Diffusion
CPET
CPET Plots
CPET-Filtering
Printing
Medications
Measuring
Comments
Interfaces
Devices

Add Remove
Tests

Name: Tests

Multiple pages: ☒ Print on every page

Height (cm): 1,5

Font size: 10

Count of columns: 3

Count of rows: 3

Patient ID	Sex	Height
Name	Date of birth	Weight
First Name	Age	BMI

Help Basic Cancel Accept

Field	Description
Name	Name of patient info setting
Multiple pages	If activated, the patient data will appear on every page in protocols with multiple pages
Height (cm)	Determines the height of the patient data fields
Font size	Determines the font size
Count of columns	Determines the number of columns
Count of rows	Determines the number of rows

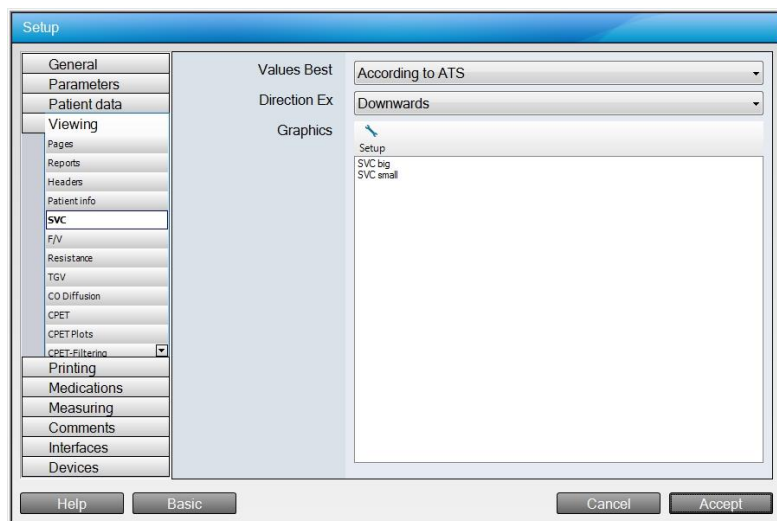
Select patient information field

- Patient ID
- Name
- First Name
- Sex
- Date of birth:
- BirthdayDay
- BirthdayMonth
- BirthdayYear
- First**
- Height
- Weight
- Race
- BMI
- BSA
- Smoker
- Ex-Smoker
- Cigarettes/day
- Smoking years
- Address
- Address 2
- City
- ZIP
- State
- Diagnosis
- Reference value

Cancel Accept

When a field is selected a short selection menu is opened to allow the user to determine the contents of the selected field, thus configure the order of the patient data to the desired view.

3.4.5 Viewing – SVC



Field	Description
Values Best	Choose whether the best values should be calculated according to ATS or to the selected best measurement
Direction Ex	Allows configuration of the direction in which expiratory flow is expressed.
Graphics	Allows configuration of the Spirometry diagram. The graph SVC big will be displayed in the measurement SVC . The graph SVC small will be displayed in the combined SVC + F/V measurement.

Selecting setup allows configuration of the spirometry diagram with a short menu.

SVC graphic

Bar plot ☒ Bar plot

Single stage Best

Pre/Post Setup

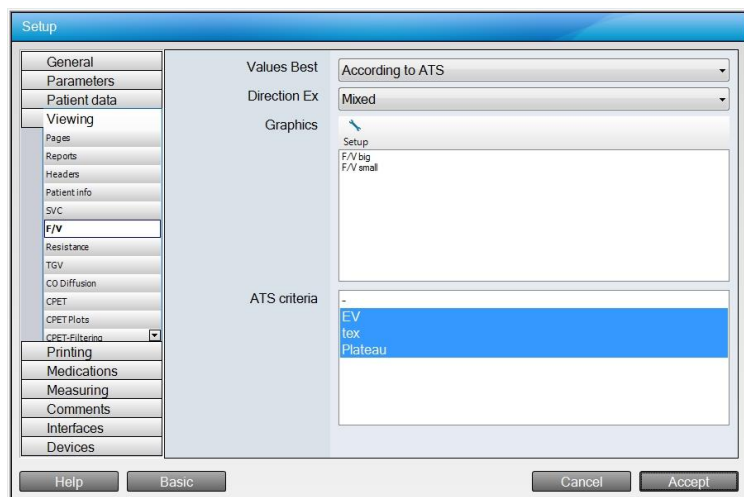
Provocation Setup

Intra-Day Setup

OK Cancel

Field	Description
Bar plot	If activated a bar chart will appear
Single stage	Configuration for single stage test if the best, the accepted or all test graph will be displayed
Pre/Post	Configuration for pre/post test if the best, the accepted or all test graph will be displayed
Provocation	Configuration for provocation test if the best, the accepted or all test graph will be displayed
Intra-Day	Configuration for Intra-Day test if the best, the accepted or all test graph will be displayed

3.4.6 Viewing – F/V



Field	Description
Values Best	Choose whether the best values should be calculated according to ATS or to the selected best measurement
Direction Ex	Allows configuration of the direction in which expiratory flow is expressed default is Expiratory Undefined
Graphics	Allows configuration of the Spirometry diagram. The graph F/V big will be displayed in the measurement F/V small will be displayed in the combined SVC + F/V measurement.
ATS criteria	Allows to choose which ATS criteria's will be proved to mark a F/V measurement as "Acceptable". Multiple choices are possible.

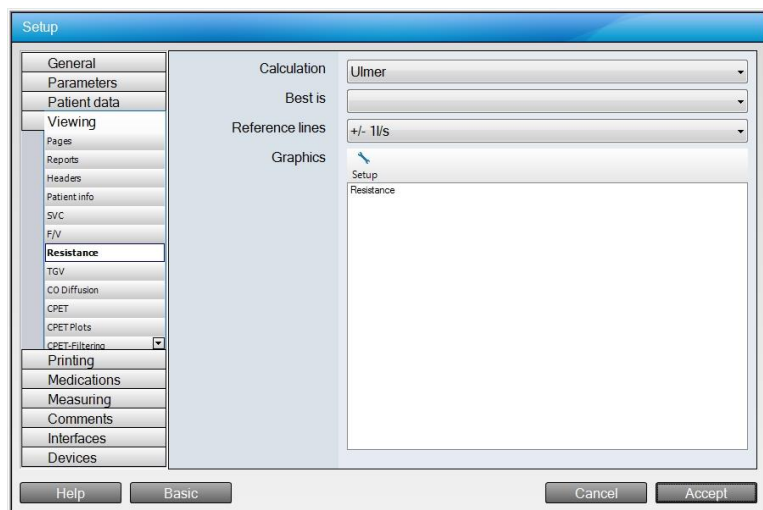
Selecting setup allows configuration of the Flow Volume diagram with a short menu:

The screenshot shows a configuration window titled "F/V graphic". It contains the following elements:

- Tidal loops:** A checkbox labeled "Tidal loops" which is currently unchecked.
- FEV1 plot:** A dropdown menu with "No visualisation" selected.
- V/t: Only expiration:** A checkbox labeled "V/t: Only expiration" which is checked.
- Time axis V/t:** A dropdown menu with "0 - 6" selected.
- Single stage:** A dropdown menu with "Best" selected.
- Pre/Post, Provocation, Intra-Day:** Each of these labels has a corresponding "Setup" button.
- Buttons:** "OK" and "Cancel" buttons are located at the bottom of the window.

Fields	Description
Tidal Loops	If activated the tidal loops will be displayed in the final Flow volume curve.
FEV1 plot	Allows to choose whether no visualisation or a Flow/Time plot or a FEV1 graph should be displayed
V/t Only expiration	Determines if the Volume time curve only displays expiratory data.
Time axis V/t	Allows selection of the time frame used for display of the Volume time curve in the flow/volume measurement. It is possible to choose between 0-6s, 0-10s, 0-30s, 0-60s.
Single stage	Configuration for single stage test if the best, the accepted or all test graph will be displayed
Pre/Post	Configuration for pre/post test if the best, the accepted or all test graph will be displayed
Provocation	Configuration for provocation test if the best, the accepted or all test graph will be displayed
Intra-Day	Configuration for Intra-Day test if the best, the accepted or all test graph will be displayed

3.4.7 Viewing – Resistance



Settings	Function
Calculation	Configuration of the Resistance method. The User can select between: Ulmer, Matthys and R0.5
Best is	Configuration of the best value selection. The User can choose between: Selected and Mean of all accepted
Reference lines	Configuration of the Reference lines. The User can choose between: no reference lines, +/- 0,5 l/s and +/- 1 l/s
Graphics	Allows configuration of the resistance graph

Selecting setup allows configuration of the resistance diagram with a short menu.

Setup Resistance graphic

Single stage: Best

Pre/Post: Setup

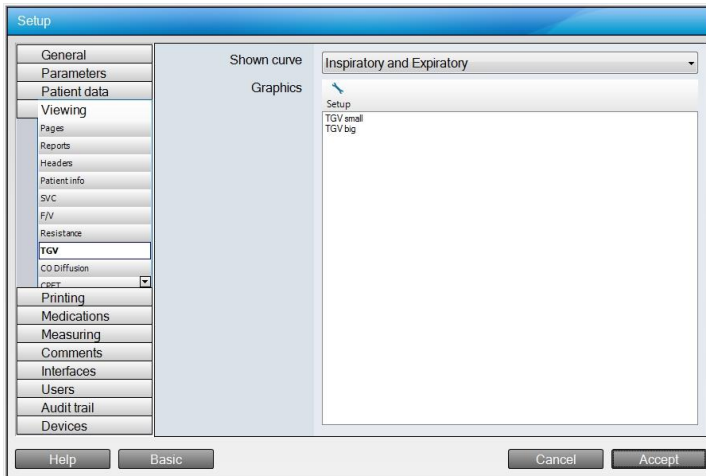
Provocation: Setup

Intra-Day: Setup

OK Cancel

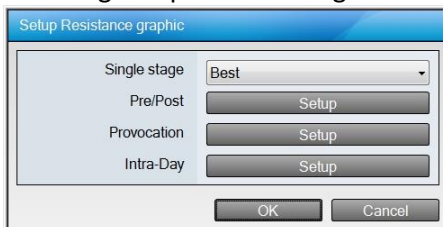
Fields	Description
Single stage	Configuration for single stage test if the best, the accepted or all test graph will be displayed
Pre/Post	Configuration for pre/post test if the best, the accepted or all test graph will be displayed
Provocation	Configuration for provocation test if the best, the accepted or all test graph will be displayed
Intra-Day	Configuration for Intra-Day test if the best, the accepted or all test graph will be displayed

3.4.8 Viewing – TGV



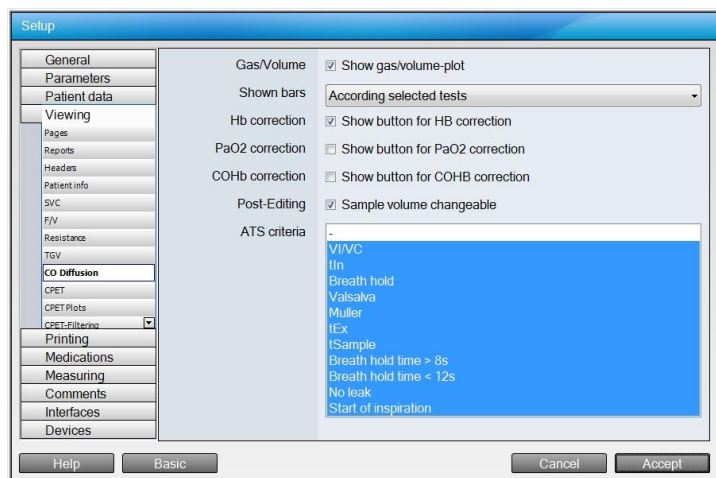
Settings	Function
Shown curve	Configuration of how the TGV curve will be displayed. The User can select between only inspiration and inspiration and expiration
Graphics	Allows configuration of the TGV graph

Selecting setup allows configuration of the TGV diagram with a short menu.



Fields	Description
Single stage	Configuration for single stage test if the best, the accepted or all test graph will be displayed
Pre/Post	Configuration for pre/post test if the best, the accepted or all test graph will be displayed
Provocation	Configuration for provocation test if the best, the accepted or all test graph will be displayed
Intra-Day	Configuration for Intra-Day test if the best, the accepted or all test graph will be displayed

3.4.9 Viewing – CO Diffusion



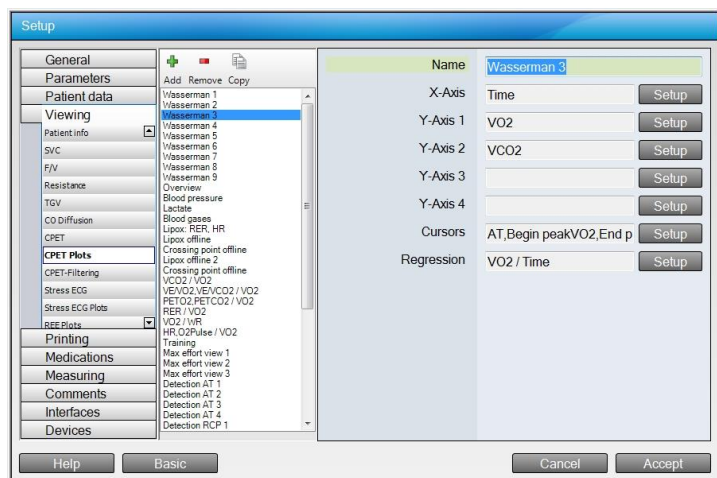
Settings	Function
Gas/Volume	If activated the graph Gas/Volume will be shown
Shown bars	Configuration of how the diffusion graph will be displayed. The User can select between selected test and only best.
Hb correction	If activated the button for Hb correction will be displayed
PaO2 correction	If activated the button for PaO2 correction will be displayed
COHb correction	If activated the button for COHb correction will be displayed
Post-Editing	If activated it is possible to change the sample volume after the measurement
ATS criteria	Selection which ATS criteria will be taken into account. It's possible to select multiple entries.

3.4.10 Viewing – CPET

Settings	Function
Last load	If activated, the maximal reachable load will be calculated by using the real stage duration of the last load stage.
Exp. duration	Time in s after which point the final load level is taken as the maximum load level.
Blood gases	If activated the blood gases at maximum load will be interpolated with the last values
Data editor	If activated it is possible to edit the data manually after the measurement
Editor login	If activated a password is needed to start the data editor
Password	Password to log into the data editor
Repeat password	Repeat password to log into the data editor
Quick info	Configure which short information should be displayed during changing the measurement. All possible quick info can be opened by the Setup button. It's possible to select multiple entries by using the CTRL-Key.
Wizard	Configure which values the integrated wizard

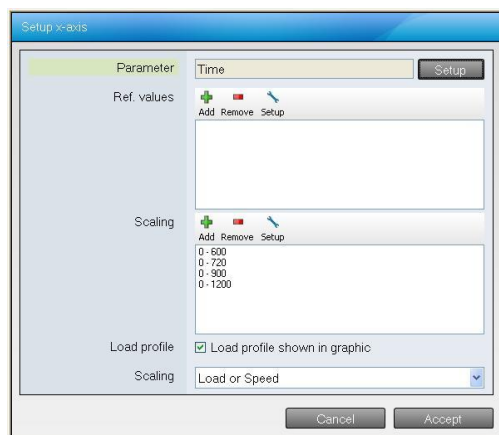
	should display. All possible values can be opened by the Setup button. It's possible to select multiple entries by using the CTRL-Key.
Max. effort criteria	Configure which criteria should be displayed for the detection of a max effort. All possible criteria can be opened by the Setup button. It's possible to select multiple entries by using the CTRL-Key.
MaxVO2 detection	Configuration of filter settings used for VO2max detection
Detection AT	Configure which parameters should be displayed for the detection of the AT. All possible parameters can be opened by the Setup button. It's possible to select multiple entries by using the CTRL-Key.
Detection RCP	Configure which parameters should be displayed for the detection of the RCP. All possible parameters can be opened by the Setup button. It's possible to select multiple entries by using the CTRL-Key.
Name AT	Labeling for AT cursor can be modified
Name RCP	Labeling for RCP cursor can be modified

3.4.11 Viewing – CPET Plots



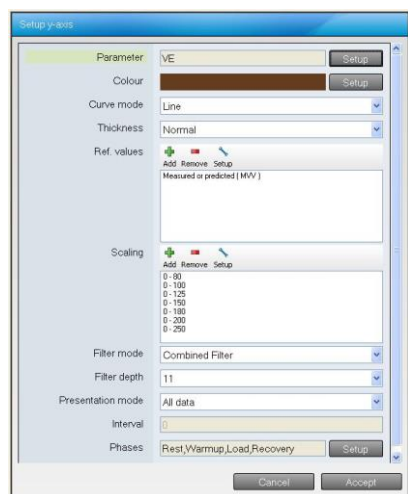
Settings	Function
Name	Name of the graph
X-Axis	Parameter of the X-Axis
Y-Axis 1	Parameter of the Y-Axis 1
Y-Axis 2	Parameter of the Y-Axis 2
Y-Axis 3	Parameter of the Y-Axis 3
Y-Axis 4	Parameter of the Y-Axis 4
Cursors	Configure which cursor should be displayed in the graph. It is possible to choose multiple cursors by pressing and holding the STRG-key.
Regression	Preferences for regression lines

After clicking the **Setup** button for the X-Axis, the following settings could be done:



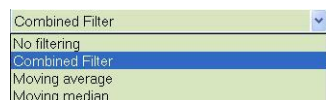
Settings	Function
Parameter	Clicking the Setup button can choose the parameter for the X-Axis.
Ref. values	Configure the ref. values for the selected parameter.
Scaling	Configure the scaling
Lastprofil	If activated the load profile will be shown in the graphic
Scaling	Choose the scaling for the X-Axis. The user can chose between: - Time - Load - Load or Speed - HR at end of load stage

After clicking the **Setup** button in of the lines of the Y-Axis the following settings can be made:



Settings	Function
Parameter	Clicking the Setup button can choose the parameter for the Y-Axis.
Colour	Choose the colour for this Y-Axis
Curve mode	Choose whether lines or points should be displayed
Thickness	Configure the strength of the line
Ref. values	Configure the Ref. values for the selected parameter
Scaling	Configure the scaling
Filter mode	Configure the filter mode. Moving median
Filter depth	Configure the depth of the filter
Presentation mode	Configure which data should be displayed.
Interval	Time interval for the presentation in s
Phases	Choose which phases should be displayed. It is possible to choose multiple phases by pressing and holding the STRG-key

After clicking the pull-down menu in the row filter mode one of the following points can be selected:



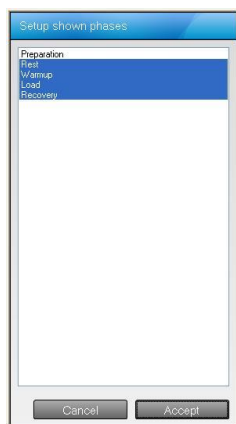
Settings	Function
No filtering	No filtering; only the raw data will be displayed
Combined Filter	The data will be sorted and then the main of the middle area will be selected
Moving average	The data is summed up the whole time and divided by the amount of data.
Moving median	The data is sorted and only the main will be used.

After clicking the pull-down menu in the row of presentation the following will be displayed:



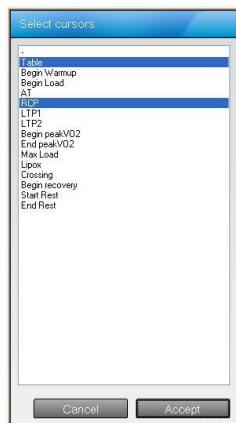
Settings	Function
All data	All measured data will be displayed
Fix time intervals	The measured values are shown averaged in accordance with the conditions laid down in the line time interval
Average of load stage	All measured values of a stage are averaged and presented in a value
Begin of load stage	All measured values of a load stage are shown averaged according to the scheduled time interval in the line interval to the start of stage.
End of load stage	All measured values of a load step are shown averaged according to the scheduled time interval in the line interval to the end of stage.

After clicking the **Setup** button in the phase line, the following settings could be done:



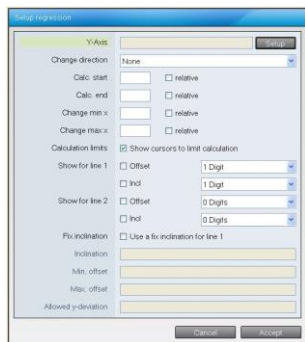
Choose which phases should be shown. It is possible to select multiple choices by pressing and holding the STRG-key

After clicking the **Setup** button in the cursor line of the CPET plot screen, the following settings could be done:



Choose which cursors should be shown. It is possible to select multiple choices by pressing and holding the STRG-key

After clicking the **Setup** button in the regression line, the following settings could be done:

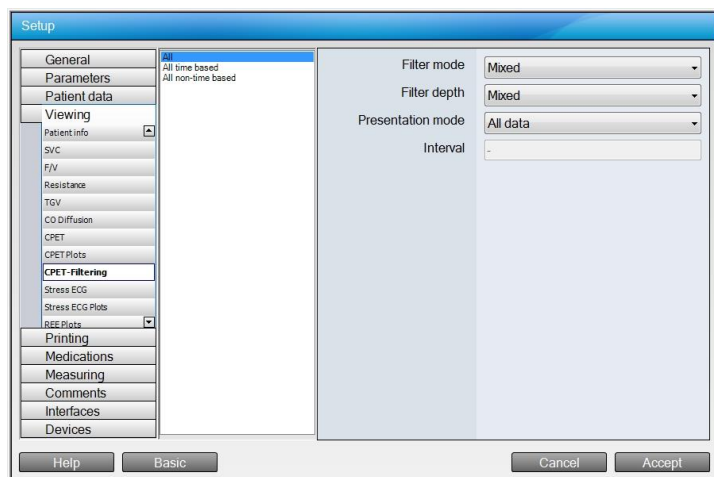


Settings	Function
Y-Axis	Choose the parameter for the calculation of regression
Change direction	Allows choosing the regression line(s). There are: - None: Only one line - Both: 2. Line flatter or steeper - Upwards: 2. Line has to be steeper - Downwards: 2. Line has to be flatter
Calc. start	Start of calculation of the regression as an absolute value or relative to the maximal value
Calc. end	End of calculation of the regression as an absolute value or relative to the maximal value
Change min x	Minimal position of the change point if the 2. Line is calculated
Change max x	Maximal position of the change point if the 2. Line is calculated
Calculation limits	If activated the LL and UL cursors will be shown
Show for Line 1 - Offset	Show Offset to regression line 1
Show for Line 1 - Incl	Show Incl to regression line 1
Show for Line 2 - Offset	Show Offset to regression line 2
Show for Line 2 - Incl	Show Incl to regression line 2
Fix inclination	If activated, the regression line 1 has always the specified slope

Min. Offset	Minimal Offset of regression line 1
Max. Offset	Maximal Offset of regression line 2
Allowed Y-deviation	Allowed Y-deviation at the calculation of the regression line

3.4.12 Viewing – CPET filtering

The filter settings can be changed for each graphic separately as shown in the previous chapter or like explained in the following for all graphics globally, for all time-based graphics or for all not time-based graphics.



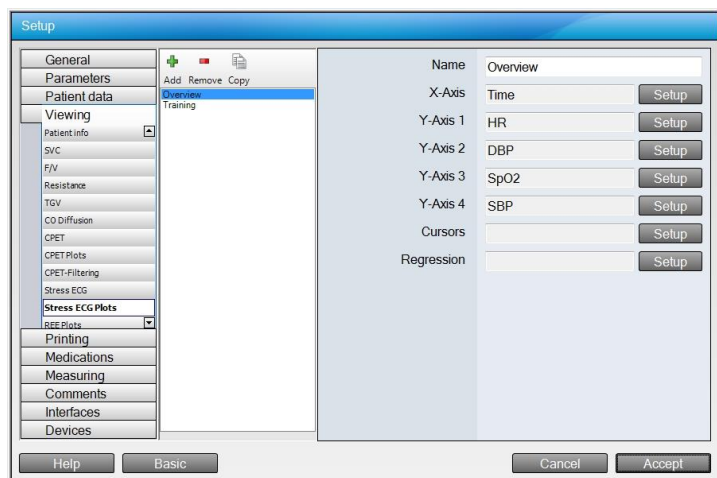
Settings	Function
Filter mode	Define the filter mode
Filter depth	Define the filter depth
Presentation mode	Define which data should be presented
Interval	Time interval for display in s

3.4.13 Viewing – Stress ECG

The screenshot shows a software window titled "Setup". On the left is a vertical sidebar with a list of tabs: General, Parameters, Patient data, Viewing, Patient info, SVC, F/V, Resistance, TGV, CO Diffusion, CPET, CPET Plots, CPET-Filtering, Stress ECG (highlighted), Stress ECG Plots, REF Plots, Printing, Medications, Measuring, Comments, Interfaces, and Devices. The main area of the window is divided into two sections. The top section contains the following settings: "Last load" with an unchecked "Interpolate" checkbox; "Exp. duration" with a text box containing "120"; "PaO2 @ EOL" with a dropdown menu showing "No estimation"; and "PaCO2 @ EOL" with a dropdown menu showing "No estimation". The bottom of the window features four buttons: "Help", "Basic", "Cancel", and "Accept".

Settings	Function
Last load	If activated, the maximal reachable load will be calculated by the real reached stage duration of the last load.
Exp. duration	Time in s after which point the final load level is taken as the maximum load level.
PaO2 at EOL	Configuration if PaO2 should be extrapolated at end of load
PaCO2 at EOL	Configuration if PaCO2 should be extrapolated at end of load

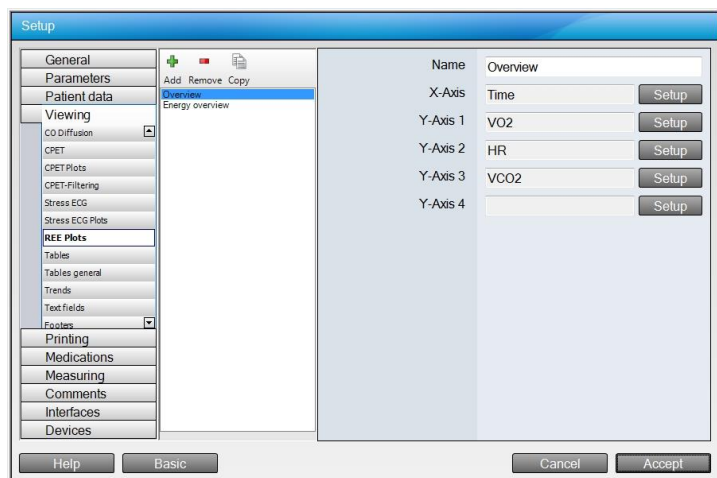
3.4.14 Viewing – Stress ECG Plots



Settings	Function
Name	Name of the graph
X-Axis	Parameter of the X-Axis
Y-Axis 1	Parameter of the Y-Axis 1
Y-Axis 2	Parameter of the Y-Axis 2
Y-Axis 3	Parameter of the Y-Axis 3
Y-Axis 4	Parameter of the Y-Axis 4
Cursors	Configure which cursor should be displayed in the graph. It is possible to choose multiple cursors by pressing and holding the STRG-key.
Regression	Preferences for regression lines

The detailed possibility for settings has been described already in the chapter CPET.

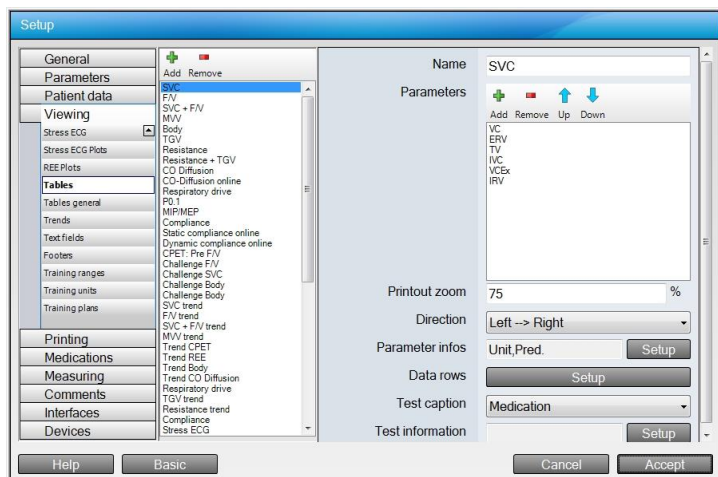
3.4.15 Viewing – REE Plots



Settings	Function
Name	Name of the graph
X-Axis	Parameter of the X-Axis
Y-Axis 1	Parameter of the Y-Axis 1
Y-Axis 2	Parameter of the Y-Axis 2
Y-Axis 3	Parameter of the Y-Axis 3
Y-Axis 4	Parameter of the Y-Axis 4

The detailed possibility for settings has been described already in the chapter CPET.

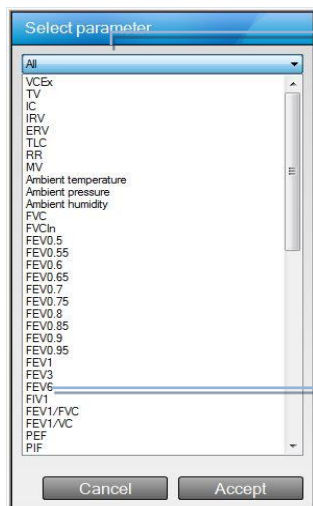
3.4.16 Viewing - Tables



For each table of Blue Cherry there is an entry in the selection area available. The following settings can be done in the configuration area:

Field	Description
Name	Name of Table
Parameters	Parameters may be added or removed from tables as desired using the buttons at the top of the section. The order in which the parameter appears in the table may also be adjusted.
Printout Zoom	Zoom in or out of the table for the expression
Direction	Configure the direction of the table; parameters may be displayed from Left to Right or Top to Bottom.
Parameter Info	Determines which values for the parameter will be displayed.
Data Rows	Adjust the information to be displayed to the parameter
Test Caption	Adjust the header information for the test
Test Information	Determines which additional information for each measurement should be displayed

Clicking the **Add** button will open a selection window for adding parameters to the selected table.



Drop down Menu for selection of parameter group, by default all available parameters are displayed

List of available parameters for adding to the table



Displayed window after clicking the setup button in the line Parameter infos. Multiple choices are possible by pressing and holding the STRG-Key.

Settings	Function
-	Blank line
Unit	Displays the parameter unit
Pred.	Displays the predicted value
LLN	Display lower set point limit
ULN	Display upper set point limit
RSD	Display relative standard deviation
Expected range	Displays the expected range in which the value should lie

Setup shown values	
Shown efforts	According to selection
Pre, Efforts	Value,%Pred. Setup
Pre, Stage	Value,%Pred. Setup
Placebo, efforts	Value,%Pred. Setup
Placebo, stage	Value,%Pred. Setup
Post, efforts	Value,%Pred,%Change Setup
Post, stage	Value,%Pred,%Change Setup
Provocation, efforts	Value,%Base Setup
Provocation, stage	Value,%Base Setup
Intra-Day Efforts	Value,%Change Setup
Intra-Day Slots	Value,%Change Setup
Cancel Accept	

Display after clicking the setup button of the line data rows.

Fields	Description
Shown effort	Adjust which efforts should be shown
Pre, Efforts	Adjust the values shown with each pre measurement
Pre, Stage	Adjust values displayed in Best of stage pre
Placebo, efforts	Adjust the values shown with each placebo measurement
Placebo, stage	Adjust values displayed in Best of stage placebo
Post, efforts	Adjust the values shown with each Post measurement
Post, stage	Adjust values displayed in Best of stage post
Provocation, efforts	Adjust the values shown with each provocation measurement
Provocation, stage	Adjust values displayed in Best of stage provocation
Intra-Day, efforts	Adjust the values shown with each intra-day measurement
Intra-Day, slots	Adjust values displayed in Best of slot intra-day

Select shown element(s)

- Value
- %Pred
- %Base
- Z-Score
- %Change
- Change
- Stage diff
- %Diff Stage

Clicking the **setup** button in each line opens this selection menu. It is possible to select multiple elements by pressing and holding the STRG-Key.



Display after clicking the pull-down menu in the line **test caption**.

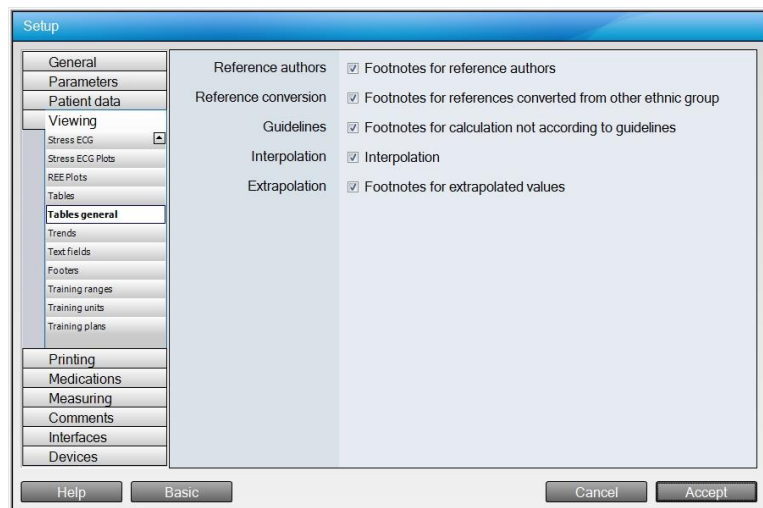
Field	Description
-	Blank line
Value	Displays the measured value
%Pred	Displays percentage of predicted
% Base	Displays the percentage of the base value (e.g. 85%)
Z-Score	Displays the Z-Score $Z\text{-Score} = (\text{Value} - \text{Predicted}) / \text{Standard deviation}$
% Change	Displays the percentage change (e.g. -15%)
Change	Displays the absolute change
Stage diff.	Displays the absolute stage difference
%Diff. Stage	Displays the percentage change of the stage
Option	Description
Stage	Indicate the stage designation e.g. Pre / Post
Time	Indicate the time
Medication	Indicate the medication in use



Display after clicking the Setup button in the line **Test infos**. Multiple choices can be made by pressing and holding the STRG-Key or Mouse.

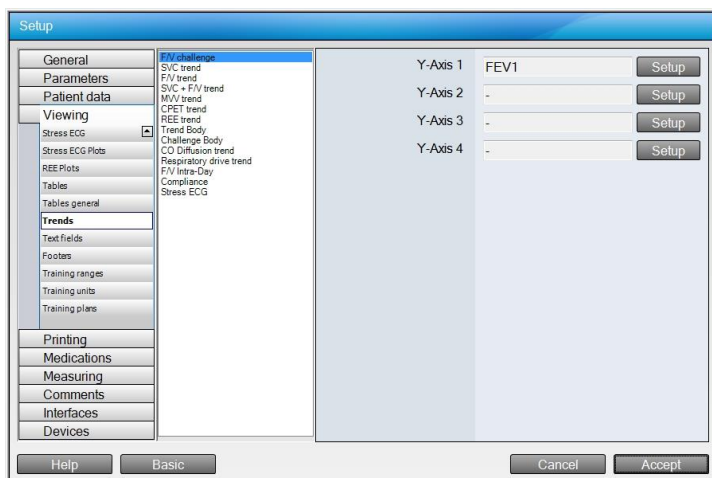
Option	Description
-	Blank line
Stage	Indicate the stage designation e.g. Pre / Post
Time	Indicate the measurement time
Medication	Indicate the medication in use
Quality Class	Indicate the Quality Class (A, B, C, D or F) from ATS

3.4.17 Viewing – Tables general

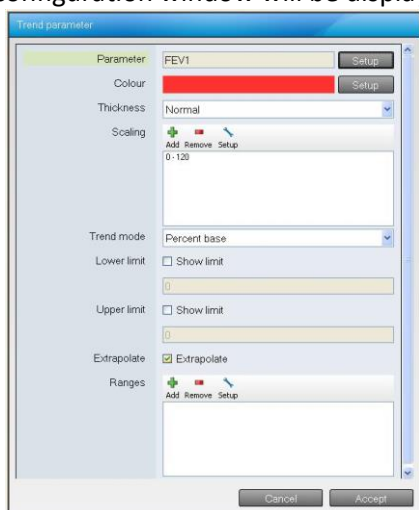


Fields	Description
Reference authors	If activated the footnote will show information about used reference authors
Reference conversion	If activated the footnote will show information about conversion of predicted values from other ethnical groups
Guidelines	If activated footnote will show information about calculations which are not according to guidelines
Interpolation	If activated footnote will show information about interpolated values
Extrapolation	If activated footnote will show information about extrapolated values

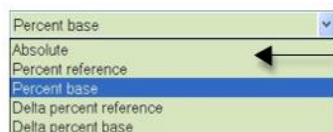
3.4.18 Viewing – Trends



For every trend in Blue Cherry exists an entry in the selection area. Up to 4 trend parameters (Y-Axis 1 to Y-Axis 4) can be defined in the configuration area. After clicking the **Setup** button in one of these lines the following configuration window will be displayed:



Field	Description
Parameter	The setup button opens a new window where the parameter can be selected
Colour	Select the colour. After clicking the setup button a window for the selection of the colour appears.
Thickness	Configure the thickness of the line
Scaling	Configure the scaling
Trend Mode	Drop down menu for Trend Mode
Colour	Select the colour for the display of the trend line
Lower Limit	Selection for display of lower limit, if active the lower limit value can be entered into the text box
Upper Limit	Selection for display of Upper limit, if active the Upper limit value can be entered into the text box
Extrapolate	Selection for extrapolation if activated the trend curve will be extrapolated.
Ranges	A display range can be defined for the parameter

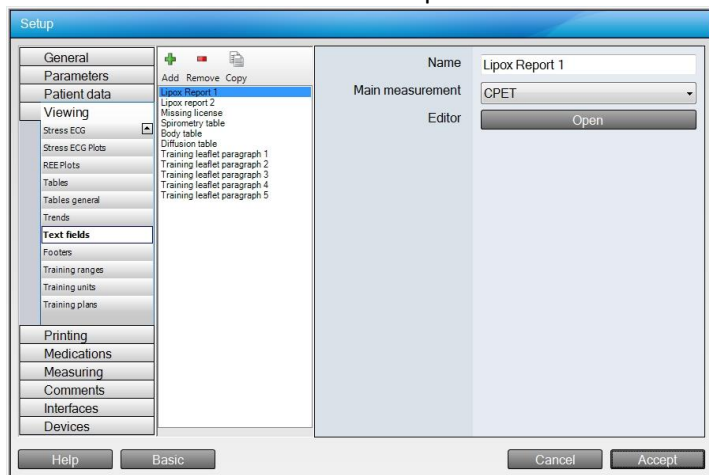


Display after clicking the drop down menu of the trend mode.

Option	Description
Absolute	Selects the absolute measured value
Percent reference	Selects the percent of reference value (e.g. 85%)
Percent Base	Selects the percent of base value (e.g. 85%)
Delta percent reference	Indicates percent deviation from reference (e.g. - 15%)
Delta percent base	Indicates the percent deviation from Base (e.g. - 15%)

3.4.19 Viewing – Text fields

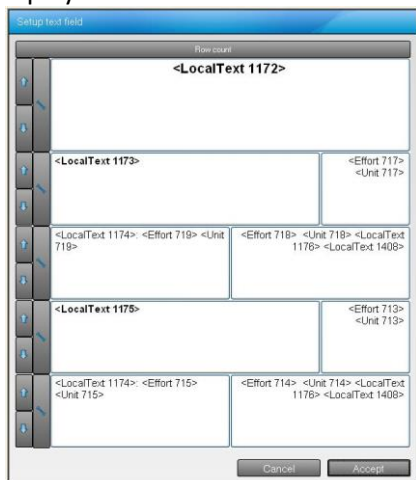
Using the function text fields, which is described below, a very powerful tool is available to create custom reports.



For every text field exists an entry in the selection area. The following settings can be made in the configuration area:

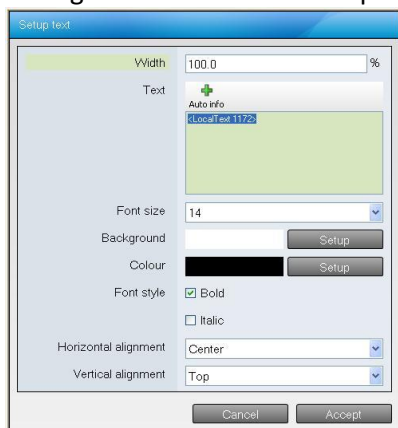
Settings	Function
Name	Name of the text field
Measurement	Configuration of the measurement where the text field will be available
Editor	Button to open the settings of the text field

After clicking the **Open** button the settings of the selected text field will be displayed.



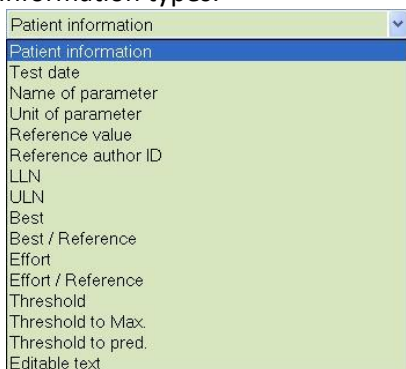
By clicking the **Row count** button the number of rows for each row could be changed. By clicking  on the left side the number of columns can be changed. And by pressing the arrow keys  it is possible to change the order of the rows.

Clicking one of the text fields opens the following window:



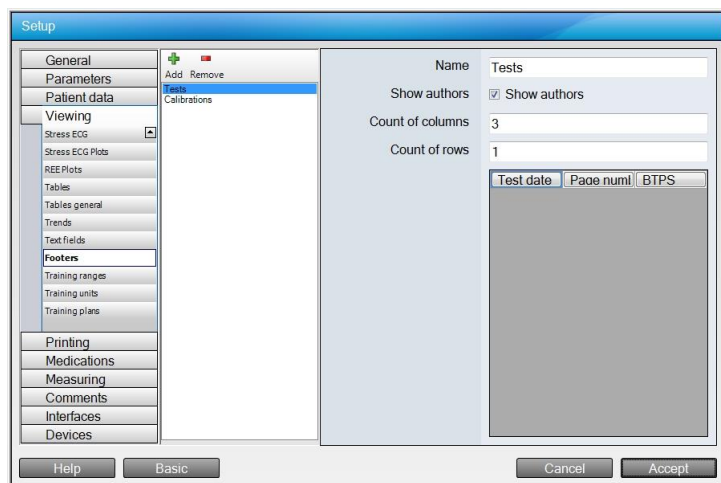
Settings	Function
Width	Text field width in percent of the entire width
Text	Configuration of the displayed text
Font size	Adjust the font size
Background	Adjust whether the text field should have a background
Colour	Clicking the setup button opens a window where the text colour can be selected
Font style	Adjust the font style
Horizontal alignment	Adjust whether the text should be displayed on the left, in the center or on the right
Vertical alignment	Adjust whether the text should be displayed on the left, in the center or on the right

It is possible to display text as well as Auto Information within the text fields. Auto Informations can include patient data, measurement results, user-defined selection areas as well as other information's on the performed measurements. The following displays the possible Auto Information types:



Depending on the selected information type, different choices are available in the field **Parameter**.

3.4.20 Viewing – Footers

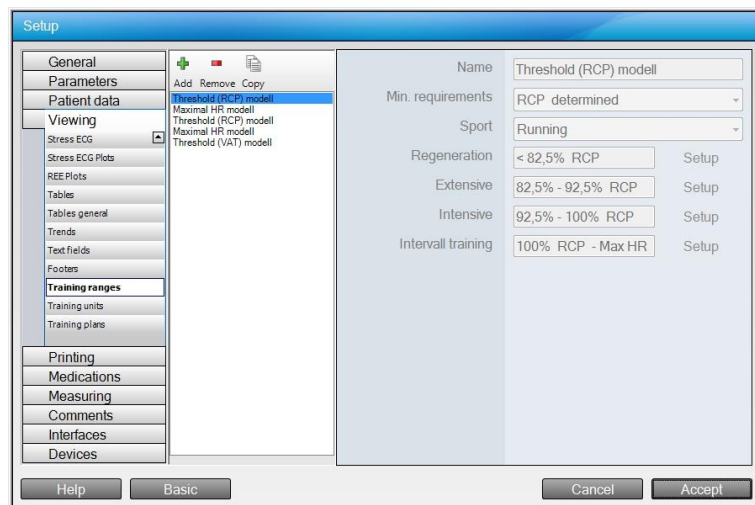


Blue Cherry allows the configuration of footers for the bottom of the printed report these can be configured under the menu Viewing – Footers.

Settings	Function
Show Authors	Shows the list of authors used for the reference value set
Count of Columns	Determines the number of columns in the footer
Count of Rows	Determines the number of Rows in the footer

After clicking a footer element a selection windows opens. Here it is possible to select an element and by clicking the **Accept** button it is possible to include the selected element into the footer.

3.4.21 Viewing – Training ranges



For every training range there is an entry in the selection area. For every additional added training range the following settings can be made:

Settings	Function
Min. requirements	Selection of minimum requirements for this training range: None, Max. HR reached, AT determined, RCP determined and AT and RCP determined
Sport	Selection of sports. Possibility to select between running and cycling
Regeneration	Configuration of Regeneration training area
Extensive	Configuration of Extensive training area
Intensive	Configuration of Intensive training area
Intervall training	Configuration of Interval training area

After selecting setup the following screen appear:

Setup training range

HR range description

Intensity description

Training description

Lower HR

Upper HR

HR determined directly

HR determined directly

Setup

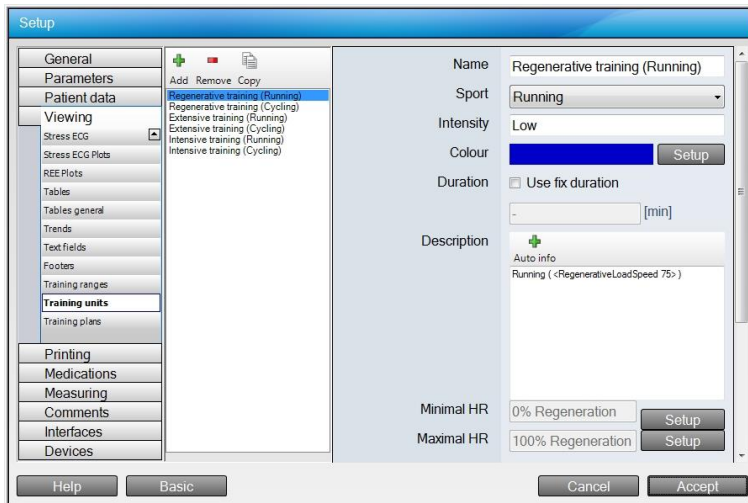
Setup

Cancel

Accept

It's possible to enter description for HR range, Intensity, Training description, lower and upper HR. After selecting the „Setup“ button, a formula editor appear which allow to enter the calculation method.

3.4.22 Viewing – Training units



For every training unit there is an entry in the selection area. For every training unit the following settings can be made:

Settings	Function
Sport	Selection of sports. Possibility to select between running and cycling
Intensity	Enter the intensity
Colour	Selection of colour
Duration	If activated the entered duration will be used. If not activated the duration will be set automatically.
Description	Description of training unit
Minimal HR	Setting for minimum HR
Maximal HR	Setting for maximum HR
Energieverbrauch	If activated the energy consumption will be calculated taking the total duration of training unit into account.

3.4.23 Viewing – Trainings plans

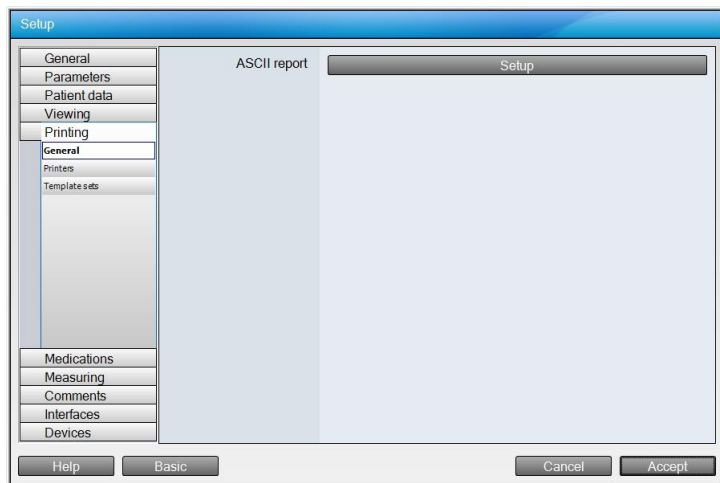
For every training plan there is an entry in the selection area. For every training plan the following settings can be made:

Settings	Function
Sport	Selection of sports. Possibility to select between running and cycling
Days/Week	Selection of lower and upper limit for training days per week
Weeks	Selection of lower and upper limit for total duration of training in weeks
Duration/Unit	Selection of lower and upper limit for duration of single training unit
Definition mode	Selection if the training plan should be created cyclic or per week
Units	Possibility to add the predefined training units
General hints	Possibility to add general comments to the training plan.

3.5 Printing

The Printing section allows configuring the printer as well as smart report templates for summary reports.

3.5.1 Printing – General

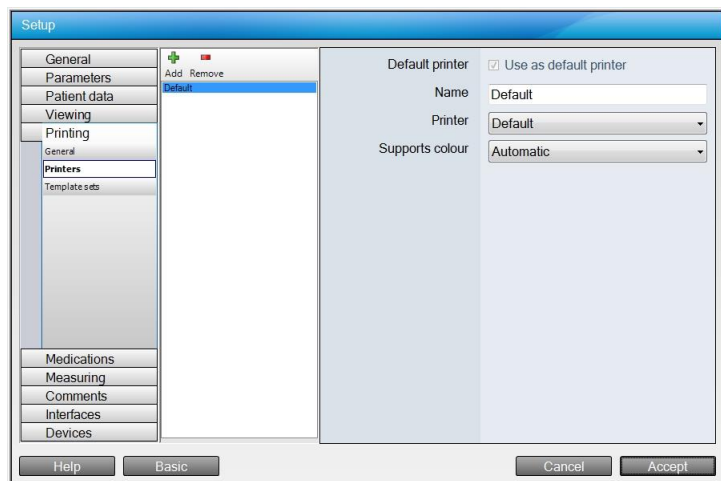


Settings	Function
ASCII report	The „Setup“ Button will allow to configure the ASCII report

The following settings are possible:

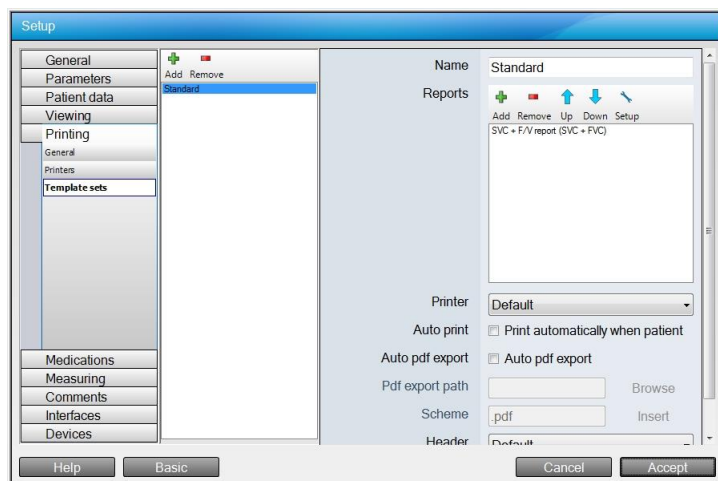
Settings	Function
Patient data	Configuration of patient data content
Table columns	Configuration of table columns. You can select between „Fix width for columns“ and “Columns separated by tabs”.
Headers width	Setting of header width
Content width	Setting of data width

3.5.2 Printing – Printers



Settings	Function
Default printer	If activated, the selected printer will be the default printer for Blue Cherry
Name	Name of the printer
Printer	Selection of the installed windows printers
Supports colour	Configuration of the colour support. User can select between - Automatic(colour setting as defines in windows) - Yes (always use colour) - No (black and white)

3.5.3 Printing – Template Sets

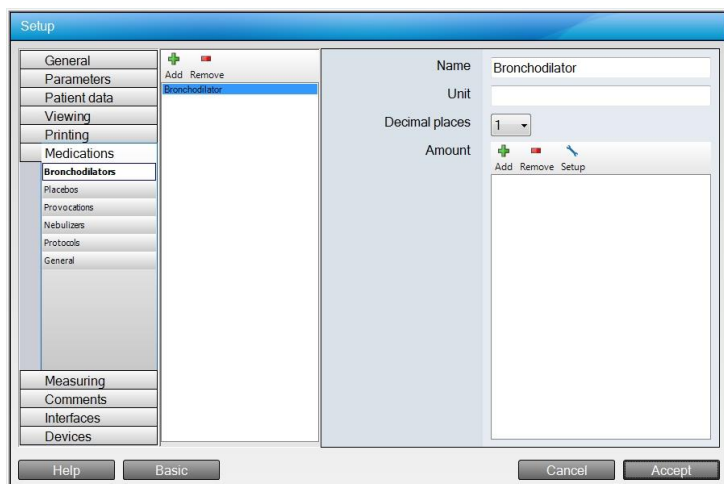


Settings	Function
Name	Name of the report template
Reports	Configuration of the reports included in the template
Printer	Configuration of the printer used for this report
Auto print	If activated Blue Cherry will print automatically when the patient will be closed
Auto pdf export	If activated Blue Cherry will automatically print when the program will be closed
PDF export path	Configuration of the folder where the PDF will be created
Scheme	Setting of the filename content
Header	Configuration of the Header used for this report
Footer	Configuration of the Footer used for this report

3.6 Medications

The Medications section allows configuration of any medication or provocation agent that may be used during testing

3.6.1 Medications – Brochodilators



For every Bronchodilator in Blue Cherry there is an entry in the selection area. By using the buttons at the top of the selection area it is possible to add or delete bronchodilators. The following settings are displayed in the configuration area:

Settings	Function
Name	Name of the Bronchodilator
Unit	Unit type for this Bronchodilator
Decimal places	Number of decimal places (0 – 3) to show in dosage measurement
Amount	Displays the quantities or dosage in which the Bronchodilator is to be given.

Selecting the **Add** button will open the following window to allow the input of new dosage values.

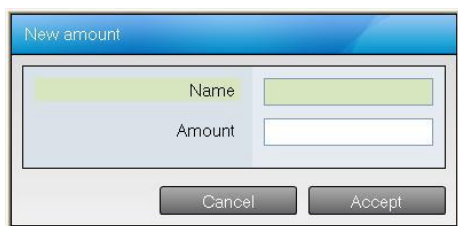
Settings	Function
Name	Name for the dosage value, if no name is entered only the quantity value appears in the list. Otherwise the name will be displayed before the quantity.
Amount	Amount of dosage.

3.6.2 Medications – Placebos

For every Placebo in Blue Cherry there is an entry in the selection area. By using the buttons at the top of the selection area it is possible to add or delete placebos. The following settings are displayed in the configuration area:

Settings	Function
Name	Name for the Medication Placebo
Unit	Adjust the unit
Decimal places	Number of decimal places (0 – 3) to show in dosage measurement
Amount	Displays the quantities or dosage in which the Placebo is to be given.

Selecting the **Add** button will open the window as illustrated to allow input of new dosage values:



Field	Description
Name	Name for the dosage value, if no name is entered only the quantity value appears in the list. Otherwise the name will be displayed before the quantity.
Amount	Amount of dosage.

3.6.3 Medications – Provocation

For every Provocation in Blue Cherry there is an entry in the selection area. By using the buttons at the top of the selection area it is possible to add or delete provocations. The following settings are displayed in the configuration area:

Field	Description
Name	Name of the provocation
Cumulative	Selection for Cumulative dose; If activated doses are cumulated for display in each stage.
Unit for dose	Unit type for dosage
Digits for Dose	Number of Decimal places (0 – 3) shown for dosage
Unit for conc.	Unit type for concentration
Digits for conc.	Number of decimal places shown for concentration
Concentrations	Concentrations of the dosage

Selecting the **Add** button will open the window as illustrated to allow input of new dosage values:

Field	Description
Name	Name for the dosage value, if no name is entered only the quantity value appears in the list. Otherwise the name will be displayed before the quantity.
Amount	Amount of dosage.

3.6.4 Medications – Nebulisers

The screenshot shows the 'Setup' window with the 'Nebulizers' tab selected in the left sidebar. The main configuration area displays the following details for a nebulizer named 'Devilbis 646':

- Name:** Devilbis 646
- Unit:** µl
- Nebulized amount:** 9
- Decimal places:** 0 (selected from a dropdown menu)

Buttons for 'Add', 'Remove', 'Mannitol Capsule', and 'Exercise' are located above the configuration fields. At the bottom of the window are buttons for 'Help', 'Basic', 'Cancel', and 'Accept'.

For every Nebulizer in Blue Cherry there is an entry in the selection area. By using the buttons at the top of the selection area it is possible to add or delete nebulizers. The following settings are displayed in the configuration area:

Field	Description
Name	Name of the Nebuliser Protocol
Unit	Unit of nebulizer performance
Nebulized amount	Amount of medication to be nebulised
Decimal places	Number of decimal places selectable from 0 to 3

3.6.5 Medications – Protocols

For every Protocol in Blue Cherry there is an entry in the selection area. By using the buttons at the top of the selection area it is possible to add or delete protocols. The following settings are displayed in the configuration area:

Field	Description
Name	Name of the Protocol
Medicament	Selection of the Medicament used for this protocol
Nebulizer	Selection of the Nebulizer used for this protocol
Parameter 1	Configuration of parameter 1 used for this protocol
Limit 1	Configuration of PD20 threshold calculation. The threshold will be calculated if the parameter exceeds the absolute difference in percentage of base or the difference between 2 stages exceed the entered value between stages.
Parameter 2	Configuration of parameter 2 used for this protocol
Limit 2	Configuration of PD100 threshold calculation. The threshold will be calculated if the parameter

	exceeds the absolute difference in percentage of base or the difference between 2 stages exceed the entered value between stages.
Placebo	Selection of the Placebo used for this protocol
Placebo puffs	Number of nebulization for the Placebo
Placebo timers	Configuration of the timer used in the placebo phase
Stages	Configuration of the provocation phases
Provo timers	Configuration of the timers used during provocation
Provostik	Settings for the Provostik

Clicking the add button in the section phases will open a menu to configure a new stage of the provocation test.

Setup provocation stage

WARNING: Please ensure dosage and parameters are correct

Name: Step 5

Medication: Metacholin [Setup]

Dose: 959

Concentration: Concentration 5 (1) [Setup]

Nebuliser: Devilbis 646 [Setup]

Nebulisations: 5

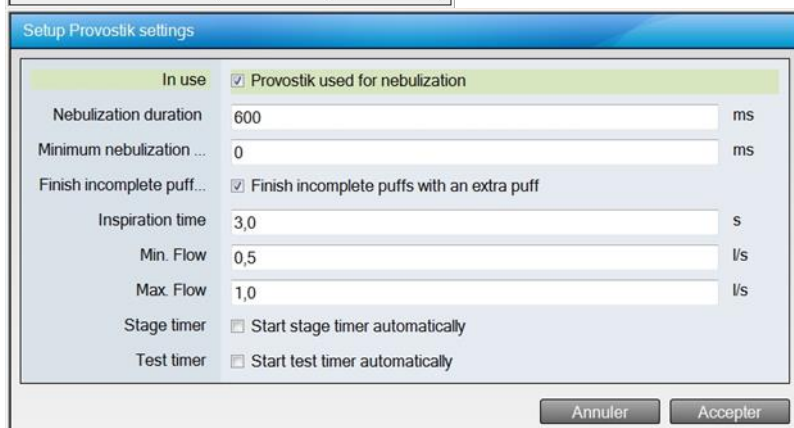
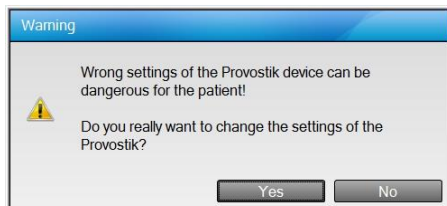
[Proposal]

[Cancel] [Accept]

Settings	Function
Name	Stage Name
Medication	Selection of the medication for given stage. Medication can be selected from the drop down menu.
Dose	Input or calculation of cumulative dose. By clicking the Proposals button the software will show a table with proposals of dosage, concentration, nebulisations and nebulizer after entering the desired dosage. After selecting one line and clicking the Accept button the corresponding configuration will be taken over to the previous menu. By clicking the headlines it is possible to sort the list ascending and descending after dosage, concentration, nebulisations as well as nebulizer.
Concentration	Selection of the concentration for the stage; can be selected from the drop down menu
Nebuliser	Selection of the nebuliser type for the given stage; can be made from the drop down menu

Nebulisations	Configure the number of nebulisations for the given stage
---------------	---

Clicking the Provostik button will open a menu to configure the Provostik device. Prior to the configuration menu a warning screen will appear.



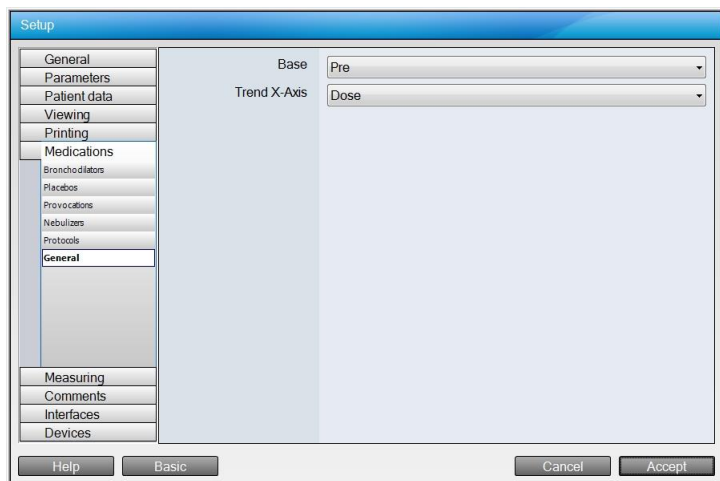
Settings	Function
In use	If activated, Blue Cherry will use the Provostik device
Nebulization duration	Configuration of the nebulization duration in ms
Minimum nebulization	Configuration of the minimum nebulization duration in ms
Finish incomplete puff	If activated, a nebulization shorter than the configured nebulization time will be completed with the next inspiration
Inspiration time	Recommended inspiration time for each breath
Min. Flow	Recommended minimum flow for each breath
Max. Flow	Recommended maximum flow for each breath
Stage timer	If activated, the stage timer will be started

	automatically after the stage has been completed
Test timer	If activated, the stage timer will be started automatically after the stage has been completed

Please see the following table giving important information with regards to stage and test timer according to the ERS recommendation.

Settings	Function
Stage timer	Adjust time between 2 stages, according to ATS /ERS the stage should be kept constant at 5 minutes (300 seconds)
Test timer	Determine time interval after inhalation of the provocation and before measurement. According to ATS/ERS measurements should be made at 30 seconds and 90 seconds after the inhalation. By using the available buttons further intervals can be added or removed.

3.6.6 Medications – General



Settings	Function
Base	Adjust whether the pre or placebo measurement should be the base measurement for the provocation
Trend X-Axis	Adjust whether the dosage or the concentration specifies the X-Axis label.

3.7 Measuring

The Measuring section allows the configuration of the measurements within Blue Cherry.

3.7.1 Measuring – General

The screenshot shows the 'Setup' window with the 'Measuring' section selected. The 'General' tab is active. The settings are as follows:

- Sensor code:** ☒ enter per patient
- Auto BTPS entry:** Never
- BTPS Interval:** 30 Minutes
- Save auto tests to:** Selected patient at test start
- Intra day:** ☐ Intra day button visible

At the bottom of the window are buttons for 'Help', 'Basic', 'Cancel', and 'Accept'.

Settings	Function
Sensor code	If activated, the user will be asked to input the sensor code of the flow sensor before the first measurement with a new patient.
Auto BTPS entry	Adjust whether the BTPS window should be displayed automatically
BTPS Interval	Time interval for the BTPS entry window
Save auto tests to	Adjust where the automatic measurements should be saved to
Intra Day	If activated, Blue Cherry will allow to perform Intra Day test

In the line Auto-BTPS the following selections are available:

Never

Never

For every patient

Fix interval

Before first test of day

Settings	Function
Never	The BTPS entry window will not be shown automatically to enter the ambient conditions
For every patient	With every new patient the BTPS entry window will be shown automatically before the measurement
Fix interval	The BTPS entry window will appear in fix time intervals. This interval can be defined in the line BTPS Interval.
Before first test of day	The BTPS entry window appears once a day before the first measurement is done

In the line save auto tests to the following settings can be done:

Selected patient at test start

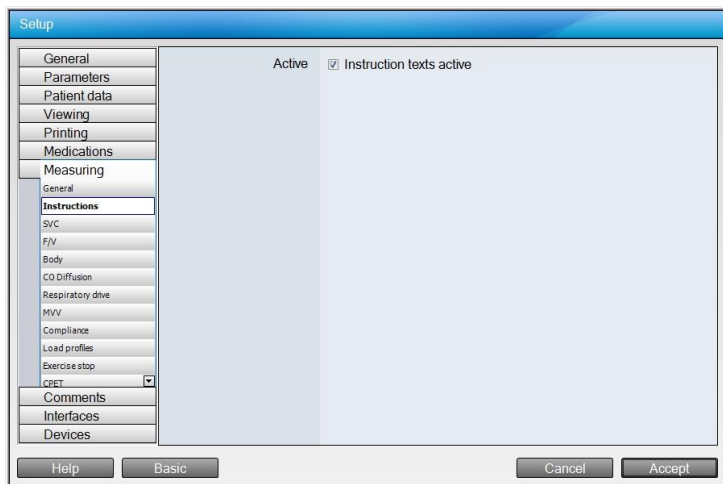
Selected patient at test start

Selected patient at test start, confirmation when saving

Selection when saving patient

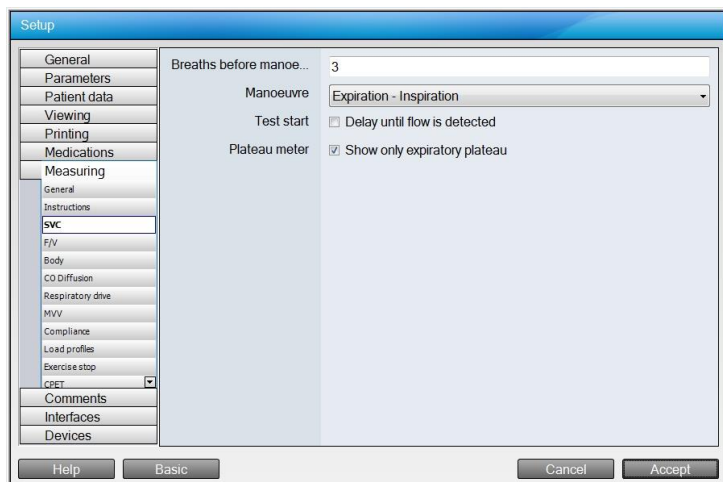
Settings	Function
Selected patient at test start	The measurement will be saved to the patient who is selected by the start of the test
Selected patient at test start, confirmation when saving	The measurement will be saved to the patient who is selected by the start of the test but has to be confirmed before saving
Selection when saving patient	When saving the test may be assigned to a user selected patient

3.7.2 Measuring – Instructions



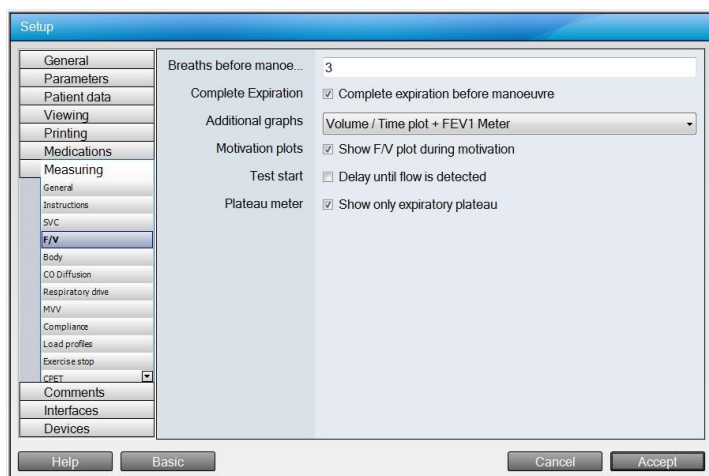
Field	Description
Active	If activated help texts will be displayed at the top of the screen during measurements.

3.7.3 Measuring – SVC



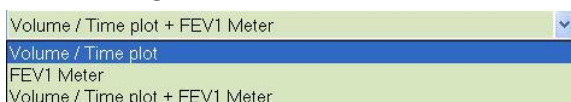
Settings	Function
Breaths before manoeuvre	Configure the number of tidal breaths before the maximal manoeuvre
Manoeuvre	Configuration of the maximal manoeuvre. Using the drop down menu it is possible to select whether after tidal breathing a deep expiration is followed by a slow maximal Inspiration (IVC) or whether a slow deep inspiration followed by a slow maximal exhalation (Vcex) should be done.
Test start	If activated, a measurement curve will be displayed after detecting the flow signal.
Plateau meter	If activated, only the speedometer of the expiratory plateau will be displayed.

3.7.4 Measuring – F/V



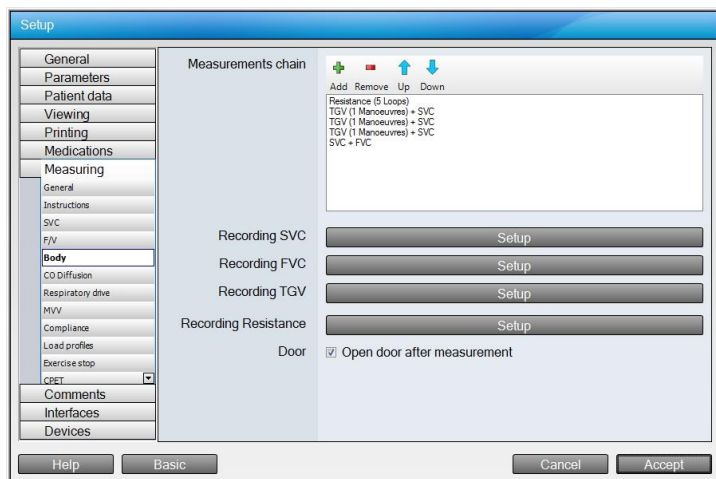
Settings	Function
Breaths before manoeuvre	Configure the number of tidal breaths before the maximal manoeuvre
Complete Expiration	If activated, a slow deep expiration has to be performed before the maximal manoeuvre starts
Additional graphs	Configuration of additional graphs
Motivation plots	If activated, the F/V graph will be shown additionally to the motivation plots
Test start	If activated, a measurement curve will be displayed after detecting the flow signal.
Plateau meter	If activated, only the speedometer of the expiratory plateau will be displayed.

The following selections can be made in the line additional graphs:



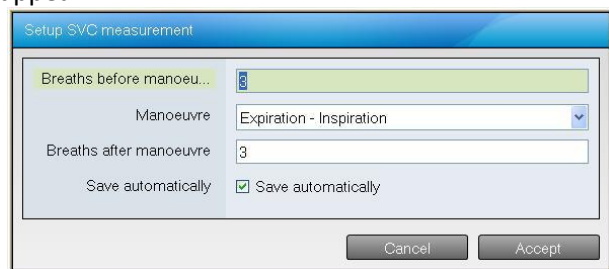
Settings	Function
Volume/Time plot	Only the Volume/Time curve will be shown additionally to the F/V graph
FEV1 Meter	Only the FEV1 bar chart will be shown additionally to the F/V graph
Volume/Time plot + FEV1 Meter	Both, the Volume/Time curve and the FEV1 bar chart will be shown additionally to the F/V graph

3.7.5 Measuring – Body



Settings	Function
Measurements chain	Allows to set when a test has to be done
Recording SVC	Allows the adjustment of the SVC test
Recording FVC	Allows the adjustment of the FVC test
Recording TGV	Allows the adjustment of the TGV test
Recording Resistance	Allows the adjustment of the Resistance test
Door	If activated, the cabin door will be opened after the performed tests

After clicking the **Setup** button in the SVC line the following window will appear:



Settings	Function
Breaths before manoeuvre	Number of breaths that had to be performed before the manoeuvre
Manoeuvre	Configure the test manoeuvre
Breaths after manoeuvre	Number of breaths that had to be performed after the manoeuvre
Save automatically	If activated, the test will be saved automatically

After clicking the **Setup** button in the FVC line the following window will appear:

Setup FVC measurement

Breaths before manoeuvre... 10

Complete Expiration ☒ Complete expiration before manoeuvre

Breaths after manoeuvre 3

Save automatically ☒ Save automatically

Cancel Accept

Settings	Function
Breaths before manoeuvre	Number of breaths that had to be performed before the manoeuvre
Complete expiration	If activated, the patient has to perform a complete exhalation before the test
Breaths after manoeuvre	Number of breaths that had to be performed after the manoeuvre
Save automatically	If activated, the test will be saved automatically

After clicking the **Setup** button in the TGV line the following window will appear:

Settings	Function
Breaths before TGV	Define the number of breaths that had to be performed before the test
Shutter	If activated, the shutter will be triggered automatically
Shutter duration	Choice whether the shutter duration should be displayed as Fix time or Fix count of breaths and how long or for how much breaths the shutter will be closed
Open shutter	Choose when to open the shutter. Immediately, Next expiration or Next inspiration
Manoeuvres / Test	Number of TGV manoeuvres per test
Breath between manoeuvres	Number of tidal breathing cycles between TGV manoeuvres
Resting expiratory pos.	If activated Blue Cherry will correct volume drift between different TGV manoeuvres
TGV followed by	Adjust which tests should be done after TGV. There are IC manoeuvre, ERV manoeuvre, IC and SVC manoeuvre, ERV and SVC manoeuvre and No manoeuvre
Breaths after manoeuvre	Define the number of breaths that had to be done after the manoeuvre
Save automatically	If activated, the test will be saved automatically
V/t of TGV-Effort	If activated, the V/t diagram of the TGV test will be saved as SVC test

After clicking the **Setup** button in the Resistance line the following window will appear:

Setup Resistance measurement

Min. Bf 15

Max. Bf 30

Metronome ☒ Show metronome

Breaths before resistance 5

Loops to save All loops

Save automatically ☒ Save automatically

Save as soon as Defined count of loops recorded

Count of loops 5

Cancel Accept

Settings	Function
Min. Bf	Recommended minimal breathing frequency
Max. Bf	Recommended maximal breathing frequency
Metronome	If activated, a metronome will be displayed during the test
Breaths before resistance	Define the number of breaths that had to be performed before the test
Max. Loops/Test	Adjust the number of loops that had to be performed per test
Save automatically	If activated, the test will be saved automatically
Save as soon as	Selection of when to save the test. There are Defined count of loops recorded , All recorded loops are acceptable and All recorded loops are acceptable and reproduceable
Count of loops	Number of loops stored for each resistance test

3.7.6 Measuring – CO Diffusion

The screenshot shows the 'Setup' window for CO Diffusion measurement. The sidebar on the left lists various setup categories, with 'Measuring' selected and 'CO Diffusion' highlighted. The main panel contains the following settings:

- Breaths before manoeuvre:** 4
- Test start:** ☐ Delay until flow is detected
- Shutter:** ☒ Close shutter automatically
- Breath-hold time:** 8
- Method for breath-hold:** Jones and Meade
- Inspiration time:** ☒ Deduct inspiration time from countdown
- Washout volume:** Until plateau
- Sample volume:** Fix volume
- Test hints:** ☐ Show test hints after measurement
- Tests / Day:** 10
- Pause:** ☒ Show warning if pause between tests is too short

Buttons at the bottom include 'Help', 'Basic', 'Cancel', and 'Accept'.

Settings	Function
Breaths before manoeuvre	Define the number of breaths that had to be performed before the test
Test start	If activated, the start will be delayed until a flow is measured
Shutter	Define the number of breaths that had to be performed before the test
Breath-hold time	Adjust how long the patient has to hold breath
Method for breath-hold time	Choose the method that defines the breath-hold time. There are Epidemiologic Standardization Project , Jones and Meade or Ogilvie
Washout volume	Choose the washout volume. There are Fix volume , First third or Until plateau
Sample volume	Choose the sample volume. There are Fix volume or VCEX Third
Test hints	If activated, hints will be shown after the test
Tests/Day	Define the number of tests per day
Pause	If activated, a warning will be shown after a too

	short pause
Pause duration	Define the pause duration in minutes
Ex trigger	Pressure threshold in KPa which will open the shutter at the end of breath hold, if exceeded
Security trigger	Pressure threshold in KPa which will automatically open the shutter during breath hold, if exceeded

After clicking the **Setup** button in the line test hints, the following window will appear:



By pressing and holding the CTRL-Key, multiple points can be selected.

3.7.7 Measuring – Respiratory Drive

The screenshot shows the 'Setup' window for the 'Respiratory drive' section. The sidebar on the left lists various setup categories, with 'Respiratory drive' currently selected. The main area displays three parameters: 'MIP duration' set to 1500 ms, 'MEP duration' set to 1500 ms, and 'P0.1 duration' set to 120 ms. Each parameter has a text input field and a unit dropdown menu. At the bottom of the window, there are four buttons: 'Help', 'Basic', 'Cancel', and 'Accept'.

Settings	Function
MIP duration	Define the duration of shutter occlusion during MIP test in ms
MEP duration	Define the duration of shutter occlusion during MEP test in ms
P0.1 duration	Define the duration of shutter occlusion during P0.1 test in ms

3.7.8 Measuring – MVV

Settings	Function
MVV Period	Duration of the MVV test in s
Test start	If activated, the measuring curve is delayed until a flow signal is detected

3.7.9 Measuring – Compliance

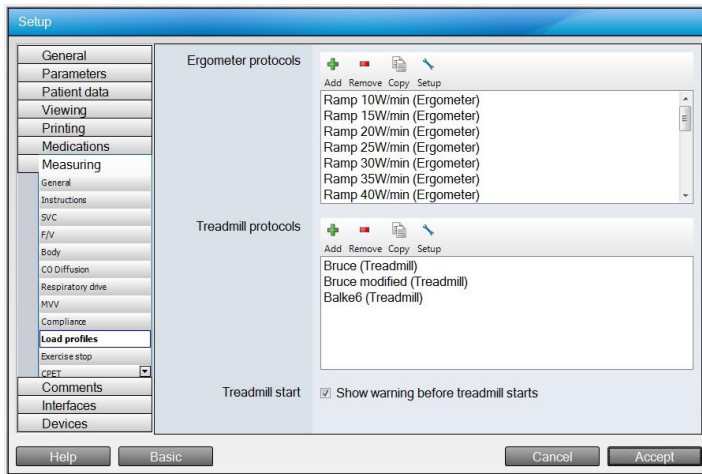
The screenshot shows the 'Setup' window with the 'Compliance' tab selected in the sidebar. The main area contains the following settings:

- Start static after: Undefined (dropdown)
- Static loops: 5 (text input)
- Max. Flow (Static): 1.00 (text input)
- Start dynamic after: Undefined (dropdown)
- Dynamic loops: 5 (text input)
- Min. Bf (Dynamic): 10 (text input)
- Max. Bf (Dynamic): 30 (text input)

At the bottom of the window are buttons for 'Help', 'Basic', 'Cancel', and 'Accept'.

Settings	Function
Start static after	Number of breathing cycles after static compliance loops will be stored
Static loops	Number of loops the software will store
Max. Flow (Static)	Maximal allowed flow during static compliance manoeuvre
Start dynamic after	Number of breathing cycles after dynamic compliance loops will be stored
Dynamic loops	Number of loops the software will store
Min. BF (Dynamic)	Minimal breathing frequency for dynamic compliance test
Max. BF (Dynamic)	Maximal breathing frequency for dynamic compliance test

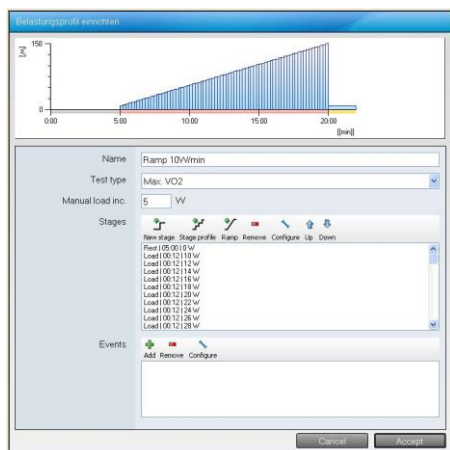
3.7.10 Measuring - Load Profiles



Settings	Function
Ergometer protocols	Add, remove, copy or configure load profiles of cycle or hand crank ergometer
Treadmill protocols	Add, remove, copy, or configure load profiles of treadmills
Treadmill start	If activated, a warning will be shown before the treadmill will starts

By clicking the available buttons it is possible to add, remove, copy or change profiles.

Clicking the Add button in the Ergometer protocol area, a new load profile can be generated. This window will appear:



Field	Description
Name	Name of Protocol
Test type	Choose the test type for which the load profile should be generated and later displayed
Manual load inc.	Increment for the manual load change
Stages	Display or configuration of load profiles
Events	List of predefined events within selected protocol

Clicking 'New stage' from the top of the stages list opens a stage input window; this window allows the user to create a single new stage within the existing protocol:

Settings	Function
Phase	Selection of the load phase. There are Rest , Warmup , Load of Recovery
Duration	Define the length of time of this stage
Load	Define the load level during this stage. By clicking the Equation button a formula editor can be opened which calculates the load value.

Clicking the **Stage profile** button opens the stage configuration window. This allows configuration of multiple stages within a set phase of exercise:

Settings	Function
Phase	Selection of the load phase. There are Rest , Warmup , Load of Recovery
Stage duration	Define the length of time of each stage
Count of Stages	Determine the number of stages within phase
Initial load	Set the start load value
Load increment	Set the load increment per stage

Clicking the **Ramp** button opens the ramp configuration window. This allows the configuration of a ramp protocol:

Field	Description
Phase	Selection of the load phase. There are Rest , Warmup , Load of Recovery
Total duration	Total duration of the ramp load
Stage duration	Duration of one stage
Initial load	Set the start load value
Load increment	Set the load increment per stage

Clicking the **Remove** button will remove the selected stage out of the profile. The button **Configure** allows to change the settings of a selected stage and by clicking the up or down button the order of the list can be changed.

The area Events allows configuring events for the load profile. Events are for example enter or measure blood pressure, record tidal loops or mark or entry blood gases. With the available buttons it is possible to add, remove or change events.

Setup event

Trigger: Fix timepoint

Phases: Rest, Warmup, Load, Recovery

Event: Measure blood pressure

Timepoint: 0 : 0 min : sec

Cancel Accept

Settings	Function
Trigger	Configure when the events should be started. There are Fix Intervalls , Fix timepoint and Trigger by load stage .
Phases	Adjust in which phase the event should be triggered. By pressing and holding the CTRL-Key it is possible to select multiple selections.
Event	Adjust which event should be triggered. There are Measure blood pressure , Record tidal breathing and Measure blood gases
Timepoint	Specify the interval at which the event should be triggered.

3.7.11 Measuring - Exercise stop

The screenshot shows the 'Setup' window for configuring exercise stop reasons. On the left, a sidebar contains a tree view with categories: General, Parameters, Patient data, Viewing, Printing, Medications, Measuring, and Exercise stop (selected). Under 'Exercise stop', there is a list of reasons: 'Predicted HR reached' and 'Predicted load reached'. Above this list are 'Add' and 'Remove' buttons. The main configuration area on the right is for 'Predicted HR reached'. It includes fields for 'Name' (Predicted HR reached), 'Parameter' (HR), 'Limit' (ref(8011)), 'Condition' (Bigger), and 'Reaction' (checkbox for 'Stop exercise automatically'). Each of these fields has a 'Setup' button next to it. At the bottom of the window are 'Help', 'Basic', 'Cancel', and 'Accept' buttons.

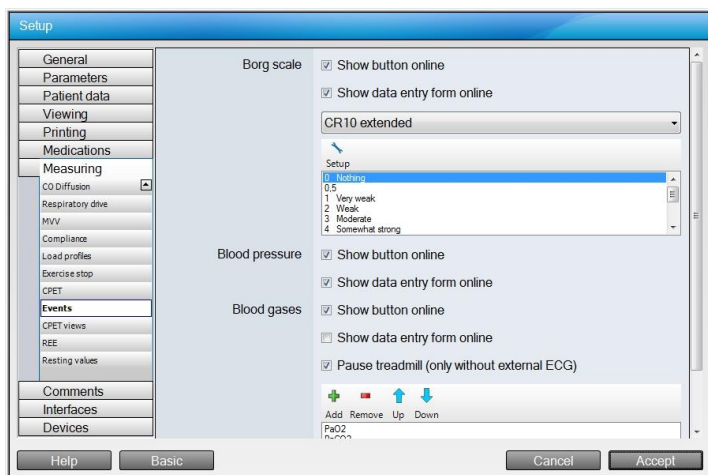
In the selection area it is possible to add or remove exercise stop reasons. The following settings are available:

Settings	Function
Name	Name of the reason for stopping
Parameter	Adjust the parameter, which is being monitored for load termination
Limit	Set the limit used for determination of stopping the test.
Condition	Adjust the condition. There is a choice between bigger and smaller .
Reaction	If activated, the load will be stopped by reaching the exercise stop reason

3.7.12 Measuring - CPET

Settings	Function
MVV from FEV1	Adjust how the MVV should be calculated. In this example 35 x FEV1 (measured)
Mask deadspace (ml)	Configure the dead space value of the mask or mouthpiece being used for testing
Tube length	Adjust the length of the tube
Blood pressure confir..	If activated the result of automatic BP measurement need to be confirmed
Insp. Totraum	Setting of inspiratory dead space. Need to be adjusted if apparatus in front of flowsensor will be added to manage different source of inspired gas concentration.
FIO2	If activated FiO2 will be set to 20.94
Enable logging	If activated, the raw data of the CPET measurement will be saved additionally.

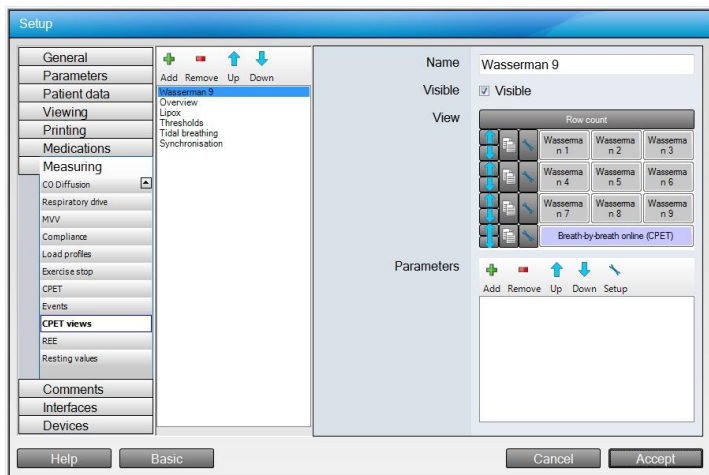
3.7.13 Measuring - Events



Here it is possible to adjust how the events Borg input, blood pressure and blood gases should be treated during the test. It is possible to create and enter all the events after the test.

Settings	Function
Borg Scale	Adjust whether the button should be displayed during the test and what to do after clicking the button. If activated the Borg scale will be shown during the test. From the drop down menu at the bottom of this section the Borg scale type can be selected. There are from 0 to 10 (CR 10), from 0 with 0.5 to 10 (CR 10 extended) and from 6 to 20 (RPE). The “Setup” button will allow changing the Text shown in the Borg scale.
Blood pressure	Adjust whether the button should be displayed during the test and what to do after clicking the button. If activated, the entry window for the blood pressure will be displayed during the test.
Blood gases	Adjust whether the button should be displayed during the test and what to do after clicking the button. If activated, the entry window for the blood gases will be displayed during the test. The parameters of the blood gas input and the order can be configured separately.

3.7.14 Measuring - CPET views



In the selection area it is possible to add or remove CPET views as well as changing their order. The following settings are available:

Settings	Function
Name	Name of the configuration
Visible	If activated the configuration will be visible as a tab during the CPEx test
View	Configuration of the display
Parameters	Configuration of the parameters

In the view section it is possible to change the number as well as the type of the displayed elements. By clicking the Row count button it is possible to define the number of the displayed rows. The button on the left of every row allows changing the number of elements per row as well as to define the height of the row in percent of the overall height. After clicking one element the following settings are available:

Setup element

Width: 33.1 %

Type: CPET graphic

CPET graphic: Wasserman 1

Cancel Accept

Settings	Function
Width	Width of the element in percent of the overall width
Type	Adjust the element type
CPET graphic	Adjust the element

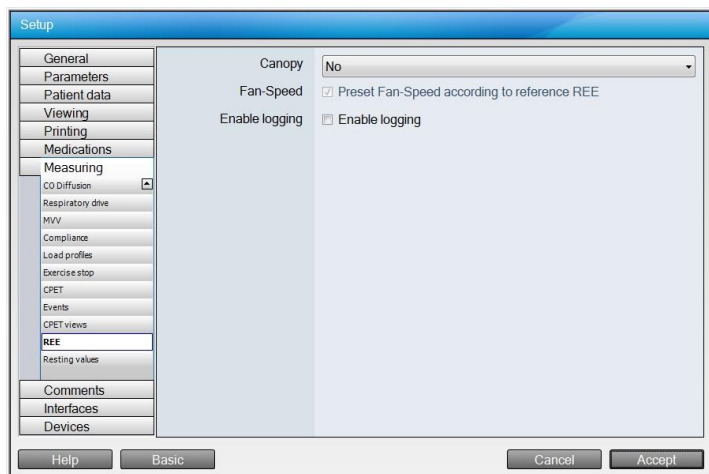
The following element types are available:

- Test data table
- Interpretation table
- Test data table
- Thresholds table
- Tidal loops table
- Tidal loops
- Lung function table
- Signal synchronisation
- SpO2 Plethysmogram

Depending on the chosen element type several elements are available in the CPET graphics line. The following picture shows the choices for the element type test table data:

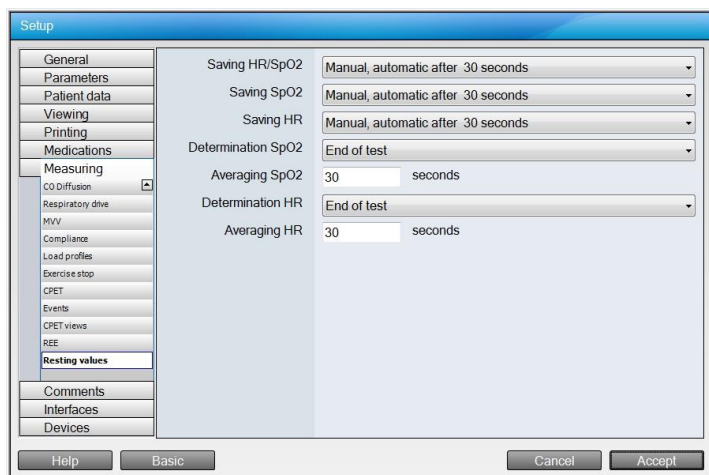
- Load stages (CPET)
- Breath-by-breath (CPET)
- Equidistant test data (CPET)
- Load stages (CPET)
- Breath-by-breath online (CPET)
- Load stage online (CPET)
- Equidistant data online (CPET)
- Blood gases (CPET)
- LIPOXmax load stages (CPET)

3.7.15 Measuring REE



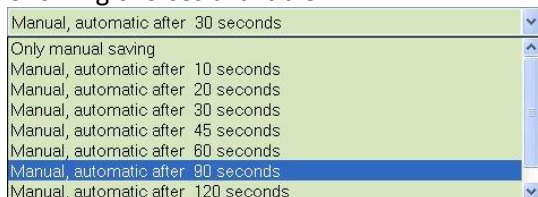
Settings	Function
Canopy	Select weather the test will be done with Canopy. Customer can select between yes, no and ask before test
Fan-Speed	If activated Blue Cherry will set fan speed automatically according to predicted REE. In addition the fan speed can be adjusted manually during test.
Enable logging	If activated, the raw data of the REE measurement will be saved additionally

3.7.16 Measuring – Resting values



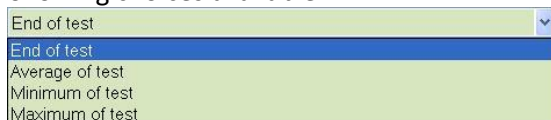
Settings	Function
Saving HR/SpO2	Adjust how or after which time the HR/SpO2 measurement should be saved.
Saving SpO2	Adjust how or after which time the SpO2 measurement should be saved.
Saving HR	Adjust how or after which time the HR measurement should be saved.
Determination SpO2	Adjust how the parameter SpO2 should be calculated
Averaging SpO2	Adjust the time-based averaging
Determination HR	Adjust how the parameter SpO2 should be calculated
Averaging HR	Adjust the time-based averaging

In the lines **Saving HR/SpO2**, **Saving SpO2** and **Saving HR** there are the following choices available:



Here it is possible to choose whether the measurement should be saved manually or automatically after a set time.

In the lines **Determination SpO2** and **Determination HR** there are the following choices available:



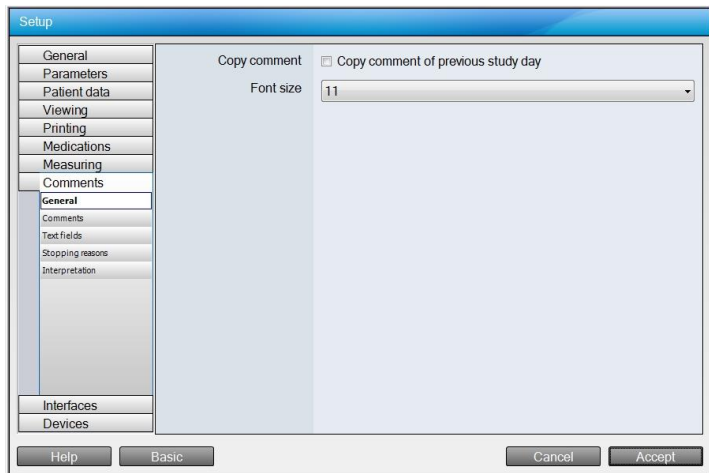
Here it is possible to define how the corresponding parameter should be calculated.

Settings	Function
End of test	The current value when you save and end the test will be saved.
Average of test	The average of the test will be saved
Minimum of test	The minimum value is stored
Maximum of test	The maximum value is stored

3.8 Comments

The comments section allows the configuration of the comments and interpretation sections of the software.

3.8.1 Comments - General



Settings	Function
Copy comment	If activated Blue Cherry will carry comment from previous study day
Font size	Define the font size for the comment

3.8.2 Comments - Comments

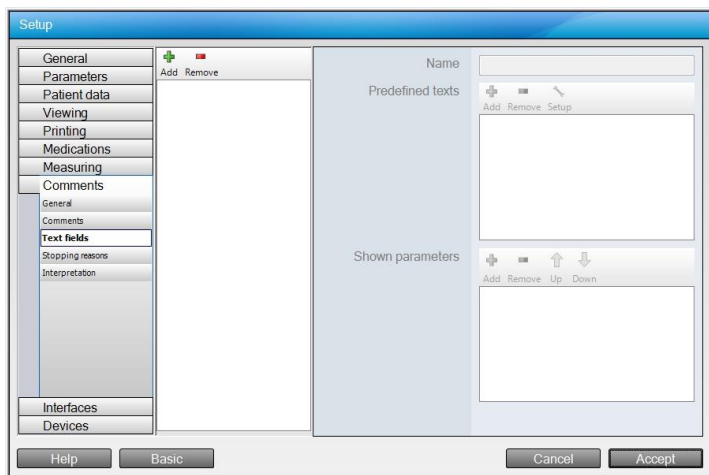
The screenshot shows the 'Setup' dialog box with the 'Comments' tab selected. The left sidebar lists various setup categories, with 'Comments' highlighted. The main area displays a table of comments. The 'Normal' comment is selected, showing its details: Name 'Normal', Measurement type 'Unspecific', and Comment 'Auto info' and 'Normal'. Buttons for 'Add', 'Remove', 'Cancel', and 'Accept' are at the bottom.

For every comment there is an entry in the selection area where it is possible to add or remove comments. The following settings are available in the configuration area:

Settings	Function
Name	Define the name of the comment
Measurement type	Define which measurement type the comment is applicable to. The relevant measurement type can be selected from the drop down menu
Comment	Determine the text value applicable to the pre-determined comment

In the comment text box it is possible to enter both text as well as Auto Info by clicking the identical button. Auto Info can include patient data, test results, user-defined selection areas and other information of performed tests.

3.8.3 Comments – Text fields



For every text field there is an entry in the selection area where it is possible to add or remove comments. The following settings are available in the configuration area:

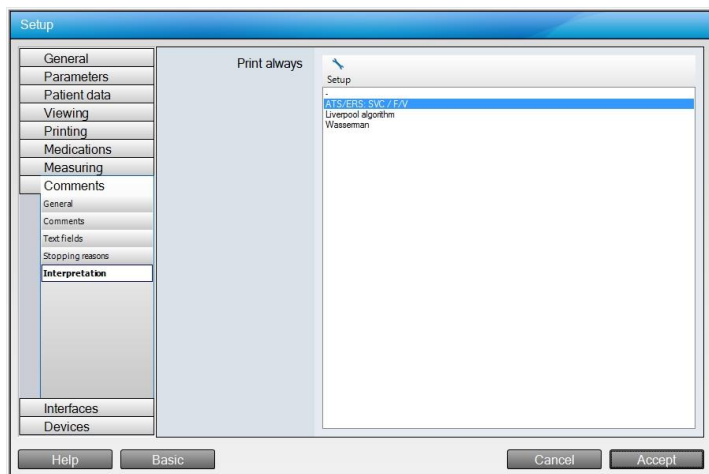
Settings	Function
Name	Name of the text field
Predefined texts	Configuration of predefined text fields
Shown parameters	Configuration of parameters that appear in addition to the text fields

3.8.4 Comments – Stopping reasons

For every stopping reason there is an entry in the selection area where it is possible to add or remove comments. The following settings are available in the configuration area:

Settings	Function
Name	Name of the stopping reason
Measurement type	Configure in which measurement type the stopping reason will appear
Comment	Input field for the text of the stopping reason.

3.8.5 Comments - Interpretation

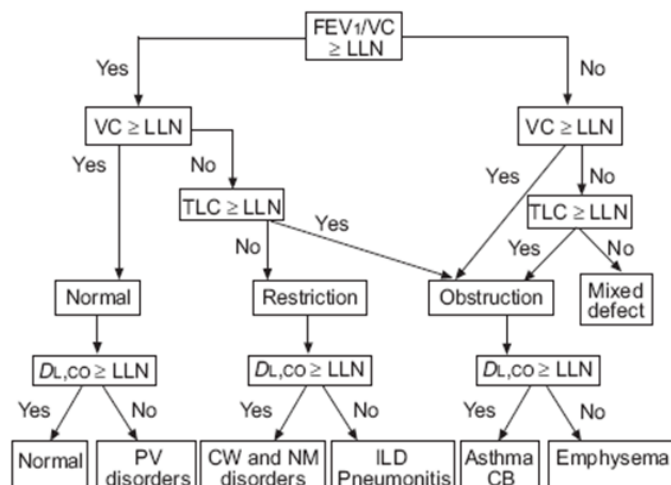


Here the automatic interpretation can be edited. In the configuration area it is possible to choose one of the available interpretation algorithms or no automatic interpretation. The resulting interpretation text is inserted automatically into the comment field of Blue Cherry, but can be deselected there. The following table shows the possible interpretation texts of the Liverpool algorithm:

Interpretation	Text
Normal	Normal lung function. For a further interpretation the determination of the DLCO (Diffusion capacity) is recommended.
Restriction	Assuming optimal cooperation a restrictive lung disease is suspected. For a further interpretation the determination of the DLCO (Diffusion capacity) is recommended.
Obstruction	Assuming optimal cooperation an obstructive lung disease is suspected. For a further interpretation the determination of the DLCO (Diffusion capacity) is recommended.
Mixed ventilatory defect	Assuming optimal cooperation a mixed ventilatory defect is suspected. For a further interpretation the determination of the DLCO

(Diffusion capacity) is recommended.

The following diagram shows the interpretation algorithm from the ATS/ERS European Respiratory Journal 2005; 26: 948–968:



The interpretation text is only an interpretation suggestion and must always be confirmed by a physician or physiologist.

3.9 Interfaces

In this section it is possible to configure the different Blue Cherry Interfaces.

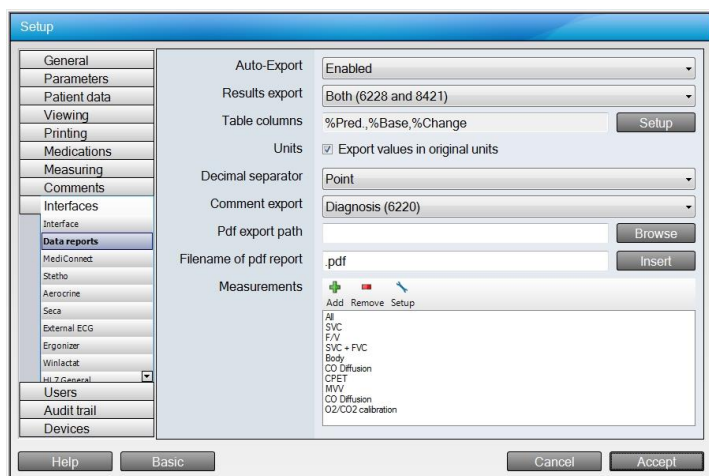
3.9.1 Interfaces – GDT- Interface

The screenshot shows the 'Setup' dialog box for the GDT-Interface. The 'Interface' tab is selected in the left sidebar. The main area shows configuration options for the GDT-Interface, including 'Enabled' (checked), 'Input folder', 'Input filename' (patient), 'Input extension' (Sequential number), 'Output folder', 'Output filename', 'Output extension' (Sequential number), 'File encoding' (ANSI (1252)), 'Overriding' (unchecked), 'Own ID', 'PCS ID', 'Run watchdog' (unchecked), 'Close button' (unchecked), 'Datasets per file' (checked), and 'Interface enabled' (checked). Buttons for 'Help', 'Basic', 'Cancel', and 'Accept' are at the bottom.

Settings	Function
Enabled	If activated, the GDT-Interface is active.
Input folder	Set the folder for ingoing GDT files
Input filename	Set the name for ingoing GDT files
Input extensions	Adjust the extension for ingoing GDT files. It is possible to choose between continuous numbers and *.GDT
Output folder	Set the folder for outgoing GDT files
Output filename	Set the name for outgoing GDT files
Output extension	Adjust the extension for outgoing GDT files. It is possible to choose between continuous numbers and *.GDT
File encoding	Set the character set for the GDT transfer.
Overriding	If activated, existing files will be overwritten by the next export.
Own ID	Set the ID for the measurement system

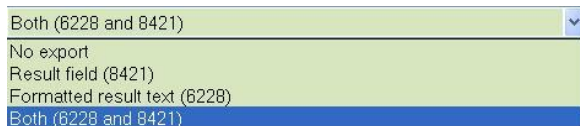
	which will be transferred by GDT.
PCS ID	Selectable receiver ID for the hospital information system which will be transferred via GDT
Run watchdog	If activated, a windows auto start routine will scan the selected input folder and Blue Cherry will start automatically if a GDT file can be found.
Close button	If activated, Blue Cherry will be minimized by clicking the close button. This reduces the GDT call of Blue Cherry.
Datasets per file	If activated, only one GDT file will be exported at a patient with multiple measurements. Otherwise, for each measurement, a single GDT file.
Data size (8100)	Select whether to generate an entry with the GDT identifier 8100 for each transmitted data set or the identifier is used only once to transfer the file size.
Existing patient	If activated, already existing patient data will be overwritten by importing a patient with the same data.
Patient data	If activated, the software will include patient data into GDT file. Otherwise the GDT file will not contain patient information.
After review	If activated, a review has to be performed in front of exporting the test (is requested by 6311)
Changed tests	If activated, changed tests will be exported
Available pages	If activated, only available pages will be transferred.

3.9.2 Interfaces – Data Reports



Settings	Function
Auto-Export	Configuration if the report should be created automatically. User can select between Disabled, Enabled and Report dependent.
Results export	Adjust how the test results will be transferred
Table columns	Configure which information will be transferred in the table columns.
Units	If activated parameter will be transferred in their original unit. Apart from that in the selected unit.
Decimal separator	Configure if dot or comma will be used as separator between decimal places.
Comment export	Adjust how the comment will be exported.
PDF export path	Configure the folder for the PDF file
Filename of pdf report	Configure how the filename will be created
Measurements	Configuration of the device and process specific GDT identifier. With the shown buttons you can add, delete and configure GDT identifiers.

After selecting the drop down menu in the line Results export the following selections will be available:



Settings	Function
No export	Results will not be exported
Result field (8421)	Results will be exported with the 8421 identifier
Formatted result text (6228)	Results will be exported as formatted result text
Both (6228 and 8421)	Results will be exported as result field as well as formatted result text

After selecting the drop down menu in the line Comment export the following selections will be available:



Settings	Function
No export	Comment will not be exported
Comment (6227)	Comment will be exported with the 6227 GDT identifier
Comment (6220)	Comment will be exported with the 6220 GDT identifier

Clicking the setup button at the top of the measurements section opens the following configuration menu.

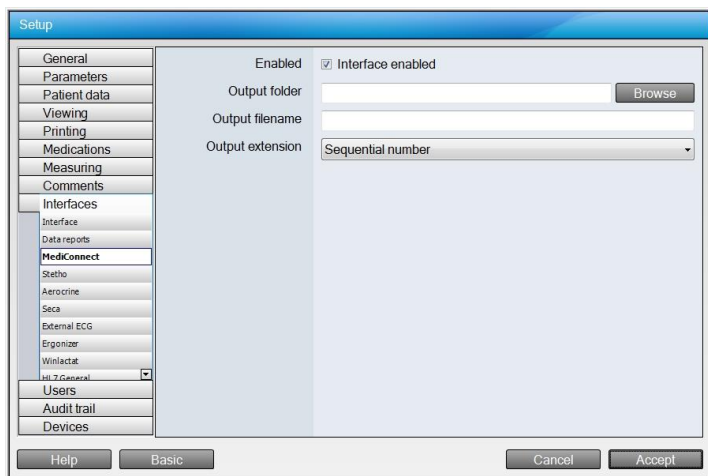
Setup report

Name	F/V
ID in GDT/BDT	LUFU02
Measurement type	F/V
Page to measure	F/V (ID 4)
Start measurement	FVC (Small lung function)
Start of test	☐ Start test automatically
After test:	-
Reviewing page	F/V (ID 4)
Create per	Measurement
Pdf export	Setup
Parameters	+ - ↺ ↻ ↓ Add Remove Setup Up Down FVCEx (FVCEx, Effort, Current) FEV1 (FEV1, Effort, Current) FEV1/FVC (FEV1/FVC, Effort, Current) FEV1/FVC (FEV1/FVC, Effort, Current) PEF (PEF, Effort, Current) MEF25 (MEF25, Effort, Current) MEF50 (MEF50, Effort, Current) MEF75 (MEF75, Effort, Current)

Cancel Accept

Einstellungen	Funktion
ID in GDT/BDT	Configuration of the device and process specific GDT identifier.
Measurement type	Adjust the measurement type
Page to measure	Adjust the measurement type which will be selected if the message Measure will be received
Start measurement	Select which measurement will be started
Start of test	If activated, the test starts automatically
After test	Adjust the behavior of Blue Cherry after a test (minimize of close)
Reviewing page	Adjust the measurement type which will be selected if the message View will be received.
Create per	Configure how report should be created. User can select between Measurement, Stage and Study day.
PDF export	Configuration of the PDF export
Parameters	Adjust the parameter list for GDT export. With the buttons you can add, delete and modify the parameter order.

3.9.3 Interfaces – MediConnect



Settings	Function
Enabled	If activated, the MediConnect interface is turned on
Output folder	Folder for the MediConnect output file
Output name	File name for the MediConnect output file
Output extension	File extension for the MediConnect output file. You can choose between sequential number and *.MC.

3.9.4 Interfaces – Stetho

Setup

General
Parameters
Patient data
Viewing
Printing
Medications
Measuring
Comments
Interfaces
Interface
Data reports
MediConnect
Stetho
Aerocrine
Seca
External ECG
Ergonizer
Winlactat
Int. 2.General
Users
Audit trail
Devices

Enabled ☒ Interface enabled

Input folder

Input filename

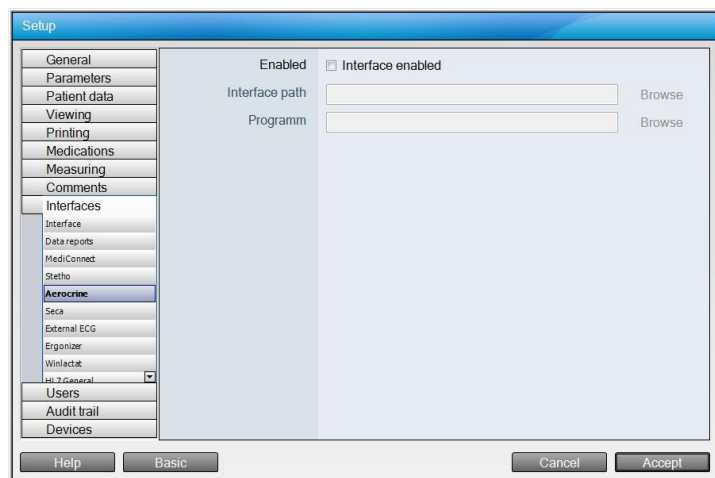
Output folder

Output filename

Close button ☐ Close button only puts Blue Cherry to Standby

Settings	Function
Enabled	If activated, the Stetho interface is turned on
Input folder	Folder for ingoing Stetho files
Input filename	Filename for ingoing Stetho files
Output folder	Folder for outgoing Stetho files
Output filename	Filename for outgoing Stetho files
Close button	If activated, Blue Cherry will be switched into a Standby mode by clicking the close button

3.9.5 Interfaces – Aerocrine



Settings	Function
Enabled	If activated the Aerocrine interface will be enabled
Interface path	Folder for the Aerocrine interface file
Programm	Folder and program selection for the Aerocrine software

3.9.6 Interfaces – Seca

The screenshot shows the 'Setup' dialog box with the 'Seca' interface selected. The settings are as follows:

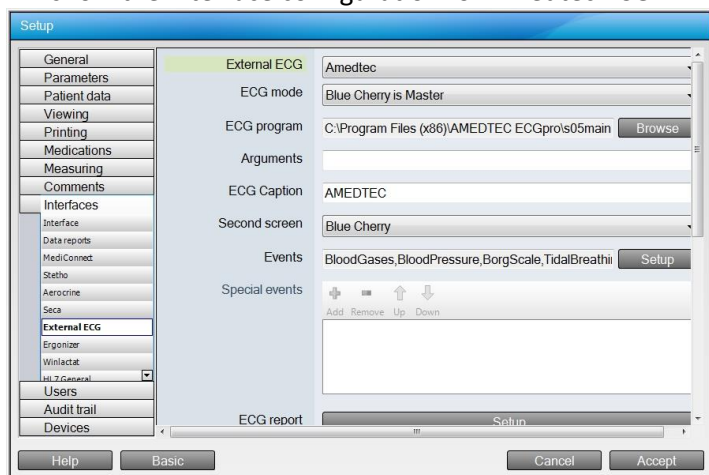
- Enabled:** ☒ Interface enabled
- Input folder:** C:\GDT\seca (with a 'Browse' button)
- Input filename:** (empty text field)
- Input extension:** Fix extension (dropdown) .gdt
- Output folder:** C:\GDT\seca (with a 'Browse' button)
- Output filename:** (empty text field)
- Output extension:** Fix extension (dropdown) .gdt
- File encoding:** Windows Central Europe (1250) (dropdown)

At the bottom of the dialog are buttons for 'Help', 'Basic', 'Cancel', and 'Accept'.

Settings	Function
Enabled	If activated the Seca interface will be enabled
Input folder	Folder for Seca input file
Input filename	Input filename
Input extension	File extension for input filename
Output folder	Folder for Seca output file
Output filename	Output filename
Output extension	File extension for output filename
File encoding	Selection of file encoding

3.9.7 Interfaces – External ECG

Blue Cherry can connect to different ECG systems. The following description will show the interface configuration for Amedtec ECG.



Depending on the chosen External ECG in the corresponding line the underlying fields will change. In the following only the fields which are always available will be explained:

Settings	Function
External ECG	Select the external ECG which is in use
ECG mode	Select the mode for the external ECG. You can choose between No ECG, Blue Cherry is Master and Blue Cherry is Slave. For the standard connection Blue Cherry is Master has to be selected.
ECG program	Choose the ECG application
Arguments	Here it is possible to define arguments which will be transferred at the start of the ECG application
ECG caption	Choose the caption for the ECG program window. For the standard connection AMEDTEC ECGpro has to be selected.
Second Screen	Adjust whether Blue Cherry or the ECG application should be displayed on the second

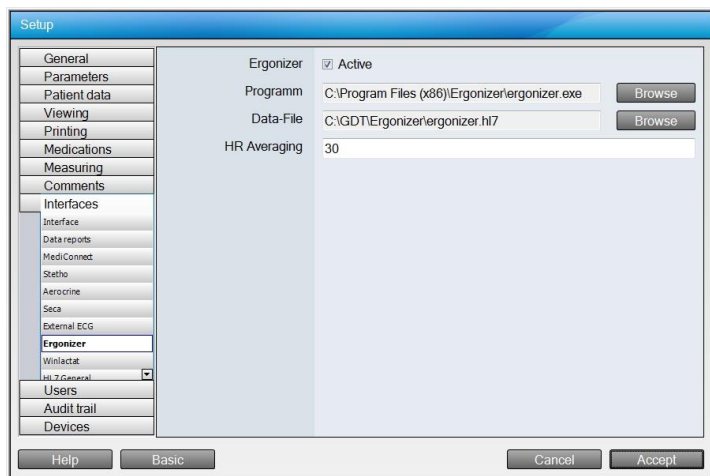
	screen
Events	Configure which events will be available in Blue Cherry
Special events	Configure which special events will be available in Blue Cherry
ECG report	Configuration of ECG report transfer
Independent test end	If activated it's possible to close Blue Cherry independent of ECG software
File encoding	Configuration of file encoding
Connection timeout	Configure after which time the measurement will be stopped if the ECG software doesn't respond anymore
Start file	Configuration of folder and filename of ECG start file
Online file	Configuration of folder and filename of ECG online file
Results file	Configuration of folder and filename of ECG results file
Profile file	Configuration of folder and filename of ECG load profile
Reference values	If activated Blue Cherry will use reference value for HR and Load from ECG software
Stop reason	If activated Blue Cherry will use stop reason from ECG software
GUI	If activated the Blue Cherry software design will be adapted to the ECG software
Forward load to ergom.	If activated the load profile selected in the ECG software will be forwarded to Blue Cherry and Blue Cherry will drive the ergometer

After selecting the Setup button in the line ECG report the following screen appear:

The screenshot shows a 'Setup ECG report' dialog box. It contains three main configuration areas: 'ECG report path' with an empty text field and a 'Browse' button; 'Report handling' with a dropdown menu currently set to 'Delete report'; and 'Move to' with an empty text field and a 'Browse' button. At the bottom of the dialog are 'Cancel' and 'Accept' buttons.

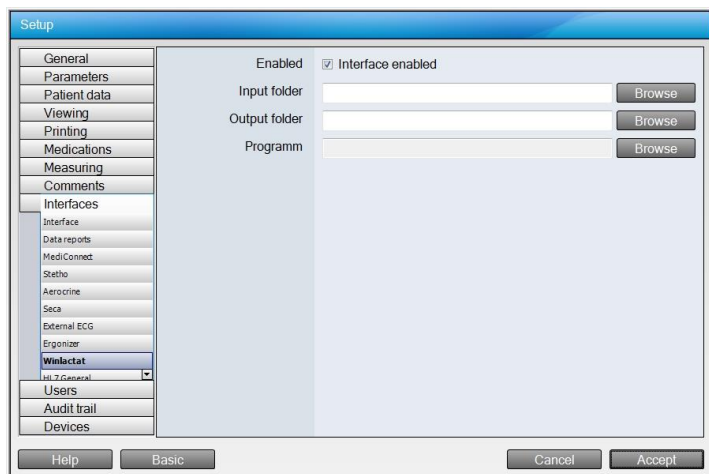
Settings	Function
ECG report path	Configuration of folder for ECG report
Report handling	Configuration of what will happen with report after Blue Cherry has overtaken the file. User can select between Delete report and Move to.
Move to	Configuration of folder where the file should be moved

3.9.8 Interfaces – Ergonizer



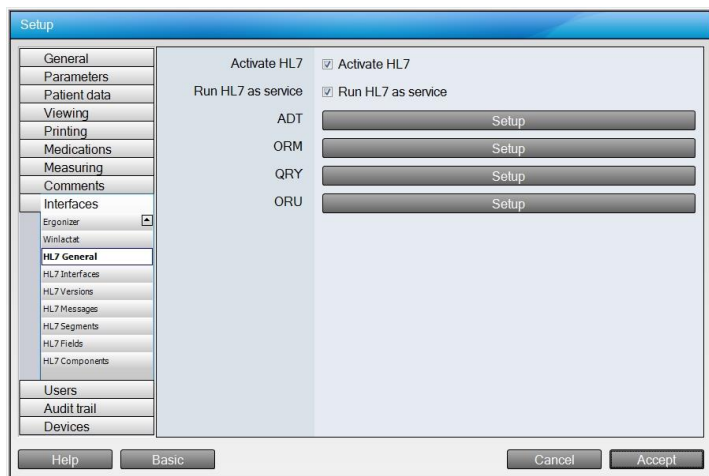
Settings	Function
Ergonizer	If activated, the Ergonizer interface is active
Program	Set the path to the Ergonizer application
Data-File	Adjust the transfer file between Blue Cherry and Ergonizer
HR Averaging	Adjust the averaging in s for the transfer of HR to the Ergonizer

3.9.9 Interfaces – Winlactat



Settings	Function
Enabled	If activated, the Winlactat interface is active
Input folder	Configuration of folder for input file
Output folder	Configuration of folder for output file
Program	Set the path to the Winlactat application

3.9.10 Interfaces – HL7 General



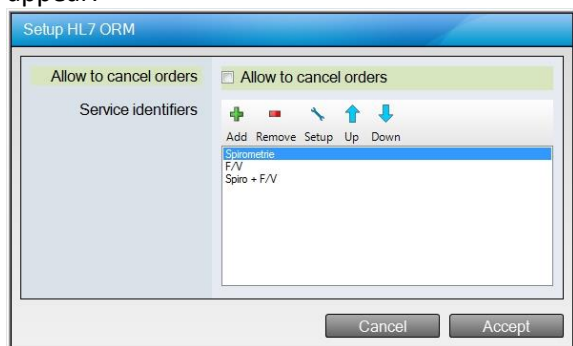
Settings	Function
Activate HL7	If activated, HL7 service is enabled
Run HL7 as service	If activated HL7 will run as a windows service
ADT	Configuration of ADT messages
ORM	Configuration of ORM messages
QRY	Configuration of QRY messages
ORU	Configuration of ORU messages

After selecting the Setup button in line ADT the following window will appear:



Settings	Function
Send ADT messages	If activated ADT messages will be send

After selecting the Setup button in line ORM the following window will appear:



Settings	Function
Allow to cancel orders	If activated ORM orders can be canceled
Service identifiers	Configuration which measurements will be used to identify the scope of HL7 service

After selecting the Setup button in line ORY the following window will appear:

Settings	Function
Query message	Configuration of Query message. User can select between QRY-Q01, QRY-Q02 and QRY-A19
What subject filter	Filter configuration for the query message. User can select between DEM and APA

After selecting the Setup button in line ORU the following window will appear:

Settings	Function
Auto-Export	Configuration if the report will be created automatically. User can select between Disabled, Enabled and Report dependent. If Report dependent will be selected the automatically created report will depend on the configuration of the report itself.
Units	If activated the parameter will be transmitted in the original unit. If not Blue Cherry will use the configured unit.
Decimal separator	Configuration if point or comma will be used as separator.
PDF Export path	Setting of path in which the PDF report will be created.
Filename of PDF report	Setting of information used to create the filename.
Measurements	Configuration of the measurement specific ORU messages.

3.9.11 Interfaces – HL7 Interfaces

Settings	Function
Enabled	Enable or disable HL7 interface
Name	Name of HL7 interface
HL7 Version	Configuration of HL7 version for this interface
File encoding	Setting of file encoding
Encoding characters	Setting of encoding for single characters
Sender and receiver	Configuration of sender and receiver
Communication	Configuration of communication details
HL7 Messages	Configuration of HL7 messages used for this interface

After selecting the Setup button in line Sender and receiver the following window will appear:

Setup sender and receiver

Sending application: BLUEC

Sending department:

Receiving application: HIS

Receiving department:

Cancel Accept

Settings	Function
Sending application	Configuration of Sending application
Sending department	Configuration of Sending department
Receiving application	Configuration of Receiving application
Receiving department	Configuration of Receiving department

After selecting the Setup button in line Communication the following window will appear:

Setup server communication

Accepted ACK: AL

Application ACK: NE

Message transfer: FileTransfer

Send ACK: ☐ Send ACK

Digits of filename: 0

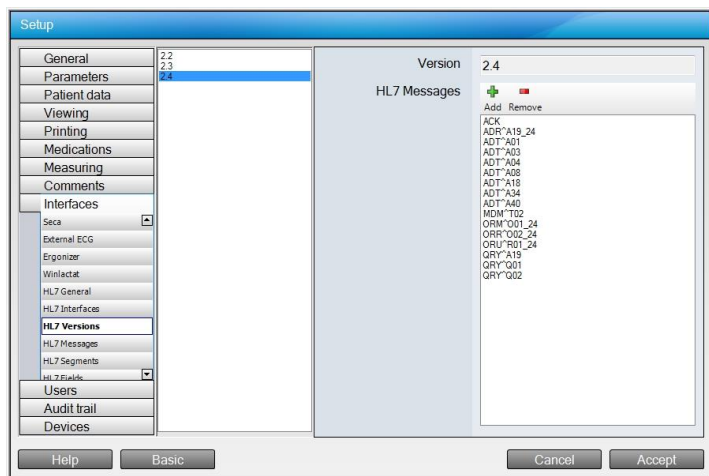
Input folder: Browse

Output folder: Browse

Cancel Accept

Settings	Function
Accepted ACK	Configuration of Accepted ACK. User can select between AL (Always), NE (Never), SU (Success), ER (Error).
Application ACK	Configuration of Application ACK. User can select between AL (Always), NE (Never), SU (Success), ER (Error).
Message transfer	Configuration of protocol. User can select between FileTransfer and TCP_IP.
Send ACK	If activated, ACK message will be send
Digit of filename	Configuration about how many digits will be used for filename
Input folder	Input folder configuration
Output folder	Output folder configuration

3.9.12 Interfaces – HL7 Versions



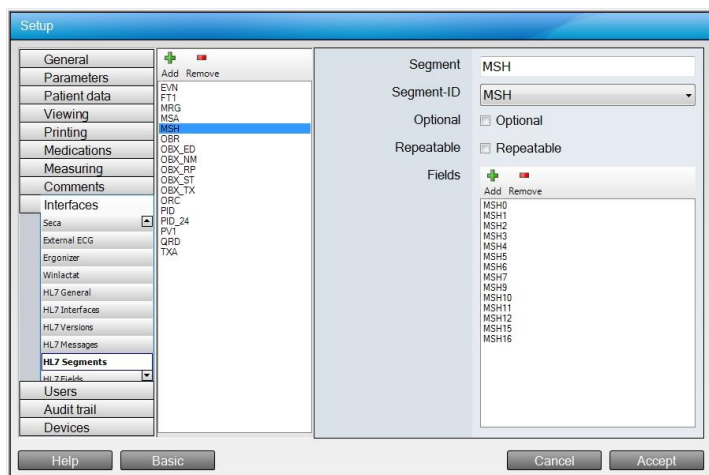
Settings	Function
Version	Used HL7 version
HL7 Messages	Select the messages which should be processed

3.9.13 Interfaces – HL7 Messages

The screenshot shows the 'Setup' window for HL7 Messages. The left sidebar has a tree view with 'HL7 Messages' selected. The main panel displays configuration for the 'ADT^A18' message. The 'Message' field is 'ADT^A18', 'Type' is 'ADT^A18', 'Handle message' is checked, 'Admit patient' is unchecked, and 'Send over server socket' is unchecked. The 'Segments' list contains 'MSH', 'EIN', 'PID', 'PV1', and 'MRG'. At the bottom are 'Help', 'Basic', 'Preview', 'Cancel', and 'Accept' buttons.

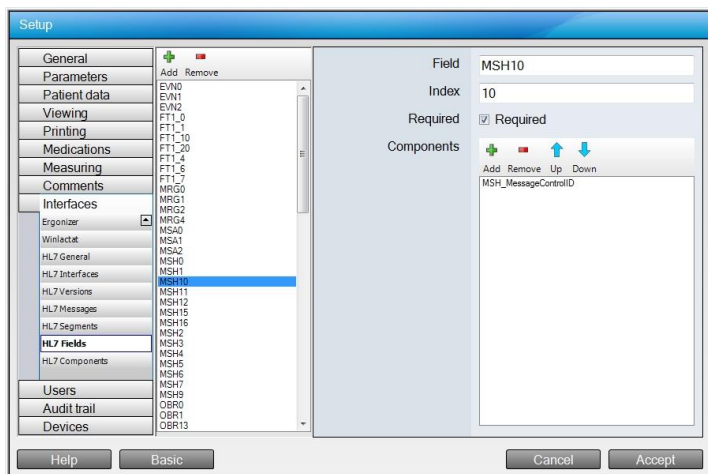
Settings	Function
Message	Name of the message
Type	Select the type of the message
Handle message	If activated, the message will be processed
Admit patient	If activated, the patient will be added to the database if he doesn't already exist
Send over server socket	If activated message will be send via server socket
Segments	Segments can be added or removed from the message. It is even possible to change their position.
Preview	Clicking the button opens a preview window showing how the message will be sent

3.9.14 Interfaces – HL7 Segments



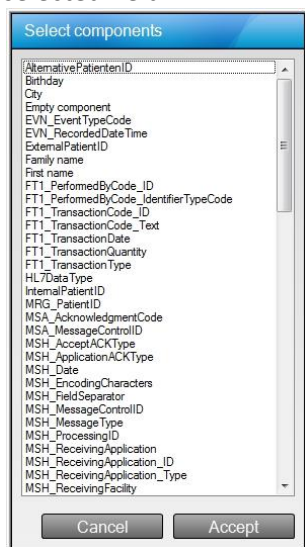
Settings	Function
Segment	Name of the Segment
Segment-ID	Select the ID of the selected segment
Optional	If activated, the selected segment is optional
Repeatable	If activated, the selected segment is repeatable
Fields	Fields can be added to or removed from the segment

3.9.15 Interfaces – HL7 Fields



Settings	Function
Field	Name of the Field
Index	Index of the selected field
Required	If activated, the selected field is required
Components	Components can be added to or removed from the field as well as moved into another order

After clicking the Add button in the line components the following window will appear which offers the possibility of adding new components to the selected field:



3.9.16 Interfaces – HL7 Components

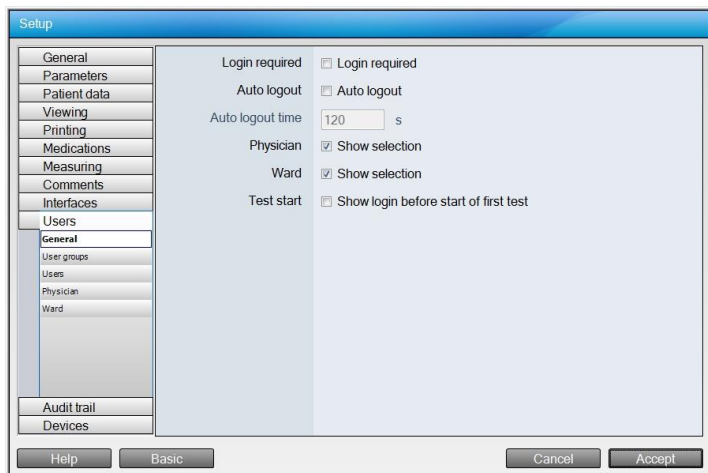
The screenshot shows the 'Setup' dialog box for HL7 Components. The 'General' tab is active. The left pane shows a tree view with 'HL7 Components' selected. The middle pane lists various HL7 components, with 'InternalPatientID' highlighted. The right pane shows the configuration for the selected component: 'InternalPatientID'. The configuration fields are: Component (InternalPatientID), Type (Patient information), Patient information (Patient ID), Interpretation (Text), and Max. text length (20). At the bottom of the dialog are buttons for 'Help', 'Basic', 'Cancel', and 'Accept'.

Settings	Function
Component	Name of the component
Type	Choose the type of the selected field
Patient information	Selection of patient information
Interpretation	Choose how to process the content of the component. User can select between DateOrTime, Enumeration, FloatValue, IntegerValue and Text
Max. text length	Depending on the settings of the previous line the format of the component can be defined

3.10 Users

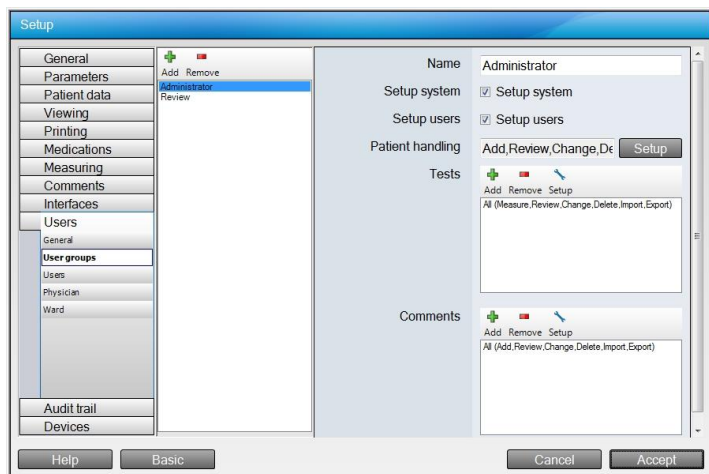
The following section will allow configuration of users as well as user groups.

3.10.1 Users – General



Settings	Function
Login required	If activated, users have to login at start up
Auto Logout	If activated, a user will be logged out automatically after a set period of inactivity.
Auto Logout Time	If auto logout is activated the time of inactivity can be configured in the corresponding text field.
Physician	If activated, a drop down menu of all physicians will be shown at login
Ward	If activated, a drop down menu of all wards will be shown at login
Test start	If activated, the user has to log in before the first test starts.

3.10.2 Users – User groups

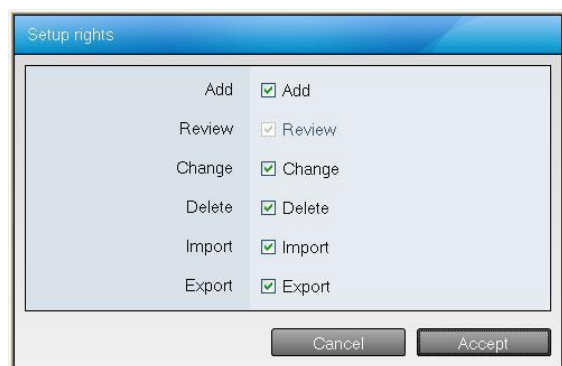


In the selection area user groups can be added or removed. After selecting a group the following settings are available in the configuration area:

Settings	Function
Name	Name for the user group
Setup system	If activated the users in the displayed group are able to change the configurations within the Blue Cherry setup
Setup users	If activated, users in the displayed group are able to add new users to the Blue Cherry system
Patient Handling	Adjust which rights the users of this group have in relation with patient data, e.g. if they are able to add or remove patients
Tests	Adjust which tests the users of the selected user group should be able to start and which rights they have in relation to the particular type of measurement, e.g. if they may edit a measurement.
Comments	Adjust whether and at which measurement types the users of this group are able to insert

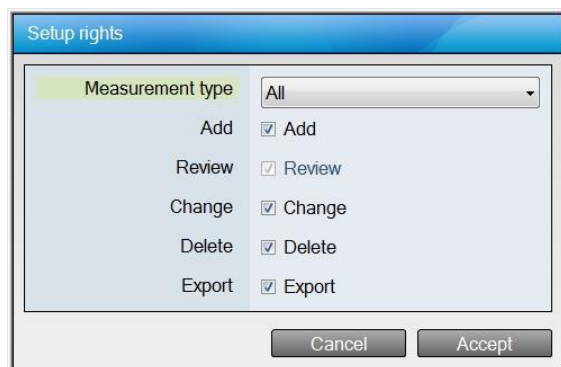
	comments and if they are able to change comments.
--	---

After clicking the Setup button in the patient handling line the following window will appear:



Settings	Function
Add	If activated, the users of this group are able to add new patients
Review	If activated, the users of this group are able to look at patient data
Change	If activated, the users of this group are able to change patient data
Delete	If activated, the users of this group are able to delete patient data
Import	If activated, the users of this group are able to import patient data
Export	If activated, the users of this group are able to export patient data

After clicking the **Setup** or **Add** button in the Tests line the following window will be displayed:



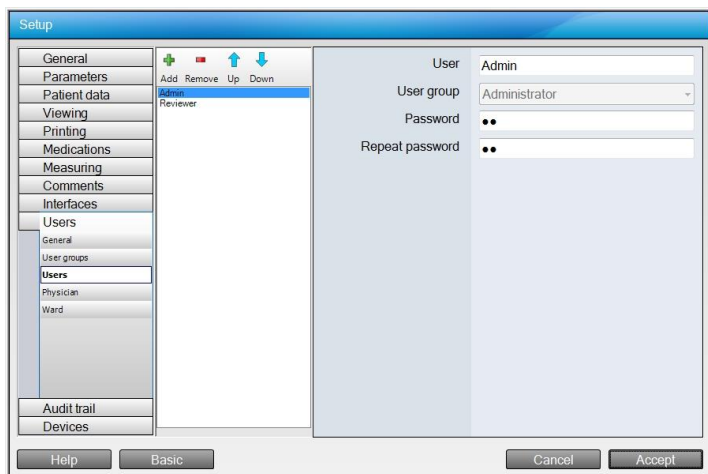
Settings	Function
Measurement type	Adjust for which measurement type rights should be set.
Add	If activated, the users of this group are able to add new patients
Review	If activated, the users of this group are able to look at patient data
Change	If activated, the users of this group are able to change patient data
Delete	If activated, the users of this group are able to delete patient data
Export	If activated, the users of this group are able to export patient data

After selecting the Setup or Add button in the comments line the following window will appear:

The screenshot shows a dialog box titled "Setup rights". It contains a "Measurement type" dropdown menu currently set to "All". Below the dropdown, there are two rows of settings: "Review" with a checked checkbox and "Change" with a checked checkbox. At the bottom of the dialog are "Cancel" and "Accept" buttons.

Settings	Function
Measurement type	Adjust for which measurement type rights should be set.
Review	If activated, the users of this group are able to look at patient data
Change	If activated, the users of this group are able to change patient data

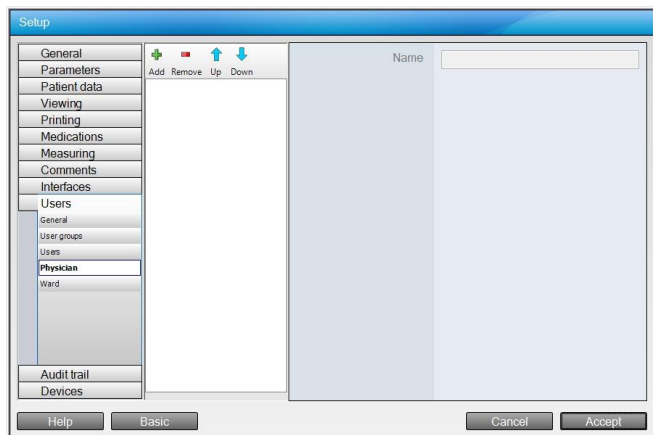
3.10.3 Users - Users



In the selection area users can be added, removed or moved up and down in order to change the order. After selecting a user the following settings are available in the configuration area:

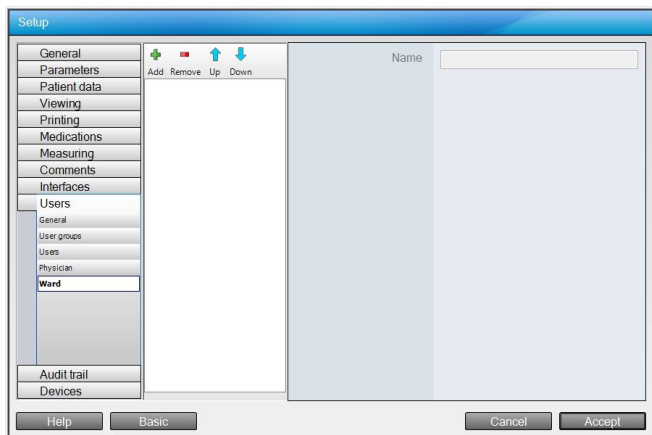
Settings	Function
User	Name of the individual user
User group	Determine which group the selected user should belong to
Password	Enter a user specific password
Repeat Password	Enter the user specific password for a second time

3.10.4 Users – Physician



In the selection area physicians can be added, removed or moved up and down in order to change the order. After selecting a physician it is possible to define a name in the configuration on the right side.

3.10.5 Users – Ward

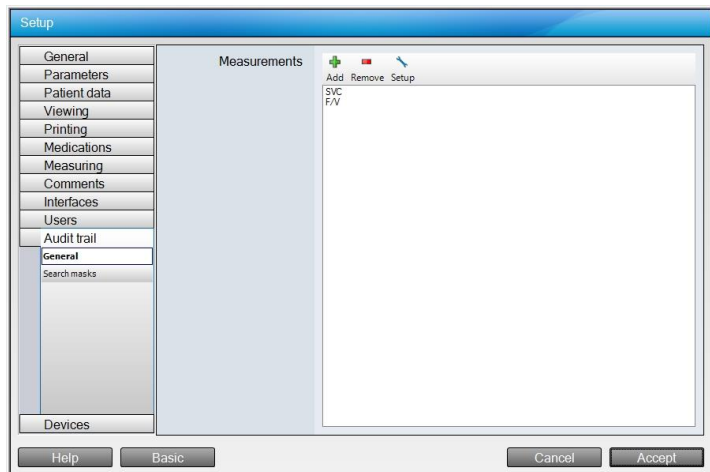


In the selection area wards can be added, removed or moved up and down in order to change the order. After selecting a ward it is possible to define a name in the configuration on the right side.

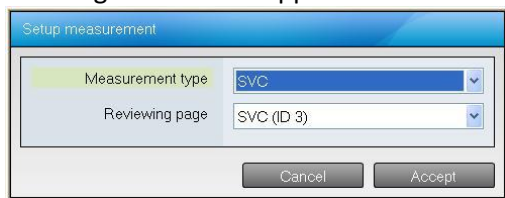
3.11 Audit Trail

In this section changes to Audit Trail can be made.

3.11.1 Audit Trail – General



In this section it is possible to define which measurements should be monitored by Audit Trail. It is possible to add or remove measurements as well as setup measurements. After clicking the **Add** or **Setup** button the following window will appear:



Settings	Function
Measurement type	Select the measurement type
Reviewing page	Select how the measurement should be displayed

3.11.2 Audit Trail – Search masks

The screenshot shows the 'Setup' dialog box for 'Search masks'. The left sidebar contains a tree view with the following items: General, Parameters, Patient data, Viewing, Printing, Medications, Measuring, Comments, Interfaces, Users, Audit trail, and Devices. Under 'Audit trail', there are sub-items 'General' and 'Search masks'. The main area of the dialog is divided into two sections. The top section has a table with the following columns: Name, Types, Users, Physicians, Period start, and Period end. Each column has a corresponding input field and a 'Setup' button. The 'Period start' and 'Period end' fields are formatted as DD/MM/YYYY. The bottom section of the dialog has buttons for 'Help', 'Basic', 'Cancel', and 'Accept'.

In the selection area it is possible to add or remove search masks. Once a search mask is added and selected the following settings are available in the configuration area:

Settings	Function
Name	Name for the search mask
Types	Adjust the type whose changes should be searched for
Users	Adjust the user whose changes should be searched for
Physicians	Adjust the physician whose changes should be searched for
Period start	Date changes should be search from
Period end	Date until changes should be searched

After clicking the **Setup** button in the types line the following window will appear:



Here it is possible to define the type of change which should be searched for. E.g. it is possible to search for changes in comments of patient data.

After clicking the **Setup** button in the users line the following window will appear:



Here it is possible to define the user whose changes should be searched for.

After clicking the **Setup** button in the physician line the following window will appear:

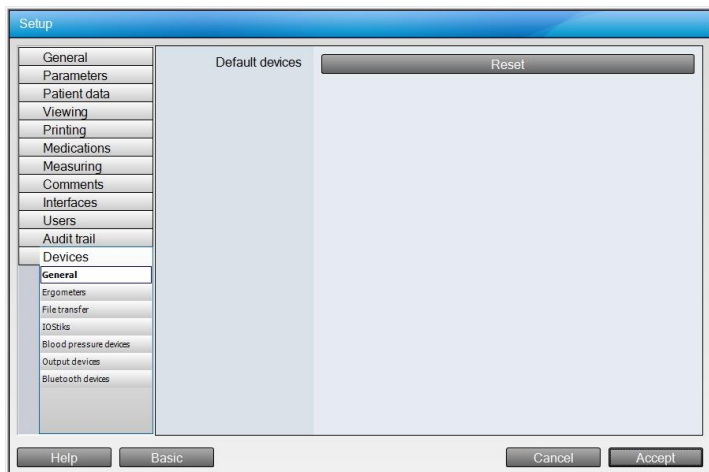


Here it is possible to define the physician whose changes should be searched for.

3.12 Devices

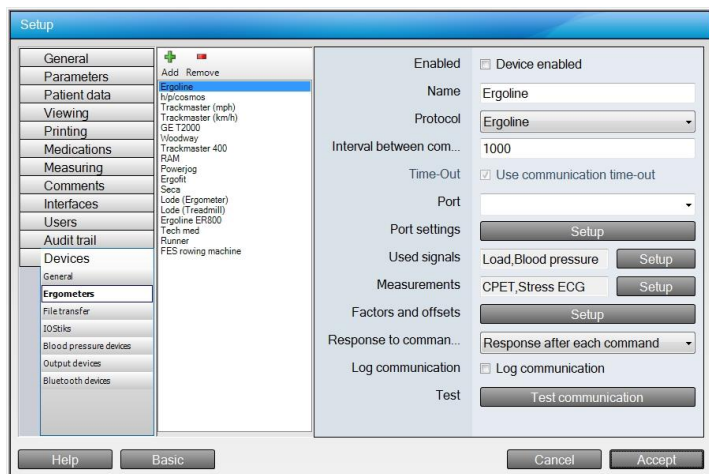
This section allow to configure settings for different devices.

3.12.1 Devices – General



By clicking the **Reset** button it is possible to reset the standard settings for measurements which will be started when the device is connected and recognised by Blue Cherry.

3.12.2 Devices – Ergometers

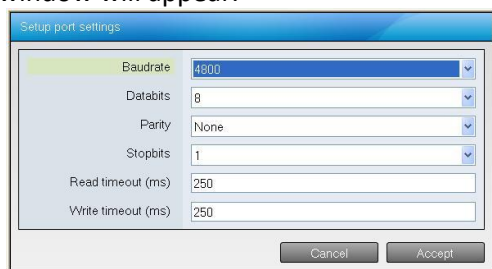


In the selection area it is possible to add or remove ergometer configurations. After clicking one of these the settings will appear in the configuration area.

Settings	Function
Enabled	If activated the ergometer will be used for Blue Cherry
Name	Name of the ergometer
Protocol	Choose the protocol for communication with the ergometer.
Intervall between com...	Configuration of time intervall between 2 commands in ms.
Time-Out	If activated timeout will be checked during communication
Port	Choose the port which the ergometer is connected to.
Port settings	Configuration of the communication
Used signals	Configuration of the signals provided by this device
Measurements	Configure for which measurements the ergometer will be available

Factors and offsets	Configuration of factor and offset used to control the load of ergometer
Response to comman...	Configuration about how to respond to commands. User can select between no response , response after each command and response after value has changed
Log communication	If activated communication will be logged in a file
Test	Here it is possible to test the communication

After clicking the **Setup** button in the port settings line the following window will appear:



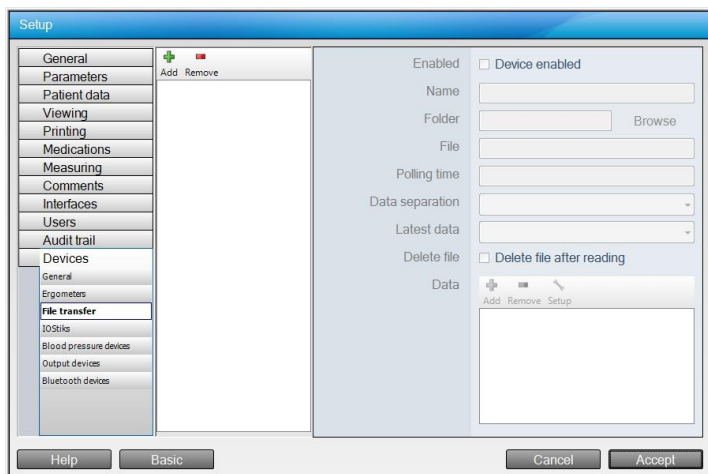
Settings	Function
Baudrate	Adjust the Baudrate, which means how many symbols are transfered per second
Databits	Adjust the number of Databits
Parity	Adjust if a paritybit should be attached and if it is straight or odd
Stopbits	Adjust the number of stopbits
Read timeout (ms)	Adjust the time of Read timeout in ms
Write timeout (ms)	Adjust the time of Write timeout in ms

After clicking the Test communication button in the test line the following window appears:

The screenshot shows a software window titled 'New'. Inside, there are four input fields arranged vertically: 'Load' (value: 0), 'RPM' (value: 0 1/min), 'SBP' (value: 0 mmHg), and 'DBP' (value: 0 mmHg). Below these fields, on the left, is the text 'BP measurement'. To the right of this text is a 'Start' button. At the bottom right of the window is a 'Close' button.

Settings	Function
Load	Adjust the load of the ergometer
RPM	Display the pedal speed
SBP	Display the systolic blood pressure
DBP	Display the diastolic blood pressure
BP measurement	Start a blood pressure measurement

3.12.3 Devices – File transfer



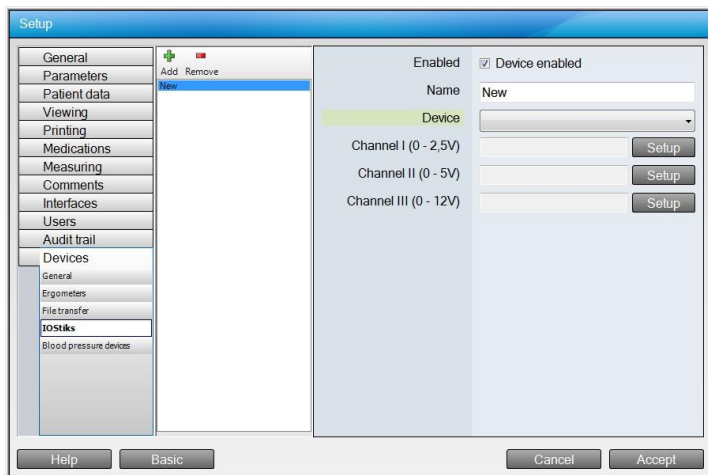
In the selection area it is possible to add or remove file transfer configurations. After clicking one of these the settings will appear in the configuration area:

Settings	Function
Enabled	If activated the file transfer will be used
Name	Name of the file transfer device
Folder	Path to the file folder
File	File name
Polling time	Adjust the time interval after which the folder will be checked for new files
Data separation	Adjust how the several data should be separated from each other. There are Tabulator, Comma, Semicolon and Fixed positions
Latest data	Adjust on which data position actual data can be found
Delete file	If activated, the file will be deleted after it is imported
Data	Adjustment of the file architecture

After clicking the **Add** or **Setup** button in the Data line the following window appears:

Settings	Function
Signal	Adjust from which signal data should be imported
Factor	Adjust the data factor
Offset	Adjust the data offset
Position	Adjust the data position
Length	Adjust the data length

3.12.4 Devices – IOStiks



In the selection area it is possible to add or remove stik configurations.
After clicking one of these the settings will appear in the configuration area:

Settings	Function
Enabled	If activated the selected IOstik will be used
Name	Name of the IOstik
Device	Select for which connected IOstik this configuration should be used
Channel I	Adjust which informations should be read by this channel
Channel II	Adjust which informations should be read by this channel
Channel III	Adjust which informations should be read by this channel

After clicking the Setup button in the lines of Channel I-III the following window appears:

Parameter	Value
SpO2	SpO2 [Setup]
Gain	1
Offset	0

Cancel Accept

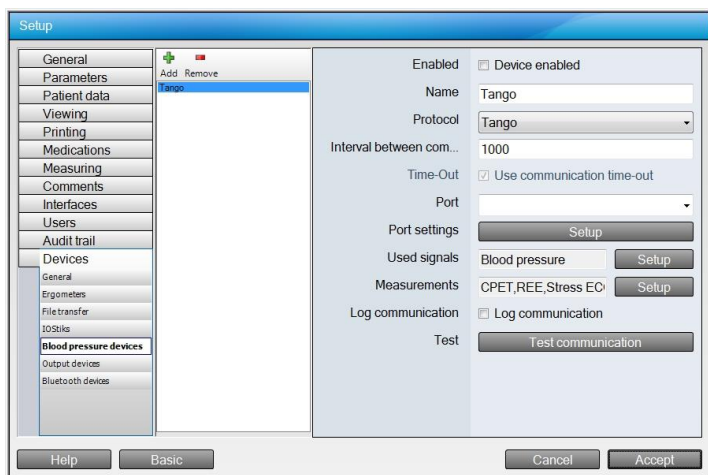
Settings	Function
Parameter	Adjust the parameter which should be transfered over this channel
Gain	Set the gain for this parameter
Offset	Set the offset for this parameter

Select parameter

- HR
- SpO2
- SBP
- DBP
- Load
- RPM
- Speed
- Elev

Choose the parameter which should be transfered.

3.12.5 Devices – Blood pressure devices

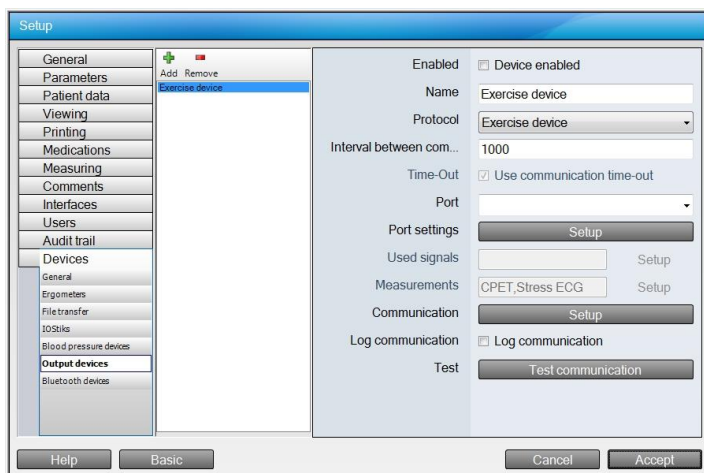


In the selection area it is possible to add or remove blood pressure devices. After selecting a device the following settings will appear in the configuration area:

Settings	Function
Enabled	If activated the blood pressure device will be used for Blue Cherry
Name	Name of the device
Protocol	Choose the protocol for communication with the blood pressure device.
Intervall between com...	Configuration of time intervall between 2 commands in ms.
Time-Out	If activated timeout will be checked during communication
Port	Choose the port which the blood pressure device is connected to.
Port settings	Configuration of the communication
Used signals	Configuration of the signals provided by this device
Measurements	Configure for which measurements the blood

	pressure device will be available
Log communication	If activated communication will be logged in a file
Test	Here it is possible to test the communication

3.12.6 Devices – Output devices

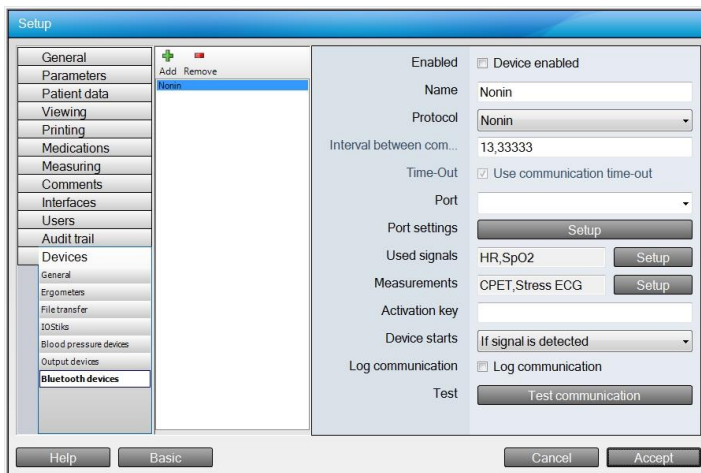


In the selection area it is possible to add or remove Output devices. After selecting a device the following settings will appear in the configuration area:

Settings	Function
Enabled	If activated the Output device will be used for Blue Cherry
Name	Name of the device
Protocol	Choose the protocol for communication with the Output device.
Intervall between com...	Configuration of time intervall between 2 commands in ms.
Time-Out	If activated timeout will be checked during communication
Port	Choose the port which the device is connected to.
Port settings	Configuration of the communication
Used signals	Configuration of the signals provided by this device
Measurements	Configure for which measurements the Output

	pressure device will be available
Communication	Configuration of communication
Log communication	If activated communication will be logged in a file
Test	Here it is possible to test the communication

3.12.7 Devices – Bluetooth devices



In the selection area it is possible to add or remove Bluetooth devices. After selecting a device the following settings will appear in the configuration area:

Settings	Function
Enabled	If activated the device will be used for Blue Cherry
Name	Name of the device
Protocol	Choose the protocol for communication with the device.
Intervall between com...	Configuration of time intervall between 2 commands in ms.
Time-Out	If activated timeout will be checked during communication

Port	Choose the port which the device is connected to.
Port settings	Configuration of the communication
Used signals	Configuration of the signals provided by this device
Measurements	Configure for which measurements the device will be available
Activation key	Enter the activation key provided by your dealer
Device starts	Configure when the Bluetooth device should start communication. User can select between if signal is detected and if sensor is connected
Log communication	If activated communication will be logged in a file
Test	Here it is possible to test the communication

4. Parameter Definitions

The following list will show all available parameters in Blue Cherry in in alphabetic order of measurement type.

ID	Measurement Type	Name	Unit	Description
7301	Box calibration	Box volume	l	Volume of Bodystik cabine
7302	Box calibration	Box corr		Body box correction factor determined during box calibration
7303	Box calibration	Time constant	s	Time constant of body box determined during box calibration
7304	Box calibration	Pump volume	ml	Volume of Body box calibration syringe
7305	Box calibration	PBStart	Pa	Box pressure at start of time constant determination
7306	Box calibration	PBEnd	Pa	Box pressure at end of time constant determination
7397	Box calibration	Ambient temperature	°C	Ambient temperature
7398	Box calibration	Ambient pressure	hPa	Ambient pressure
7399	Box calibration	Ambient humidity	%	Ambient humidity
1300	Breathing pattern	Test time		Time the test has been performed
1301	Breathing pattern	Vt	l	Tidal volume
1302	Breathing pattern	Bf	1/min	Breathing frequency
1303	Breathing pattern	VE	l/min	Minute Ventilation
1304	Breathing pattern	tIn	s	Inspiration time
1305	Breathing pattern	tEx	s	Expiration time
1306	Breathing pattern	tTot	s	Duration of 1 complete breathing cycle
1307	Breathing pattern	Vt/tIn	l/s	Tidal volume divided by inspiration time
1308	Breathing pattern	tIn/tTot	%	Inspiration time in percentage of total time for 1 breath
1395	Breathing pattern	Vol corr in		Inspiratory corection factor for volume calibration
1396	Breathing pattern	Vol corr ex		Expiratory corection factor for volume calibration
1397	Breathing pattern	Ambient temperature	°C	Ambient temperature
1398	Breathing pattern	Ambient pressure	hPa	Ambient pressure
1399	Breathing pattern	Ambient humidity	%	Ambient humidity
1200	CO Diffusion	Test time		Time the test has been performed
1201	CO Diffusion	Vd	l	Dead space volume of apparatus
1202	CO Diffusion	VA	l	Alvoelar volume
1203	CO Diffusion	TLco	mmol/kPa/min	Diffusion capacity
1204	CO Diffusion	Kco	mmol/kPa/min/l	Transfer coefficient of the lung Kco = TLCO/VA
1205	CO Diffusion	TLco (Hb)	mmol/kPa/min	Diffusion capacity corrected for Hb
1206	CO Diffusion	Kco (Hb)	mmol/kPa/min/l	Transfer coefficient of the lung corrected for Hb
1207	CO Diffusion	TLC	l	Total lung capacity
1208	CO Diffusion	FRC	l	Functional residual capacity
1209	CO Diffusion	RV	l	Residual volume
1210	CO Diffusion	VI	l	Inspiratory capacity
1211	CO Diffusion	ERV	l	Expiratory reserve volume
1212	CO Diffusion	RV/TLC	%	Residual volume in percentage of total lung capacity

ID	Measurement Type	Name	Unit	Description
1213	CO Diffusion	FRC/TLC	%	Functional residual capacity in percentage of total lung capacity
1214	CO Diffusion	VI/VC	%	Inspiratory capacity in percent of vital capacity
1215	CO Diffusion	FE_CO	%	Expiratory carbon dioxide concentration
1216	CO Diffusion	FE_CH4	%	Expiratory methane concentration
1217	CO Diffusion	FI_CO	%	Inspiratory carbon dioxide concentration
1218	CO Diffusion	FI_CH4	%	Inspiratory methane concentration
1219	CO Diffusion	Vdiscard	l	Discard volume
1220	CO Diffusion	Vsample	l	Sample volume
1221	CO Diffusion	PaO2	mmHg	Arterial oxygen partial pressure
1222	CO Diffusion	Hb	g/dl	Haemoglobin
1223	CO Diffusion	COHb	%	Carboxyhaemoglobin
1224	CO Diffusion	Tdiff	s	Diffusion time
1225	CO Diffusion	T85_in	s	Time until 85% of the VI has been inhaled
1226	CO Diffusion	T85_ex	s	Time until 85% of the VI has been exhaled
1227	CO Diffusion	T90_in	s	Time until 90% of the VI has been inhaled
1228	CO Diffusion	T90_ex	s	Time until 90% of the VI has been exhaled
1229	CO Diffusion	T_sv	s	Time until sample volume starts
1230	CO Diffusion	Pm_in	hPa	Mouth pressure inspiratory
1231	CO Diffusion	Pm_ex	hPa	Mouth pressure expiratory
1232	CO Diffusion	HBConstant		Constant used for Hb correction
1233	CO Diffusion	TLCBody-TLCCH4	l	Difference between TLC measured with Bodyplethysmography and Diffusion
1234	CO Diffusion	VCEx	l	Expiratory vital capacity
1235	CO Diffusion	TV	l	Tidal volume
1236	CO Diffusion	Vdapp	l	Dead space volume of apparatus
1237	CO Diffusion	Drift CO	%	Drift of CO during breath hold time
1238	CO Diffusion	Drift CH4	%	Drift of CH4 during breath hold time
1239	CO Diffusion	VI (Ambient air)	l	Inspired volume before shutter is closed
1240	CO Diffusion	ATPD to BTPS		Conversion factor from ATPD to BTPS
1241	CO Diffusion	STPD to BTPS		Conversion factor from STPD to BTPS
1242	CO Diffusion	PIF	l/s	Peak inspiratory flow
1243	CO Diffusion	TLco/VC	mmol/kPa/min/l	Diffusion capacity divided by vital capacity
1244	CO Diffusion	TLco/TLC(p)	mmol/kPa/min/l	Diffusion capacity divided by total lung capacity
1245	CO Diffusion	%FRC/%TLco		Ratio of FRC as percent predicted to TLco as percent predicted
1246	CO Diffusion	%VC/%TLco		Ratio of VC as percent predicted to TLco as percent predicted
1247	CO Diffusion	VA/TLC(p)		Ratio of alveolar volume to total lung capacity measured by body plethysmography
1248	CO Diffusion	VA/TLC		Alveolar volume divided by Total lung capacity
1249	CO Diffusion	TLco/RV	mmol/kPa/min/l	Diffusion capacity divided by residual volume
1250	CO Diffusion	%FVC/%TLco		Ratio of FVC as percent predicted to TLco as percent predicted
1295	CO Diffusion	Vol corr in		Inspiratory corection factor for volume calibration
1296	CO Diffusion	Vol corr ex		Expiratory corection factor for volume calibration
1297	CO Diffusion	Ambient temperature	°C	Ambient temperature
1298	CO Diffusion	Ambient pressure	hPa	Ambient pressure
1299	CO Diffusion	Ambient humidity	%	Ambient humidity
501	CPET	Time	min:sec	Test time

ID	Measurement Type	Name	Unit	Description
502	CPET	Load	W	Load
503	CPET	Speed	km/h	Speed
504	CPET	Elev	%	Elevation
505	CPET	RPM	1/min	pedal speed
506	CPET	VO2	l/min	Oxygen Uptake $VO2 = \int_0^T Fex(t) dt \times \Delta F O2$ $\Delta F O2 = \frac{F i O2 - F e O2 - F i O2 \times F e C O2}{(1 - F i O2)}$ Fex = expired flow FiO2 = inspired O2 concentration FeO2 = expired O2 concentration FeCO2 = expired CO2 concentration
507	CPET	VO2/kg	ml/min/kg	Oxygen uptake per body weight VO2/kg = VO2 / body weight x 1000
508	CPET	VCO2	l/min	Carbon Dioxide production $VCO2 = \int_0^T Fex(t) dt \times F E C O2$
509	CPET	RER		Respiratory Exchange Ratio RER = VCO2/VO2
510	CPET	VEx	l	Expired volume
511	CPET	tEx	s	Time for expiration
512	CPET	VIn	l	Inspired volume
513	CPET	tIn	s	Time for inspiration
514	CPET	Vt	l	Tidal volume
515	CPET	Bf	1/min	Breathing frequency
516	CPET	VE	l/min	Minute Ventilation $VE = \int_0^T Fex(t) dt$
517	CPET	BR	l/min	Breathing reserve BR = MVV - VEpeak MVV = Maximum Voluntary Volume (FEV1x35) VEpeak is Minute Ventilation at VO2max
518	CPET	BR	%	Breathing reserve BR = (MVV - VEpeak)/MVV * 100
519	CPET	VE/VO2		Ventilatory equivalent for O2 Minute Ventilation divided by Oxygen uptake
520	CPET	VE/VCO2		Ventilatory equivalent for CO2 Minute Ventilation divided by Carbon Dioxide production
521	CPET	Vd(g)	l	Dead space volume (noninvasive calculation) $Vd = Vt \times \frac{PETCO2 - PECO2}{PETCO2} - Vdm$ Vt = Tidal volume PaCO2 = arterial PCO2 PECO2 = mixed expired PCO2 Vdm= mask dead space

ID	Measurement Type	Name	Unit	Description
522	CPET	Vd(g)/Vt	%	Dead space - tidal volume ratio (noninvasive calculation) $\frac{Vd(g)}{Vt} = \frac{PETCO2 - PECO2}{PETCO2} - \frac{Vdm}{Vt - Vdm}$
523	CPET	FO2Et		Endtidal fraction of O2 concentration
524	CPET	FCO2Et		Endtidal fraction of CO2 concentration
525	CPET	FIO2Et		Inspiratory fraction of O2 concentration
526	CPET	FICO2Et		Inspiratory fraction of CO2 concentration
527	CPET	PETO2	mmHg	End tidal O2 pressure
528	CPET	PETCO2	mmHg	End tidal CO2 pressure
529	CPET	HR	1/min	Heart rate
530	CPET	HRR	1/min	Heart rate reserve HRR = predicted HR - HR at VO2max
531	CPET	O2Pulse	ml/beat	O2 Pulse O2Puls = VO2 x 1000 / HR
532	CPET	O2Pulse (/kg)	ml/kg/beat	O2 Pulse per body weight O2Pulse(/kg) = O2Pulse / body weight
533	CPET	SBP	mmHg	Systolic blood pressure
534	CPET	DBP	mmHg	Diastolic blood pressure
535	CPET	DP	mmHg/min	Double product DP = SBP x HR
536	CPET	SpO2	%	Oxygen saturation
537	CPET	PaO2	mmHg	Arterial oxygen partial pressure
538	CPET	PaCO2	mmHg	Arterial carbon dioxide partial pressure
539	CPET	Lactate	mmol/l	Lactate concentration
540	CPET	P(A-a)O2	mmHg	Alveolar - Arterial PO2 difference P(A-a)O2 = PAO2 - PaO2 $PAO2 = FiO2 \times (PB - 47) - \frac{PaCO2}{RER}$ PB = ambient barometric pressure in mmHg
541	CPET	P(a-ET)CO2	mmHg	Arterial End-tidal PCO2 difference P(a-ET)CO2 = PaCO2 - PETCO2
542	CPET	pH		pH blood gas value
543	CPET	HCO3	meq/l	Bicarbonat blood gas value
544	CPET	BE	meq/l	Base Excess blood gas value
545	CPET	Mets		Metabolic equivalent $METS = \frac{VO2/Kg}{3,5}$
546	CPET	Borg		Borg Index
547	CPET	Lipides	mg/min	Lipids oxidation
548	CPET	Glucides	mg/min	Carbohydrate oxidation
549	CPET	Proteines	mg/min	Proteines oxidation
550	CPET	Lipides	kcal/min	Lipids oxidation
551	CPET	Glucides	kcal/min	Carbohydrate oxidation
552	CPET	Proteines	kcal/min	Proteines oxidation
553	CPET	Lipides	%	Lipids oxidation

ID	Measurement Type	Name	Unit	Description
554	CPET	Glucides	%	Carbohydrate oxidation
555	CPET	Proteines	%	Proteines oxidation
556	CPET	Energy	kcal/min	Energy consumption
557	CPET	Vd(b)	l	Dead space volume $Vd = Vt \times \frac{PaCO2 - PECO2}{PaCO2} - Vdm$ Vt = Tidal volume PaCO2 = arterial PCO2 PECO2 = mixed expired PCO2 Vdm= mask dead space
558	CPET	Vd(b)/Vt	%	Dead space - tidal volume ratio $\frac{Vd(b)}{Vt} = \frac{PaCO2 - PECO2}{PaCO2} - \frac{Vdm}{Vt - Vdm}$
559	CPET	%VO2	%	Oxygen uptake in percent of VO2max
560	CPET	PAO2	mmHg	Alveolar PO2 pressure
561	CPET	Load/Ref.	%	Load in percent of reference load
562	CPET	SpO2 Quality	%	Quality of SpO2 reading
563	CPET	Fat	mg/min	Lipids oxidation
564	CPET	CH	mg/min	Carbohydrate oxidation
565	CPET	Proteines	mg/min	Proteines oxidation
566	CPET	Fat	kcal/24h	Lipids oxidation
567	CPET	CH	kcal/24h	Carbohydrate oxidation
568	CPET	Proteines	kcal/24h	Proteines oxidation
569	CPET	Fat	%	Lipids oxidation
570	CPET	CH	%	Carbohydrate oxidation
571	CPET	Proteines	%	Proteines oxidation
572	CPET	REE	kcal/24h	Resting Energy Expenditure $REE = (3.9 \times VO2 + 1.1 \times VCO2) \times 1.44$
573	CPET	O2Delay	ms	Delay in rise of O2 signal
574	CPET	CO2Delay	ms	Delay in rise of O2 signal
575	CPET	REE/BSA	kcal/24h/m ²	Resting Energy Expenditure per Body Surface Area $BSA = 0.007184 \times Height(cm)^{0.725} \times Weight(kg)^{0.425}$ BSA calculation according to formula DuBois
576	CPET	RQnp		RQ corrected for proteine consumption
577	CPET	Load (i)	W	Load interpolated over each load stage
578	CPET	HR (i)	1/min	HR interpolated over each load stage
579	CPET	VO2ref	l/min	Predicted Oxygen consumption
580	CPET	VEref	l/min	Predicted minute ventilation
581	CPET	Vt/VC	%	Tidal volume in percent of vital capacity
582	CPET	REE (Weir)	kcal/24h	Resting Energy Expenditure $REE = (3.9 \times VO2 + 1.1 \times VCO2) \times 1.44$
583	CPET	Load (/norm)	W	Predicted load calculated by using the norm weight of patient
584	CPET	VO2 (/norm)	l/min	Predicted oxygen consumption calculated by using the norm weight of patient
585	CPET	VO2/breath	ml	Oxygen consumption per breath
586	CPET	VCO2/breath	ml	Carbon dioxide production per breath

ID	Measurement Type	Name	Unit	Description
587	CPET	Time	s	Time
588	CPET	VCO2/kg	ml/min/kg	Carbon dioxide production per body weight $VCO2/kg = VCO2 / \text{body weight} \times 1000$
589	CPET	FIO2 Offset		Offset for inspiratory fraction of O2 concentration
590	CPET	Load/kg	W/kg	Load per body weight
591	CPET	PECO2	mmHg	Mixed expired PCO2 pressure
592	CPET	PECO2/PETCO2		Mixed expired PCO2 pressure divided by PETCO2
593	CPET	Fan	l/min	Fan speed
596	CPET	Load / Speed + Elev		Parameter which will show Load if a cycle ergometer protocole is used and Speed/Elevation if a treadmill protocole is used
597	CPET	Ambient temperature	°C	Ambient temperature
598	CPET	Ambient pressure	hPa	Ambient pressure
599	CPET	Ambient humidity	%	Ambient humidity
701	CPET	Vdm	ml	Mask dead space
702	CPET	MVV	l/min	Maximum Voluntary Volume (FEV1x35)
703	CPET	VO2/WR	ml/min/W	Slope of VO2/WR
704	CPET	VE/VCO2 Slope		Slope VE/VCO2
705	CPET	HR (Rest)	beats/min	Heart rate at rest
706	CPET	VO2 (Rest)	l/min	Oxygen consumption at rest
707	CPET	HR (AT)	beats/min	Heart rate at anaerobic threshold
708	CPET	VO2 (AT)	l/min>	Oxygen consumption at anaerobic threshold
709	CPET	%VO2 (AT)	%	Oxygen consumption at anaerobic threshold in percent of VO2max
710	CPET	VE/VO2 (AT)	l/min	Ventilatory equivalent for VO2 at anaerobic threshold
711	CPET	HR	beats/min	Heart rate
712	CPET	VO2	l/min	Oxygen consumption
713	CPET	Load (Lipox)	W	Load at LIPOXmax point
714	CPET	Load/Ref (Lipox)	%	Load in percentage of predicted load at LIPOXmax
715	CPET	HR (Lipox)	beats/min	Heart rate at LIPOXmax point
716	CPET	Lipids (Lipox)	mg/min	Lipides at LIPOXmax point
717	CPET	Load (Crossing point)	W	Load at crossing point
718	CPET	Load/Ref (Crossing point)	%	Load in percentage of predicted load at crossing point
719	CPET	HR (Crossing point)	beats/min	Heart rate at crossing point
720	CPET	Glucids / WR	mg/min/kg/W	Glucides divided by work rate
721	CPET	Training unit duration	min	Duration of training unit
722	CPET	Energy consumed during training	kcal	Energy consumption during training unit
723	CPET	O2Pulse	ml/beat	Oxygen pulse $O2Pulse = \frac{VO2 \times 1000}{HR}$
724	CPET	Vd(g)/Vt	%	Vd(g)/Vt at VO2max
725	CPET	PaO2 (peakVO2)	mmHg	Arterial oxygen partial pressure at VO2max

ID	Measurement Type	Name	Unit	Description
726	CPET	PaCO2 (peakVO2)	mmHg	Arterial carbon dioxide partial pressure at VO2max
727	CPET	P(A-a)O2 (peakVO2)	mmHg	Alveolar - Arterial PO2 difference at VO2max
728	CPET	P(a-ET)CO2 (peakVO2)	mmHg	Arterial End-tidal PCO2 difference at VO2max
729	CPET	BR	l/min	BR absolute at VO2max
730	CPET	BR	%	BR relative at VO2max
731	CPET	Bf	l/min	Bf at VO2max
732	CPET	VE/VCO2 (AT)		Ventilatory equivalent for CO2 at anaerobic threshold
733	CPET	HRR	l/min	Heart rate reserve at VO2max
734	CPET	PaO2 (Rest)	mmHg	Arterial oxygen partial pressure at rest
735	CPET	P(A-a)O2 (Rest)	mmHg	Alveolar - Arterial PO2 difference at rest
736	CPET	P(A-a)O2 (AT)	mmHg	Alveolar - Arterial PO2 difference at anaerobic threshold
737	CPET	SpO2 (Rest)	%	Oxygen saturation at rest
738	CPET	SpO2	%	Oxygen saturation at VO2max
739	CPET	P(a-ET)CO2 (AT)	mmHg	Arterial End-tidal PCO2 difference at anaerobic threshold
740	CPET	VO2(AT / peakVO2)	%	Oxygen consumption at anaerobic threshold in percent of VO2max
741	CPET	VO2(RCP / peakVO2)	%	Oxygen consumption at respiratory compensation point in percent of VO2max
742	CPET	RER		Respiratory exchange ratio at VO2max
743	CPET	VE	l/min	Minute ventilation at VO2max
744	CPET	Load	W	Load at VO2max
745	CPET	Load (i)	W	Interpolated load at VO2max
746	CPET	Time	min:sec	Duration of load phase
747	CPET	VCO2	l/min	VCO2 at VO2max
748	CPET	VO2/kg (AT)	ml/min/kg	Oxygen uptake per body weight at anaerobic threshold
749	CPET	VO2/kg (RCP)	ml/min/kg	Oxygen uptake per body weight at respiratory compensation point
750	CPET	VO2/kg	ml/min/kg	Oxygen uptake per body weight at VO2max
751	CPET	SBP (Rest)	mmHg	Systolic blood pressure at rest
752	CPET	SBP	mmHg	Systolic blood pressure at VO2max
753	CPET	DBP (Rest)	mmHg	Diastolic blood pressure at rest
754	CPET	DBP	mmHg	Diastolic blood pressure at VO2max
755	CPET	Vt	l	Tidal volume at VO2max
756	CPET	PETO2 (Rest)	mmHg	End tidal O2 pressure at rest
757	CPET	PETCO2 (Rest)	mmHg	End tidal CO2 pressure at rest
758	CPET	RER (Rest)		Respiratory exchange ratio at rest
759	CPET	FEV1	l	Forced expired volume after 1s
760	CPET	VO2/Ref. (AT)	%	Oxygen consumption in percentage of predicted at anaerobic threshold
761	CPET	PETCO2 (AT)	mmHg	End tidal CO2 pressure at anaerobic threshold
762	CPET	PaCO2 (Rest)	mmHg	Arterial carbon dioxide partial pressure at rest
763	CPET	VO2/Ref. (RCP)	%	Oxygen consumption in percentage of predicted at respiratory compensation point
764	CPET	OUES		Oxygen uptake efficiency slope OUES is derived from the slope of VO2 versus Log VE
765	CPET	HR/VO2-Slope	beats/ml/kg	Slope of HR over VO2
766	CPET	VO2/WR(m)	ml/min/W	Slope of VO2 over work rate

ID	Measurement Type	Name	Unit	Description
793	CPET	Vol corr in		Inspiratory corection factor for volume calibration
794	CPET	Vol corr ex		Expiratory corection factor for volume calibration
795	CPET	O2 corr		O2 correction factor determined during gas calibration
796	CPET	CO2 corr		CO2 correction factor determined during gas calibration
797	CPET	Ambient temperature	°C	Ambient temperature
798	CPET	Ambient pressure	hPa	Ambient pressure
799	CPET	Ambient humidity	%	Ambient humidity
813	CPET	CH	mg/min	Carbohydrate oxidation
2101	CPET	%HR	%	Heart rate as percent predicted
2102	CPET	%Load	%	Load as percent predicted
2103	CPET	FeO2		Expiratory fraction of O2 concentration
2104	CPET	FeCO2		Expiratory fraction of CO2 concentration
2105	CPET	FeO2Et		Expiratory fraction of end tidal O2 concentration
2106	CPET	FeO2		Mean expiratory fraction of O2 concentration
2107	CPET	FIO2		Inspiratory fraction of O2 concentration
2108	CPET	Log(VE)	log(l/min)	Logarithm of minute ventilation
2109	CPET	Load (m)	W	Measured load
2110	CPET	Speed (m)	km/h	Measured speed
2111	CPET	Elev. (m)	%	Measured elevation
2112	CPET	Sf	1/min	Rowing frequency (Rowing machine)
2113	CPET	tin/ttot		inspiration time devided by duration of total breath
2114	CPET	Vt/IC	%	Tidal volume in percentage of inspiratory capacity
2115	CPET	VA (b)	l/min	Alveolar volume calculated from blood gases
2116	CPET	CO	l/min	Cardiac output estimated
2217	CPET	CH	mg/min	Carbohydrate oxidation
1800	Dynamic compliance	Test time		Time the test has been performed
1801	Dynamic compliance	CDyn	l/kPa	Dynamic compliance
1802	Dynamic compliance	CDynSpec	1/kPa	Specific dynamic compliance CDynSpec = CDyn/FRC
1803	Dynamic compliance	EDyn	kPa/l	Dynamic elasticity
1804	Dynamic compliance	Vt	l	Tidal volume
1805	Dynamic compliance	tIn	s	Time for inspiration
1806	Dynamic compliance	tEx	s	Time for expiration
1807	Dynamic compliance	Bf	1/min	Breathing frequency
1808	Dynamic compliance	Wtot	J	Total work of breathing
1809	Dynamic compliance	Wel	J	Elastic work of breathing
1810	Dynamic compliance	Wvis	J	Viscous work of breathing
1811	Dynamic compliance	Ptp	kPa	Transpulmonary pressure
1893	Dynamic compliance	Mouth press. corr. in		Inspiratory corection factor for mouth pressure calibration
1894	Dynamic compliance	Mouth press. corr. ex		Expiratory corection factor for mouth pressure calibration
1895	Dynamic compliance	Vol corr in		Inspiratory corection factor for volume calibration
1896	Dynamic compliance	Vol corr ex		Expiratory corection factor for volume calibration
1897	Dynamic compliance	Ambient temperature	°C	Ambient temperature

ID	Measurement Type	Name	Unit	Description
1898	Dynamic compliance	Ambient pressure	hPa	Ambient pressure
1899	Dynamic compliance	Ambient humidity	%	Ambient humidity
200	F/V	Test time		Time the test has been performed
201	F/V	FVCEx	l	Forced expiratory vital capacity
202	F/V	FVCIn	l	Forced inspiratory vital capacity
203	F/V	FEV0.5	l	Forced expiratory volume after 0.5s
204	F/V	FEV0.55	l	Forced expiratory volume after 0.55s
205	F/V	FEV0.6	l	Forced expiratory volume after 0.6s
206	F/V	FEV0.65	l	Forced expiratory volume after 0.65s
207	F/V	FEV0.7	l	Forced expiratory volume after 0.7s
208	F/V	FEV0.75	l	Forced expiratory volume after 0.75s
209	F/V	FEV0.8	l	Forced expiratory volume after 0.8s
210	F/V	FEV0.85	l	Forced expiratory volume after 0.85s
211	F/V	FEV0.9	l	Forced expiratory volume after 0.9s
212	F/V	FEV0.95	l	Forced expiratory volume after 0.95s
213	F/V	FEV1	l	Forced expiratory volume after 1s
214	F/V	FEV3	l	Forced expiratory volume after 3s
215	F/V	FEV6	l	Forced expiratory volume after 6s
216	F/V	FIV1	l	Forced inspiratory volume after 1s
217	F/V	FEV1/FVC	%	Tiffeneau Index, FEV1 in percentage of FVC
218	F/V	FEV1/VC	%	FEV1 in percentage of VC
219	F/V	PEF	l/s	Peak expiratory flow
220	F/V	PIF	l/s	Peak inspiratory flow
221	F/V	EV	l	Extrapolated volume
222	F/V	EVrel	%	Extrapolated volume in percentage of FVC
223	F/V	tex	s	Duration time of expiration
224	F/V	MEF25	l/s	Maximal instantaneous forced expiratory flow when 25% of FVC remains to be expired
225	F/V	MEF50	l/s	Maximal instantaneous forced expiratory flow when 50% of FVC remains to be expired
226	F/V	MEF75	l/s	Maximal instantaneous forced expiratory flow when 75% of FVC remains to be expired
227	F/V	MEF85	l/s	Maximal instantaneous forced expiratory flow when 85% of FVC remains to be expired
228	F/V	MEF25-50	l/s	Mean forced expiratory flow between 25% and 50% of FVC
229	F/V	MEF25-75	l/s	Mean forced expiratory flow between 25% and 75% of FVC
230	F/V	MEF50-75	l/s	Mean forced expiratory flow between 50% and 75% of FVC
231	F/V	MEF75-85	l/s	Mean forced expiratory flow between 75% and 85% of FVC
232	F/V	MIF25	l/s	Maximal instantaneous forced inspiratory flow when 25% of FVC remains to be inhaled
233	F/V	MIF50	l/s	Maximal instantaneous forced inspiratory flow when 50% of FVC remains to be inhaled
234	F/V	MIF75	l/s	Maximal instantaneous forced inspiratory flow when 75% of FVC remains to be inhaled
235	F/V	AEx	l*/l/s	Area delineated by maximum expiratory flow volume curve
236	F/V	AI _n	l*/l/s	Area delineated by maximum inspiratory flow volume curve
237	F/V	dV@EOT	l	Expiratory volume change at the end of FV test
238	F/V	MEF25/FVC	1/s	MEF25 divided by FVC

ID	Measurement Type	Name	Unit	Description
239	F/V	MEF50/FVC	l/s	MEF50 divided by FVC
240	F/V	MEF75/FVC	l/s	MEF75 divided by FVC
241	F/V	PEF/FVC	l/s	PEF divided by FVC
242	F/V	Lung age	years	Lung age is calculated for patients 20-84 years old. Lung age is equal to the predicted FEV1 that matches patients actual FEV1.
243	F/V	tPEF	ms	Time begin with start of expiration until PEF has been reached
244	F/V	FEV1/FEV6	%	FEV1 in percentage of FEV6
245	F/V	Soft air trapping	ml	Difference between SVC and FVC
246	F/V	A/T		Ratio of area between expiratory loop and triangular modell
247	F/V	A/T(r)		Ratio of area between expiratory loop (starting at PEF) and triangular modell
248	F/V	A/T(96%)		Ratio of area between expiratory loop (starting at PEF and ending at 96% of FVC) and triangular modell
249	F/V	MEF(FRC)	l/s	Maximal instantaneous forced expiratory flow at FRC level
250	F/V	IC/FVC	%	Inspiratory capacity in percent of forced vital capacity
251	F/V	MEF25-75/FVC	%/s	Mean forced expiratory flow between 25% and 75% of FVC divided by FVC
252	F/V	%VCRef	%	Volume in percentage of vital capacity reference value
253	F/V	FVCmax	l	Maximum of Forced expiratory vital capacity and forced inspiratory vital capacity
254	F/V	VC	l	Vital capacity
255	F/V	IC	l	Inspiratory capacity
256	F/V	TV	l	Tidal volume
257	F/V	IRV	l	Inspiratory reserve volume
258	F/V	ERV	l	Expiratory reserve volume
294	F/V	BTPS corr.		Body Temperature Pressure Saturated (BTPS) factor
295	F/V	Vol corr in		Inspiratory corection factor for volume calibration
296	F/V	Vol corr ex		Expiratory corection factor for volume calibration
297	F/V	Ambient temperature	°C	Ambient temperature
298	F/V	Ambient pressure	hPa	Ambint pressure
299	F/V	Ambient humidity	%	Ambient humidity
7101	Flow linearity check	Deviation low in	%	Inspiratory deviation from expected value for low flow
7102	Flow linearity check	Deviation low ex	%	Expiratory deviation from expected value for low flow
7103	Flow linearity check	Low flow in	l/s	Inspiratory flow during low flow linearity check
7104	Flow linearity check	Low flow ex	l/s	Expiratory flow during low flow linearity check
7105	Flow linearity check	Deviation medium in	%	Inspiratory deviation from expected value for medium flow
7106	Flow linearity check	Deviation medium ex	%	Expiratory deviation from expected value for medium flow
7107	Flow linearity check	Medium flow in	l/s	Inspiratory flow during medium flow linearity check

ID	Measurement Type	Name	Unit	Description
7108	Flow linearity check	Medium flow ex	l/s	Expiratory flow during medium flow linearity check
7109	Flow linearity check	Deviation high in	%	Inspiratory deviation from expected value for high flow
7110	Flow linearity check	Deviation high ex	%	Expiratory deviation from expected value for high flow
7111	Flow linearity check	High flow in	l/s	Inspiratory flow during high flow linearity check
7112	Flow linearity check	High flow ex	l/s	Expiratory flow during high flow linearity check
7113	Flow linearity check	Syringe volume	l	Volume of calibration syringe
7197	Flow linearity check	Ambient temperature	°C	Ambient temperature
7198	Flow linearity check	Ambient pressure	hPa	Ambient pressure
7199	Flow linearity check	Ambient humidity	%	Ambient humidity
6001	HR	HR	beats/min	Heart rate
6003	Manual entry	SBP	mmHg	Systolic blood pressure
6004	Manual entry	DBP	mmHg	Diastolic blood pressure
6006	Manual entry	UN	mg/min	Urea Nitrogen production
6007	Manual entry	Hct	%	Hematocrit
1500	MEP	Test time		Time the test has been performed
1501	MEP	PEmax	kPa	Maximum expiratory pressure
1593	MEP	Mouth press. corr. in		Inspiratory correction factor for mouth pressure calibration
1594	MEP	Mouth press. corr. ex		Expiratory correction factor for mouth pressure calibration
1595	MEP	Vol corr in		Inspiratory correction factor for volume calibration
1596	MEP	Vol corr ex		Expiratory correction factor for volume calibration
1597	MEP	Ambient temperature	°C	Ambient temperature
1598	MEP	Ambient pressure	hPa	Ambient pressure
1599	MEP	Ambient humidity	%	Ambient humidity
1400	MIP	Test time		Time the test has been performed
1401	MIP	P1max	kPa	Maximum inspiratory pressure
1402	MIP	P0.1max	kPa	Pressure after 100ms during maximum inspiratory maneuver
1493	MIP	Mouth press. corr. in		Inspiratory correction factor for mouth pressure calibration
1494	MIP	Mouth press. corr. ex		Expiratory correction factor for mouth pressure calibration
1495	MIP	Vol corr in		Inspiratory correction factor for volume calibration
1496	MIP	Vol corr ex		Expiratory correction factor for volume calibration
1497	MIP	Ambient temperature	°C	Ambient temperature
1498	MIP	Ambient pressure	hPa	Ambient pressure
1499	MIP	Ambient humidity	%	Ambient humidity
7401	Mouthpressure calibration	Corr ex		Inspiratory mouth pressure correction factor measured during mouth pressure calibration
7402	Mouthpressure calibration	Corr in		Expiratory mouth pressure correction factor measured during mouth pressure calibration
7403	Mouthpressure calibration	Applied pressure ex	mbar	Pressure used for expiratory mouth pressure calibration
7404	Mouthpressure calibration	Applied pressure in	mbar	Pressure used for inspiratory mouth pressure calibration

ID	Measurement Type	Name	Unit	Description
7497	Mouthpressure calibration	Ambient temperature	°C	Ambient temperature
7498	Mouthpressure calibration	Ambient pressure	hPa	Ambient pressure
7499	Mouthpressure calibration	Ambient humidity	%	Ambient humidity
300	MVV	Test time		Time the test has been performed
301	MVV	MVV	l/min	Maximum voluntary volume
302	MVV	VT	l	Tidal volume
303	MVV	BF	l/min	Breathing frequency
304	MVV	Start	s	Start time of the test
305	MVV	End	s	Time when the test has been finished
306	MVV	Duration	s	Duration of MVV manœuvre
307	MVV	MVV/(40*FEV1)	%	MVV in percentage of FEV1x40
394	MVV	BTPS corr.		Body Temperature Pressure Saturated (BTPS) factor
395	MVV	Vol corr in		Inspiratory corection factor for volume calibration
396	MVV	Vol corr ex		Expiratory corection factor for volume calibration
397	MVV	Ambient temperature	°C	Ambient temperature
398	MVV	Ambient pressure	hPa	Ambient pressure
399	MVV	Ambient humidity	%	Ambient humidity
6005	NO	NO	ppb	Exhaled nitric oxide concentration
7201	O2/CO2 Calibration	O2 corr		O2 correction factor determined during gas calibration
7202	O2/CO2 Calibration	CO2 corr		CO2 correction factor determined during gas calibration
7203	O2/CO2 Calibration	O2 Offset		O2 offset determined during gas calibration
7204	O2/CO2 Calibration	CO2 Offset		CO2 offset determined during gas calibration
7205	O2/CO2 Calibration	T90 O2	ms	T90 of O2 signal determined during gas calibration
7206	O2/CO2 Calibration	T90 CO2	ms	T90 of CO2 signal determined during gas calibration
7207	O2/CO2 Calibration	Delay O2	ms	Delay of O2 signal determined during gas calibration
7208	O2/CO2 Calibration	Delay CO2	ms	Delay of CO2 signal determined during gas calibration
7209	O2/CO2 Calibration	Ambient O2	%	Ambient Oxygen concentration
7210	O2/CO2 Calibration	Ambient CO2	%	Ambient Carbon dioxide concentration
7211	O2/CO2 Calibration	O2 cal gas	%	O2 concentration of calibration gas cylinder
7212	O2/CO2 Calibration	CO2 cal gas	%	CO2 concentration of calibration gas cylinder
7297	O2/CO2 Calibration	Ambient temperature	°C	Ambient temperature
7298	O2/CO2 Calibration	Ambient pressure	hPa	Ambient pressure
7299	O2/CO2 Calibration	Ambient humidity	%	Ambient humidity
1600	P0.1	Test time		Time the test has been performed
1601	P0.1	P0.1	kPa	Pressure after 100ms during slow and relaxed tidal breathing manœuvre
1602	P0.1	P0.1/VE	kPa/l/min	P0.1 divided by minute ventilation
1603	P0.1	P0.1/Vt/tin	kPa/l/s	P01 divided by the relation of tidal volume and inspiratory time
1604	P0.1	P0.1/P0.1max	%	P0.1 divided by P0.1max
1605	P0.1	P0.1/Plmax	%	P0.1 divided by maximum inspiratory pressure

ID	Measurement Type	Name	Unit	Description
1606	P0.1	TTmus		Tension time index for inspiratory muscles $TTmus = ((5 * P0.1 * tln) / Pimax) * (ti/ttot * 0,01)$
1693	P0.1	Mouth press. corr. in		Inspiratory corection factor for mouth pressure calibration
1694	P0.1	Mouth press. corr. ex		Expiratory corection factor for mouth pressure calibration
1695	P0.1	Vol corr in		Inspiratory corection factor for volume calibration
1696	P0.1	Vol corr ex		Expiratory corection factor for volume calibration
1697	P0.1	Ambient temperature	°C	Ambient temperature
1698	P0.1	Ambient pressure	hPa	Ambient pressure
1699	P0.1	Ambient humidity	%	Ambient humidity
8101	PFT	VC	l	Vital capacity
8102	PFT	VCIn	l	Inspiratory vital capacity
8103	PFT	VCEx	l	Expiratory vital capacity
8104	PFT	IC	l	Inspiratory capacity
8105	PFT	TV	l	Tidal volume
8106	PFT	ERV	l	Expiratory reserve volume
8107	PFT	IRV	l	Inspiratory reserve volume
8108	PFT	TLC	l	Total lung capacity (TLC fix)
8109	PFT	RV	l	Residual volume (TLC fix)
8110	PFT	TLC	l	Total lung capacity (RV fix)
8111	PFT	RV	l	Residual volume (RV fix)
801	REE	REE	kcal/24h	Resting Energy Expenditure $REE = (3.9 \times VO_2 + 1.1 \times VCO_2) \times 1.44$
802	REE	Vdm	ml	Dead space mask
803	REE	VO2	l/min	Oxygen consumption
804	REE	VO2/kg	ml/min/kg	Oxygen consumption per body weight
805	REE	VCO2	l/min	Carbon Dioxide production
806	REE	RER		Respiratory exchange ratio
807	REE	RQnp		RQ corrected for proteine consumption
808	REE	Vt	l	Tidal volume
809	REE	Bf	1/min	Breathing frequency
810	REE	VE	l/min	Minute Ventilation
811	REE	Fan	l/min	Fan speed
812	REE	Fat	mg/min	Fat oxidation
814	REE	Proteines	mg/min	Proteines oxidation
815	REE	Fat	kcal/24h	Fat oxidation
816	REE	CH	kcal/24h	Carbohydrate oxidation
817	REE	Proteines	kcal/24h	Proteines oxidation
818	REE	Fat	%	Fat oxidation
819	REE	CH	%	Carbohydrate oxidation
820	REE	Proteines	%	Proteines oxidation
821	REE	REE (Weir)	kcal/24h	Resting Energy Expenditure $REE = (3.9 \times VO_2 + 1.1 \times VCO_2) \times 1.44$

ID	Measurement Type	Name	Unit	Description
822	REE	REE/BSA	kcal/24h/m ²	Resting Energy Expenditure per Body Surface Area $BSA = 0.007184 \times Height(cm)^{0.725} \times Weight(kg)^{0.425}$ BSA calculation according to formula DuBois
823	REE	HR	1/min	Heart rate
824	REE	SBP	mmHg	Systolic blood pressure
825	REE	DBP	mmHg	Diastolic blood pressure
826	REE	DP	mmHg/min	Double product DP = SBP x HR
827	REE	SpO2	%	Oxygen saturation
828	REE	PETO2	mmHg	End tidal O2 pressure
829	REE	PETCO2	mmHg	End tidal CO2 pressure
830	REE	PaO2	mmHg	Arterial oxygen partial pressure
831	REE	PaCO2	mmHg	Arterial carbon dioxide partial pressure
832	REE	P(A-a)O2	mmHg	Alveolar - Arterial PO2 difference
833	REE	P(a-ET)CO2	mmHg	Arterial End-tidal PCO2 difference
834	REE	pH		pH blood gas value
835	REE	HCO3	meq/l	Bicarbonat blood gas value
836	REE	BE	meq/l	Base Excess blood gas value
893	REE	Vol corr in		Inspiratory corection factor for volume calibration
894	REE	Vol corr ex		Expiratory corection factor for volume calibration
895	REE	O2 corr		O2 correction factor determined during gas calibration
896	REE	CO2 corr		CO2 correction factor determined during gas calibration
897	REE	Ambient temperature	°C	Ambient temperature
898	REE	Ambient pressure	hPa	Ambient pressure
899	REE	Ambient humidity	%	Ambient humidity
901	REE	max ΔVO2	%	Difference between maximal and minimal VO2 in section used for calculation of REE
902	REE	max ΔVCO2	%	Difference between maximal and minimal VCO2 in section used for calculation of REE
903	REE	max ΔRER	%	Difference between maximal and minimal RER in section used for calculation of REE
2201	REE	Time	min:sec	Time in minutes and seconds
2202	REE	Time	s	Time in seconds
2203	REE	VO2	l/min	Oxygen consumption
2204	REE	VO2/kg	ml/min/kg	Oxygen consumption per body weight
2205	REE	VCO2	l/min	Carbon dioxide production
2206	REE	RER		Respiratory exchange ratio
2207	REE	RQnp		Respiratory quotient corrected for proteine
2208	REE	VEx	l	Expiratory volume
2209	REE	tEx	s	Time for expiration
2210	REE	VIn	l	Inspiratory volume
2211	REE	tIn	s	Time for inspiration
2212	REE	Vt	l	Tidal volume
2213	REE	Bf	1/min	Breathing frequency
2214	REE	VE	l/min	Minute ventilation
2215	REE	Fan	l/min	Fan speed

ID	Measurement Type	Name	Unit	Description
2216	REE	Fat	mg/min	Lipids oxidation
2218	REE	Proteines	mg/min	Proteines oxidation
2219	REE	Fat	kcal/24h	Lipids oxidation
2220	REE	CH	kcal/24h	Carbohydrate oxidation
2221	REE	Proteines	kcal/24h	Proteines oxidation
2222	REE	Fat	%	Lipids oxidation
2223	REE	CH	%	Carbohydrate oxidation
2224	REE	Proteines	%	Proteines oxidation
2225	REE	REE	kcal/24h	Resting Energy Expenditure
2226	REE	REE (Weir)	kcal/24h	Resting Energy Expenditure calculated according to the equation of Weir
2227	REE	REE/BSA	kcal/24h/m ²	Resting Energy Expenditure per Body Surface Area
2228	REE	HR	1/min	Heart rate
2229	REE	SBP	mmHg	Systolic blood pressure
2230	REE	DBP	mmHg	Diastolic blood pressure
2231	REE	DP	mmHg/min	Double product
2232	REE	SpO2	%	Oxygen saturation
2233	REE	SpO2 Quality	%	Quality of SpO2 reading
2234	REE	FO2Et		Endtidal fraction of O2 concentration
2235	REE	FCO2Et		Endtidal fraction of CO2 concentration
2236	REE	FiO2Et		Inspiratory fraction of endtidal O2 concentration
2237	REE	FiCO2Et		Inspiratory fraction of endtidal CO2 concentration
2238	REE	PETO2	mmHg	End tidal O2 pressure
2239	REE	PETCO2	mmHg	End tidal CO2 pressure
2240	REE	PaO2	mmHg	Arterial oxygen partial pressure
2241	REE	PaCO2	mmHg	Arterial carbon dioxide partial pressure
2242	REE	P(A-a)O2	mmHg	Alveolar - Arterial PO2 difference
2243	REE	P(a-ET)CO2	mmHg	Arterial End-tidal PCO2 difference
2244	REE	pH		pH blood gas value
2245	REE	HCO3	meq/l	Bicarbonat blood gas value
2246	REE	BE	meq/l	Base Excess blood gas value
2247	REE	FiO2 Offset		Offset between measured FiO2 and FIO2
2248	REE	O2Delay	ms	Delay between O2-Signal and Flow
2249	REE	CO2Delay	ms	Delay between CO2-Signal and Flow
2250	REE	CO2 Offset	%	Offset between measured FiCO2 and FiCO2
2297	REE	Ambient temperature	°C	Ambient temperature
2298	REE	Ambient pressure	hPa	Ambient pressure
2299	REE	Ambient humidity	%	Ambient humidity
1100	Resistance	Test time		Time the test has been performed
1101	Resistance	Rawtot	kPa/(l/s)	Total airway resistance
1102	Resistance	Rawin	kPa/(l/s)	Inspiratory airway resistance
1103	Resistance	Rawex	kPa/(l/s)	Expiratory airway resistance
1104	Resistance	sRawtot	kPa*s	Specific total airway resistance
				sRawtot = Rawtot x TGV
1105	Resistance	sRawin	kPa*s	Specific inspiratory airway resistance
				sRawin = Rawin x TGV
1106	Resistance	sRawex	kPa*s	Specific expiratory airway resistance
				sRawex = Rawex x TGV
1107	Resistance	Refftot	kPa/(l/s)	Total effective airway resistance

ID	Measurement Type	Name	Unit	Description
1108	Resistance	Reffin	kPa/(l/s)	Inspiratory effective airway resistance
1109	Resistance	Reffex	kPa/(l/s)	Expiratory effective airway resistance
1110	Resistance	sRefftot	kPa*s	Specific total effective airway resistance sRefftot = Refftot x TGV
1111	Resistance	sReffin	kPa*s	Specific inspiratory effective airway resistance sReffin = Reffin x TGV
1112	Resistance	sReffex	kPa*s	Specific expiratory effective airway resistance sReffex = Reffex x TGV
1113	Resistance	Gawtot	1/kPa/(l/s)	Total airway conductance
1114	Resistance	Gawin	1/kPa/(l/s)	Inspiratory airway conductance
1115	Resistance	Gawex	1/kPa/(l/s)	Expiratory airway conductance
1116	Resistance	sGawtot	1/(kPa*s)	Specific total airway conductance sGawtot = Gawtot x TGV
1117	Resistance	sGawin	1/(kPa*s)	Specific inspiratory airway conductance sGawin = Gawin x TGV
1118	Resistance	sGawex	1/(kPa*s)	Specific expiratory airway conductance sGawex = Gawex x TGV
1119	Resistance	sGefftot	1/kPa/(l/s)	Specific total effective conductance sGefftot = Gefftot x TGV
1120	Resistance	sGeffin	1/kPa/(l/s)	Specific inspiratory effective conductance sGeffin = Geffin x TGV
1121	Resistance	sGeffex	1/kPa/(l/s)	Specific expiratory effective conductance sGeffex = Geffex x TGV
1122	Resistance	Gefftot	1/(kPa*s)	Total effective airway conductance
1123	Resistance	Geffin	1/(kPa*s)	Inspiratory effective airway conductance
1124	Resistance	Geffex	1/(kPa*s)	Expiratory effective airway conductance
1125	Resistance	tIn	s	Time for inspiration
1126	Resistance	tEx	s	Time for expiration
1127	Resistance	Bf	1/min	Breathing frequency
1128	Resistance	Max. Flow In	l/s	Maximum inspiratory flow
1129	Resistance	Max. Flow Ex	l/s	Maximum expiratory flow
1130	Resistance	Box volume	l	Box volume
1131	Resistance	TotalSRawTot	kPa*s	Total specific airway resistance (including application resistance)
1132	Resistance	TotalSRawEx	kPa*s	Expiratory specific airway resistance (including application resistance)
1133	Resistance	TotalSRawIn	kPa*s	Inspiratory specific airway resistance (including application resistance)
1134	Resistance	TotalSReffTot	kPa*s	Total specific effective airway resistance (including application resistance)
1135	Resistance	TotalSReffEx	kPa*s	Expiratory specific effective airway resistance (including application resistance)
1136	Resistance	TotalSReffIn	kPa*s	Inspiratory specific effective airway resistance (including application resistance)
1137	Resistance	AppRawTot	kPa/(l/s)	Total application resistance
1138	Resistance	AppRawEx	kPa/(l/s)	Expiratory application resistance

ID	Measurement Type	Name	Unit	Description
1139	Resistance	AppRawIn	kPa/(l/s)	Inspiratory application resistance
1193	Resistance	Box time const.	s	Time constant of body box measured during box calibration
1194	Resistance	Box press. corr.		Box pressure correction factor measured during box calibration
1195	Resistance	Vol corr in		Inspiratory corection factor for volume calibration
1196	Resistance	Vol corr ex		Expiratory corection factor for volume calibration
1197	Resistance	Ambient temperature	°C	Ambient temperature
1198	Resistance	Ambient pressure	hPa	Ambient pressure
1199	Resistance	Ambient humidity	%	Ambient humidity
2300	Rint	Test time		Time the test has been performed
2301	Rint	Rint	kPa/(l/s)	Airway resistance by using interrupter technique
2302	Rint	Rint,i	kPa/(l/s)	Inspiratory airway resistance by using interrupter technique
2303	Rint	Flow	l/s	Flow
2393	Rint	Mouth press. corr. in		Inspiratory corection factor for mouth pressure calibration
2394	Rint	Mouth press. corr. ex		Expiratory corection factor for mouth pressure calibration
2395	Rint	Vol corr in		Inspiratory corection factor for volume calibration
2396	Rint	Vol corr ex		Expiratory corection factor for volume calibration
2397	Rint	Ambient temperature	°C	Ambient temperature
2398	Rint	Ambient pressure	hPa	Ambient pressure
2399	Rint	Ambient humidity	%	Ambient humidity
401	SpO2	SpO2	%	Oxygen saturation
402	SpO2	HR	1/min	Heart rate
403	SpO2	SpO2 (min)	%	Minimum SpO2
404	SpO2	HR (min)	1/min	Minimum HR
405	SpO2	SpO2 (max)	%	Maximum SpO2
406	SpO2	HR (max)	1/min	Maximum HR
6002	SpO2	SpO2	%	Oxygen saturation
1700	Static compliance	Test time		Time the test has been performed
1701	Static compliance	CStat	l/kPa	Static compliance
1702	Static compliance	CStatSpec	1/kPa	Specific static compliance
				CStatSpec = Cstat / FRC
1703	Static compliance	EStat	kPa/l	Static elasticity
1704	Static compliance	IVC	l	Inspiratory vital capacity
1705	Static compliance	tIn	s	Time for inspiration
1706	Static compliance	tEx	s	Time for expiration
1707	Static compliance	Bf	1/min	Breathing frequency
1793	Static compliance	Mouth press. corr. in		Inspiratory corection factor for mouth pressure calibration
1794	Static compliance	Mouth press. corr. ex		Expiratory corection factor for mouth pressure calibration
1795	Static compliance	Vol corr in		Inspiratory corection factor for volume calibration
1796	Static compliance	Vol corr ex		Expiratory corection factor for volume calibration
1797	Static compliance	Ambient temperature	°C	Ambient temperature

ID	Measurement Type	Name	Unit	Description
1798	Static compliance	Ambient pressure	hPa	Ambient pressure
1799	Static compliance	Ambient humidity	%	Ambient humidity
1901	Stress ECG	Time	min:sec	Time in minutes and seconds
1902	Stress ECG	Time	s	Time in seconds
1903	Stress ECG	Load	W	Load
1904	Stress ECG	Load (i)	W	Load interpolated
1905	Stress ECG	Load (norm.)	W	Load using reference for patient with normal weight
1906	Stress ECG	Load/Ref.	%	Load in percentage of reference value
1907	Stress ECG	Load/kg	W/kg	Load per patient weight
1908	Stress ECG	Speed	km/h	Speed
1909	Stress ECG	Elevation	%	Elevation
1910	Stress ECG	RPM	1/min	Pedal cycling speed
1911	Stress ECG	HR	1/min	Heart rate
1912	Stress ECG	HR (i)	1/min	Heart rate interpolated over load stage
1913	Stress ECG	HRR	1/min	Heart rate reserve HRR = predicted HR - HRmax
1914	Stress ECG	SBP	mmHg	Systolic blood pressure
1915	Stress ECG	DBP	mmHg	Diastolic blood pressure
1916	Stress ECG	DP	mmHg/min	Double product DP = SBP x HR
1917	Stress ECG	SpO2	%	Oxygen saturation
1918	Stress ECG	SpO2 Qual.	%	Quality of SpO2 reading
1919	Stress ECG	PaO2	mmHg	Arterial oxygen partial pressure
1920	Stress ECG	PaCO2	mmHg	Arterial carbon dioxide partial pressure
1921	Stress ECG	Lactate	mmol/l	Lactate concentration
1922	Stress ECG	pH		pH blood gas value
1923	Stress ECG	HCO3	meq/l	Bicarbonat blood gas value
1924	Stress ECG	BE	meq/l	Base Excess blood gas value
1925	Stress ECG	Mets		Metabolic equivalent $METS = \frac{VO_2/Kg}{3,5}$
1926	Stress ECG	Borg		Borg Index
1927	Stress ECG	%HR	%	Heart rate in percentage of predicted
1928	Stress ECG	Load (m)	W	Load
1929	Stress ECG	Speed (m)	km/h	Speed
1930	Stress ECG	Elev. (m)	%	Elevation
1931	Stress ECG	Sf	1/min	Rowing frequency (Rowing machine)
1996	Stress ECG	Load		Load or speed depending on ergometer type
1997	Stress ECG	Ambient temperature	°C	Ambient temperature
1998	Stress ECG	Ambient pressure	hPa	Ambient pressure
1999	Stress ECG	Ambient humidity	%	Ambient humidity
2001	Stress ECG	HR (Rest)	beats/min	Heart rate at rest
2002	Stress ECG	HR (max.Load)	beats/min	Heart rate at maximum load
2003	Stress ECG	max. Load	W	Maximum load
2004	Stress ECG	HRR (max. Load)	1/min	Heart rate reserve at maximum load
2005	Stress ECG	PaO2 (Rest)	mmHg	Arterial oxygen partial pressure at rest
2006	Stress ECG	SpO2 (Rest)	%	Arterial carbon dioxide partial pressure at rest
2007	Stress ECG	SpO2 (max. Load)	%	Oxygen saturation at maximum load
2008	Stress ECG	Load duration	min:sec	Duration of load phase
2009	Stress ECG	SBP (Rest)	mmHg	Systolic blood pressure at rest
2010	Stress ECG	SBP (max. Load)	mmHg	Systolic blood pressure at max load

ID	Measurement Type	Name	Unit	Description
2011	Stress ECG	DBP (Rest)	mmHg	Double product at rest
2012	Stress ECG	DBP (max. Load)	mmHg	Double product at maximum load
2097	Stress ECG	Ambient temperature	°C	Ambient temperature
2098	Stress ECG	Ambient pressure	hPa	Ambient pressure
2099	Stress ECG	Ambient humidity	%	Ambient humidity
8001	Stress test	Time	min:sec	Test time in minutes and seconds
8002	Stress test	Time	s	Test time in seconds
8003	Stress test	Load	W	Load
8004	Stress test	Load (i)	W	Load interpolated over each load stage
8005	Stress test	Load (norm.)	W	Load using reference for patient with normal weight
8006	Stress test	Load/Ref.	%	Load in percentage of predicted load
8007	Stress test	Load/kg	W/kg	Load per body weight
8008	Stress test	Speed	km/h	Speed
8009	Stress test	Elevation	%	Elevation
8010	Stress test	RPM	1/min	Cycle speed of cycle ergometer
8011	Stress test	HR	1/min	Heart rate
8012	Stress test	HR (i)	1/min	Heart rate interpolated over load stage
8013	Stress test	HRR	1/min	Heart rate reserve HRR = predicted HR - HRmax
8014	Stress test	SBP	mmHg	Systolic blood pressure
8015	Stress test	DBP	mmHg	Diastolic blood pressure
8016	Stress test	DP	mmHg/min	Double product
8017	Stress test	SpO2	%	Oxygen saturation
8018	Stress test	SpO2 Qual.	%	Quality of SpO2 reading
8019	Stress test	PaO2	mmHg	Arterial oxygen partial pressure
8020	Stress test	PaCO2	mmHg	Arterial carbon dioxide partial pressure
8021	Stress test	Lactate	mmol/l	Lactate concentration
8022	Stress test	pH		pH blood gas value
8023	Stress test	HCO3	meq/l	Bicarbonat blood gas value
8024	Stress test	BE	meq/l	Base Excess blood gas value
8025	Stress test	Mets		Metabolic equivalent $METS = \frac{VO_2/Kg}{3,5}$
8026	Stress test	Borg		Borg Index
8027	Stress test	%HR	%	Heart rate in percentage of predicted
8028	Stress test	Load (m)	W	Measured load
8029	Stress test	Speed (m)	km/h	Measured speed
8030	Stress test	Elev. (m)	%	Measured elevation
8031	Stress test	Sf	1/min	Rowing frequency (Rowing machine)
8096	Stress test	Load/Speed+Elevation		Parameter which will show Load if a cycle ergometer protocole is used and Speed/Elevation if a treadmill protocole is used
8097	Stress test	Ambient temperature	°C	Ambient temperature
8098	Stress test	Ambient pressure	hPa	Ambient pressure
8099	Stress test	Ambient humidity	%	Ambient humidity
100	SVC	Test time		Time the test has been performed
101	SVC	VC	l	Slow Vital capacity
102	SVC	IVC	l	Inspiratory vital capacity
103	SVC	VCEx	l	Expiratory vital capacity
104	SVC	TV	l	Tidal volume

ID	Measurement Type	Name	Unit	Description
105	SVC	IC	l	Inspiratory capacity
106	SVC	IRV	l	Inspiratory reserve volume
107	SVC	ERV	l	Expiratory reserve volume
108	SVC	TLC	l	Total lung capacity
109	SVC	RR	1/min	Respiratory rate, breathing frequency
110	SVC	MV	l/min	Minute Ventilation
111	SVC	60%VC	l	60% of vital capacity
193	SVC	IC (From TGV)	l	Inspiratory capacity measured during FRCpl measurement
194	SVC	BTPS corr.		Body Temperature Pressure Saturated (BTPS) factor
195	SVC	Vol corr in		Inspiratory corection factor for volume calibration
196	SVC	Vol corr ex		Expiratory corection factor for volume calibration
197	SVC	Ambient temperature	°C	Ambient temperature
198	SVC	Ambient pressure	hPa	Ambient pressure
199	SVC	Ambient humidity	%	Ambient humidity
1000	TGV	Test time		Time the test has been performed
1001	TGV	TLC	l	Total lung capacity
				TLC = TGV + IC
1002	TGV	TGV	l	Functional residual capacity measured with Bodyplethysmography
1003	TGV	RV	l	Residual volume
				RV = TLC - VC
1004	TGV	TGV/TLC	%	Functional residual capacity in percentage of total lung capacity
1005	TGV	RV/TLC	%	Residual volume in percentage of total lung capacity
1006	TGV	IC	l	Inspiratory capacity
1007	TGV	ERV	l	Expiratory reserve volume
1008	TGV	TV	l	Tidal volume
1009	TGV	IC	l	Inspiratory capacity measured during FRCpl measurement
1010	TGV	ERV	l	Expiratory capacity measured during FRCpl measurement
1011	TGV	TLCBody-TLCCH4	l	Difference between TLC measured with Bodyplethysmography and Diffusion
1012	TGV	Pm,max	kPa	Maximum mouth pressure
1013	TGV	Pm,min	kPa	Minimum mouth pressure
1014	TGV	PB,max	kPa	Maximum box pressure
1015	TGV	PB,min	kPa	Minimum box pressure
1016	TGV	TLC Offset	l	TLC offset
1017	TGV	Box volume	l	Box volume
1091	TGV	Box time const.	s	Time constant of body box measured during box calibration
1092	TGV	Box press. corr.		Box pressure correction factor measured during box calibration
1093	TGV	Mouth press. corr. in		Inspiratory mouth pressure correction factor measured during mouth pressure calibration
1094	TGV	Mouth press. corr. ex		Expiratory mouth pressure correction factor measured during mouth pressure calibration

ID	Measurement Type	Name	Unit	Description
1095	TGV	Vol corr in		Inspiratory corection factor for volume calibration
1096	TGV	Vol corr ex		Expiratory corection factor for volume calibration
1097	TGV	Ambient temperature	°C	Ambient temperature
1098	TGV	Ambient pressure	hPa	Ambient pressure
1099	TGV	Ambient humidity	%	Ambient humidity
601	Tidal loops	TV	l	Tidal volume
602	Tidal loops	IC	l	Inspiratory capacity
603	Tidal loops	TV/IC	%	Tidal volume in percent of inspiratory capacity
604	Tidal loops	Flow limitation	%	Flow limitation
605	Tidal loops	EELV	l	End expiratory lung volume
606	Tidal loops	EILV	l	End inspiratory lung volume
607	Tidal loops	FEV1	l	Forced expired volume after 1s
608	Tidal loops	TV/VC	%	Tidal volume in percent of vital capacity
1	Undefined	Time	s	Time
2	Undefined	Flow	l/s	Flow
3	Undefined	Volume	l	Volume
4	Undefined	HR	1/min	Heart rate
5	Undefined	SpO2	%	Oxygen saturation
6	Undefined	SpO2 intensity	%	SpO2 intensity
7	Undefined	Ambient temperature	°C	Ambient temperature
8	Undefined	Ambient pressure	hPa	Ambient pressure
9	Undefined	Ambient humidity	%	Ambient humidity
10	Undefined	Length	cm	Length
11	Undefined	O2	%	Oxygen concentration
12	Undefined	CO2	%	Carbon dioxide concentration
13	Undefined	O2-Cell pressure	hPa	Oxygen cell pressure
14	Undefined	CO2-Cell pressure	hPa	Carbon dioxide cell pressure
15	Undefined	CO2-Cell Temp.	°C	Temperature inside CO2 cell
27	Undefined	PB	Pa	Body box pressure
28	Undefined	PM	kPa	Mouth pressure
29	Undefined	CO	%	Carbon monoxide concentration
30	Undefined	CH4	%	Methane concentration
31	Undefined	Channel I	V	Raw signal of IOStik channel I
32	Undefined	Channel II	V	Raw signal of IOStik channel II
33	Undefined	Channel III	V	Raw signal of IOStik channel III
34	Undefined	Ptp	kPa	Transpulmonary pressure
35	Undefined	Shift volume	ml	Shift volume in Bodyplethysmography
36	Undefined	Relative dosis	%	Relative dosis
37	Undefined	Load (m)	W	Cycle ergometer load
38	Undefined	Speed (m)	km/h	Treadmill speed
39	Undefined	Elev. (m)	%	Treadmill elevation
40	Undefined	Sf	1/min	Rowing frequency (Rowing machine)
41	Undefined	Sync.		Synchronisation signal (Rowing machine)
42	Undefined	Ambient CO2	%	Ambient carbon dioxide concentration
5001	Undefined	Age	years	Patient age
5002	Undefined	Height	cm	Patient height
5003	Undefined	Weight	kg	Patient weight

ID	Measurement Type	Name	Unit	Description
5004	Undefined	BMI	kg/m ²	Body Mass Index $BMI = \frac{Weight}{Height^2}$ Height in m Weight in Kg
5005	Undefined	BSA	m ²	Body surface area
5006	Undefined	PD20		Provocation dosis when FEV1 decreases 20% from base test
5007	Undefined	PC20		Provocation concentration when FEV1 decreases 20% from base test
5008	Undefined	Cigarettes/day	Cig.	Amount of cigarettes per day
5009	Undefined	Smoking years	years	Amount of smoking years
5010	Undefined	Threshold (FVC)		Threshold (total change) used as limit for detection of bronchial responsiveness by provocation based on FVC
5011	Undefined	Threshold parameter (FVC)		ID of parameter used as limit for detection of bronchial responsiveness by provocation based on FVC
5012	Undefined	Threshold Stage diff. (FVC)		Threshold (change between stages) used as limit for detection of bronchial responsiveness by provocation based on FVC
5013	Undefined	Threshold (Resistance)		Threshold (absolute change) used as limit for detection of bronchial responsiveness by provocation based on Resistance
5014	Undefined	Threshold limit (Resistance)		ID of parameter used as limit for detection of bronchial responsiveness by provocation based on Resistance
5015	Undefined	Threshold Stage diff. (Resistance)		Threshold (change between stages) used as limit for detection of bronchial responsiveness by provocation based on Resistance
5016	Undefined	PD100		Provocation dosis when Airway resistance increase 1000% from base test
5017	Undefined	PC100		Provocation concentration when Airway resistance increase 100% from base test
5018	Undefined	Pack years		Pack years is calculated by multiplying the smoking years and the number of packs per day
5019	Undefined	IBW	kg	Ideal body weight calculated by Height in cm minus 100
7001	Volume calibration	Vol corr in		Inspiratory corection factor for volume calibration
7002	Volume calibration	Vol corr ex		Expiratory corection factor for volume calibration
7003	Volume calibration	Syringe volume	l	Calibration syringe volume
7004	Volume calibration	Corr In Low		Inspiratory corection factor for volume calibration for low flow
7005	Volume calibration	Corr Ex Low		Expiratory corection factor for volume calibration for low flow
7006	Volume calibration	Low flow in	l/s	Inspiratory flow during low flow calibration
7007	Volume calibration	Low flow ex	l/s	Expiratory flow during low flow calibration
7008	Volume calibration	Corr In Medium		Inspiratory corection factor for volume calibration for medium flow
7009	Volume calibration	Corr Ex Medium		Expiratory corection factor for volume calibration for medium flow

ID	Measurement Type	Name	Unit	Description
7010	Volume calibration	Medium flow in	l/s	Inspiratory flow during medium flow calibration
7011	Volume calibration	Medium flow ex	l/s	Expiratory flow during medium flow calibration
7012	Volume calibration	Corr In High		Inspiratory corection factor for volume calibration for high flow
7013	Volume calibration	Corr Ex High		Expiratory corection factor for volume calibration for high flow
7014	Volume calibration	High flow in	l/s	Inspiratory flow during high flow calibration
7015	Volume calibration	High flow ex	l/s	Expiratory flow during high flow calibration
7096	Volume calibration	BTPS corr.		BTPS correction factor
7097	Volume calibration	Ambient temperature	°C	Ambient temperature
7098	Volume calibration	Ambient pressure	hPa	Ambient pressure
7099	Volume calibration	Ambient humidity	%	Ambient humidity