



Thermo Fisher Scientific

Centri-Log V1.0

Operating Manual

50127006-1

November 2010

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Release History: Operating Manual 50127006-1 printed in November 2010.

Table of contents

| | | |
|------------------|--|------------|
| Chapter 1 | General | 1-1 |
| Chapter 2 | Log onto System after Launching Program | 2-1 |
| Chapter 3 | Program Configuration | 3-1 |
| | Setting-up the centrifuge network..... | 3-2 |
| | User table administration..... | 3-7 |
| | System settings..... | 3-10 |
| | Configuration of the operating sequence..... | 3-11 |
| | Configuration of utilized barcodes | 3-14 |
| | Configuration of data storage..... | 3-31 |
| | Barcode generation | 3-39 |
| Chapter 4 | Workspace Administration | 4-1 |
| | Configuration of an exported workspace..... | 4-2 |
| | Disconnect workspace..... | 4-3 |
| | Import workspace | 4-3 |
| Chapter 5 | Data Logging and Data Display | 5-1 |
| | Start communication with centrifuges..... | 5-2 |
| | Stopping communication with centrifuges..... | 5-2 |
| | Data displayed in the program interface..... | 5-3 |
| | Manual editing of bag data | 5-6 |
| Chapter 6 | Centrifugation Sequence/Use of Barcode Readers | 6-1 |
| | User input prompts | 6-2 |
| | Error messages | 6-3 |
| | Status messages | 6-6 |
| | Special barcodes to operate Centri-Log..... | 6-7 |
| Chapter 7 | Open Daily Records | 7-1 |
| Chapter 8 | Create Process Templates with the Centri-Log Editor | 8-1 |
| | Process definition interface | 8-2 |
| | Program configuration..... | 8-4 |
| | Workspace management | 8-4 |
| | Edit process definitions..... | 8-5 |
| Chapter 9 | Evaluate Log Files with Centri-Log Viewer | 9-1 |
| | Display data in main window | 9-2 |
| | Program configuration..... | 9-3 |
| | Workspace management | 9-3 |

Table of contents

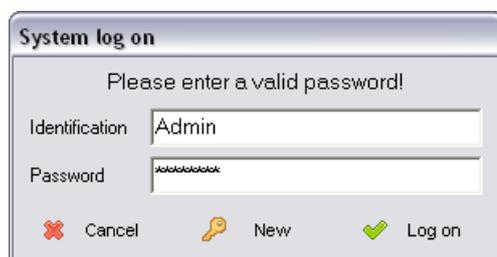
| | |
|--|------------|
| File evaluation | 9-4 |
| Open Daily Records | 9-7 |
| Evaluation of the bag indexing files..... | 9-8 |
| Appendix A Data structure of the log file..... | A-1 |
| Data to identify the process (identifier <P>)..... | A-1 |
| Process specifications according to the process definition (identifier <V>)..... | A-2 |
| Set centrifuge set-point values (identifier <S>) | A-5 |
| Actual values of the centrifuge (identifier <I>) | A-6 |
| Error entries (identifier <F>) | A-7 |
| Cancel information (identifier <A>)..... | A-8 |
| Status information (ID)..... | A-8 |
| Time stamp format | A-8 |
| Appendix B Daily log file structure | B-1 |
| Appendix C Use of regular expressions | C-1 |
| Verifying individual characters..... | C-1 |
| Verifying code start..... | C-1 |
| Verifying on code level..... | C-2 |
| Definition of a character class | C-2 |
| Special characters as placeholders | C-3 |
| Special character for frequency determination | C-3 |
| Alternative character strings | C-4 |
| Appendix D Formatting Instructions for Time Entries | D-1 |
| Appendix E Formatting Instructions for Centrifuge Data | E-1 |
| Appendix F Special barcodes to operate Centri-Log | F-1 |
| Appendix G Contact Information..... | G-1 |

General

This manual for the Centri-Log software provides you with an overview of the configuration options and general use of the program. In addition to straightforward program descriptions, this manual also features a depiction of the centrifugation process as it applies when using the Centri-Log software.

Log onto System after Launching Program

All program functions that may result in a change of the database or the configuration data are initially blocked right after starting the program. The user must log onto the system to activate these functions. Once the program has checked and verified all relevant data, the system log on window opens. This log on window can also be accessed with the menu item [Program/Log on](#) or by clicking the corresponding button in the toolbar.



Users enter an identification together with the matching password, both of which are stored in the system¹. Then users press the [Log on](#) button to complete the user log on process.

The toolbar also features two buttons to log users on and off.



Pressing this button logs the user on the software. The log on window depicted here is then displayed as well.



This button serves to log the user out. The software continues to run normally after the user logs out; however, all functions used to change current settings are blocked.

Here you can enter a new password. Press the [New](#) button after input. The software then carries out the corresponding instruction by changing the password.

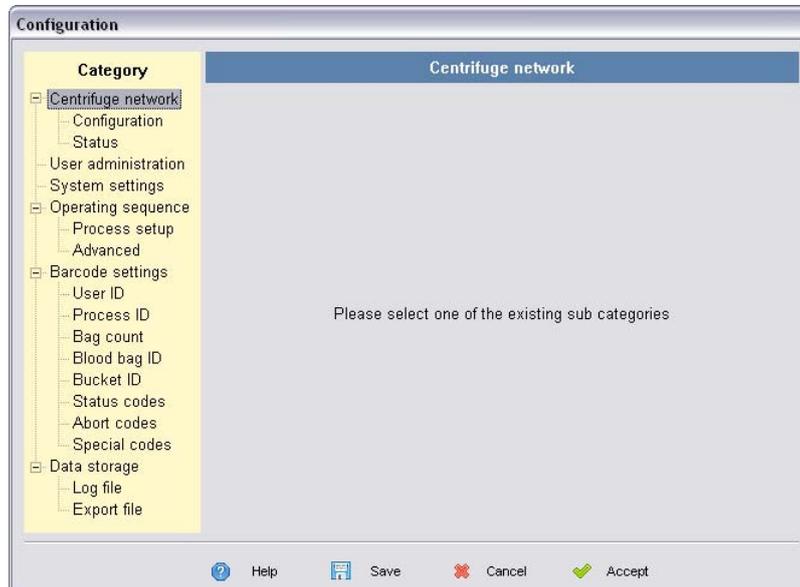
¹The user “Admin” is defined after the installation. This user can log on with the password “password” and has all administrative rights within the software.

Program Configuration

Contents

- “Setting-up the centrifuge network” on page 3-2
- “User table administration” on page 3-7
- “System settings” on page 3-10
- “Configuration of the operating sequence” on page 3-11
- “Configuration of utilized barcodes” on page 3-14
- “Configuration of data storage” on page 3-31
- “Barcode generation” on page 3-39

The program configuration is used to define in detail how the software behaves. The configurations and settings specified here affect the structure of the network, depiction of the transferred information on screen, saving of data, support of the barcode reader, or general program responses or actions. These settings make it possible to adjust the program functions to the individual needs of the respective user.



The configuration window depicted above shows the basic structure of all pages within the configuration.

The left side features a list of the available topics in the form of a hierarchy display, sometimes also called a tree structure. This type of listing provides an overview over all configuration topics and each level is easy to navigate.

The right side of the window has an area for displaying the respective options. The title in the blue frame also provides additional orientation help since it also lists the currently selected category.

The lower window area lists the buttons for accessing help, saving the configuration, closing the window without applying the changes, and for closing the window after accepting the data.

Setting-up the centrifuge network

The pages of the **Centrifuge network** category are only needed if the program is being configured or changes are made to the network structure. This may be necessary if new devices are to be installed or devices are removed from the monitoring system.

Network configuration

The settings on the [Centrifuge network/Configuration](#) page serves to set up the centrifuge network. The installed centrifuge type, the mode of operation, the serial number of the centrifuge, as well as a freely selectable device name can be specified for each device address. The following figure shows the window in form mode:

Use the two buttons [Show form](#) and [Show table](#) to toggle the window between the form and the table view. The table view is easier to navigate when a large number of devices have been connected to the system. The following figure shows the window with the table view enabled:

| Address | Centrifuge | Mode of operation | Serial number | Name |
|---------|------------|-------------------|---------------|---------------------|
| 1 | RC12BP+ | Logging | 00000001 | ThermoScientific 01 |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |

Configuration of the installed centrifuges

Both views feature the same input options concerning the configuration data. These are as follows:

- Address

Use the bus **Address** selection box to indicate for which device address the current settings are to be displayed. All 30 addresses possible with a Centri-Log installation are available. The selection box is not used with the table view since all addresses are listed below one another. A unique address is assigned to each centrifuge within the network. This address is assigned during the setup process and usually remains unchanged as long as this centrifuge is integrated into the Centri-Log bus system.

- Centrifuge

Use the **Centrifuge** type field to specify the centrifuge to be supported by the selected bus address. The following centrifuge types are available: Cryofuge 5500i, Cryofuge 6000i, Cryofuge 8500i, RC 3BP+, RC 12BP+, and RC BIOS. Selecting the correct centrifuge is important to ensure that all specific device properties are supported by the Centri-Log software.

If this field is disabled, the corresponding function is blocked if the bus system is enabled.

- Mode of operation

Use the **Mode of operation** selection box to indicate which functions the Centri-Log program is to execute. This setting can be specified separately for each device. Select one of three modes of operation:

| | |
|--------------|---|
| Data display | The data display mode of operation queries all centrifuges during a normal cycle. The collected data are displayed by the program. However, the software does not carry out any other tasks. The connected barcode readers are not supported either. This setting is intended for test operations or special tasks. |
| Logging | The next step then consists of logging and evaluating the collected data. The Centri-Log software creates a log file of each centrifugation run, which not only saves the centrifuge data but also the information collected by the barcode reader. However, use of the barcode reader is not mandatory. The software checks all specified tolerance limits while still in logging mode but any violation of these limits is only recorded without indicating this to the user. |
| Monitoring | While in monitoring mode, the Centri-Log software is able to block or release centrifugation runs. A release is usually issued only if all of the required information is available and the centrifuge settings match those of the process specifications. Please consult “ Centrifugation Sequence/Use of Barcode Readers ” on page 6-1 and “ Create Process Templates with the Centri-Log Editor ” on page 8-1 for additional information. |

- Serial number

This field is for entering the serial number of the centrifuge. The serial number makes it possible to clearly identify the centrifuge. The used centrifuge can be identified by its serial number when creating the log files.

- Centrifuge is identified by

In addition to the address of the centrifuge in the bus system, the name defined by the user can also be used for identification purposes. It is possible to assign any type of name or designation to the individual centrifuges. These names are then used in the centrifuge selection boxes or for the window titles.

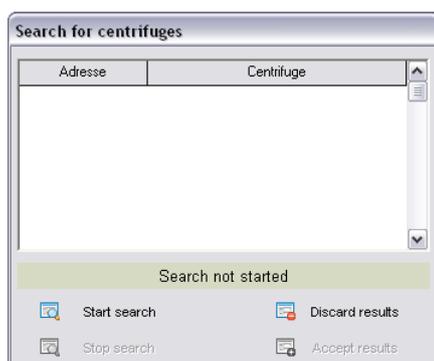
Identification of the centrifuge within the software

The lower window area features the selection box to determine how centrifuges are identified. The Centri-Log software uses the centrifuge identification in many areas. This is the case in the selection box for opening the display window, the window title bar of the display window, or in the log files. There are three identification options:

- | | |
|---------------|--|
| Serial number | The serial number of the centrifuge as entered into the device table is used for identifying the centrifuge. |
| Designation | The name defined by the user as entered into the network settings is used for identifying the centrifuge. |
| Address | The bus address of the centrifuge is used to identify the centrifuge. |

Search centrifuge

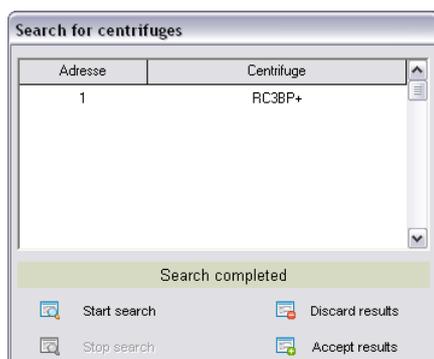
Configuring the centrifuge network is made easier by the automatic centrifuge search function. Click [Search for centrifuges](#) to open the automatic centrifuge search window.



Click [Start search](#) to begin searching for connected centrifuges. The software then attempts to query the configuration setting from every possible centrifuge address. If a valid “hit” is found, the configuration and the associated centrifuge type is depicted in the window.

If the search process is not to include all addresses, the search can be stopped at any time with the [Stop search](#) button. The software may not react at once when clicking the button. This is because any started query must be processed and finished first.

After the search is finished, all found centrifuges are listed in the window:

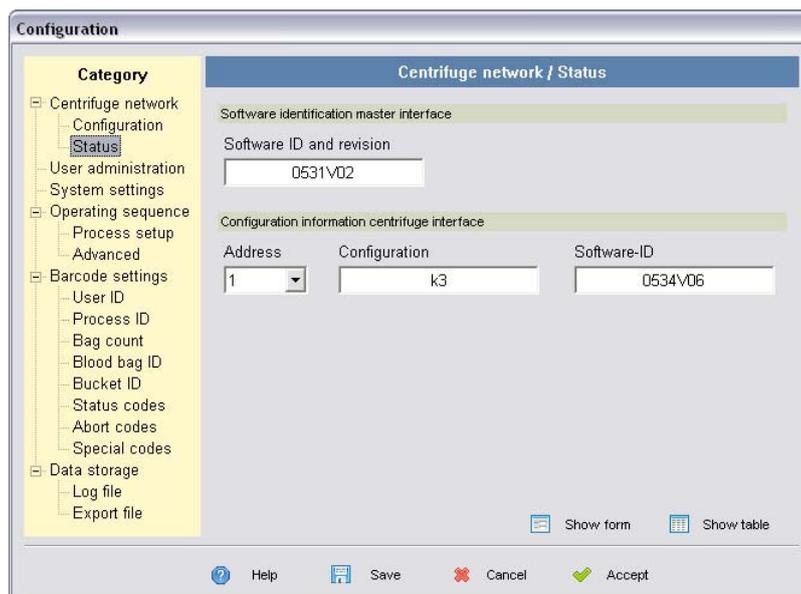


Click [Discard results](#) to close the window without applying the found centrifuges to the device table.

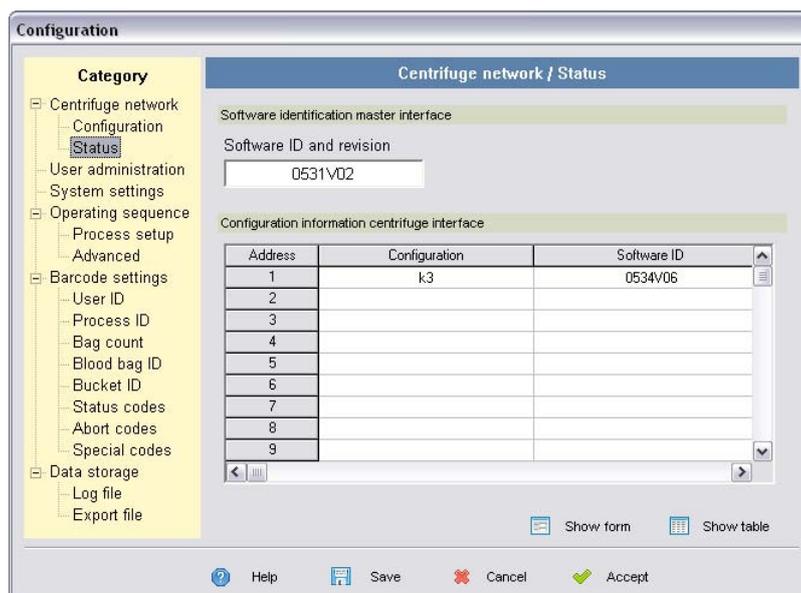
Click **Accept results** and the Centri-Log software imports the found centrifuges to the device table. The serial number and the centrifuge name are automatically assigned in this case.

Display status information

The information in the **Centrifuge network/Status** display area is intended for the network installation and in case the system must be serviced. The individual fields depict information only if the bus system is enabled. The following figure shows the view of this configuration page in form mode:



As with the network configuration, this page may also be depicted as a table view. The following figure shows the window with the table view enabled:



The upper window area indicates the information about the software of the external master interface. The **Software ID and revision** field shows the read software ID. This ID is comprised of an internal admin number and the revision or version ID.

The lower window area is reserved for the configuration data of the centrifuge interface.

Use the bus address selection box to indicate what of the following information is to be displayed with which centrifuge. The table view lists all possible bus addresses. Making a selection is therefore not necessary in table view.

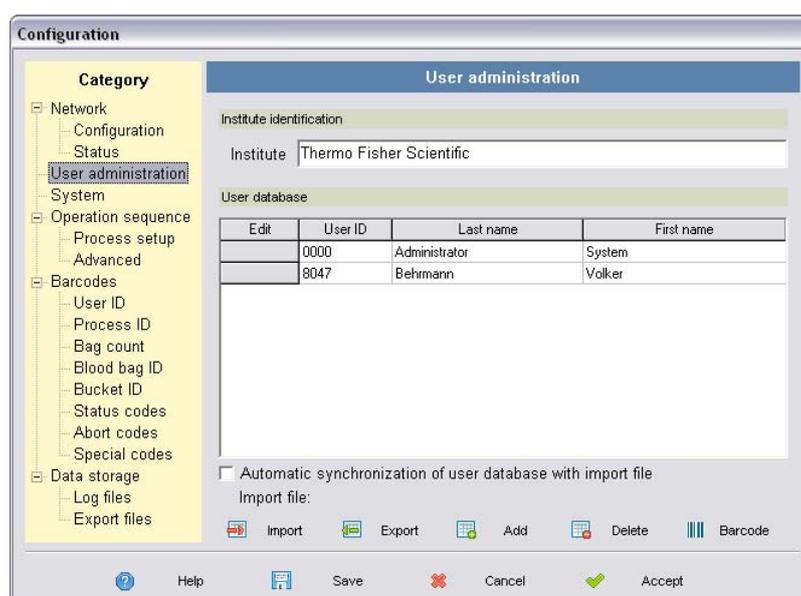
The **Configuration** field provides information about the configuration setting of the centrifuge interface. This setting determines with which centrifuge the interface is working. The configuration setting is defined during the installation of the Centri-Log hardware into the centrifuge and is depicted here for informational purposes. The following configuration settings are defined for the centrifuges:

| Configuration | Centrifuge |
|---------------|---------------------|
| k1 | RC 12BP+ |
| k3 | RC 3BP+ |
| k5 | Cryofuge 5500i/RC 4 |
| k6 | Cryofuge 6000i |
| k7 | RC BIOS |
| k8 | Cryofuge 8500i |

The **Software ID** field provides the software ID of the processor in the centrifuge interface. This ID is comprised of an internal admin number and the revision or version ID.

User table administration

Administration of the user tables stored in Centri-Log is possible with the **User administration** configuration page. The following figure depicts this page of the program configuration:



Specify institute name

The upper window area features an input field where the name of the organization or institute can be entered. This information is used by the software to identify the installation location.

Maintain stored user table

The PC accesses the user table with the user profiles while in monitoring mode if a personnel ID is entered via barcode reader. The Centri-Log software thereby controls and monitors access to the centrifuges. This ensures that only authorized persons carry out centrifugation processes.

The software also needs the user table to check user authorization when logging on while the program is running.

All of the defined user profiles are sorted and depicted in the table. The sort order is determined by the personnel number after the window is accessed. It is also possible to use a different sort order for the table. Just click with the mouse on the corresponding column header.

Edit user profile

The existing user data can be edited by directly typing text into the table's personnel number, last name, and first name fields. If additional user data are to be edited, click with the mouse on the first column of the table to open the advanced data input window for the corresponding record.

The following figure shows the editing window for all of the data of a user record (user profile input):

User profile input

First name: System Last name: Administrator

User identification: 0000

Allow PC operation

Log on name: Admin Password / Password repeat: [masked]

User has to change the password at next log on

Password is valid for: unlimited

Assigned user privileges:

- Start/stop communication with centrifuges
- Unlock centrifuge after detected errors
- Set up new workspace
- Edit process definitions
- Configuration of installed centrifuges
- User administration
- Configuration of basic system settings
- Set up centrifugation process
- Change bar code configuration
- Configuration data storage

Cancel Accept

In addition to the personnel code, it is also possible to change the last name and first name, and to assign PC usage privileges. Privileges can only be assigned to a user with identification and password. Check the box next to “User has to change the password at next log on” if you wish to enable this option. It is also possible to define for how long the password is to be valid. Individual privileges can be assigned to any user. In addition to releasing individual configuration pages, this also includes the starting/stopping of communication , as well as editing the process definition and setting up a distributed installation.

Export and import user data

Click **Export** to export the user table to an ASCII file (*.csv). The personnel code, last name, and first name are entered into the export file. Advanced settings such as password or assigned privileges are not exported to prevent the manipulation of critical security-related data.

Analog to the export function, the software also has an import function to import user data. This function is called with the **Import** button. The file structure must match the structure of the export file. If the software imports and integrates the data from the import file into the user table, the data is synchronized. Users not yet listed in the user table are added at that time. If a user from the user table is not listed in the import file, this user is removed from the user table.

The Centri-Log software is also able to carry out an automatic data synchronization with the import file. This option is enabled with **Automatic synchronization of user database with import file**. If this option is activated synchronization is carried out as soon as the software is started and every midnight. This function makes it possible to centrally manage the user table without using the configuration within the Centri-Log software each time a change occurs.

Create new user profile

Click **Add** to create a new user profile (user record). The same window as in section “**Edit user profile**” on [page 3-8](#) opens. In this case, all fields are empty and must be filled.

Click **OK** to add the new user profile to the user table. The process checks whether the user profile (user record) is unique. To meet this criterion, neither the personnel number nor the identification may be used by more than one user.

The software also checks whether input is complete. A personnel number must always be entered. PC usage privileges can only be assigned to a user with identification and password.

Delete user profile

To delete a user record (profile), select a user profile from the table. This is done by clicking with the mouse in one of the corresponding table columns (personnel number, last name, and first name).

Then click **Delete**. Answer “YES” to the confirmation dialog and the Centri-Log software deletes the displayed record. The record is marked as deleted only internally and remains for the evaluation of logged centrifugation runs.

Generate user barcodes

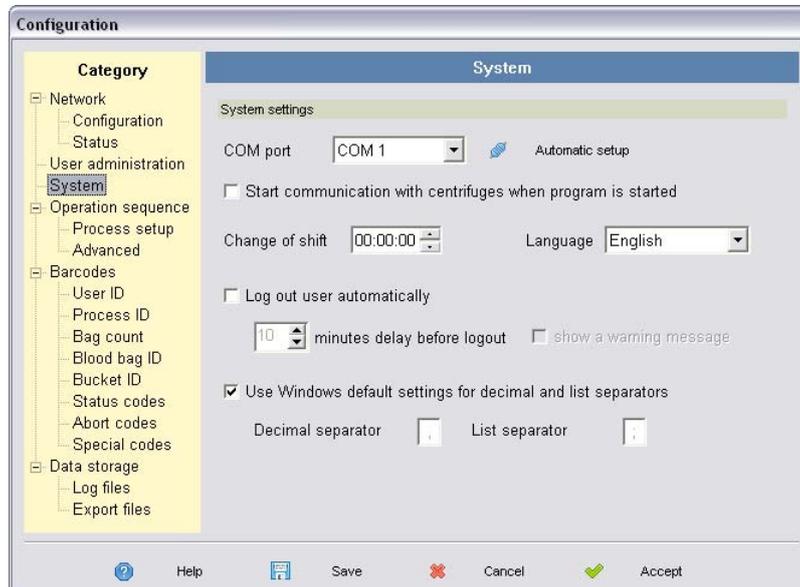
Click **Barcode** to generate barcodes for the defined users. If one of the records is selected, the barcode window for an individual barcode opens. If a record is not selected, the barcode window for generating all barcodes opens.

Please see section “**Barcode generation**” on [page 3-39](#) for additional information about generating barcodes.

Note If one of the records is selected, this selection can be reversed by clicking in the first cell of the title.

System settings

The **System settings** category includes all configuration settings defining the general software behavior. The following figure depicts this system settings page:



COM port

Use the **COM port** option to determine which serial port the Centri-Log software uses to address the master interface. You can select the correct port manually or automatically search for the master interface. The automatic search considers all RS232 interfaces of the PC. These can be actual physical interfaces or virtual interfaces as they are provided by a USB-serial port converter.

Start communication with centrifuges when program is started

Check the “Start communication with centrifuges when program is started” field to determine whether the program starts the bus system automatically. If this field is selected, communication with the centrifuges is started automatically when the program starts and the display window(s) open(s).

Change of shift

Here you can select a time for the shift change. This setting is important when creating subdirectories and for the daily log entries. Creating daily subdirectories and the daily logs is usually based on the time of the day. For example, a new directory or daily log is created at midnight. When the shift change time is set, this time changes to the time of the day indicated here.

Language

Use this drop down box to select a language to be used for the user navigation of the Centri-Log software. Additional languages are available at this time. The software must be restarted after changing the language.

Log out user automatically

The user must log onto the system to execute many of the Centri-Log software functions. If security is a concern, it is possible to specify that users are logged out automatically. The user is logged out automatically after a specified time of inactivity if this option is checked.

If automatic log out is enabled, you can set the inactivity time here. The user is automatically logged out after that time.

It is also possible to configure the software to display a warning before the user is automatically logged out. This warning is displayed approx. 20 seconds before the log out process starts and can be used to cancel the log out.

Select separators

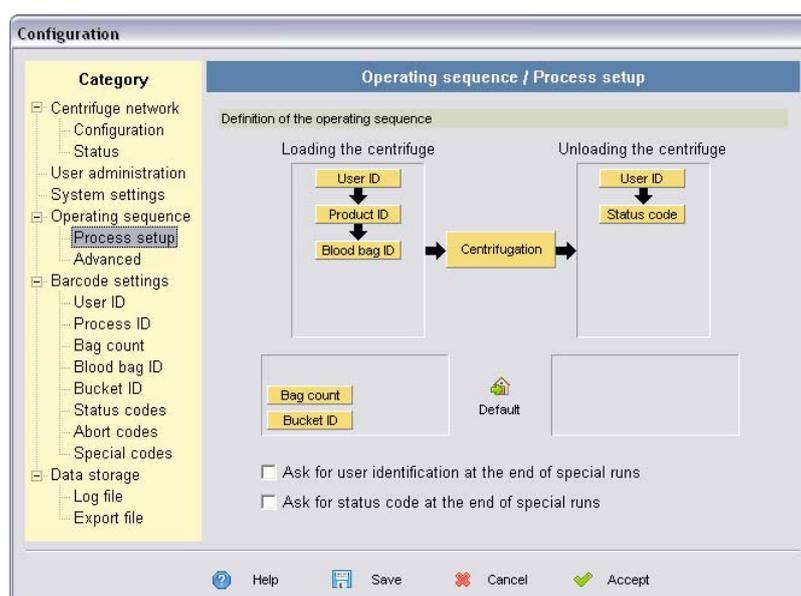
Separators are used for decimal numbers and when importing or exporting data to separate individual parts of decimal numbers and individual data. These separators differ depending on the selected language. A different separator can be selected to match the selected language. A separator can be selected from the standard characters of the Windows installation or set manually.

Configuration of the operating sequence

There are two operating sequence configuration pages that can be used to define details of the desired functionality of the software when working with the centrifuges. Use these pages to determine which data to log and which alternate sequences to make available to the user at the centrifuge.

Definition of the process sequence

The process setup page provides options for the visual configuration of the desired operating steps when working with the centrifuges. The figure below depicts this configuration page:



The upper half of the window features a graphical depiction of the entire sequence. The sequence starts with loading the centrifuge, followed by the actual centrifugation run and the subsequent unloading of the centrifuge. The possible operating steps are depicted underneath the sequence flowchart. Use the mouse to drag these into the sequence flowchart to activate the corresponding step. Simply click “Default” to configure a default configuration. No additional steps are required. The default configuration is suitable for many application cases.

The following operating steps are available for loading the centrifuge:

| | |
|--------------|---|
| User ID | Identification of the user for loading the centrifuge. Enable this step and the user ID must be scanned at the centrifuge as a barcode before every centrifugation. |
| Process ID | The process ID tells the software which processing step is to be executed. Centri-Log can use this information to check the settings of the centrifuge before the start and to monitor centrifugation. |
| Bag count | Querying the number of bags serves to prepare the bag input step. There are two alternatives to input the blood bag data to conclude this input. Either a special barcode can be scanned or a specific number of blood bags can be pre-selected to complete input. Enable this step to use the second option. |
| Blood bag ID | Scanning the blood bag ID is a key step in the process sequence. This step logs what was actually processed in the centrifugation run. |
| Bucket | Scanning the bucket ID logs the used buckets. This step is currently implemented for future software expansions. In order to use this function, buckets must feature barcodes, which is currently not yet the case. |

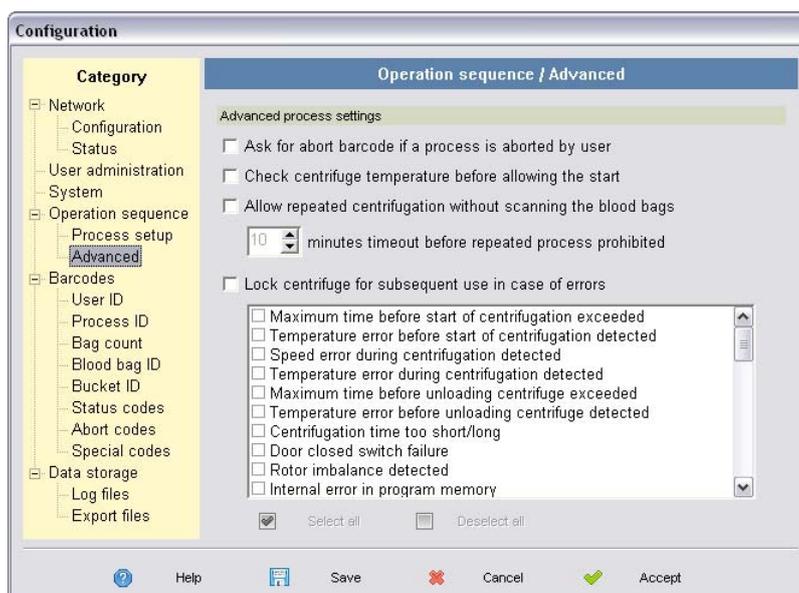
The following unloading operating steps can be defined:

| | |
|-------------|--|
| User ID | Identification of the user for unloading the centrifuge. If this option is checked, the software prompts for a personnel ID after opening the lid. The system is not ready for the next run until this ID has been scanned and entered. There is no personnel ID prompt if centrifugation has not been carried out. This means the prompt is skipped if the lid is only closed and immediately opened again. |
| Status code | The user can assign a status to individual blood bags or the entire run at the end of the centrifugation process. This operating step is enabled by selecting this option. |

Two additional options are available when enabling the operating steps at the end of the centrifugation. A prompt asking for the user ID and the status code at the end of special runs can be enabled. Special runs include the test runs, the runs to pre-regulate temperatures, and the QC runs of the RC 3BP+ and the RC 12BP+.

Advanced process settings

The configuration page for the advanced operating sequence features additional options to set the operating sequence at the centrifuge. The figure below depicts this configuration page:



Ask for abort code if process is aborted by user

Scanning an abort label with an abort code makes it possible to stop the process data input. This can also be documented in the daily log. Enable the corresponding option for this function to be available.

Check centrifuge temperature before allowing start

A temperature tolerance range can be specified for each process definition. This is done by checking the second option. If the actual temperature before starting the centrifuge is outside of the permitted tolerance range, this would result in an error message at the start of the monitoring process. To prevent this, the software can check the temperature before the start and only allow the start to commence if the temperature is within the permitted tolerance range.

Allow repeated centrifugation without scanning blood bags

Check the selection box **Allow repeated centrifugation without scanning the blood bags** to determine that the user at the centrifuge is permitted to carry out a centrifugation run with the process and blood bag data of the previous run.

Usually, the personnel ID, the process ID, and the barcodes of the blood bags must be scanned and entered before each run. If an error occurs during the run, it may be necessary to centrifuge the same blood bags a second time. The user can scan a special barcode after scanning the personnel ID to save time and use the same data of the previous run (see [“Special barcodes to operate Centri-Log”](#) on [page 6-7](#)). This special code tells the Centri-Log software to use the same process ID with the same blood bag data for a second centrifugation.

This function is linked with the centrifuge. This means only the previous run of the respective centrifuge can be repeated. It is also possible to define a timeout for the saved data. Once the specified time has run out, the data are no longer available for a repeat run.

Lock centrifuge for subsequent use in case of errors

If a centrifuge malfunctions, additional runs with this centrifuge should perhaps be blocked. This function is enabled with the option **Lock centrifuge for subsequent use in case of errors**. If this option is enabled, the centrifuge cannot be used for any additional runs after a malfunction. Only a user with the corresponding privileges can release the centrifuge later on. Privileges can be assigned to individual users when editing the user data (see “[Edit user profile](#)” on [page 3-8](#)).

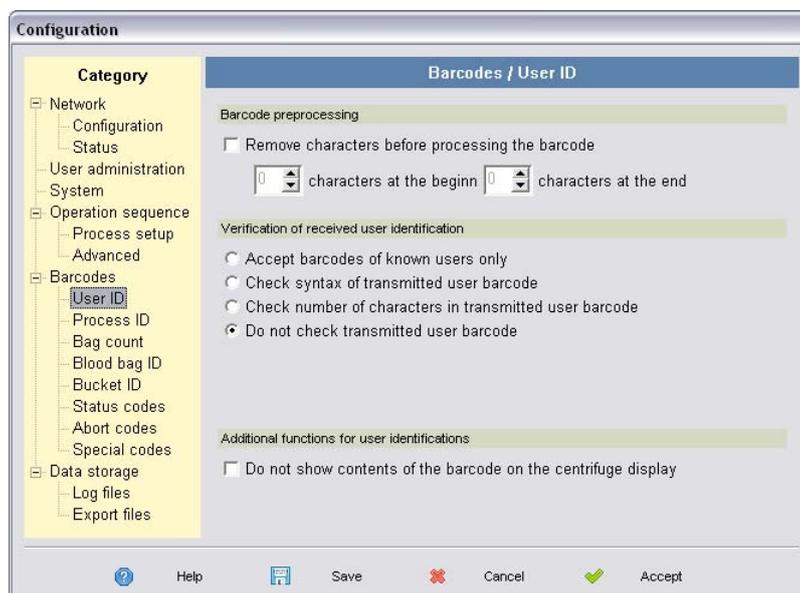
After this function is globally enabled, the displayed error list can be used to fine-tune the program behavior. For example, it is possible to specify for each error if the centrifuge is to be blocked after this error occurs.

Configuration of utilized barcodes

Use the configuration pages described here to adjust the program to the barcodes to be scanned. A category exists for each code. All parameters for the corresponding code can be set in the category. Special barcodes are an exception. Configuration settings cannot be made on this sub-page since it serves only to generate the barcodes for the special codes used by Centri-Log.

Configuration page for user ID

The user barcode configuration page lists the settings needed to preprocess the barcode, the barcode check, and the advanced barcode processing functions.



Barcode preprocessing

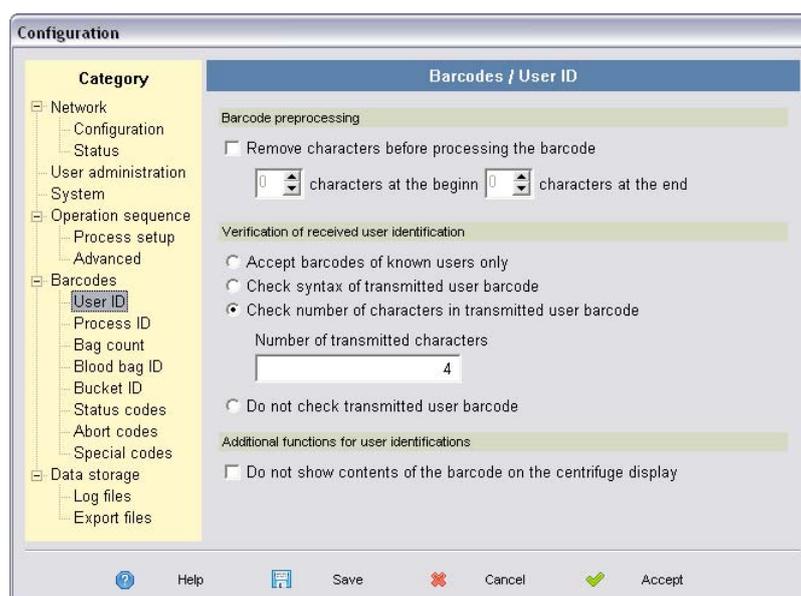
Use this section of the configuration settings to determine how many characters are to be removed from the beginning and end of the barcode before sending the barcode to the next step of the evaluation process. For example, start and stop characters of the checksums can be removed.

Verification of received user barcodes

Four options are available for verifying the scanned barcodes. These four options also represent different levels of data security. The first option, and lowest data security level, is to accept all scanned barcodes without verification (last option in the list titled “Do not check transmitted user barcode”). The figure above depicts this selected option.

Verification of the barcode length

To increase data security, the software can check the length of the transmitted barcodes. An additional input field opens when this option is enabled. Here you can enter the expected code length:



Different lengths can be defined for each code. Input is comma-separated (3,4,5) or by indicating a range (3-5). Limiting input to a shorter length increases operational reliability of the program as well.

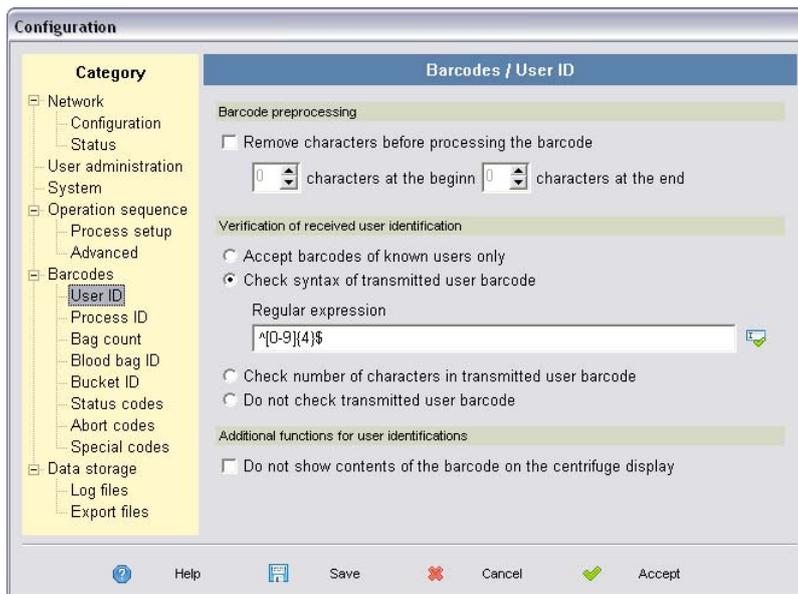
Note The entered code length always corresponds to the actual transferred barcode length regardless of the characters to be removed. Removal of the characters is a further processing step that is not carried out until the length has been checked.

Check syntax of transmitted barcode

The syntax check of the transmitted barcodes is based on so-called “regular expressions.” This expression is used to define a pattern that must correspond with the scanned barcode. The software can now interpret the transmitted character string based on this pattern.

3 Program Configuration

Configuration of utilized barcodes

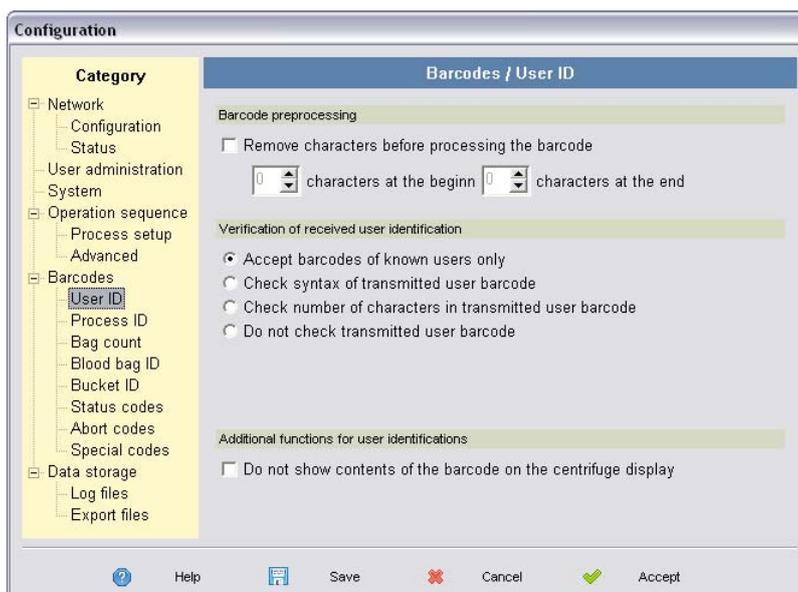


Use the **Regular expression** input box to enter the pattern for checking the transmitted barcode. A button next to the input box can be used to test the regular expression. Click this button to open a window where you can enter a sample scanned barcode. The program then indicates whether the barcode matches the regular expression.

Please consult [Appendix C](#) of this manual for additional information about regular expressions.

Accept codes of known users only

If the option **Accept codes of known users only** is enabled, a scanned personnel ID is compared with the entries in the user table. The scanned ID is only accepted as valid if a corresponding entry is listed in the table.



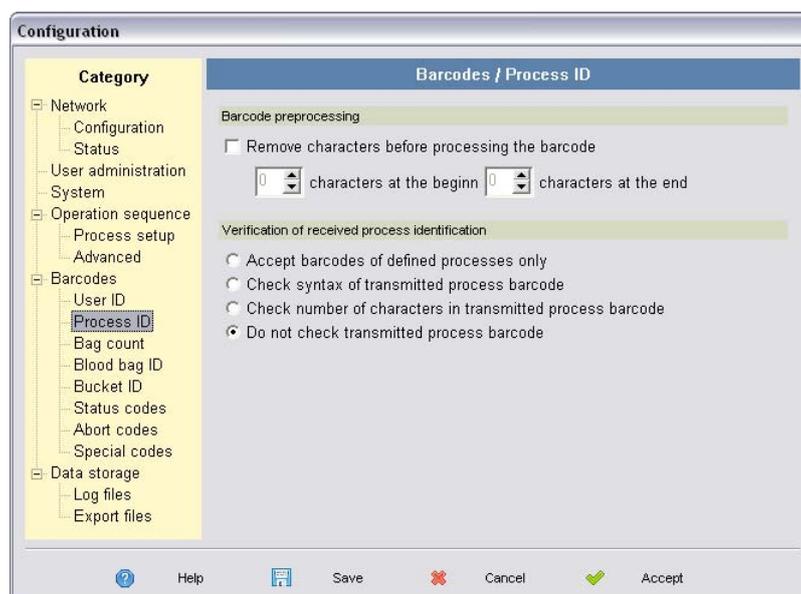
We recommended using this option to increase data security. This option ensures that every operator is uniquely identified. If comparing with the table is omitted, the syntax check should be used to verify the structure of the transmitted barcodes. This ensures that only barcodes with a defined structure are accepted.

Remove characters before processing the barcode

If the personnel ID is also used as access ID to other DP systems, it is usually desired to keep this ID hidden from others. A scanned barcode is usually depicted in the display of the barcode reader. To keep the personnel ID hidden from view, the box **Do not show contents of the barcode on the centrifuge** can be selected. The then entered code is depicted as asterisks in the display.

Configuration page for process ID

The configuration page for process barcodes features the same settings as the configuration page for user barcodes. This page also features a preprocessing function for the barcodes as well as a verification function.



Barcode preprocessing

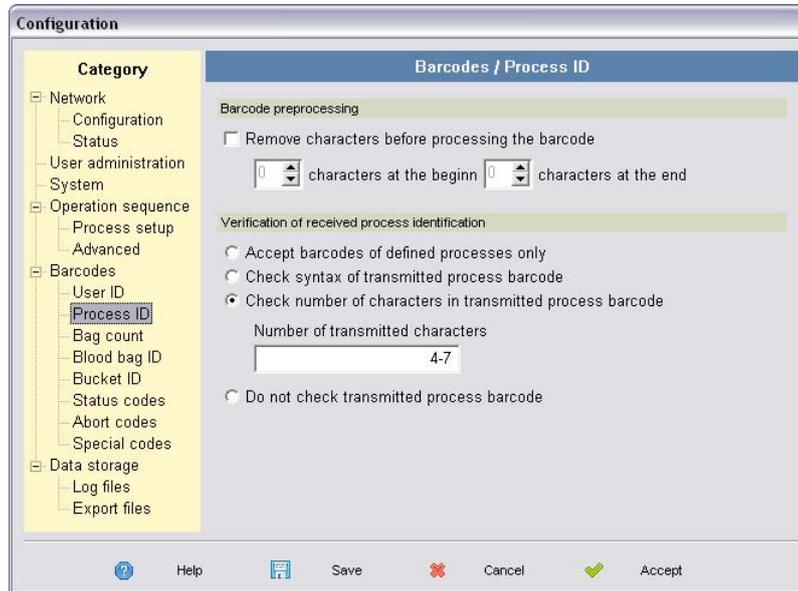
Use this section of the configuration settings to determine how many characters are to be removed from the beginning and end of the barcode before sending the barcode to the next step of the evaluation process. For example, start and stop characters of the checksums can be removed.

Verification of received process identification

Four options are available for verifying the scanned barcodes. These four options also represent different levels of data security. The first option, and lowest data security level, is to accept all scanned barcodes without verification (last option in the list titled “Do not check transmitted process barcode”). The figure above depicts this selected option.

Verification of the barcode length

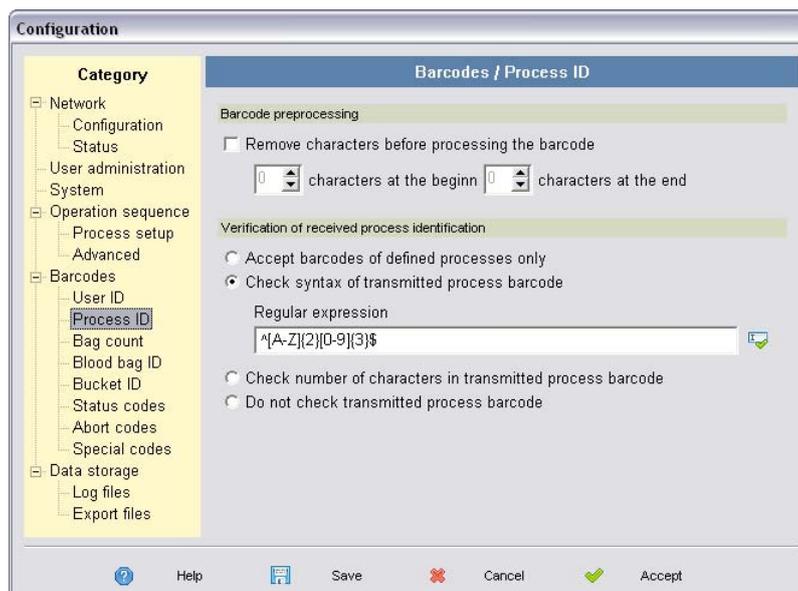
To increase data security, the software can check the length of the transmitted barcodes. An additional input field opens when this option is enabled. Here you can enter the expected code length:



Note The entered code length always corresponds to the actual transferred barcode length regardless of the characters to be removed. Removal of the characters is a further processing step that is not carried out until the length has been checked.

Check syntax of transmitted barcode

The syntax check of the transmitted barcodes is based on so-called “regular expressions.” This expression is used to define a pattern that must correspond with the scanned barcode. The software can now interpret the transmitted character string based on this pattern.



Use the **Regular expression** input box to enter the pattern for checking the transmitted barcode. A button next to the input box can be used to test the regular expression. Click this button to open a window where you can enter a sample scanned barcode. The program then indicates whether the barcode matches the regular expression.

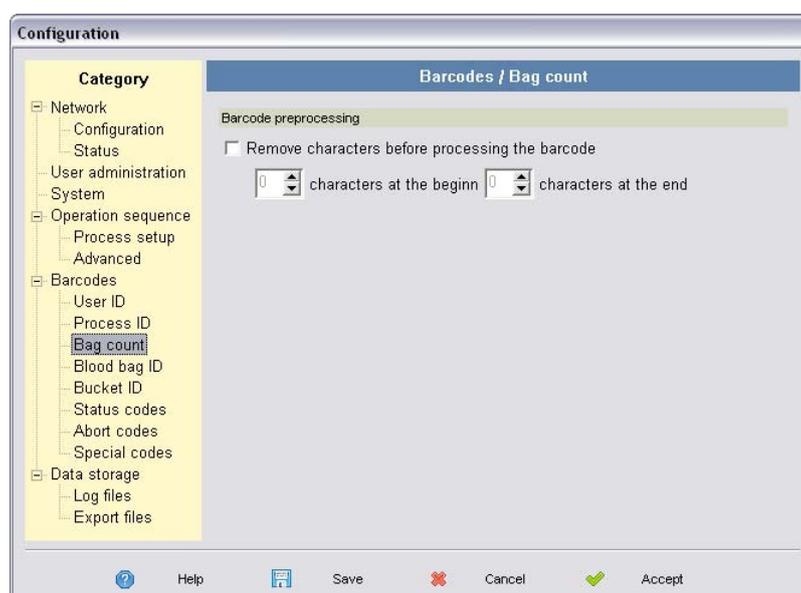
Please consult [Appendix C](#) of this manual for additional information about regular expressions.

Accept codes of defined processes only

If the option **Accept codes of defined processes only** is enabled, a scanned process ID is compared with the entries in the process database. The scanned ID is only accepted as valid if a corresponding entry is listed in the database.

Configuration page for bag count

The configuration page for the bag count does not require any additional input except for the preprocessing function:



Barcode preprocessing

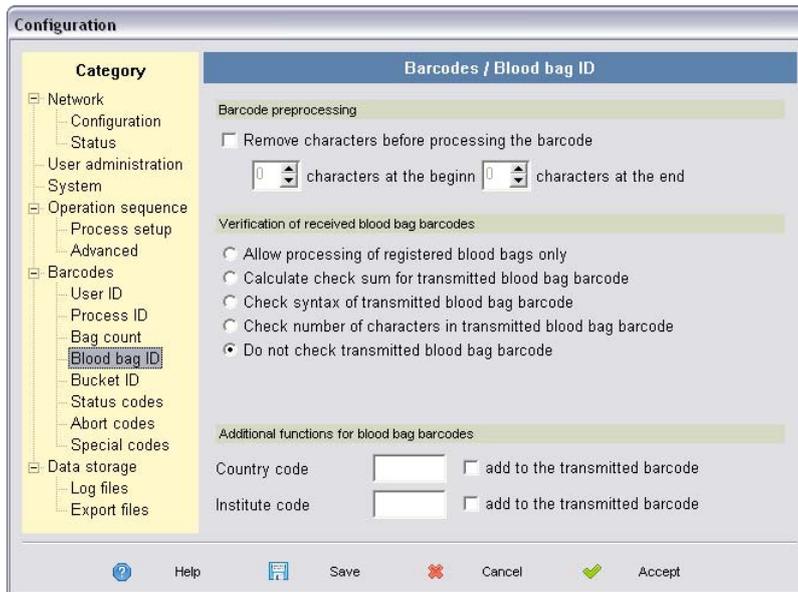
Use this section of the configuration settings to determine how many characters are to be removed from the beginning and end of the barcode before sending the barcode to the next step of the evaluation process. For example, start and stop characters of the checksums can be removed.

Configuration page for blood bag ID

The blood bag ID configuration page features advanced blood bag functions in addition to the familiar preprocessing settings.

3 Program Configuration

Configuration of utilized barcodes



Barcode preprocessing

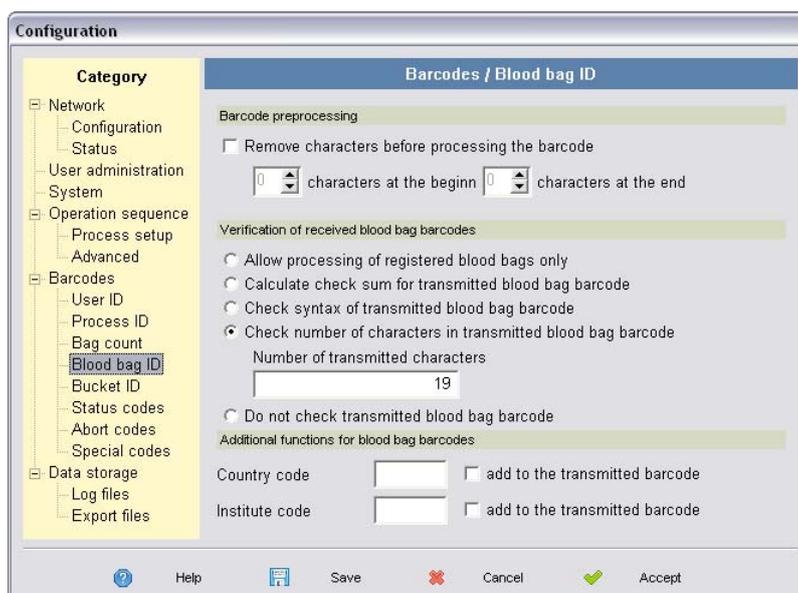
Use this section of the configuration settings to determine how many characters are to be removed from the beginning and end of the barcode before sending the barcode to the next step of the evaluation process. For example, start and stop characters of the checksums can be removed.

Verification of received blood bag barcodes

Five options are available for verifying the scanned barcodes. These five options also represent different levels of data security. The first option, and lowest data security level, is to accept all scanned barcodes without verification (last option in the list titled “Do not check transmitted blood bag barcode”). The figure above depicts this selected option.

Verification of the barcode length

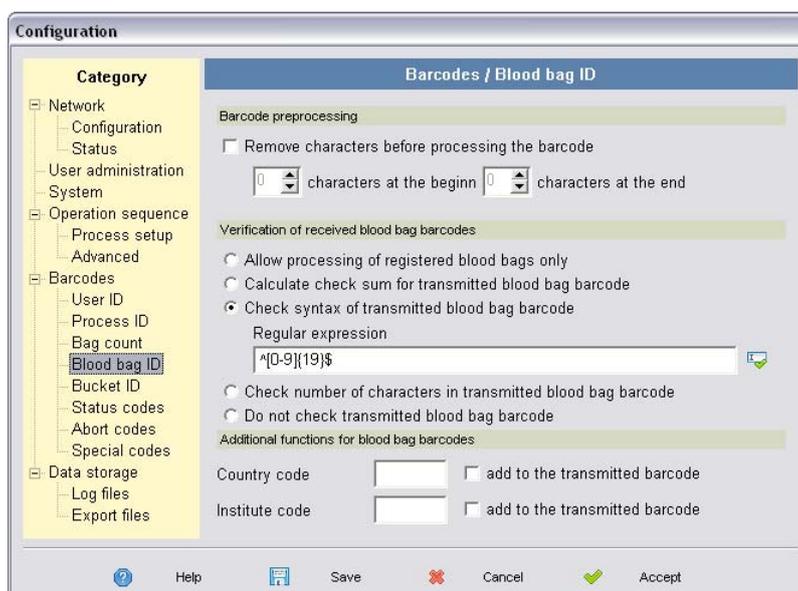
To increase data security, the software can check the length of the transmitted barcodes. An additional input field opens when this option is enabled. Here you can enter the expected code length:



Note The entered code length always corresponds to the actual transferred barcode length regardless of the characters to be removed. Removal of the characters is a further processing step that is not carried out until the length has been checked.

Check syntax of transmitted barcode

The syntax check of the transmitted barcodes is based on so-called “regular expressions.” This expression is used to define a pattern that must correspond with the scanned barcode. The software can now interpret the transmitted character string based on this pattern.

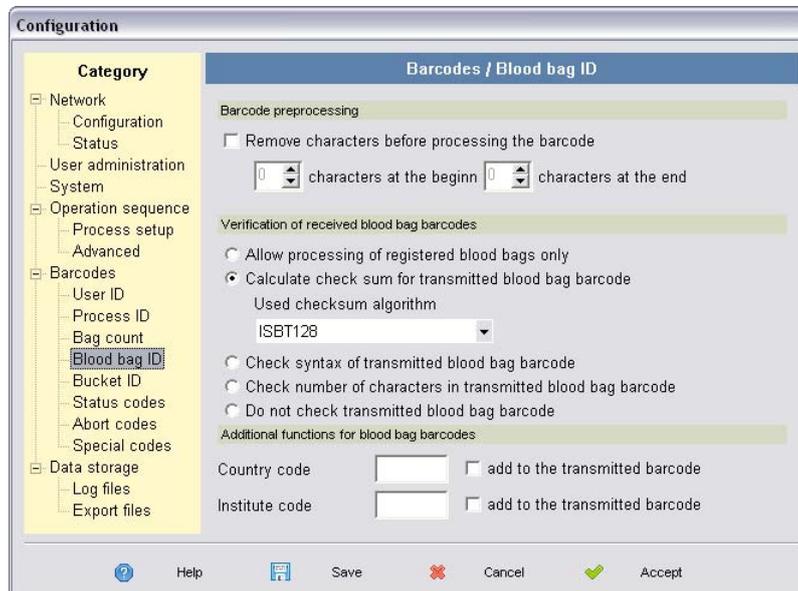


Use the **Regular expression** input box to enter the pattern for checking the transmitted barcode. A button next to the input box can be used to test the regular expression. Click this button to open a window where you can enter a sample scanned barcode. The program then indicates whether the barcode matches the regular expression.

Please consult [Appendix C](#) of this manual for additional information about regular expressions.

Calculate checksum for transmitted blood bag barcode

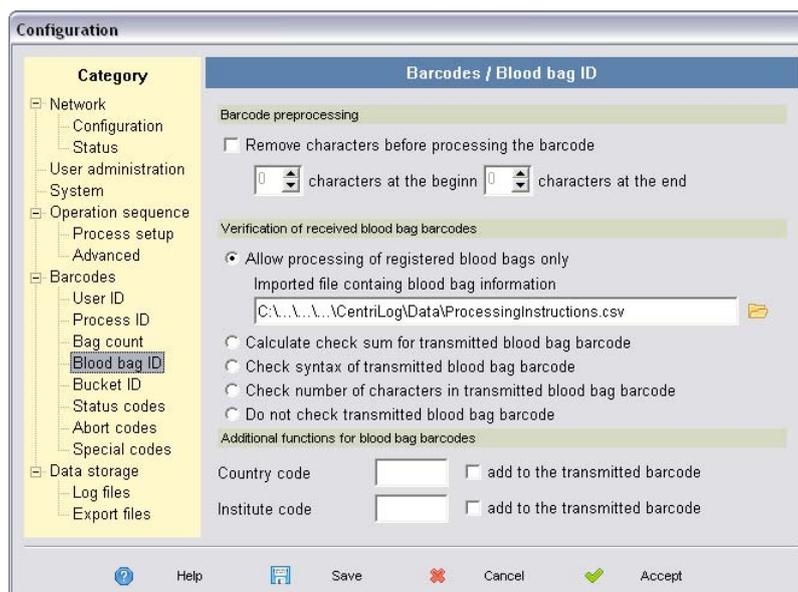
Checking and verifying the checksum represents another level of data security. Enable this option to display a selection box with the existing checksum algorithms.



Select ISBT 128, Eurocode, or ISO7064. These checksum algorithms are implemented as plug-ins and can be expanded as needed without having to reinstall the software.

Allow processing of registered blood bags only

If the option **Allow processing of registered blood bags only** is enabled, the Centri-Log software uploads a data file in short intervals. This file contains the blood bag IDs and the process ID of the next processing step. Enable this option to open an input box for the file name and path.



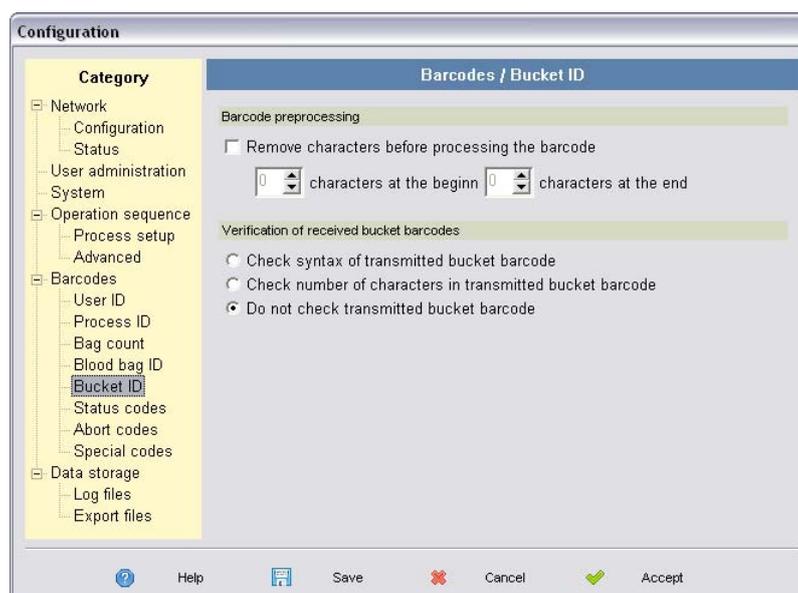
Use the button next to the input box to open the dialog for selecting the data file. The data file must be made available from a central EDP system and must be updated regularly.

Add country and institute codes

The lower window area features input boxes for country and institute codes. You can also select whether to add the codes to the transmitted blood bag barcodes. If this option is enabled, the resulting character string contains the elements in the following order: Country code - Institute code - Bag barcode.

Configuration page for bucket ID

The configuration page for bucket barcodes features the same settings as the other barcode configuration pages.



Barcode preprocessing

Use this section of the configuration settings to determine how many characters are to be removed from the beginning and end of the barcode before sending the barcode to the next step of the evaluation process. For example, start and stop characters of the checksums can be removed.

Verification of received bucket barcodes

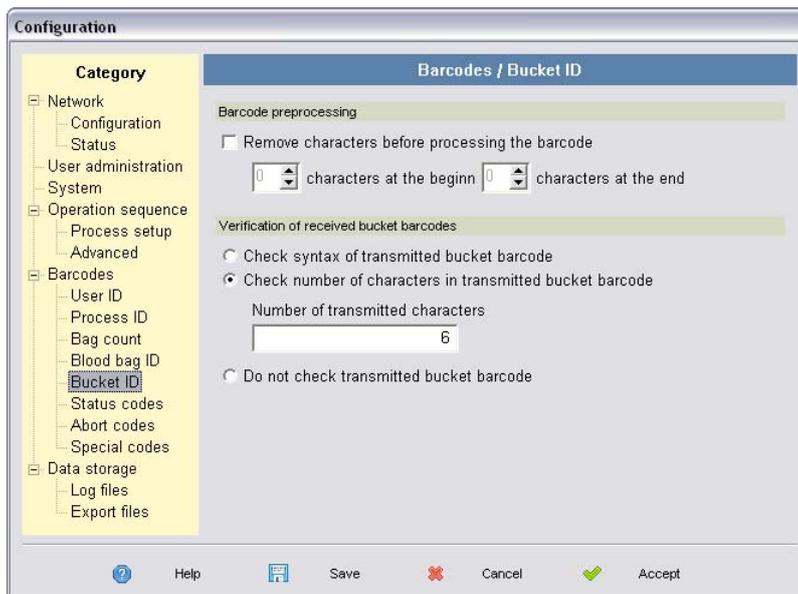
Three options are available for verifying the scanned barcodes. These three options also represent different levels of data security. The first option, and lowest data security level, is to accept all scanned barcodes without verification (last option in the list titled “Do not check transmitted bucket barcode”). The figure above depicts this selected option.

Verification of the barcode length

To increase data security, the software can check the length of the transmitted barcodes. An additional input field opens when this option is enabled. Here you can enter the expected code length:

3 Program Configuration

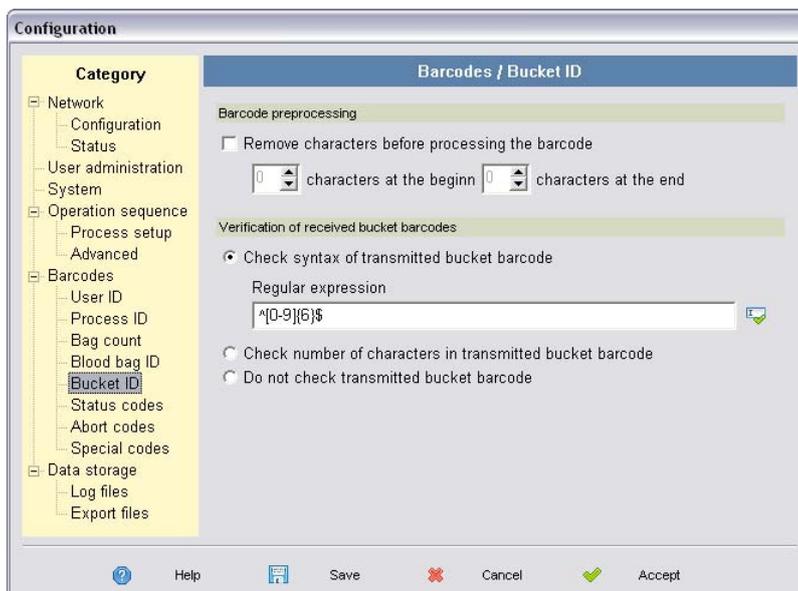
Configuration of utilized barcodes



Note The entered code length always corresponds to the actual transferred barcode length regardless of the characters to be removed. Removal of the characters is a further processing step that is not carried out until the length has been checked.

Check syntax of transmitted barcode

The syntax check of the transmitted barcodes is based on so-called “regular expressions.” This expression is used to define a pattern that must correspond with the scanned barcode. The software can now interpret the transmitted character string based on this pattern.

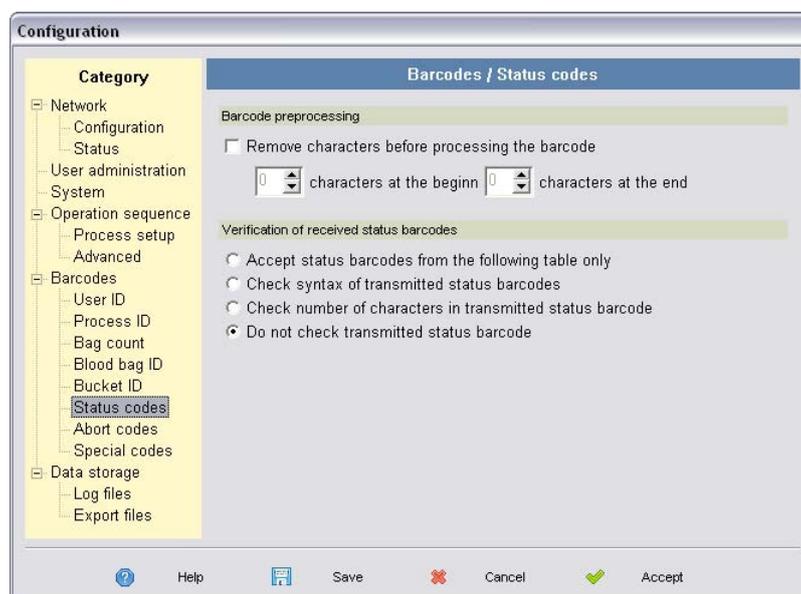


Use the **Regular expression** input box to enter the pattern for checking the transmitted barcode. A button next to the input box can be used to test the regular expression. Click this button to open a window where you can enter a sample scanned barcode. The program then indicates whether the barcode matches the regular expression.

Please consult [Appendix C](#) of this manual for additional information about regular expressions.

Configuration page for status codes

The status barcode configuration page lists the options for processing the barcodes then scanned as status information for the centrifugation or the blood bags.



Barcode preprocessing

Use this section of the configuration settings to determine how many characters are to be removed from the beginning and end of the barcode before sending the barcode to the next step of the evaluation process. For example, start and stop characters of the checksums can be removed.

Verification of received status barcodes

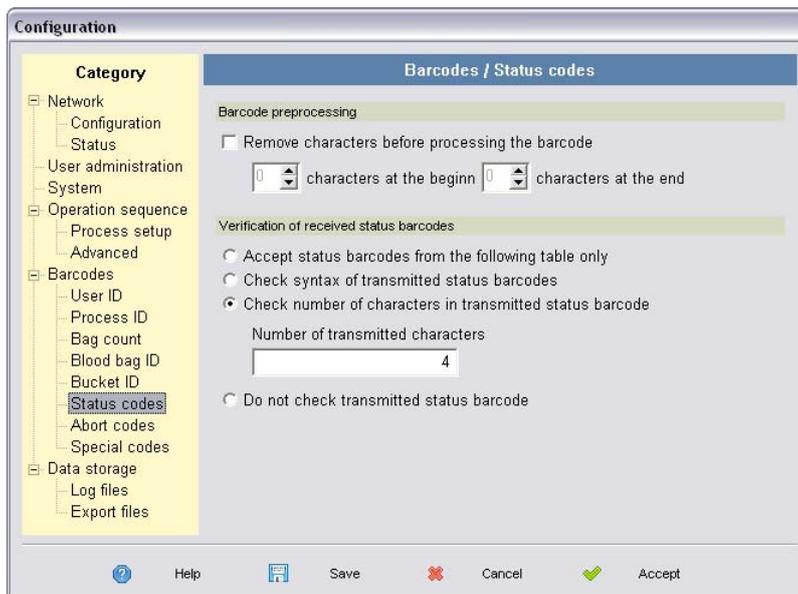
Four options are available for verifying the scanned barcodes. These four options also represent different levels of data security. The first option, and lowest data security level, is to accept all scanned barcodes without verification (last option in the list titled "Do not check transmitted status barcode"). The figure above depicts this selected option.

Verification of the barcode length

To increase data security, the software can check the length of the transmitted barcodes. An additional input field opens when this option is enabled. Here you can enter the expected code length:

3 Program Configuration

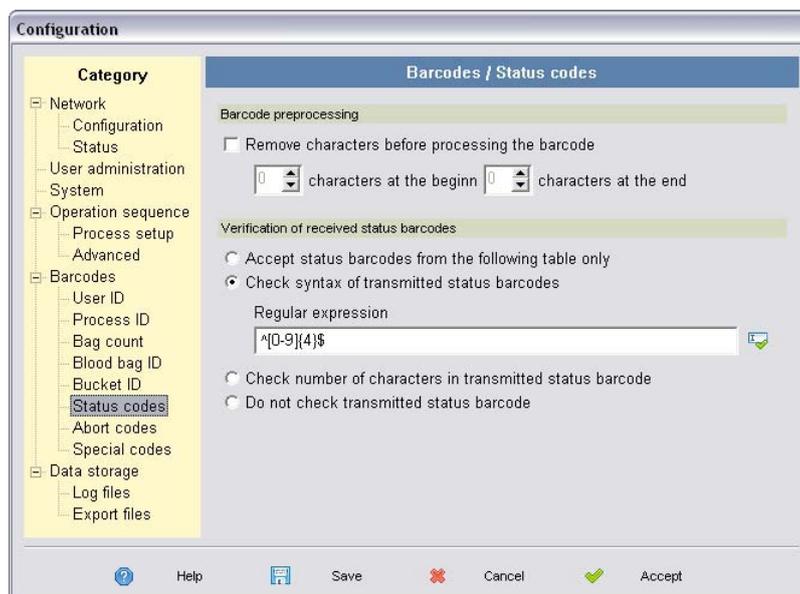
Configuration of utilized barcodes



Note The entered code length always corresponds to the actual transferred barcode length regardless of the characters to be removed. Removal of the characters is a further processing step that is not carried out until the length has been checked.

Check syntax of transmitted barcode

The syntax check of the transmitted barcodes is based on so-called “regular expressions.” This expression is used to define a pattern that must correspond with the scanned barcode. The software can now interpret the transmitted character string based on this pattern.

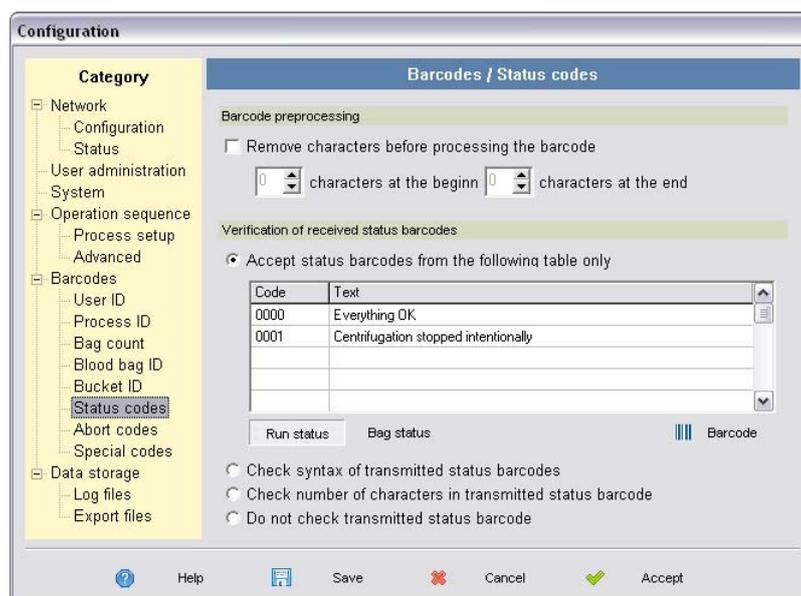


Use the **Regular expression** input box to enter the pattern for checking the transmitted barcode. A button next to the input box can be used to test the regular expression. Click this button to open a window where you can enter a sample scanned barcode. The program then indicates whether the barcode matches the regular expression.

Please consult [Appendix C](#) of this manual for additional information about regular expressions.

Verification of status code tables

If the option to check the tables is enabled, the status tables are displayed. There is one table for the status codes of the centrifugation and one for the individual blood bags. These are superimposed over one another due to space constraints and therefore not both visible at the same time. You can toggle between the different tables with the buttons [Run status](#) and [Bag status](#).



If the status input is enabled in the operating sequence configuration, only the barcodes listed in these tables are accepted during normal operation. The same codes can be stored in both tables. The difference between run status and bag status is only defined by the program sequence.

Click [Barcode](#) to generate a barcode for the defined status codes. If a row in the table is selected, the barcode window for this barcode opens. If no row is selected, the barcode window to generate all barcodes opens.

Please see section [“Barcode generation”](#) on [page 3-39](#) for additional information about generating barcodes.

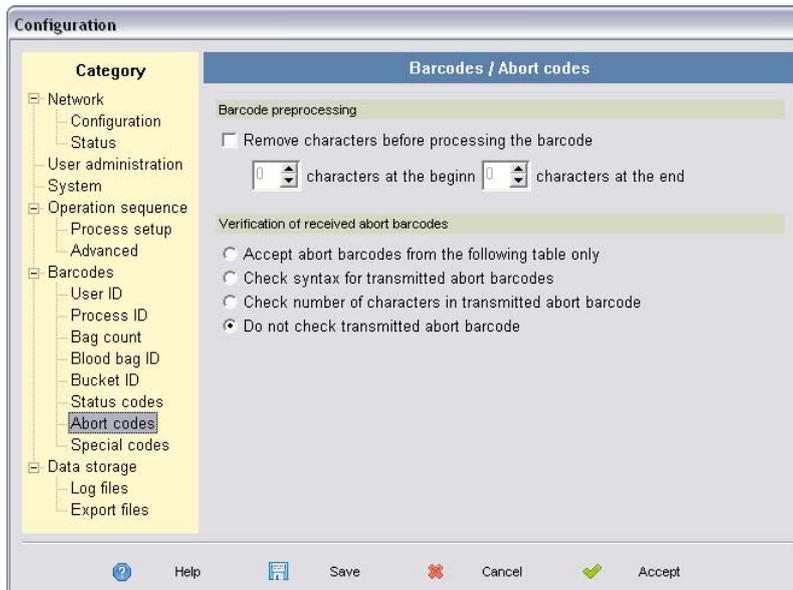
Note If one of the records is selected, this selection can be reversed by clicking in the first cell of the title.

Configuration page for abort codes

Abort codes are used to log information about a canceled process. If the corresponding option is enabled in the sequence control, the software prompts for a reasons when aborting the scan. Then one of the defined abort codes must be scanned.

3 Program Configuration

Configuration of utilized barcodes



Barcode preprocessing

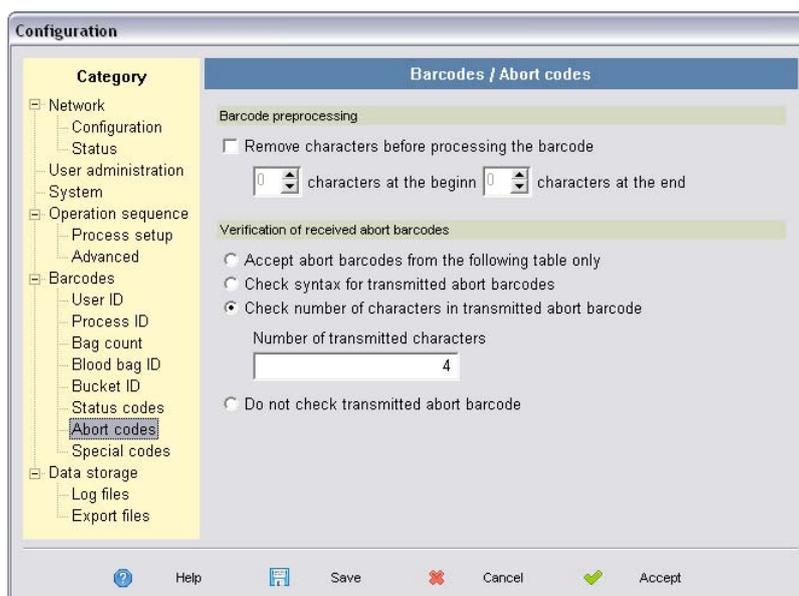
Use this section of the configuration settings to determine how many characters are to be removed from the beginning and end of the barcode before sending the barcode to the next step of the evaluation process. For example, start and stop characters of the checksums can be removed.

Verification of received abort barcodes

Four options are available for verifying the scanned barcodes. These four options also represent different levels of data security. The first option, and lowest data security level, is to accept all scanned barcodes without verification (last option in the list titled "Do not check transmitted abort bar code"). The figure above depicts this selected option.

Verification of the barcode length

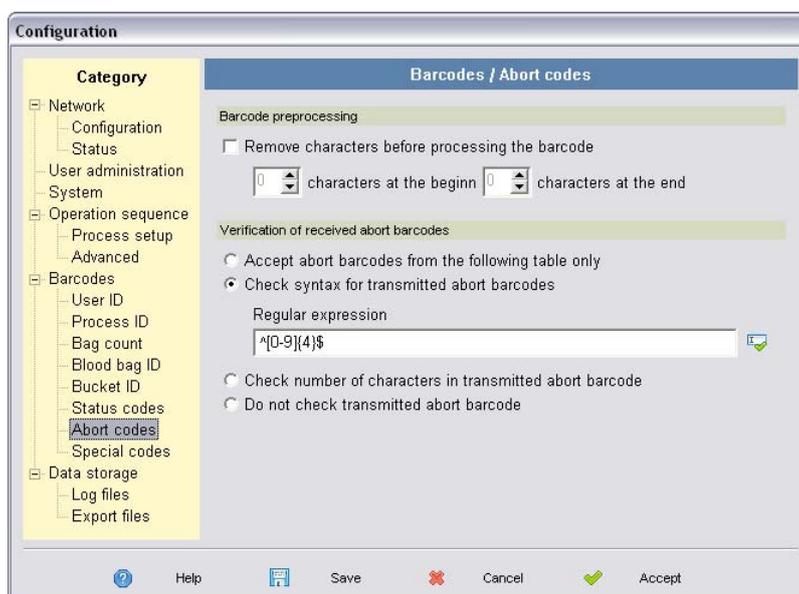
To increase data security, the software can check the length of the transmitted barcodes. An additional input field opens when this option is enabled. Here you can enter the expected code length:



Note The entered code length always corresponds to the actual transferred barcode length regardless of the characters to be removed. Removal of the characters is a further processing step that is not carried out until the length has been checked.

Check syntax of transmitted barcode

The syntax check of the transmitted barcodes is based on so-called “regular expressions.” This expression is used to define a pattern that must correspond with the scanned barcode. The software can now interpret the transmitted character string based on this pattern.

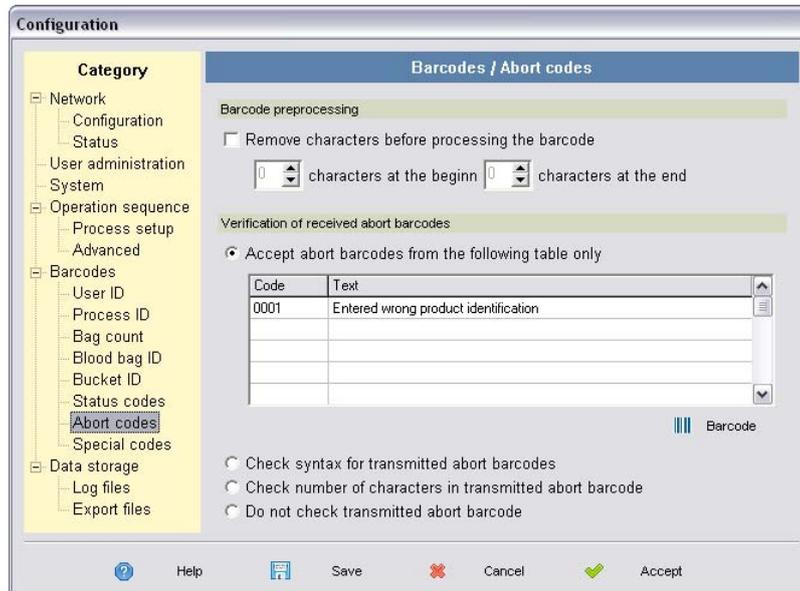


Use the **Regular expression** input box to enter the pattern for checking the transmitted barcode. A button next to the input box can be used to test the regular expression. Click this button to open a window where you can enter a sample scanned barcode. The program then indicates whether the barcode matches the regular expression.

Please consult [Appendix C](#) of this manual for additional information about regular expressions.

Verification of abort code tables

If the option [Accept abort bar codes from the following table only](#) is enabled, a table to enter the abort code is then displayed.



You can enter a plain text for information purposes into this table in addition to the abort code. If an abort process is to be documented, Centri-Log uses the information from this table to enter the reason for the abort as plain text into the log file.

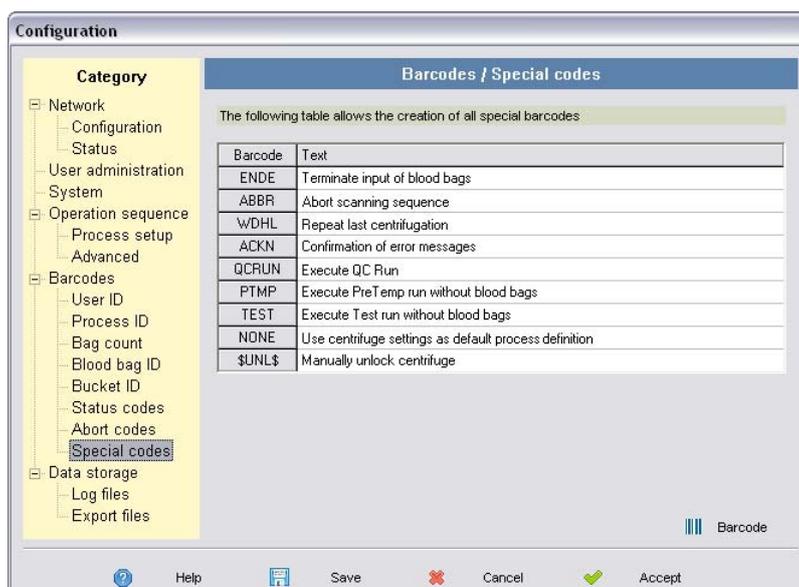
Click [Barcode](#) to generate a barcode for the defined abort codes. If a row in the table is selected, the barcode window for this barcode opens. If no row is selected, the barcode window to generate all barcodes opens.

Please see section [“Barcode generation”](#) on [page 3-39](#) for additional information about generating barcodes.

Note If one of the records is selected, this selection can be reversed by clicking in the first cell of the title.

Configuration page for special codes

The page for special codes features a table listing all special codes. The following figure depicts the page with the special codes:



The first table column lists the special codes. These are fixed defaults and cannot be changed. The second column can be used to enter a plain text for each code.

Click **Barcode** to generate a barcode for the defined abort codes. If a row in the table is selected, the barcode window for this barcode opens. If no row is selected, the barcode window to generate all barcodes opens.

Please see section “Barcode generation” on page 3-39 for additional information about generating barcodes.

Note If one of the records is selected, this selection can be reversed by clicking in the first cell of the title.

Configuration of data storage

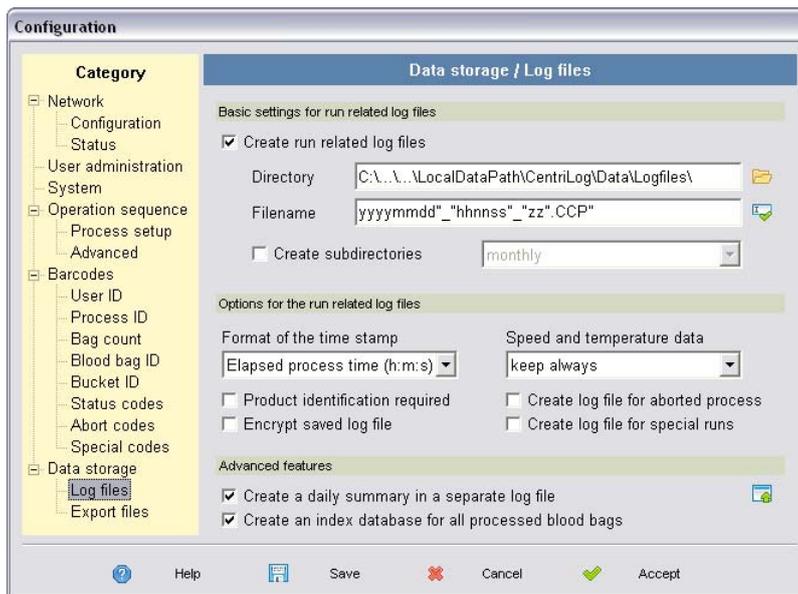
The two configuration pages for the data storage feature the settings for saving the logged process data. One page contains all options for the run logs, the other the settings for the export file.

Configuration of run logs

The **Log file** configuration page features the setting options for the log files created for each centrifugation run. The following figure depicts the corresponding configuration window:

3 Program Configuration

Configuration of data storage

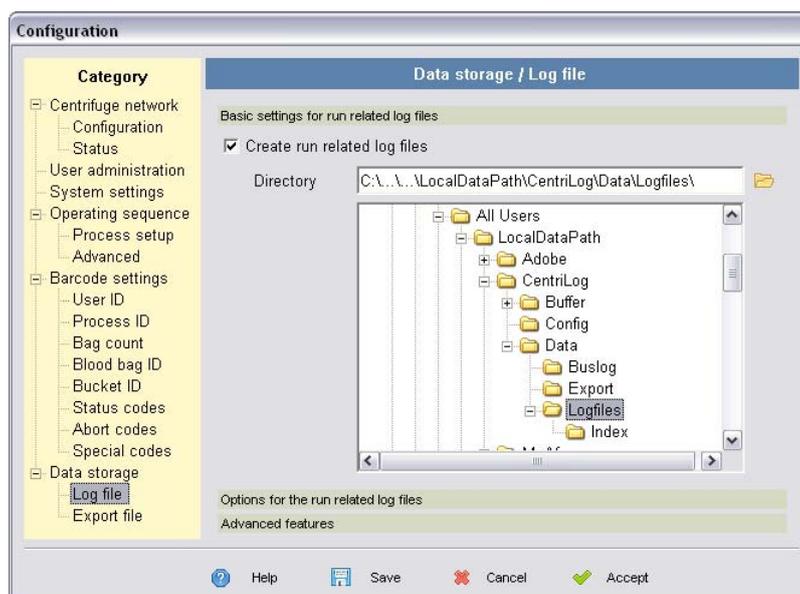


The upper window area features the option of enabling or disabling run-related logs. This is done with the **Create run related log files** selection box. Only if the log generation function is enabled is it possible to make changes to the configuration settings.

Note If the program Centri-Log Viewer is later to be used to evaluate centrifugation runs, the run-related logs must be created. However, if exporting the data to a central EDP is sufficient, then these run-related logs are not necessary.

Select drive and default directory

Use the **Directory** selection box to determine the drive and default directory for saving the log files. Click the button next to the input box to select a directory. The following figure shows the configuration window with the opened directory selection window.



After the storage path for the run logs has been selected, the directory selection window can be closed again by clicking the button next to the input box.

The directory must be on the local computer or a linked network drive. If the selected directory should be inaccessible during program operation (e.g. due to a disconnected network link), the log files are saved in a temporary directory on the local drive. Once access to the directory has been restored, Centri-Log copies the locally saved data to the selected target directory. A corresponding error message is displayed if this problem persists for a longer period.

File name template

A sample can be entered in this input box for the file name to be used. This sample can consist of plain text and a series of defined control characters. The control characters make it possible for the software to include additional information in the file name. These may be date and time information as well as values from the run count. Please consult [Appendix D](#) and [Appendix E](#) of this manual for additional information about possible control characters.

The following example depicts a template for a file name and how this translates into the actual file name of the run-related log:

Template: yyyymmdd”_”hhnnss”_”zz”.HCP”

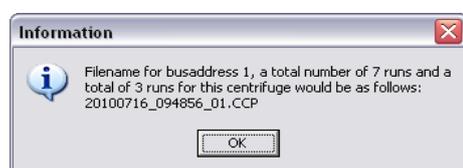
Converts to: yyyymmdd Consists of the date of centrifugation. A run on 22 September 2005 generates the character string 20050922.

 hhnnss Consists of the time of centrifugation. A run carried out at 11:18:12 generates the character string 111812.

 zz These characters result in the centrifuge address being entered into the file name. The character string is therefore 01 if the centrifuge has the address 1.

File name: All characters enclosed in “ “ are applied to the file name without being changed. This example therefore results in the following file name: 20050922_111812_01.HCP

Use the button next to the input box to test the file name generation. This test uses sample data and the current date to see if generating a file name is possible. If the file name was successfully created, this name is then displayed in a message window. The following figure shows the window for the example listed above:



An error message is displayed if the file name cannot be created. If this is the case, the template for the file name must be checked and corrected if necessary.

The selected file name should be unique if possible. This is already achieved by using the centrifuge address or a combination of date and run count. If the file name is not unique, the software automatically adds a file count.

Format of the time stamp

This setting determines the format used to save points in time in the log file. Which format is more advantageous depends on how the log file is to be processed later. The following four options are available:

| | |
|-----------------|---|
| Runtime (h:m:s) | The time of scanning saved in the format hour/minute/second. Time information is relative to the logging start. |
| Runtime (s) | The time of scanning is later than the number of expired seconds since logging started. |
| Time of day | Each time stamp documents the actual time when a scan was carried out. |
| Date & Time | In addition to the time of scanning, the time stamp also indicates the date. |

Speed and temperature data

Speed and temperature are logged in a defined timeframe during the centrifugation run. If the run was free of errors, the actual values do not contain any additional information compared with the also logged set values. The actual values can therefore be suppressed to reduce the volume of the logged data. This requires changing the setting of this selection box from **Keep always** to **Keep in case of errors**.

Process identification required

If a device is in logging mode, process data is not required to start a centrifuge run. If centrifugation is now carried out without the scanned process data, a statement is received about the centrifugation itself but the process cannot be associated with any blood bags. You can therefore check this selection box to specify that at least a process ID must be scanned for creating a log file.

Create log file for aborted processes

Scanning an abort label with an abort code makes it possible to stop the process data input. If this option is activated, the aborted process is documented in a log file.

Encrypt saved log file

Centrifugation logs are usually saved in a readable ASCII file ¹. This makes it easier to evaluate and transfer data to a parent EDP system but represents a risk factor due to the possibility of data manipulation.

It is therefore possible to enable the log file encryption option. The data are then encrypted and a checksum is attached before saving the data to the file. This means it is easily and quickly possible to determine whether the file is still in its original state during subsequent processing.



IMPORTANT If the log file is encrypted, only Centri-Log can open it. Once opened in Centri-Log, use the software to generate an unencrypted ASCII file.

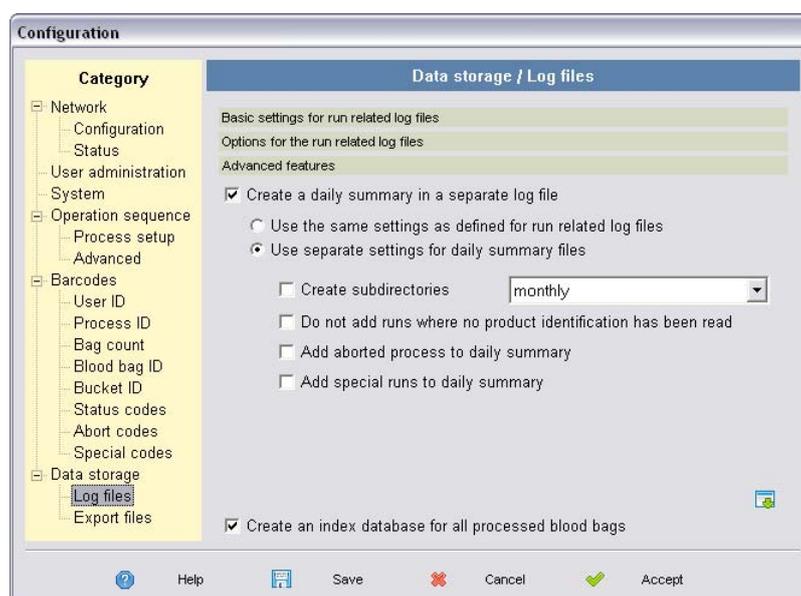
¹Please consult [Appendix A](#) of this manual for additional information about the log file structure.

Create log file for special runs

The Centri-Log software allows the execution of so-called special runs. These are runs to pre-regulate temperatures or for the function test of the centrifuge (“[Special barcodes to operate Centri-Log](#)” on [page 6-7](#)). Use this selection box to specify that a run related log is to be created for these special runs or processes as well.

Create a daily summary

In addition to run related logs, the software can also create a daily summary. This summary saves an overview of all runs of the corresponding day. If the daily summary option is enabled, the associated options are displayed on the configuration page.



The daily summary is saved in the same directory as the run logs. However, the daily summary features four options that are already used with the run logs. These are as follows: “Create subdirectories,” “Do not add runs where no process identification has been read,” “Add aborted process to daily summary,” and “Add special runs to daily summary.” You can specify for these four options whether to apply all settings of the run logs or whether the settings for the daily summary must be determined separately.

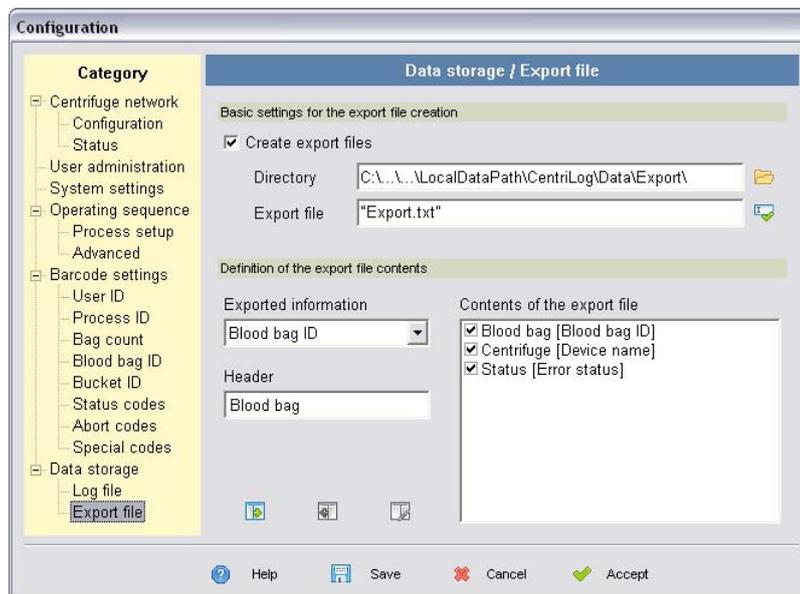
Use the button in the lower window area to close the daily summary view. Use the same button to open a closed view.

Create an index database for all processed blood bags

If the blood bag indexing is enabled, the software creates index tables for the processed blood bags. The software saves the bag codes together with the selected run information to these tables. This makes it possible to search for specific bag codes and quick access to run-related logs with information about processing the bags.

Configuration of the export file

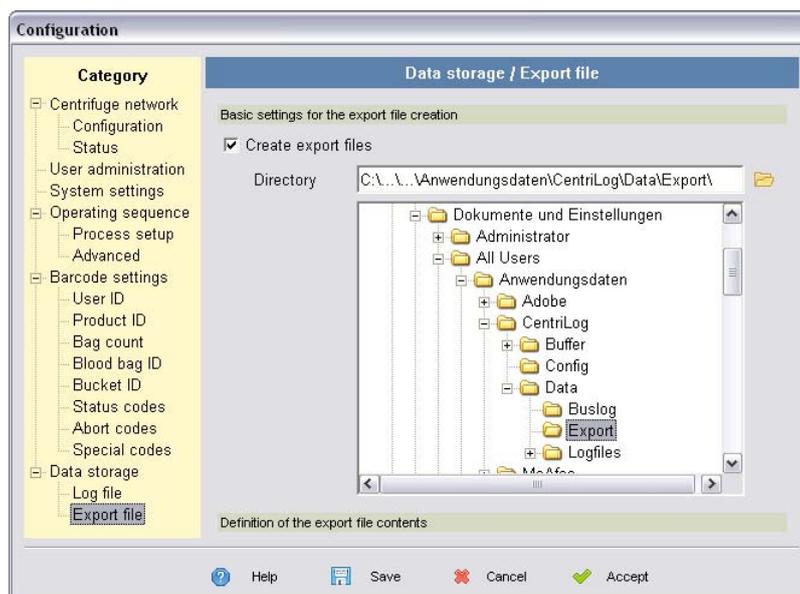
The second data storage page lists all basic settings for the export file creation. The export file serves to transfer the logged data to a central EDP system. Data are stored in the export file not per run but as it pertains to each blood bag. The following figure depicts the configuration window:



The upper window area features the option of enabling or disabling creating the export file. Only if the export file creation function is enabled is it possible to make changes to the configuration settings.

Select drive and default directory

Use the **Directory** selection box to determine the drive and default directory for saving the log files. Click the button next to the input box to select a directory. The following figure shows the configuration window with the opened directory selection window.



After the storage path for the run logs has been selected, the directory selection window can be closed again by clicking the button next to the input box.

The directory must be on the local computer or a linked network drive. If the selected directory should be inaccessible during program operation (e.g. due to a disconnected network link), the log files are saved in a temporary directory on the local drive. Once access to the directory has been restored, Centri-Log copies the locally saved data to the selected target directory. A corresponding error message is displayed if this problem persists for a longer period.

Export file name

Use the input box underneath the directory selection box to enter a file name for the export file. You can also use the file name to determine an automatic time interval for saving data to a file. This is done by entering a file name that also includes timeframe information.

Variation 1: Create single export file

If a plain file name is entered, Centri-Log uses this file to save information to be exported in this file. The following are examples of such simple file names: “EXPORT.TXT” or “2004-04.EXP”
Make sure these file names are always enclosed in “ ” as well.

Variation 2: Automatic creation of export files

The files names of export files may also include control statements for the automatic generation of file names. The thusly generated file names may include regular characters and additional time information (date/time). All characters applied to the file name without further editing must be enclosed by the characters “ ”.

Example: Entering `yyyy-mm”.EXP”` would result in the same export file in April 2004 as entering `“2004-04.EXP”`. This has the advantage that file names are created automatically for subsequent months, i.e. in May `2004-05.EXP`, in June `2004-06.EXP`, and in January 2006 the file `2006-01.EXP`.

Please consult [Appendix D](#) of this manual for additional information about formats of control statements.

Definition of the export file contents

The lower half of the window features the options than can be selected for the export file. Use these options to define what data are stored in the export file.

The window is here divided into three sections:

1. The actual field selection with input box for the header
2. The action buttons to change the selection
3. The field list with all fields to be included in the export file

Field selection and header input

Use the **Exported information** selection box to determine which fields are to be added to the export file. The input box **Header** below this drop-down selection box is used to specify which header is to be displayed in the first row of the export file for this field. If the desired field is already displayed in the selection box, the header input field shows the header previously defined for this field. An empty input box is displayed in case of new fields.

Action buttons for the selected fields

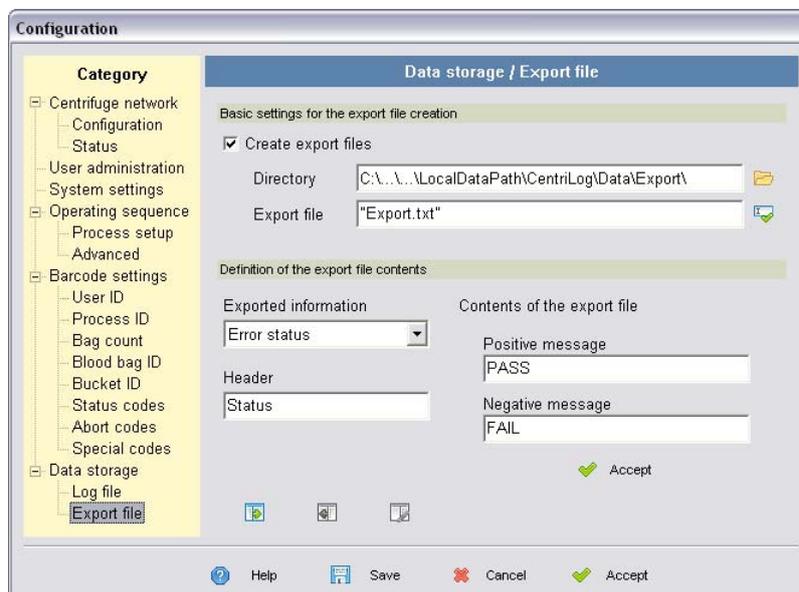
Use the three action buttons underneath the field selection box to add fields to the list, delete fields from the list, or display additional information about specific field types.

 Button to add selected field to field list

Use this action button to add the field listed above to the definition of the export file. If this field is already in the list, the software first checks whether a new header was entered. If the header is different from the one in the list, the entry is updated. If the header is the same, a warning message is depicted and the field list is not changed. If no entry in the list is selected, the field is appended to the end of the list. However, if a row in the field list is selected, the entry is added before this row.

Additional information may be needed for some fields. This includes the fields **Error status** and **Start time**, among others. If one of these fields is added to the selection list, the list is first hidden and an additional input area is depicted.

The following figure depicts the window section with the input area for the error status:



A freely selectable text can be used for the “Positive message” (run without problems) and “Negative message” (run with errors) status information. The text is then saved in the export file as specified.

Time information fields can be used to determine in which format the time is to be saved in the export file. Please consult [Appendix D](#) of this manual for additional information about possible formats.

Click **Accept** to return to the field list view. Changes to the additional information are not saved.



Button to delete selected field from field list

Use this button to delete a selected entry from the list.



Button to edit additional information

If a field with additional information is selected (via field selection of the field list), click this button to edit the additional information. Click the button to open the corresponding input area in the window. Input is completed with the “Accept” button.

Contents of the export files

The field list includes all fields that can be entered into the export file. The order in this list corresponds with the order of the fields in the list. Each entry in this list consists of a header and the field name in square brackets.

You can also remove individual fields from the list without actually deleting them right away. Simply place the mouse cursor into the checkbox in front of the corresponding entry. Then click the left mouse button. A small tick is displayed in the checkbox when saving the field; otherwise, the field remains empty.

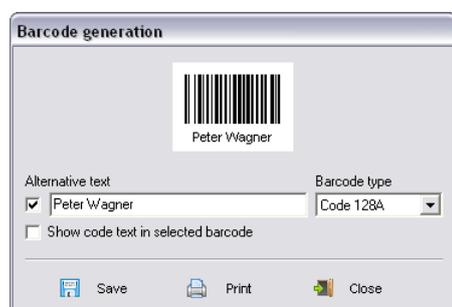
If an entry in the field list is selected, the field selection and the input box for the header is immediately updated to reflect the corresponding selection.

Barcode generation

The barcode generation options can be accessed from the configuration page for the user specifications, from the abort codes page, and the status and special codes page. The layout of the opened window depends on whether the barcode is to be generated for one record or for all records.

Barcodes for a single record

Is one of the records selected, click **Barcode** to open the following window:



The upper window area depicts the generated barcode. The alternative text and showing the actual barcode can be enabled by ticking the corresponding checkboxes. If necessary, the alternative text can be edited. Use the **Barcode type** selection box to select the type of barcode to be generated.

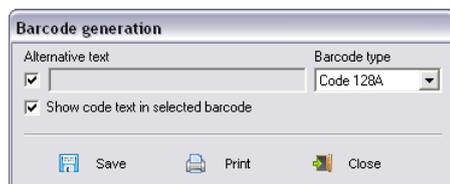
Note Some barcode types may restrict the type of characters you can use. For example, some code types can only depict letters and numbers. An error message is displayed if the desired barcode cannot be generated.

Click **Save** to save the generated barcode as a *.bmp file. This means the barcode is available for additional processing.

Click **Print** to print out the generated barcode.

Barcodes for all records

If a record is not selected in the table, the barcode window for generating all barcode opens. The following figure depicts this window:



As with generating barcodes for an individual record, it is possible to enable showing the alternative text and the plain text of the code as well. However, this window does not provide an option for indicating an alternative text since changes in this window would affect all barcodes. Use the **Barcode type** selection box to select the type of barcode to be generated.

The two buttons **Save** and **Print** have the same functions as with the individual barcodes.

An error message is displayed during saving or printing if one of the records cannot be converted to the desired code type and that particular record is skipped.

Workspace Administration

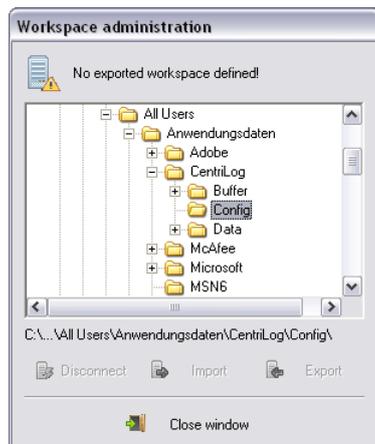
Contents

- “Configuration of an exported workspace” auf Seite 4-2
- “Disconnect workspace” auf Seite 4-3
- “Import workspace” auf Seite 4-3

4 Workspace Administration

Configuration of an exported workspace

Click the **Program/Workspace** menu item to open the following dialog to administrate the workspace:



The three programs Centri-Log Control, Centri-Log Editor, and Centri-Log Viewer are installed on one PC during a standard Centri-Log installation. This means all three configuration files are also on the same PC.

Data security can be enhanced by copying these configuration files to a network drive. It is also possible to use the programs Centri-Log Editor and Centri-Log Viewer on other computers with network access to edit process definitions or evaluate run-related logs.

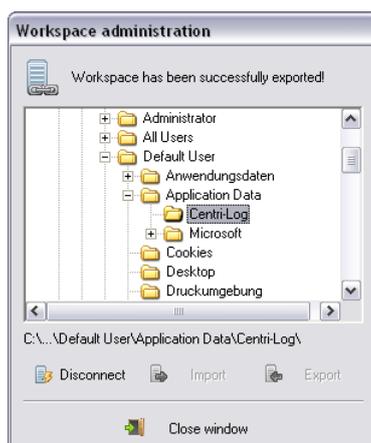
This dialog makes it possible to move the configuration files to a network directory and to import existing configuration files, for example, after a new installation of the software.

Configuration of an exported workspace

If several computers are to access data of a Centri-Log installation, the configuration files must be in a directory accessible by these computers. This is achieved by exporting the workspace (configuration files for users, centrifuges, process, etc.). Centri-Log then manages this exported workspace and keeps the associated data up-to-date.

First, select the directory from the directory selection to which the configuration files are to be moved. Then click “Export” to export the workspace to the selected directory. A corresponding message is displayed if the export of the files was successful. Otherwise, an error message is displayed. In case of an error message, check whether the selected directory has the respective permissions and attributes allowing the creation of files.

If the export was successful, this is indicated in the window.



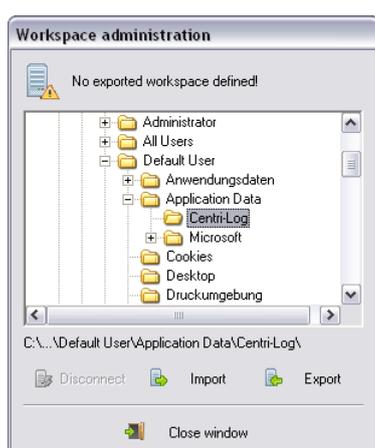
The message “Workspace has been successfully exported” is displayed above the directory selection box. The button to disconnect the workspace located at the bottom of the window is then available as well.

Disconnect workspace

The connection with the exported workspace can be severed if the workspace is no longer needed or the files are to be saved to a different location. Simply click **Disconnect**. Confirm the security prompt and the software deletes all configuration files in the directory of the workspace. This eliminates the possibility of two versions of the files no longer being synchronized by the software.

Import workspace

It is also possible to import configuration files if an exported workspace does not yet exist. This is done by first selecting the directory with the configuration data. If all files with the correct version are in this directory, the **Import** button is enabled.



Click **Import** and the Centri-Log software imports all of the configuration data from the selected directory to the local configuration directory. This function makes it possible to restore the entire database in case of a new software installation without having to re-enter the data.

Data Logging and Data Display

Contents

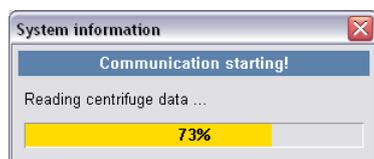
- “Start communication with centrifuges” on page 5-2
- “Stopping communication with centrifuges” on page 5-2
- “Data displayed in the program interface” on page 5-3
- “Manual editing of bag data” on page 5-6

This chapter describes how to establish and sever communication with the centrifuges. The data display in the program interface is discussed as well.

Start communication with centrifuges

Communication must be started manually if the automatic start of the bus system is not enabled (“[Start communication with centrifuges when program is started](#)” on [page 3-10](#)). This is done with the menu item **Program/Start** or by clicking the corresponding button in the toolbar. However, communication cannot be started unless a user with the corresponding privileges is logged on.

After the start of the communication, the Centri-Log software starts to establish communication between the PC and the individual centrifuges. First, all relevant data of the centrifuges are read. The following window depicts the progress of this process.



The initialization phase is divided into four individual steps carried out in the following order:

Step 1: Reading configuration information

The centrifuge configuration is read first. This information indicates which device is addressed at the utilized bus address.

Step 2: Reading processor identification

The software then determines the processor ID of the interface processor. This is an internal identification and serves only service-related tasks.

The configuration setting and the identification of the interface processor is read from the entries in the area **Network/Status** of the configuration while the bus system is running (“[Display status information](#)” on [page 3-6](#)).

Step 3: Reading status information

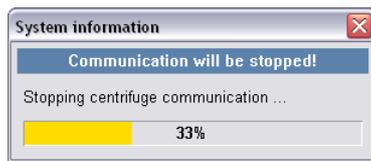
The third step consists of the software reading the status information from the centrifuges.

Step 4: Reading centrifuge values

The last step consists of updating the centrifuge values. This involves reading all current data of the centrifuge.

Stopping communication with centrifuges

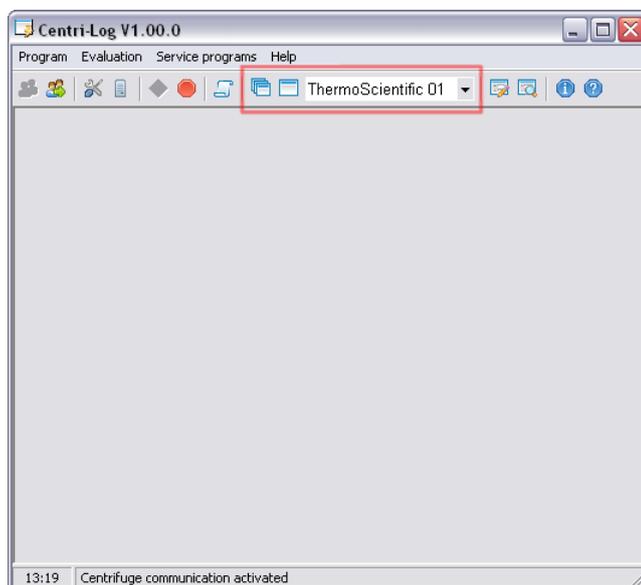
Use the menu item **Program/Stop** to stop communication with the centrifuges. A button is also available in the toolbar to carry out the same function. While communication is stopped, the familiar information window is displayed.



Once communication with the centrifuges has stopped, Centri-Log sends a series of information to each device required to completely finish the communication. This is also why ending communication takes a certain amount of time illustrated with the progress bar.

Data displayed in the program interface

If communication has been started, the window with the progress bar disappears and the selection options for the display windows (views) are now enabled in the toolbar of the window. These are marked with a red frame in the following figure.



Use this button to open the overview windows. A window is opened for each registered centrifuge. However, this window only depicts the current data concerning speed, runtime, and temperature.



The second button opens a detail view of a centrifuge. This window then shows all available centrifuge information.

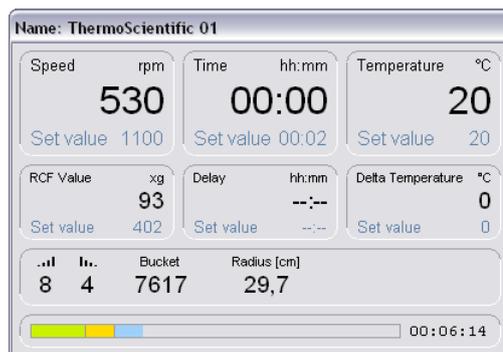
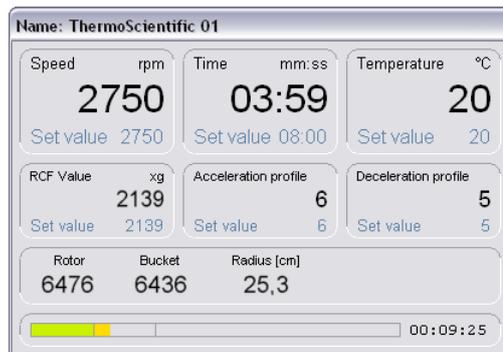
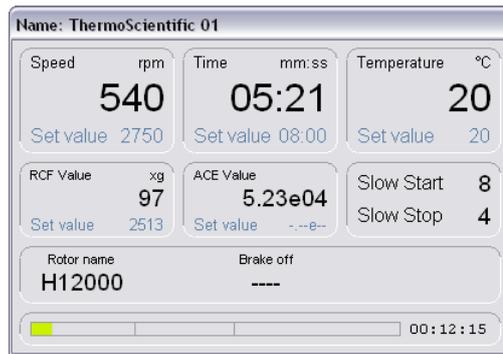
A selection box for the centrifuges is located in the toolbar in addition to these two buttons. This list includes all centrifuges registered in the network configuration. Here, the address, serial number, or the name is used as the designation depending on the selection in the network configuration (“[Identification of the centrifuge within the software](#)” on [page 3-5](#)).

If the detail window of a centrifuge is open, then this window can be used to quickly toggle between the centrifuges. The selected centrifuge remains selected when switching from the detail view to the overview windows. The selection list is automatically updated when one of the overview windows is enabled with the mouse.

Data displayed in the detail window

Information about one of the centrifuges can be depicted in an open detail window. Use the selection list in the toolbar to determine which centrifuge to depict. A centrifuge identification is also depicted in the title bar of the open window.

The following figures show examples of the windows of RC 12BP+, a Cryofuge 5500i, and a Cryofuge 6000i:

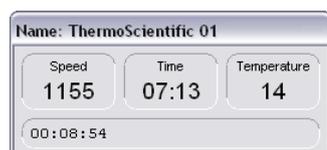


The set values and the actual values take up most of the space of the window. Insofar as available, both values are displayed together in one data block. The set value is depicted in a smaller font and more subdued color since the current values are the more important information.

The lower half of the window features an area to depict the status. This area is used to display sequence and error messages. The software also shows here the remaining time until the centrifuge comes to a standstill. This time is calculated from the specifications for the acceleration and braking profile as well as the set runtime or set ACE value. Since the calculation is based on the ideal behavior of the centrifuge, a slight adjustment of the calculated time may be made during centrifugation. This calculation is also not possible for all operating conditions of the centrifuge.

Data displayed in the overview window

The overview windows represent a simple form of displaying data. They contain only the three important actual values. These are speed, time/ACE, and temperature. This restriction means many of these small windows can be displayed at the same time. The figure below shows only one overview window that would be the same for all centrifuges since there are no differences when it comes to centrifuge types.



The upper window area depicts the three actual values; the status is indicated in the lower area. Information about sequence and error messages is shown in this small window as well. A progress bar as shown in the detail view status indication is not available here due to space constraints. However, the software again shows the remaining time until the centrifuge comes to a standstill.

Informational icons for special operating states

Icons for special operating states can be depicted in the process sequence display window. The following are the three possible icons:



This icon in the display window indicates that the software is currently editing blood bag barcodes. This may be entering blood bags while loading the centrifuge or assigning status information at the end of the centrifugation process. Clicking the icon opens the barcode input window according to [“Manual editing of bag data”](#) on [page 5-6](#).



This icon indicates that the centrifuge is blocked from any further use. If the corresponding option is enabled in the program configuration, the Centri-Log software is able to block the centrifuge after a malfunction or error. Only a user with the corresponding privileges can release the centrifuge later on. Please consult sections [“Lock centrifuge for subsequent use in case of errors”](#) on [page 3-14](#) and [“Edit user profile”](#) on [page 3-8](#) for information about enabling this function and assigning privileges or permissions to users. Click on the icon to release the centrifuge. The user authentication window opens if no user is logged on or the logged on user does not have the corresponding privileges or permissions. The centrifuge is released after entering identification and password.



The software has detected a deviation in the defined sequence when this icon is displayed in the window. This could be a monitoring error for the speed or the temperature, for example. This icon indicates a variety of other information as well. Click on this icon to open an information window containing the software messages.

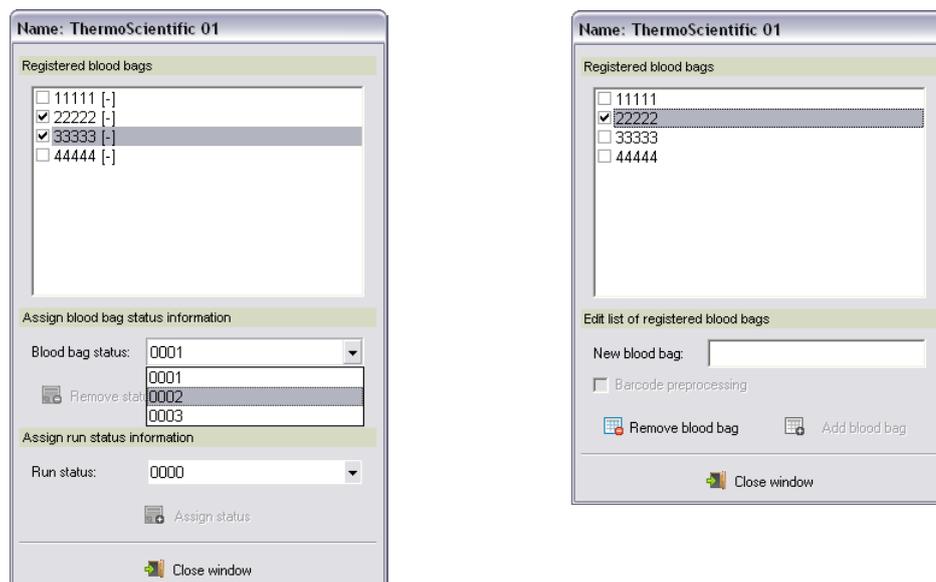
These icons are depicted in the overview windows as well as the detail windows. There is no difference in functionality between the two display types.

Manual editing of bag data

Since processing blood bags may result in damaged barcodes, Centri-Log allows the manual editing of bag data within the program interface. Such editing includes entering bag information before a run as well as assigning status information at the end of the centrifugation process.

Enter bag when loading centrifuge

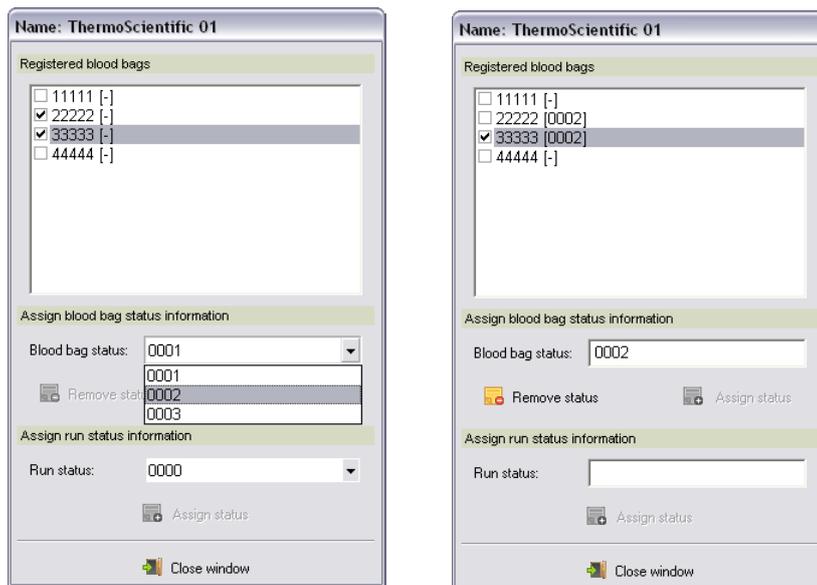
If the centrifuge is currently being loaded with blood bags, clicking the icon described in section “[Informational icons for special operating states](#)” on [page 5-5](#) opens the following input window within the display window:



The display area in the upper window half shows a list of already registered blood bags. The input area to edit this list is underneath. Here you enter a bag barcode and add this code to the list by clicking [Add blood bag](#). It is also possible to remove bags from the list. Select the corresponding entry from the list and click [Remove blood bag](#).

Assign run status information

If the option to assign a status after a run is enabled in the sequence control, the corresponding icon is displayed in the display windows in this state “[Informational icons for special operating states](#)” on [page 5-5](#). Click to open the following input window:



The display area in the upper window half shows a list of already processed blood bags together with the respective saved status information. The input areas for the bag status and run status are below that.

Click **Assign status** to assign the status code to the blood bags if the blood bags to be processed are selected in the bag list and if a bag status has been entered. However, it is also possible to remove the status code of a blood bag from the list. Select the corresponding entry from the list and click **Remove status**.

The run status information is underneath the bag status input area. Here you enter a run status and click **Assign status** to complete the status information input. As with the centrifuge input, this is the last step in the sequence. Now you can close the window.

If a table has been created in the configuration of the status barcodes, a drop-down selection list is displayed for bag and run status instead of the input boxes.

Centrifugation Sequence/Use of Barcode Readers

Contents

- “User input prompts” on page 6-2
- “Error messages” on page 6-3
- “Status messages” on page 6-6
- “Special barcodes to operate Centri-Log” on page 6-7

Process data may be scanned and read with different sequences and sequence steps since Centri-Log features numerous configuration options concerning the support of barcode readers. The program function for each barcode is here described individually in an overview.

User input prompts

| | |
|-------------------|--|
| Action: | Scanning user identification |
| Display: | User ID |
| Program function: | <p>Loading or Unloading (optional)</p> <p>The user must scan his or her personnel number. If configured accordingly, Centri-Log compares the scanned barcode with the entries in the user table. This ensures that only authorized persons carry out centrifugation processes.</p> <p>The additional text message is optional. Additional text is displayed here only if the software is configured to log the unloading of the centrifuge. This text is Loading for loading the centrifuge and Unloading for unloading.</p> |
| Action: | Scanning process identification |
| Display: | Process ID |
| Program function: | <p>A valid process ID must be scanned at this point. Process definitions are store on the computer for the individual products. Centri-Log uses process definitions after scanning the process code to check and monitor the centrifugation process. Please consult Chapter 8: "Create Process Templates with the Centri-Log Editor" for additional information about process definitions.</p> |
| Action: | Scanning blood bag count |
| Display: | Bag count |
| Program function: | <p>Centri-Log expects here a barcode indicating the number of bag barcodes to be scanned. This barcode determines the number of blood bags to be processed.</p> |
| Action: | Scanning blood bag identification |
| Display: | Bag No. 01, Bag No. 02... |
| Program function: | <p>Centri-Log counts the blood bags when scanning the blood bag identification and updates the number displayed on the centrifuge. This means the max. number of blood bags that can be scanned is defined by the process definition. Scanning is limited to the number of blood bags specified. If a number of blood bags is not specified, scan the ENDE barcode to stop the scanning process if the load is insufficient.</p> |
| Action: | Scanning bucket data |
| Display: | Bucket No. 01, Bucket No. 02... |
| Program function: | <p>This function is currently supported by Centri-Log but barcodes are not attached to buckets at this time. This function should therefore be disabled in the sequence control.</p> |
| Action: | Scanning abort code |
| Display: | Abort code |

| | |
|-------------------|---|
| Program function: | An abort code must be scanned at this point. The abort code provides information about why the process was canceled. If the corresponding option is enabled, Centri-Log checks whether the scanned code is listed in the abort code table. |
| Action: | Entering the run status |
| Display: | Run status |
| Program function: | Here you scan either a barcode for the run status or a blood bag code of the previous run. A scanned run status ends the status input while scanning a blood bag barcode enters the bag status. |
| Action: | Entering the bag status |
| Display: | Bag status |
| Program function: | Scan a status code as defined in the bag status table. Once the status code has been scanned, the prompt to enter the run status is displayed again. |
| Action: | Finalizing the scanning process |
| Display: | Scan ENDE! |
| Program function: | If the number of blood bags to be processed is not defined by scanning a blood bag count code, and if the scanning of the bucket identification is not enabled, then closing the lid while scanning the blood bags results in a state where only ending the scanning process is possible. (If the lid of the centrifuge is closed, additional blood bags cannot be loaded to the centrifuge). Centri-Log continues the sequence when scanning the ENDE barcode. |
| Action: | Forced process abort |
| Display: | Scan ABBR! |
| Program function: | If the lid of the centrifuge is closed while scanning the blood bag or bucket data, but the scanned number does not correspond with the expected number, the system switches to a state where only aborting the scanning process is possible. |

Error messages

Centri-Log can depict error messages on the display during the scanning process. These error messages always refer to the previously scanned barcode. The following types of error messages may be displayed:

- a. The scanned barcode does not match the specified length

Different lengths can be specified for each barcode. If the scanned code does not match the length definition, Centri-Log depicts a corresponding error message in the display.

Example: USER ID wrong length!

- b. The scanned barcode does not match the defined syntax

If the syntax verification function has been enabled for the barcode, then Centri-Log checks each scanned barcode based on the stored regular expression. An error message is displayed if the character string does not match the specification.

Example: USER ID not valid!

- c. The scanned barcode is not in one of the tables

Centri-Log compares certain barcodes with a specified database. This applies to the user code, the process code, the status codes for the bags and the run, and - insofar as configured - also to the abort code. If a scanned barcode is not found in the corresponding tables, a message is depicted for the user in the display.

Example: USER ID unknown!

- d. The scanned barcode has an incorrect check character

The check character verification must be enabled for the blood bags. Different algorithms can be selected in the configuration for this purpose. If one of the checksum algorithms is enabled, an incorrect check character results in the corresponding error message.

Example: Bag No. 01 checksum error!

- e. The scanned bag may not be processed

The system can be configured in such a way concerning the blood bags that a specification file with permitted centrifugations is processed. The process code of the next processing step is assigned to each blood bag. If a barcode is now scanned at the centrifuge not defined for the selected process, a corresponding error message is displayed.

Example: Bag No. 01 not permitted!

- f. The scanned value is not within the permitted value range

Centri-Log checks whether the scanned value is within the valid range when a blood bag count is to be scanned. The scanned bag count must be at least one but not more than the quantity specified in the process definition.

Example: Bag count invalid!

- g. The scanned barcode was already scanned in this sequence.

Each barcode may exist only once in each sequence. This is checked for blood bags and buckets. A message is displayed if a code is scanned twice. This example shows the third blood bag as already scanned previously.

Example: Bag No. 03 existing!

- h. Running the selected process is not permitted with this centrifuge

Each process definition includes information about for which centrifuge this process was defined. If a process not defined for a specific centrifuge type is selected anyhow, an error message is displayed.

Example: Centrifuge not permitted!

- i. Running the selected process is not permitted with the rotor/bucket

In addition to the centrifuge information, the process definitions also indicate which rotor/bucket is to be used for a product. Centri-Log displays an error message if a different rotor/bucket is used in the centrifuge.

Example: Rotor/bucket not permitted!

- j. The function of the scanned special code is not permitted at this time

The Centri-Log program sequence can use a variety of special barcodes (“[Special barcodes to operate Centri-Log](#)” on [page 6-7](#)). However, these codes cannot be scanned at all steps of the sequence. An error message is displayed if the scanned barcode is not accepted by the software.

Example: Barcode PTMP not permitted!

Not only is the current status of the centrifuge a decisive factor for the repeat function (barcode WDHL), but the function must also be enabled in the program configuration. (see “[Allow repeated centrifugation without scanning blood bags](#)” on [page 3-13](#))

The same applies to the special barcode ENDE. If the specification of a blood bag count has been enabled in the program configuration, then the special code is not accepted during the standard program sequence although the software has the correct status.

k. The repeat function is not possible at this time.

Another error message in connection with the repeat function is listed here. If the function is enabled in the program configuration but no data are available for a repeat, then the error message depicted below is displayed.

Example: Repeating not possible!

Data are not available for a repeat run until at least the process code and one blood bag code are scanned. It is important to remember that a defined validity period may apply to the repeat data when using this function. If this time is exceeded the data are no longer available and any attempts to carry out a repeat run results in the indicated error message.

l. Special pretemp runs or tests are not possible at this time.

If a special pretemp run or centrifuge test is to be carried out, then the corresponding special barcode must be scanned instead of the first blood bag barcode. However, if the blood bag barcode is scanned, then the special barcodes are rejected during subsequent scanning attempts.

Example: Test run not possible!

m. A data synchronization file is not available

The Centri-Log software tries to find the corresponding process definition in the database after a process barcode has been scanned. This error message is displayed if the file used for this purpose is not found.

Example: File errors

Many of the error messages listed here are only examples and may be displayed in conjunction with various barcodes. For example, the message **User ID not valid** as well as **Process ID not valid**, **Run status not valid** or **Bag status not valid** may be displayed.

Status messages

Centri-Log may depict other status messages in the display of the barcode reader not associated with the scanning process. The following is a list of all messages that may occur during the standard centrifugation operation.

| | |
|---------------|--|
| Display: | Pretemp run No log file / recorded |
| Significance: | If the special barcode for a pretemp run is scanned instead of the first barcode for a blood bag, then the software displays this text to indicate that the pretemp run was initiated. The software displays an informational text to indicate that a log has not been created if the generation of run-related logs for special runs has been disabled in the program configuration. |
| Display: | Test run No log file / recorded |
| Significance: | If the special barcode for a test run is scanned instead of the first barcode for a blood bag, then the software displays this text to indicate that the test run was initiated. The software displays an informational text to indicate that a log has not been created if the generation of run-related logs for special runs has been disabled in the program configuration. |
| Display: | Ready to run |
| Significance: | Centri-Log indicates that the system is ready to log a centrifugation run after all barcodes have been scanned. However, this message is displayed only if the lid of the centrifuge is still open. |
| Display: | Enabled! |
| Significance: | Centri-Log uses this text to indicate that the set values of the device match the process specifications once all barcodes have been scanned and the lid of the centrifuge is closed. The centrifugation run can be started. |
| Display: | Set values? |
| Significance: | If this is depicted in the display after closing the lid, then the set values of the centrifuge do not match the process specifications for the indicated process. The centrifuge cannot be started if in monitoring mode. |
| Display: | Temperature? |
| Significance: | It is possible to set an option in the Centri-Log software that permits starting the centrifuge only at the correct temperature. This message is displayed if the determined device temperature is outside the permitted range. The centrifuge cannot be started if in monitoring mode. |
| Display: | Rotor/Bucket? |
| Significance: | After closing the lid of the centrifuge, Centri-Log checks whether the installed rotor matches the specification in the process definition. This message is displayed if a deviation is detected. The centrifuge cannot be started if in monitoring mode. |

| | |
|---------------|--|
| Display: | Run started |
| Significance: | This message is displayed if Centri-Log detects the centrifugation start. The message serves only to monitor the system activities and does not require any actions by the user or operator. |
| Display: | Run stopped |
| Significance: | This error message is displayed as soon as Centri-Log detects that the centrifuge has come to a standstill. Again, the message only serves to monitor the system activities. |
| Display: | Run errors detected! |
| Significance: | This message is depicted on the centrifuge display if an error was detected during the logged process. The user can then view detailed information about the detected errors using the Centri-Log software. |
| Display: | No log file! |
| Significance: | It is possible to specify in the program configuration for Centri-Log to create files during logging mode only if at least the process code has been scanned. Centri-Log then indicates in the display if a file is not created. |
| Display: | Centrifuge locked! |
| Significance: | Centri-Log can be configured to block a centrifuge for further use if an error has occurred. The message depicted here is then displayed on a blocked centrifuge. |
| Display: | Centrifuge off |
| Significance: | Centri-Log displays a message to indicate it detected a switched off device. |

Special barcodes to operate Centri-Log

Several special barcodes can be used to carry out special runs while Centri-Log is in standard operating mode. The following is an overview of these barcodes:

| Plain barcode text | Use |
|--------------------|--|
| ENDE | This barcode is used while entering the blood bag data if fewer than the max. number of bags is to be centrifuged. The max. number of bags allowed for one processing step is specified in the process definition. If fewer bags are to be centrifuged, the process is to be finished by scanning the ENDE barcode. |
| ACKN | This barcode is an acknowledgment code for an error detected during the data input process. If only specific blood bags are permitted in the process, the system enters an error state when an impermissible bag is used. The system remains in this state until the error is acknowledged by scanning an acknowledgment code at the centrifuge. |
| QCRUN | Activation barcode for a QC run. If such a run is to be carried out on a RC 3BP+, RC 12BP+, or RC BIOS centrifuge, use barcode QCRUN. The barcode is to be scanned instead of the regular process code and switches the software to the QC run status. |

6 Centrifugation Sequence/Use of Barcode Readers

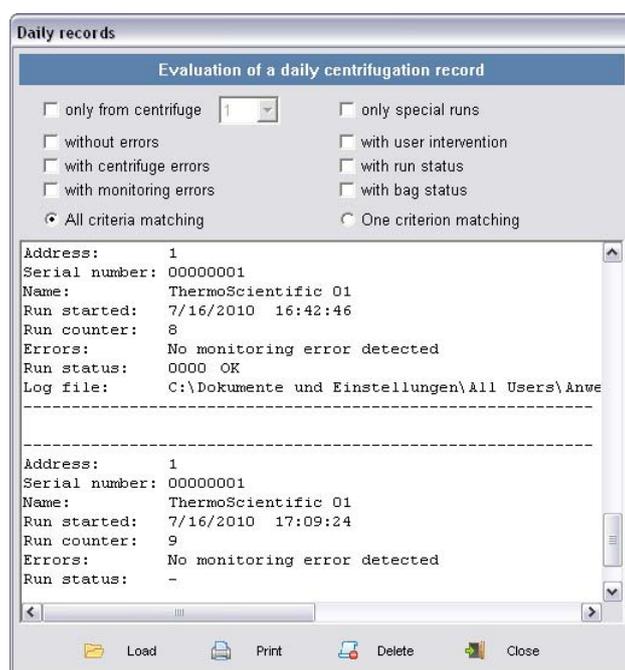
Special barcodes to operate Centri-Log

| | |
|---------|--|
| ABBR | Use this barcode to instruct Centri-Log to return to the first sequence step of the process data input sequence. If user and process code were already scanned, the system now expects the blood bag data. The user can scan the ABBR code to return to the beginning of the data input if it is determined that the wrong process code was accidentally entered. |
| WDHL | The barcode WDHL makes it possible to repeat centrifugation with the process code and blood bag data of the previous centrifugation run. Please consult “Allow repeated centrifugation without scanning blood bags” on page 3-13 in this manual for additional information. |
| NONE | Centri-Log uses user-defined tolerance limits to monitor centrifugation. These are defined once for each process. It is also possible to define a process with NONE. This produce does not contain any set value specifications but only the tolerance. Centri-Log uses the tolerance limits defined for NONE whenever centrifugation is carried out without a scanned process code. The barcode NONE makes it possible to carry out blood bag centrifugation without previously defined process specifications. Since a process code is expected before entering the blood bag data, NONE can be used to instruct Centri-Log to accept the set values of the centrifuge as the specifications for this run. |
| PTMP | The special barcode PTMP initiates a run to pre-regulate temperatures of the centrifuge. This barcode is scanned instead of the first blood bad code if the user and process code have already been entered. This barcode simplifies the standard production operation since a run to pre-regulate the temperature can be carried out with the subsequently used process code. It is possible to specify in the program configuration whether to generate a run-related log or create an entry in the day record. |
| TEST | The special barcode TEST initiates a function test run with the centrifuge. This barcode is also scanned instead of the first blood bag code. It is possible to specify in the program configuration whether to generate a run-related log or create an entry in the day record. |
| \$UNL\$ | The barcode \$UNL\$ is only needed in case the Centri-Log control station fails. (Defective PC, software ended by user.) If the Centri-Log software is in the monitoring operating mode, the software can block the start of the centrifuge. If the control station then fails, the start can no longer be released. Scan the unlock barcode \$UNL\$ to instruct the centrifuge directly to release the start. |

These barcodes to be used with the centrifuge are listed in [Appendix E: “Formatting Instructions for Centrifuge Data”](#) of this manual.

Open Daily Records

It is possible to open and view a daily record within Centri-Log. This is done with menu item **Evaluation/Open daily summary**. The following window then opens:



The upper window area provides options to select whether all centrifugations are to be depicted or only those matching specific filter criteria. Two filtering methods are available here. One method displays only records matching all filter conditions at once. The other method displays all records matching at least one of the filter conditions.

Various status information can be used as a filter criterion in addition to limiting display to a specific centrifuge address.



IMPORTANT Please note that there is a difference between the two settings “All criteria matching” and “One criterion matching.” The first setting represents an AND operation. All records are displayed if none of the filter criteria are activated. Use the filters to restrict what is displayed. The second setting carries out an OR operation. No record is displayed if none of the filter criteria are activated. Use the filter settings to expand the volume of depicted records.

Click **Load** to open a daily record. Clicking this button opens the standard dialog to open a file. Select a file and then click OK to load the daily record.

7 Open Daily Records

After loading the daily record, the display area depicts all entries corresponding with the set filter criteria. This makes it possible to decide which files should be reviewed in more detail (in case of errors). This method saves time when evaluating the logged data.

Additional buttons are used for a printout of the displayed information or to delete the daily record.

The daily record window also enables quick access to the log files. Open one of the displayed files by positioning the mouse cursor over the file name of the file and then click with the left mouse button.

Create Process Templates with the Centri-Log Editor

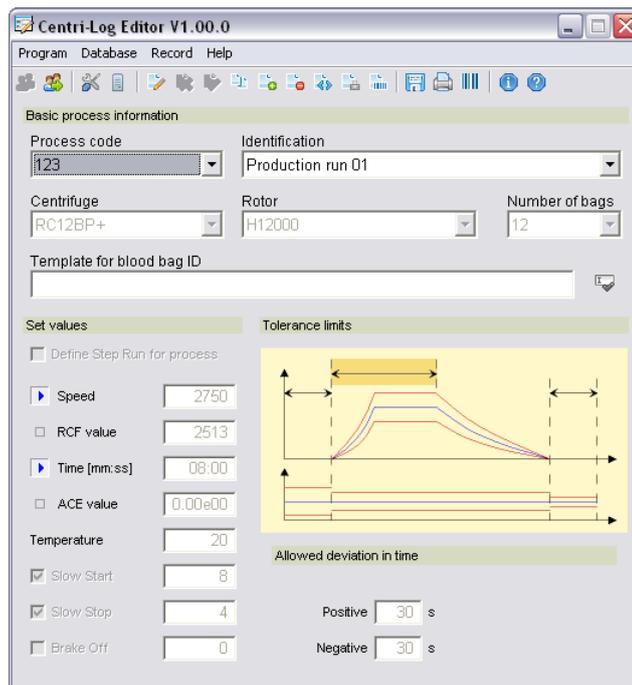
Contents

- “Process definition interface” on page 8-2
- “Program configuration” on page 8-4
- “Workspace management” on page 8-4
- “Edit process definitions” on page 8-5

The Centri-Log Editor serves to make available the data for the run monitoring. Process definitions for the individual process codes can be defined with this program. This included the set values for the centrifugation and the limit values for the monitoring.

Process definition interface

The main window of the Centri-Log Editor is also the input interface for the process definitions. This is where the information about the first valid process code is output after starting the program. The following figure shows an example of a program window after starting the program.



The software is then in an operating mode where the process data cannot be changed. This is indicated by the disabled set and limit value fields. The upper window area, however, features the enabled selection boxes for the process code and the process identification, to be able to view all existing process definitions. Only a logged on user with the corresponding privileges can change the product definition data.

Basic product information

The upper window area has a drop-down selection box listing the process code in the first row on the left. This process code corresponds with the character string as to be scanned on the centrifuge using the barcode reader. Text in this drop-down selection box cannot be changed but it is possible to switch between the process definitions to be displayed. Another drop-down selection box for the process identification is next to the process code. Use this box to select a different production definition. However, if data has been released for editing, the identification can be changed here as well.

Definition of the device data

The setting options for the type of centrifuge to be used, the rotor, and the utilized bucket are listed below the basic process information. The type of production can thus be defined in detail for each process. It is also possible to determine the acceleration and braking profiles of the Centri-Log software uses for monitoring.

Moreover, you can select the max. number of bags to be processed from the numbers listed in the drop-down box. This value is later the upper limit for the number of barcodes to be scanned.

Template for blood bag ID

Enter a regular expression here that is then used for checking the blood bag barcode when using this process definition. This makes it possible to restrict the use of the defined process to certain blood bags. For example, it is possible that the blood bag barcode itself includes information about the product to be produced. If this is the case, Centri-Log checks with every scanned blood bag whether this bag may be processed with the previously specified process definition.

Please consult [Appendix C: “Use of regular expressions”](#) of this manual for additional information about regular expressions.

Definition of the centrifuge data (set values)

The left section of the remaining window space serves to indicate the centrifuge data. Here you can enter the set values to be used for centrifugation. The area therefore lists data that must be set later at the centrifuge as well.

Different input boxes are displayed depending on the selected centrifuge type. For example, it is not possible to select a delayed start for a RC 3BP+, a Cryofuge 6000i does not support entry of an ACE value, while a Cryofuge 5500i supports neither the delayed start nor a delta temperature. This manual shows the RC 12BP+ interface as an example.

Alternate inputs are possible for some values. For example, this is the case with the speed and the RCF value. A button in front of the value type indicates which value is currently enabled. Automatic conversion is additionally available for the speed and the RCF value. The associated RCF value is automatically calculated proportionally after entering the speed. The same applies to the speed when an RCF value is entered.

Definition of the tolerance limits

The input area for the monitoring limits is to the right of the centrifuge data. These are used by Centri-Log to evaluate the centrifugation run. The depicted graphic shows an example of a centrifugation process. Moving the mouse cursor across the graphic emphasizes the respective part of the process with a color change. Click with the left mouse button to select the process step and the associated limit values, which are then depicted below the graphic.

Monitored centrifugation can be divided into roughly three phases:

Phase 1: Delay between closing of the lid and start of centrifugation.

In addition to the max. time you can also enter the temperature limits to be monitored. The upper and lower limit can be defined for the temperature and later the speed and runtime.

Phase 2: Centrifugation

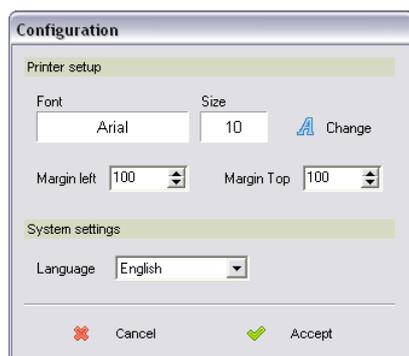
In addition to temperature limits it is also possible to indicate runtime control and speed limits for the centrifugation process. The input for the speed is subdivided into acceleration, final speed, and braking phase.

Phase 3: Delay after centrifugation end until opening lid

Phase 3 has the same structure concerning the required inputs as phase 1. Enter the limits for the delay and temperature.

Program configuration

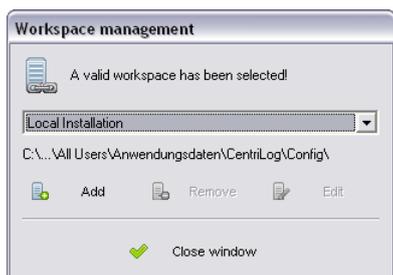
Click the [Program/Configuration](#) menu item to open the configuration window.



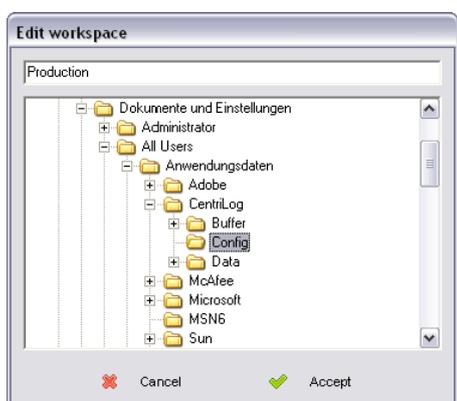
Here you can change some basic program settings. This window includes language settings and settings to print out the parameters. These include font and font size as well as page margins.

Workspace management

The Centri-Log Editor requires access to the configuration files of the installation to evaluate the log files. This is not a problem if the program is installed on a PC. The paths of the files are known in this case. However, if a different PC is to be used to access the data, the file path must be indicated within the Editor, which means the corresponding workspace must be set up. Use the [Program/Workspace](#) menu item to open the window to manage the workspace.



If a connection was not established yet to a different workspace, the selection box in the window depicts the local installation. The additional directory is displayed underneath the selection box. To use a different workspace, this workspace must be added to the workspace selection first. Click **Add** to open the window to select a directory.



Enter a designation for the new workspace and select the corresponding directory. Click **Accept** to add the new workspace to the list.

Click **Remove** to delete a set up workspace from the list again. Click **Edit** to change the designation of the used directory.

Edit process definitions

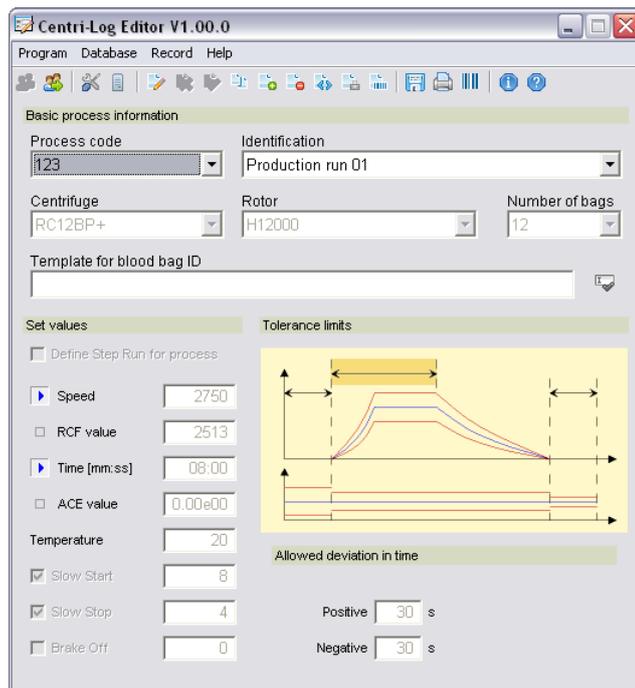
All records are locked against changes right after the program is started. A few software functions are, however, available to the user. It is possible to view all records, to view the version history of a record, to print out the process definition, or prepare barcodes for processing at the centrifuge. All other functions require that the user logs on to the system. This is done with the menu item **Program/Log On** or by clicking the corresponding button in the toolbar.

Basic data editing steps

After log on, the input boxes continue to be locked but the functions of the software to edit data are available. The following figure depicts the program interface.

8 Create Process Templates with the Centri-Log Editor

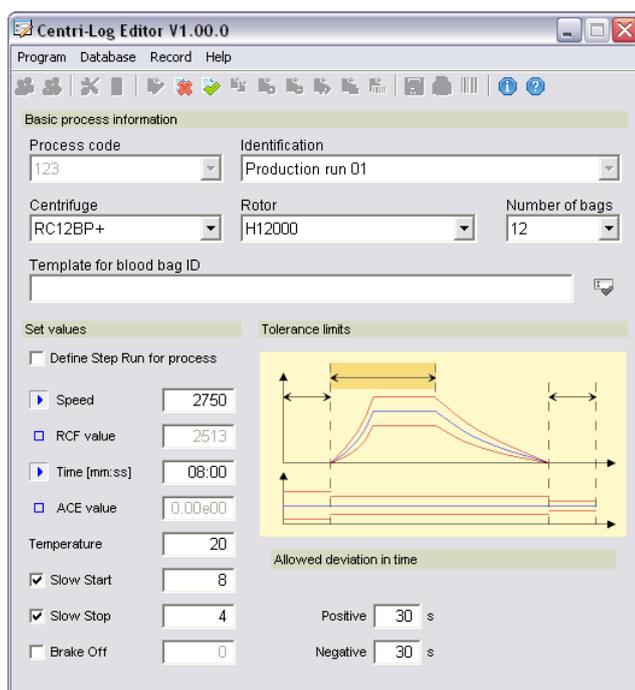
Edit process definitions



The following functions are now available:

-  Click the button in the toolbar or use the menu item *Record/Edit* to switch the displayed record to editing mode. It is now possible to make changes in the data fields. However, you cannot switch to a different record in this mode. This means input must be finished first.
-  Use this button to copy the displayed record. Or use the menu function *Record/Copy*. First, indicate the process code of the new product. Then the copied record is displayed in the window. Editing is then possible after switching to edit mode.
-  Use this button in the toolbar or the menu item *Record/Create new* to create a new record. First, indicate the process code of the new product. After this input, the newly created record is displayed in the window. Editing is then possible after switching to edit mode.
-  Use this button in the toolbar to delete the displayed record. The same function is also available with the menu item *Record/Delete*. Confirm the prompt to delete the record from the list of enabled records. However, the record is not actually deleted since it is necessary for the evaluation of carried out centrifugation runs.

All other functions of the software are blocked if the record is in edit mode. Finish editing to return to standard mode. This can be done either by canceling or by accepting the changed data. The following figure shows the program window while a record is being edited:



Only two buttons are here still enabled:

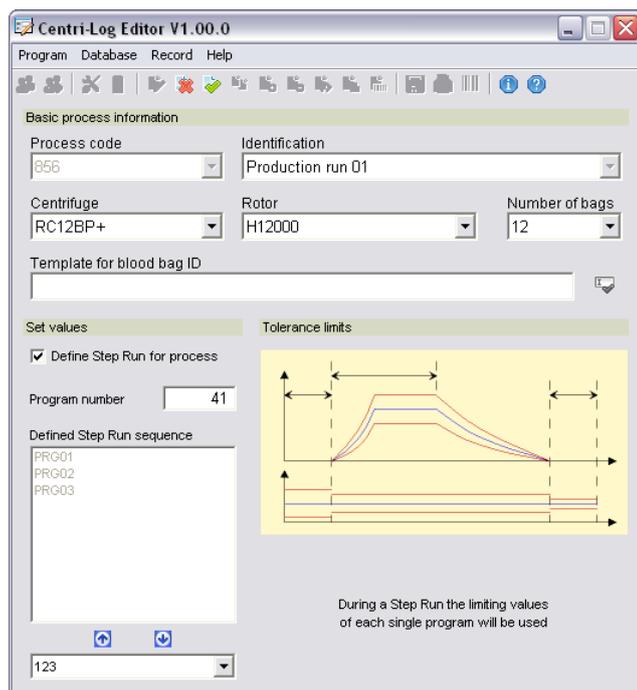
 Use this button and the corresponding menu item *Record/Cancel change* to exit edit mode without applying the changes to the record.

 The menu item *Record/Accept change* or the button depicted here apply the changes to the displayed record.

Once changes have been made to one of the records, the data saving functions are available. It is of significance here that not only the current record status is saved but all previously saved versions are kept as well. This ensures that always the currently valid record is used when evaluating a centrifugation.

Definition of Step Runs for the RC 3BP+ / RC 12BP+

When using the RC 3BP+ and RC 12BP+, users are able to run several programs sequentially. The necessary process definitions can also be defined for these Step Runs using the Centri-Log Editor. The first step is to define the individual used programs. This is the same process as with the centrifuge. Then the process definition for the Step Run is to be defined. Check the [Define Step Run for Product](#) checkbox first. The following program window is then displayed.



Centrifuge data or limit values do not need to be entered for a Step Run. This information is already included in the definitions of the individual programs. Instead, the input area for the Step Run is at the position of the centrifuge data.

First, enter the program number of the Step Run being used. Centri-Log uses this information during the centrifugation process to check the correct settings of the centrifuge.

The defined Step Run sequence is listed underneath the program number input area. The window depicting the example already lists three programs entered into the sequence box. This is why there is a button for adding as well as deleting a program (up and down arrow). Below these two buttons is a drop-down selection list with all programs defined for the selected device and the active rotor.

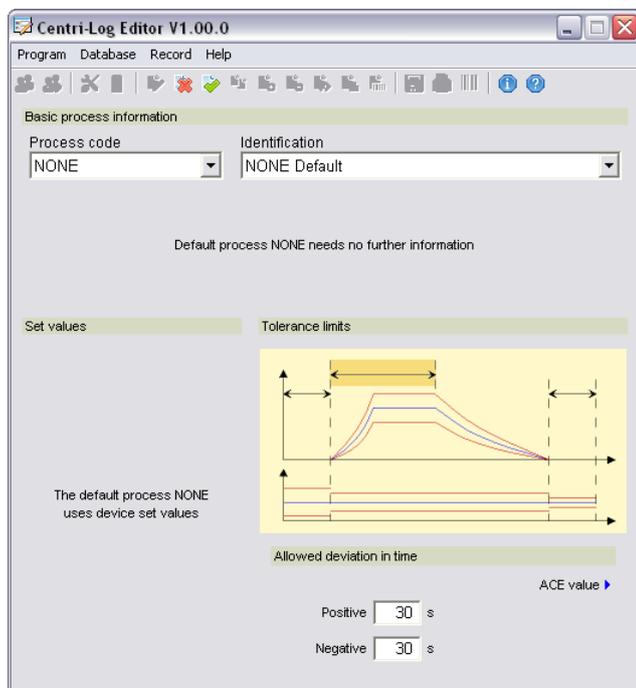
 Click this button to add the program selected in the list to the program sequence box. The program is always appended at the end of the list.

 Use this button to remove entries from the program sequence. Each click of the button removes the respective last entry.

The software monitors the defined Step Runs when saving the process data. A corresponding error message is displayed if setting changes to individual used programs have been made that make the Step Run impossible. For example, this could be the case when changing the rotor or bucket.

Default process code NONE

One process definition is already created after installing the software. This definition uses the process code NONE and represents a special case among the process definitions. It is not possible to specify device information or set values for this process. Only limit values can be entered. The displayed window changes accordingly with process definition NONE.



The process definition NONE is always used when a prodprocessuct code was not scanned at the centrifuge; it is therefore the default. During logging mode, the software permits start of the centrifuge without all required data having been scanned and entered. If this is the case, Centri-Log uses the set values of the centrifuge instead of the process definition. The software utilizes the NONE definition and the limit values saved to NONE to avoid unnecessary error messages. The process NONE is also used if the user scans this special barcode while in monitoring mode. This makes special tests and production runs possible for which a process code has yet to be created.

Since process code NONE is used equally for all devices, a run time and an ACE tolerance value can be defined. This is also necessary because both set values may occur with the RC 3BP+ or RC 12BP+ and this process code must be universally usable.

Evaluate Log Files with Centri-Log Viewer

Contents

- “Display data in main window” on page 9-2
- “Program configuration” on page 9-3
- “Workspace management” on page 9-3
- “File evaluation” on page 9-4
- “Open Daily Records” on page 9-7
- “Evaluation of the bag indexing files” on page 9-8

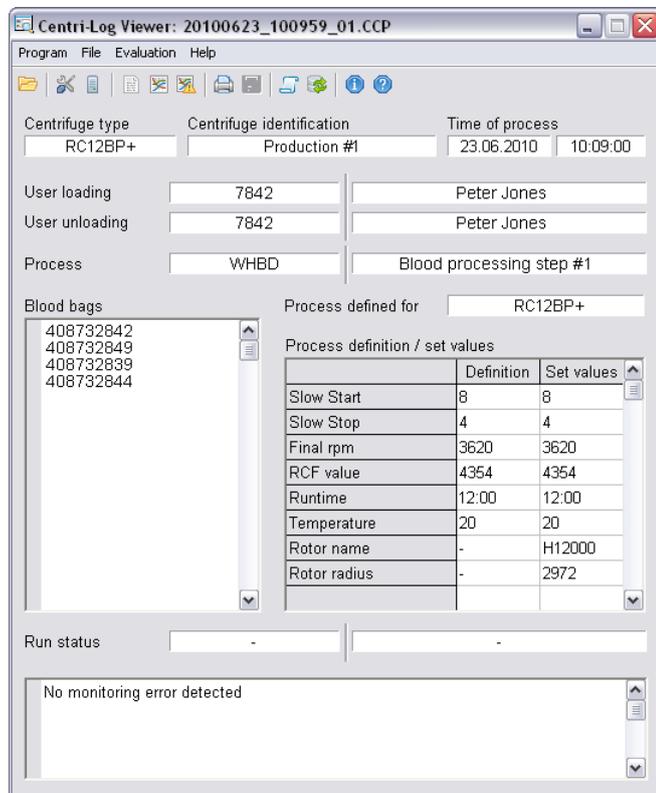
The program Centri-Log Viewer was developed to be able to evaluate the log files generated by Centri-Log. A standard text editor can be used for unencrypted ASCII files as well. However, this method is not recommended due to the volume of data included in a log file. If a file is encrypted, the Centri-Log Viewer is the only way to view the file.

9 Evaluate Log Files with Centri-Log Viewer

Display data in main window

Display data in main window

The program depicts all process data as well as the set and limit values after opening a log file. The following figure shows the main window of Centri-Log with an opened log file:



Click the menu item **File/Open** to open a log file. The source directory is the data directory entered into the Centri-Log configuration (“**Select drive and default directory**” on [page 3-32](#)). The file name is displayed in the window title bar as soon as a log file is opened.

The upper window area lists information about the types of centrifuges, the identification of the centrifuge, and the time of centrifugation together with data and time of the day. The user identification for loading and unloading of the centrifuge as well as the process code are displayed underneath. The center of the window is divided into the list of centrifuged blood bags and the associated process specifications.

The table with blood bag data provides information about whether status information was saved for the corresponding blood bag (gray column). The # character indicates that status information was saved. To view the status information, just click with the mouse on the gray area in from the corresponding blood bag entry.

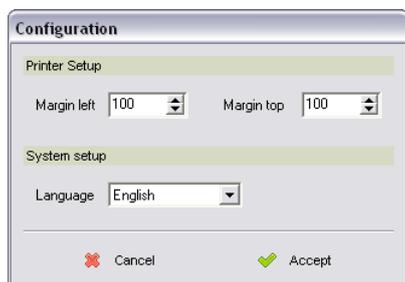
Data from the process definition and the centrifuge set values are listed in the right side of the window. Both columns (Definition/Set values) usually list the same data (centrifugation with the set values matching the process). Above this table the software depicts which process definition is defined for which centrifuge.

The bottom area of the window is used only to depict any logged errors.

If a log file is opened and displayed, the Centri-Log Viewer tries to determine the first and last name of the user from the user table. The description of the documented process is displayed as well.

Program configuration

Use the menu item [Program/Configuration](#) to open the following configuration window:



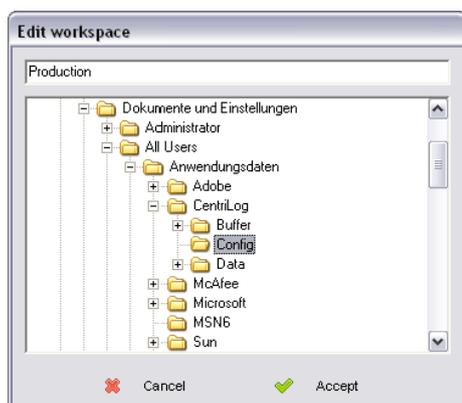
In addition to the used language, printout options can be defined here as well. However, this is limited to the desired page margin. All other parameters are determined by the program automatically.

Workspace management

The Centri-Log Viewer requires access to the configuration files of the installation to evaluate the log files. This is not a problem if the program is installed on a PC. The paths of the files are known in this case. However, if a different PC is to be used to access the data, the file path must be indicated within the Viewer, which means the corresponding workspace must be set up. Use the [Program/Workspace](#) menu item to open the window to manage the workspace.



If a connection was not established yet to a different workspace, the selection box in the window depicts the local installation. The additional directory is displayed underneath the selection box. To use a different workspace, this workspace must be added to the workspace selection first. Click [Add](#) to open the window to select a directory.



9 Evaluate Log Files with Centri-Log Viewer

File evaluation

Enter a designation for the new workspace and select the corresponding directory. Click **Accept** to add the new workspace to the list.

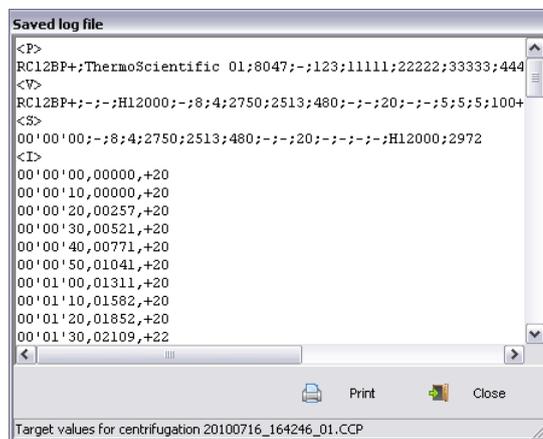
Click **Remove** to delete a set up workspace from the list again. Click **Edit** to change the designation of the used directory.

File evaluation

In addition to opening a log file, additional file evaluation and processing options are available using the **File** menu.

Evaluation of the original file

Use the menu item **File/Original file** to open a display window. This window then depicts the content of the log file. The following figure shows this window:

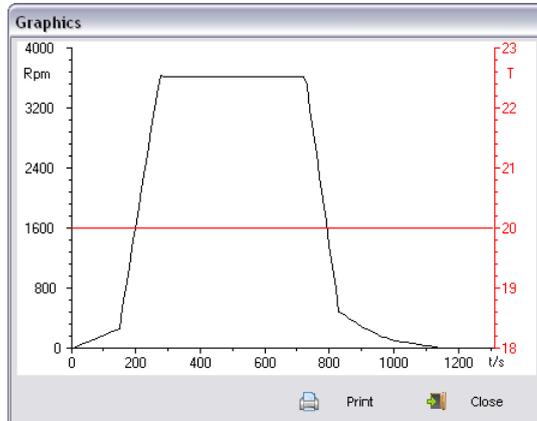


If the log file was encrypted, this window depicts the content of the file in a readable format. Please consult [Appendix A: “Data structure of the log file”](#) of this manual for details about the layout and structure of the log file.

This window features a button to print out the file using a printer.

Graphical depiction of the actual values

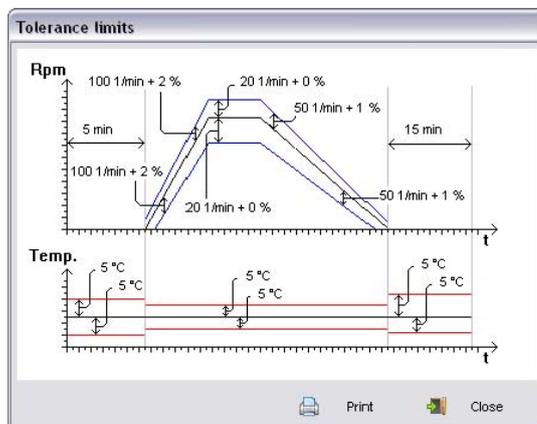
Click the menu item [File/Graphic](#) to open a window with a graphic of the speed and temperature curves. The following figure depicts this window.



As with the file window, a button to generate a printout is available in this window as well. However, the contents of the graphic are output on the printer in this case.

Graphical depiction of the limit values

The following figure depicts the page with the limit values. Click the menu item [File/Tolerance limits](#) to open this window.

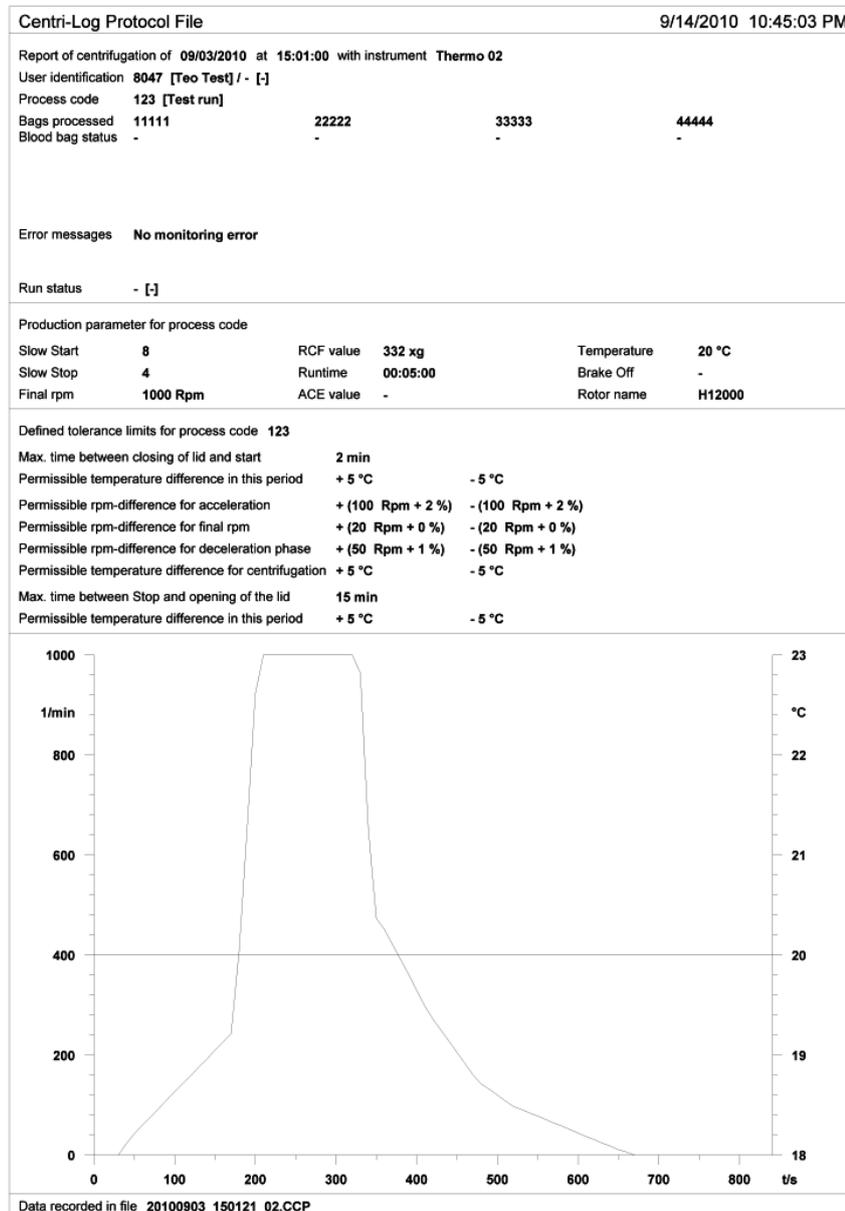


This graphic depicts the three phases of centrifugation from closing the lid before start to opening the lid after the centrifuge has come to a standstill. Limit values are entered here for all monitored parameters. The depicted curves are only for visualization purposes. They do not correspond with the real values.

Again, this window has a printout button.

Generating reports

The menu item **File/Report** is used to generate a printed report for the corresponding centrifugation run.



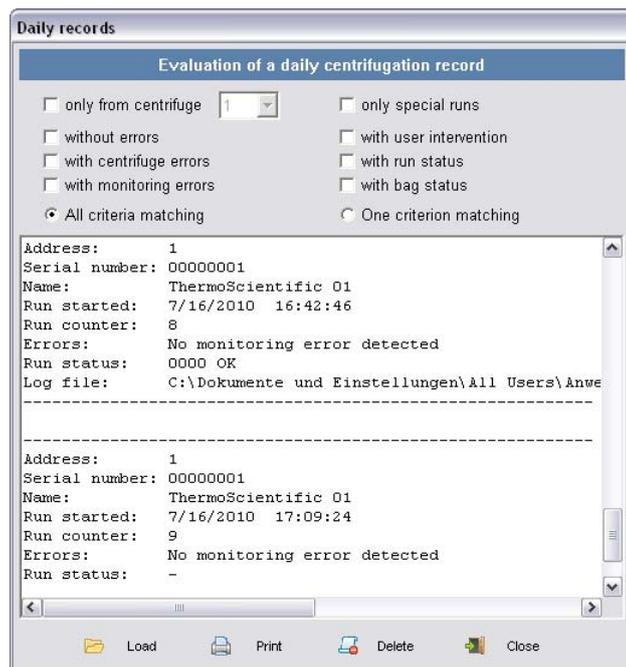
The upper area of the printout features the process data. The set values according to the scanned process code are listed underneath. The third section features the tolerance limits from the process definitions. The report printout concludes with the speed (rpm) and temperature graphic followed by the file name of the evaluated log file.

Saving the decrypted file

If the opened log file is saved while encrypted, use the menu item **File/Save decrypted** to save the file as a normal ASCII file without encryption.

Open Daily Records

It is also possible to open and view a daily record within Centri-Log Viewer. This is done with menu item **Evaluation/Open daily summary**. The following window then opens:



The upper window area provides options to select whether all centrifugations are to be depicted or only those matching specific filter criteria. Two filtering methods are available here. One method displays only records matching all filter conditions at once. The other method displays all records matching at least one of the filter conditions.

Various status information can be used as a filter criterion in addition to limiting display to a specific centrifuge address.



IMPORTANT Please note that there is a difference between the two settings “All criteria matching” and “One criterion matching.” The first setting represents an AND operation. All records are displayed if none of the filter criteria are activated. Use the filters to restrict what is displayed. The second setting carries out an OR operation. No record is displayed if none of the filter criteria are activated. Use the filter settings to expand the volume of depicted records.

Click Load to open a daily record. Clicking this button opens the standard dialog to open a file. Select a file and then click OK to load the daily record.

After loading the daily record, the display area depicts all entries corresponding with the set filter criteria. This makes it possible to decide which files should be reviewed in more detail (in case of errors). This method saves time when evaluating the logged data.

9 Evaluate Log Files with Centri-Log Viewer

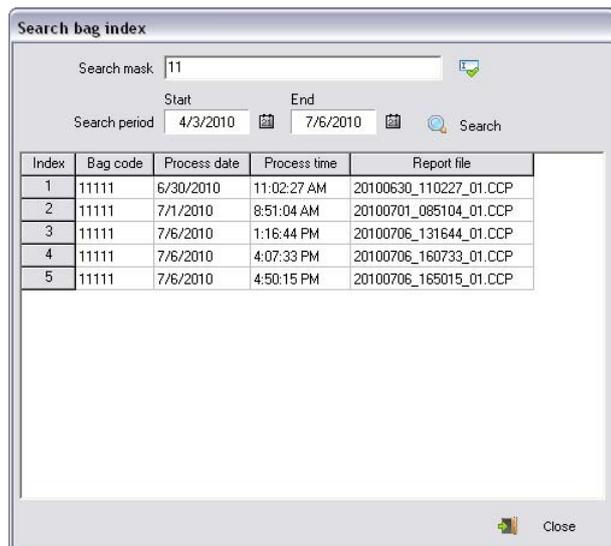
Evaluation of the bag indexing files

Additional buttons are used for a printout of the displayed information or to delete the daily record.

The daily record window also enables quick access to the log files. Open one of the displayed files by positioning the mouse cursor over the file name of the file and then click with the left mouse button.

Evaluation of the bag indexing files

Click the menu item [Evaluation/Open bag index](#) to open the window to search the blood bag index for blood bags. The following figure shows this window:



A regular expression can be entered in the mask input box to search for a blood bag code.

The use of regular expressions makes it possible to search for bag codes matching a specific pattern. The character string 11 depicted in the figure searches only for blood bag codes that contain 11 in any position. Please consult [Appendix C: “Use of regular expressions”](#) of this manual for additional information about regular expressions.

Use the button next to the input box to test the regular expression. Click this button to open a window where you can enter any desired character string. After clicking *OK*, the software checks whether the regular expression is included in the entered character string.

Use the time selection boxes [Start](#) and [End](#) to restrict the search for bags to a specific time period. Use the buttons next to the selection boxes to define the time period. The respective calendar month is then displayed:



The red frame marks the current date. Use the mouse to click on a date on the calendar to select that specific date. The buttons in the calendar have the following meaning:

-  Changes the displayed year to the previous year.
-  Changes the displayed month to the previous month.
-  Changes the displayed month to the next month.
-  Changes the displayed year to the next year.
-  Cancels the date selection.
-  Uses the selected date as start or end date.

If start and end date of the search period are selected the software then checks the plausibility of the input. If the start date is later than the end date, a corresponding error message is displayed.

If the search period is set correctly, then click the “Search” button to launch a search in the bag code database. The found data are depicted in the table once the search process is completed.

Simply click in the first column of the table (underneath the title **Index**) to open the corresponding log file in the Centri-Log Viewer.

Data structure of the log file

All centrifugation data are saved in the log file. Information is here divided into several groups, which contain logistically associated data. Each group can be identified with an identifier that precedes the data entries. The individual entries of each group are separated by a semicolon.

Data to identify the process (identifier <P>)

Table A-1. Data to identify the process (identifier <P>)

| Number | Entry | Remarks |
|--------|---------------------------------|---|
| 1 | Instrument Type | Plain text identification of the used device type. (Ex.: Cryofuge 6000i, RC 12BP+) |
| 2 | Device identification | Here you specify which device is used for centrifugation. One of three pieces of information can be saved: 1. Centrifuge serial number 2. User-defined ID (device name) 3. Centrifuge bus address |
| 3 | User identification (loading) | The barcode scanned by user at centrifuge for identification is entered. The entry “-” is listed here if no identification is specified. |
| 4 | User identification (unloading) | The barcode scanned by user at centrifuge for identification is entered. The entry “-” is listed here if no identification is specified. |
| 5 | Process identification | If a barcode was scanned to identify the product to be produced, this barcode is saved here. The entry “-” is listed here if this identification is missing. |
| 6...n | Blood bag data | The data of the centrifuged blood bags starts at the fifth position. Number of entries is here variable. However, only a max. of 50 entries can be used here. The entry “-” is listed here if no data were scanned at the centrifuge. |
| n + 1 | Timestamp | The time stamp identifies the start of centrifugation. It has the following format: DayMonthYearHourMinute Ex.: 120520031353 for 12.05.2003 13:53 |

Process specifications according to the process definition (identifier <V>)

Table A-2. Process specifications according to the process definition database (identifier <V>)

| Number | Entry | Unit | Remarks |
|--------|----------------------|------|---|
| 1 | Instrument Type | | States in plain text the device type for which the process is defined. (Ex.: Cryofuge 5500i, Cryofuge 6000i) The entry “-” is listed here if no product code or the special code NONE were scanned. |
| 2 | Rotor number | | Includes the last four digits of the rotor order number for which the process is defined. The entry “-” is listed here if no process code or the special code NONE were scanned. A number is also not indicated for the RC 3BP+, RC 12BP+, and RC BIOS. A rotor name is output here under number 4. |
| 3 | Bucket number | | Includes the last four digits of the bucket order number for which the process is defined. The entry “-” is listed here if no process code or the special code NONE were scanned. A number is also not indicated for the RC 3BP+, RC 12BP+, and RC BIOS. A rotor name is output here under number 4. |
| 4 | Rotor name | | Includes the rotor name for the centrifuges RC 3BP+, RC 12BP+, and RC BIOS. The entry “-” is listed here for all other centrifuges. |
| 5 | Program number | | When a step run is being processed with a RC 3BP+, RC 12BP+, or RC BIOS, the program number of the defined program is entered here. The entry “-” is listed here when processing a single program or in case of a different centrifuge. |
| 6 | Step Run ID | | When a step run is being processed with a RC 3BP+, RC 12BP+, or RC BIOS, “1” is entered; the character “-” in all other cases. |
| 7 | Acceleration profile | | An entry is always listed here for Cryofuges. An entry is listed only when slow start is active and no step run is being processed with a RC 3BP+, RC 12BP+, or RC BIOS. |
| 8 | Braking profile | | An entry is always listed here for Cryofuges. An entry is listed only when slow stop is active and no step run is being processed with a RC 3BP+, RC 12BP+, or RC BIOS. |
| 9 | Final speed | rpm | |

Table A-2. Process specifications according to the process definition database (identifier <V>)

| Number | Entry | Unit | Remarks |
|--------|---|------|--|
| 10 | RCF-value | g | A value is then entered here only if the used process definition was generated for a device that supports this parameter. The entry “-” is listed here if this value is missing. |
| 11 | Run time | s | The runtime in seconds is entered here regardless of the time setting at the centrifuge. If a run with ACE preselection is active with a RC 3BP+, RC 12BP+, or RC BIOS, “-” is entered here. |
| 12 | ACE-value | | When centrifugation with ACE preselection is active with a RC 3BP+, RC 12BP+, or RC BIOS, an entry is made here. |
| 13 | Start delay | min | A value is then entered here only if the used process definition was generated for a device that supports this parameter. The entry “-” is listed here if this value is missing. |
| 14 | Temperature | °C | |
| 15 | Delta temperature | °C | A value is then entered here only if the used process definition was generated for a device that supports this parameter. The entry “-” is listed here if this value is missing. |
| 16 | Brake Off Speed | Upm | Speed for the deceleration cut-off with the RC 3BP+, RC 12BP+, or RC BIOS. |
| 17 | maximum admitted delay between closing of the lid and start of centrifugation. | min | Entry structure: Absolute value Ex.: 3 |
| 18 | maximum positive temperature offset between closing of the lid and start of centrifugation. | °C | Entry structure: Absolute value Ex.: 5 |
| 19 | maximum negative temperature offset between closing of the lid and start of centrifugation. | °C | Entry structure: Absolute value Ex.: 5 |
| 20 | Upper limit for speed-time profile in acceleration phase | rpm | Entry structure: Absolute value “+” relative value “%” Ex.: 20+2% |
| 21 | Lower limit for speed-time profile in acceleration phase | rpm | Entry structure: Absolute value “+” relative value “%” Ex.: 20+2% |

A Data structure of the log file

Process specifications according to the process definition (identifier <V>)

Table A-2. Process specifications according to the process definition database (identifier <V>)

| Number | Entry | Unit | Remarks |
|--------|---|------|---|
| 22 | Upper limit for speed-time profile in final speed phase | rpm | Entry structure: Absolute value “+” relative value “%” Ex.: 10+0% |
| 23 | Lower limit for speed-time profile in final speed phase | rpm | Entry structure: Absolute value “+” relative value “%” Ex.: 10+0% |
| 24 | Upper limit for speed-time profile in deceleration phase | rpm | Entry structure: Absolute value “+” relative value “%” Ex.: 10+1% |
| 25 | Lower limit for speed-time profile in deceleration phase | rpm | Entry structure: Absolute value “+” relative value “%” Ex.: 10+1% |
| 26 | maximum positive temperature offset between start of centrifugation and standstill. | °C | Entry structure: Absolute value Ex.: 5 |
| 27 | maximum negative temperature offset between start of centrifugation and standstill | °C | Entry structure: Absolute value Ex.: 5 |
| 28 | Upper limit for the deviation during run time | s | Entry structure: Absolute value Ex.: 3 |
| 29 | Lower limit for the deviation during run time | s | Entry structure: Absolute value Ex.: 3 |
| 30 | Upper limit for the deviation with ACE value | | Entry structure: Absolute value Ex.: 2,50e03 |
| 31 | Lower limit for the deviation with ACE value | | Entry structure: Absolute value Ex.: 2,50e03 |
| 32 | Max. permissible time between standstill and opening of the lid | min | Entry structure: Absolute value Ex.: 25 |

Table A-2. Process specifications according to the process definition database (identifier <V>)

| Number | Entry | Unit | Remarks |
|--------|---|------|--|
| 33 | Max. positive temperature deviation between standstill and opening of the lid | °C | Entry structure: Absolute value Ex.: 4 |
| 34 | Max. negative temperature deviation between standstill and opening of the lid | °C | Entry structure: Absolute value Ex.: 4 |

All of the information for the process specifications is listed in one line.

Set centrifuge set-point values (identifier <S>)

Table A-3. Set centrifuge set-point values (identifier <S>)

| Number | Entry | Unit | Remarks |
|--------|----------------------|------|--|
| 1 | Timestamp | | See below for time stamp format. |
| 2 | Program number | | When a program is being processed with a RC 3BP+, RC 12BP+, or RC BIOS, the program number of the defined program is entered here. The entry “-” is listed here in case of a different centrifuge. |
| 3 | Step Run ID | | When a step run is being processed with a RC 3BP+, RC 12BP+, or RC BIOS, “1” is entered; the character “-” in all other cases. |
| 4 | Acceleration profile | | An entry is always listed here for Cryofuges. An entry is listed only when slow start is active and no step run is being processed with a RC 3BP+, RC 12BP+, or RC BIOS. |
| 5 | Braking profile | | An entry is always listed here for Cryofuges. An entry is listed only when slow stop is active and no step run is being processed with a RC 3BP+, RC 12BP+, or RC BIOS. |
| 6 | Final speed | rpm | |
| 7 | RCF-value | g | A value is then entered here only if the used process definition was generated for a device that supports this parameter. The entry “-” is listed here if this value is missing. |
| 8 | Run time | s | The runtime in seconds is entered here regardless of the time setting at the centrifuge. If a run with ACE preselection is active with a RC 3BP+, RC 12BP+, or RC BIOS, “-” is entered here. |

A Data structure of the log file

Actual values of the centrifuge (identifier <l>)

Table A-3. Set centrifuge set-point values (identifier <S>)

| Number | Entry | Unit | Remarks |
|--------|-------------------|--------|--|
| 9 | ACE-value | | When centrifugation with ACE preselection is active with a RC 3BP+, RC 12BP+, or RC BIOS, an entry is made here. |
| 10 | Start delay | min | A value is then entered here only if the used process definition was generated for a device that supports this parameter. The entry “-” is listed here if this value is missing. |
| 11 | Temperature | °C | |
| 12 | Delta temperature | °C | A value is then entered here only if the used process definition was generated for a device that supports this parameter. The entry “-” is listed here if this value is missing. |
| 13 | Brake Off Speed | rpm | Speed for the deceleration cut-off with the RC 3BP+, RC 12BP+, or RC BIOS. |
| 14 | Rotor number | | This field is only used for centrifuges with automatic rotor detection. If the rotor is detected, the last four digits of the order number are entered here. The entry “-” is listed here for centrifuges without automatic rotor detection. |
| 15 | Bucket number | | This lists the bucket number entered by the user. The entry “-” is listed here if a rotor without bucket is used with centrifuges with automatic rotor detection. |
| 16 | Rotor name | | Includes the rotor name for the centrifuges RC 3BP+, RC 12BP+, and RC BIOS. The entry “-” is listed here for all other centrifuges. |
| 17 | Rotor radius | 0,1 mm | The radius of the rotor is entered here. The entry corresponds with the set bucket for centrifuges without automatic rotor detection. If the device features automatic rotor detection, the entry is made after the completed rotor detection. |

Actual values of the centrifuge (identifier <l>)

Table A-4. Actual values of the centrifuge (identifier <l>)

| Number | Entry | Unit | Remarks |
|--------|-------------|------|--|
| 1 | Timestamp | | See below for time stamp format. |
| 2 | Speed | rpm | |
| 3 | Temperature | °C | Optional, depending on program configuration |

Error entries (identifier <F>)

Centrifuge error

Table A-5. Centrifuge error

| Number | Entry | Remarks |
|--------|-------------------|----------------------------------|
| 1 | Timestamp | See below for time stamp format. |
| 2 | Error ID | “E-” and 2-digit number |
| 3 | Error-Description | Plain text |

Please consult the user manual of the centrifuge for the possible error identifiers.

Monitoring errors

Table A-6. Monitoring errors

| Number | Entry | Remarks |
|--------|-------------------|----------------------------------|
| 1 | Timestamp | See below for time stamp format. |
| 2 | Error ID | “F-” 2-digit number |
| 3 | Error-Description | Plain text |

The following error identifiers are possible:

| | |
|------|--|
| F-01 | User intervention during centrifuging. (Stop key pressed) |
| F-02 | User intervention during centrifuging. (Quick stop pressed) |
| F-10 | Permissible waiting time in phase 1 exceeded. |
| F-11 | Temperature limits in phase 1 exceeded. |
| F-12 | Revolution error during centrifuging. |
| F-13 | Temperature limits in phase 2 exceeded. |
| F-14 | Permissible waiting time in phase 3 exceeded. |
| F-15 | Temperature limits in phase 3 exceeded. |
| F-16 | Noncompliance with preset run time. |
| F-17 | Set-point centrifuge values do not match process specifications. |
| F-18 | Lid of centrifuge opened again without run. |
| F-19 | Centrifuge switched off during data logging. |
| F-20 | Incorrect device for scanned process code. |
| F-21 | Incorrect rotor/bucket for scanned process code. |
| F-22 | Bus system stopped during run. |

A Data structure of the log file

Cancel information (identifier <A>)

| | |
|------|--------------------------------------|
| F-23 | Pretemp temperature error |
| F-24 | Centrifuge reset during logging |
| F-50 | Acceleration profile not verifiable. |
| F-51 | Deceleration profile not verifiable. |

Cancel information (identifier <A>)

Cancel information is only entered into the log file if this option is enabled in the program configuration.

Table A-7. Cancel information (identifier <A>)

| Number | Entry | Remarks |
|--------|-------------|--|
| 1 | Abort code | Barcode scanned at centrifuge. |
| 2 | Cancel text | Plain text information about the scanned cancel code. Text information is only entered if text information was specified and saved for the scanned code. |

Status information (ID)

An evaluation of the entire centrifugation run can be stored in the log file using the status information. It is also possible to store an evaluation of each centrifuged vessel. However, the evaluation is only entered if the status input is enabled on the corresponding barcode page.

Table A-8. Status information (ID)

| Number | Entry | Remarks |
|--------|-------------|---|
| 1 | Vessel data | Barcode of one of the centrifuged vessels. Or the character "-" for the run status. |
| 2 | Status code | Scanned status code. |
| 3 | Status text | Plain text information about the scanned status code. |

At least one evaluation line is entered if status information is available in a log file. This line then contains the run status. The max. number of lines is here one line more than the number of centrifuged vessels.

Time stamp format

Users can select from four different time stamp formats. Which time stamp to use depends on the requirements (GMP) and the intended use of the log file. The four formats are as follows:

1. Elapsed time since closing the lid (in seconds)
Format: sss.sss Ex.: 000.210
2. Elapsed time since closing the lid (in hours, minutes, seconds)

- | | | |
|---|--------------------|--------------------------|
| Format: | hh`nn`ss | Ex.: 00`03`30 |
| 3. Absolute time in hours, minutes, seconds | | |
| Format: | hh:nn:ss | Ex.: 10:30:50 |
| 4. Absolute time in hours, minutes, seconds | | |
| Format: | tt.mm.jjj;hh:nn:ss | Ex.: 19.06.2003;10:30:50 |

Log file generated from individual data blocks

The simplest form of a log file is comprised of the following blocks:

1. One block with process data (ID p)
2. One block with process specifications (ID V)
3. One block with set-point values (ID S)
4. One block with actual values (ID I)
5. One block with error information (ID F)

The example below shows such a log file.

```

<P>
RC12BP+; Ther mo 02; 8047; - ; 211; 11111; 22222; 120820101730
<V>
RC12BP+; - ; - ; H12000; - ; - ; 7; 5; 1200; 478; 360; - ; - ; 20; - ; - ; 5; 5; 5; 100+2%
100+2% 20+0% 20+0% 50+1% 50+1% 5; 5; 30; 30; - ; - ; 15; 5; 5
<S>
00' 00' 00; - ; - ; 7; 5; 1200; 478; 360; - ; - ; 20; - ; - ; - ; H12000; 2972
<I>
00' 00' 00; 00000; +20
00' 00' 10; 00000; +20
00' 00' 20; 00044; +20
00' 00' 30; 00088; +20
00' 00' 40; 00162; +20
00' 00' 50; 00322; +20
...
...
00' 08' 20; 00039; +20
00' 08' 30; 00031; +20
00' 08' 40; 00023; +20
00' 08' 50; 00014; +20
00' 09' 00; 00006; +20
00' 09' 10; 00000; +20
00' 09' 20; 00000; +20
00' 09' 30; 00000; +20
00' 09' 40; 00000; +20
00' 09' 50; 00000; +20
<F>
No monitoring errors
  
```



IMPORTANT Display of the process specifications in several lines is due to the automatic word wrap. The entry is listed in one line in the log file.

A Data structure of the log file

Time stamp format

Individual types of data blocks may also occur multiple times in the log file. Among them are error blocks and the set-point and actual value blocks. If the set-point values are changed during the run, a set-point block is entered into the log file at the time of the change. The process then continues with a new actual value block. If a device error occurs during the run, the error is entered into the log file as well. The process then continues with a new actual value block after the error entry is entered.

The following example depicts a log file during a run while set-point values were changed:

```
<P>
RC12BP+; Ther mo 02; 8047; - ; 211; 11111; 22222; 120820101742
<V>
RC12BP+; - ; - ; H12000; - ; - ; 7; 5; 1200; 478; 360; - ; - ; 20; - ; - ; 5; 5; 5; 100+2%
100+2% 20+0% 20+0% 50+1% 50+1% 5; 5; 30; 30; - ; - ; 15; 5; 5
<S>
00' 00' 00; - ; - ; 7; 5; 1200; 478; 360; - ; - ; 20; - ; - ; - ; - ; H12000; 2972
<I>
00' 00' 00; 00000; +20
00' 00' 10; 00000; +20
00' 00' 20; 00000; +20
<S>
00' 00' 30; - ; - ; 7; 5; 2800; 478; 360; - ; - ; 20; - ; - ; - ; - ; H12000; 2972
<I>
00' 00' 30; 00000; +20
00' 00' 40; 00013; +20
00' 00' 50; 00057; +20
00' 01' 00; 00104; +20
...
...
00' 10' 21; 00014; +20
00' 10' 31; 00005; +20
00' 10' 41; 00000; +20
00' 10' 51; 00000; +20
00' 11' 01; 00000; +20
00' 11' 11; 00000; +20
00' 11' 21; 00000; +20
<F>
00' 00' 30; F- 17; Target values invalid
00' 02' 30; F- 12; Rotation error; 1394 1/ min
```



IMPORTANT Display of the process specifications in several lines is due to the automatic word wrap. The entry is listed in one line in the log file.

Daily log file structure

An entry is made to the daily log for each centrifugation run. This entry has the following structure:

| Entry | Remark |
|----------------|---|
| Address | Centrifuge address in bus system |
| Serial number | Centrifuge serial number |
| ID | User-defined centrifuge identifier |
| Run time | Date and time of centrifuging. |
| Run counter | Consecutive number of centrifugation with this device |
| Error | Number of lines depends on occurred errors |
| Run status | Status information scanned for this run |
| File reference | Complete path of associated log file |

The following example depicts an entry in the daily log file:

```
Address:      1
Serial number: 00000000
Identification: Cryofuge 1
Run time:     05.10.2005 13:07:55
Run counter:  1
Error:        No monitoring errors
Run status :  0000 Run is OK
Report file:  C:\Logfiles\20051005_130755_01.HCP
```

Use of regular expressions

Regular expressions are usually used to search for character strings in longer texts. Special characters make it possible to define conditions. For example, it is possible to determine that a specific character (or a group of characters) is to occur at a specific frequency. The Centri-Log software uses regular expressions only to verify a scanned barcode with a specified pattern. When using this syntax verification, it is important to remember that the existence of the defined character string is checked. This means a positive result is always reported if the regular expression is found somewhere in the barcode. Please refer to the respective examples for additional information.

Verifying individual characters

If an individual character is indicated in the regular expression, which is not a special character, then this character must be contained in the barcode. The same applies to an indicated character string.

| | | |
|-----------|------------------------|---------|
| Example 1 | The regular expression | 123 |
| | accepts the barcodes | 1234567 |
| | | 0123456 |
| | but not | 012456 |

As you can see from the examples, the regular expression must only be included in the barcode. It is of no importance where in the character string the regular expression is located.

Verifying code start

If you want to prevent that any occurrence of the regular expression anywhere in the barcode yields a positive result, then use the special character `^`. This special character specifies the start of the barcode.

| | | |
|-----------|------------------------|-------------------|
| Example 2 | The regular expression | <code>^123</code> |
| | accepts the barcodes | 1234567 |
| | | 123ABCD |
| | but not | 0123456 |

The example shows that now only barcodes are accepted where the requested character string occurs at the beginning.

Verifying on code level

It is also possible to do the same thing for the end of the barcode. The special character is then \$.

| | | |
|-----------|------------------------|--------------------|
| Example 3 | The regular expression | 123\$ |
| | accepts the barcodes | 0000123 ABCD123 |
| | but not | 0123456 |

Combining code start and code end allows you to describe the entire code. You can also use this method to define only the first and last characters of the code without limiting the length of the barcode.

Note Items 2 and 3 used the special characters ^ and \$ to determine the code start and code end. However, if these special characters are included in the barcode itself, you must redefine them as plain characters and not special characters. This is done by using the characters \ in front of the special characters. The regular expression 123\\$ therefore verifies the character string 123\$ and not 123 at the end of the barcode as described in item 3.

Definition of a character class

Many times, a barcode is not to be verified for its correct character string but just for its correct structure. This is why character classes can be defined in regular expressions. Such a definition is always placed inside of square brackets. The following are some character class examples: [0-9] with all digits from 0 to 9, [a-z] with small letters a to z or [123] with the three digits 1, 2 and 3. If a character class is defined, the barcode then must contain a character from the defined class at the corresponding position in order to be accepted.

| | | |
|-----------|------------------------|--------------------|
| Example 4 | The regular expression | ^12[ABC] |
| | accepts the barcodes | 12A4567 12C4567 |
| | but not | 12F4567 |

The example shown here depicts a positive list. Which characters may be included in the barcode is also specified in the character class. However, it is also possible to create a negative list. If this is the case, none of the characters in the character class are allowed at the corresponding position in the barcode.

In order to define the character class as a negative list, the first character within the square brackets must be the special character ^. Example 5 depicts the use of such a negative list as a character class.

| | | |
|-----------|------------------------|--------------------|
| Example 5 | The regular expression | ^12[^ABC] |
| | accepts the barcodes | 12V4567 1234567 |
| | but not | 12A4567 |

Note Various predefined character classes are available. These may be used in regular expressions as well as in user-defined character classes. The following are among the predefined classes:

| | |
|-----------------|---|
| <code>\w</code> | An alphanumeric character including the character “_” |
| <code>\W</code> | No alphanumeric character, not even the character “_” |
| <code>\d</code> | A numeric character |
| <code>\D</code> | No numeric character |

These predefined classes can be used to write the regular expression as `^12[0-9]` as well as `^12\d`.

Special characters as placeholders

The special character `.` (period) serves as placeholder for any character.

| | | |
|-----------|------------------------|---------------------|
| Example 6 | The regular expression | <code>^12.45</code> |
| | accepts the barcodes | 1234567 12A45NV |
| | but not | 1233456 |

As the example shows, a specific character must be at the position of the special character in the scanned barcode. If that position has several characters, the verification has a negative result.

Special character for frequency determination

A character to determine frequency can follow any of the characters of a regular expression. This character can be used to determine how often the previous characters must occur in the barcode for the verification to be positive.

The following list depicts the special characters to determine frequency:

| | |
|--------------------|---|
| <code>*</code> | Does not occur or occurs multiple times |
| <code>+</code> | Occurs once or multiple times |
| <code>?</code> | Does not occur or occurs once |
| <code>{n}</code> | Occurs exactly n-times |
| <code>{n,}</code> | Occurs at least n-times |
| <code>{n,m}</code> | Occurs at least n-times but not more than m-times |

Here are some examples:

| | | |
|-----------|------------------------|----------------------|
| Example 7 | The regular expression | <code>^12.+45</code> |
| | accepts the barcodes | 1234567 120304567 |
| | but not | 12456 |

The placeholder . in this example is defined as occurring once or multiple times (+). This means not only the code with the 3 in the placeholder's stead is accepted but also the code with the inserted character string 030. A barcode without characters in place of the placeholder, however, is rejected.

| | | |
|-----------|------------------------|-----------|
| Example 8 | The regular expression | $^12.*45$ |
| | accepts the barcodes | 1234567 |
| | | 12030456 |
| | | 124567 |

By entering the special character * behind the placeholder, now barcodes without a character at the position of the placeholder are accepted as well.

| | | |
|-----------|------------------------|-----------------|
| Example 9 | The regular expression | $^12[0-9]{2}45$ |
| | accepts the barcode | 12334567 |
| | but not | 123456 |
| | | 12AA4567 |

The expression {2} behind the character class [0-9] clearly defines that only two digits may occur at this position within the barcode. Barcodes with one digit or letter are therefore rejected.

| | | |
|------------|------------------------|-------------------|
| Example 10 | The regular expression | $^12[0-9]{2,3}45$ |
| | accepts the barcode | 12334567 |
| | | 12303456 |
| | but not | 123456 |
| | | 1230034567 |

The expression {2,3} determines that all codes with two or three digits at the position of the character classes are to be accepted.

Alternative character strings

If several character strings are enclosed in parentheses () and separated by the special character |, then this is an alternative character string. The syntax verification now checks whether one of the defined character strings is at the indicated position.

| | | |
|------------|------------------------|----------------|
| Example 11 | The regular expression | $^12(34 AB)56$ |
| | accepts the barcode | 1234567 |
| | | 12AB567 |
| | but not | 12356 |
| | | 1204567 |

By combining the individual elements, regular expressions can be created that allow for comprehensive syntax verification. For example, the transferred blood bag codes can be checked for a specific structure.

Formatting Instructions for Time Entries

The Centri-Log software may interpret entered character strings as formatting instructions for time information. This includes, for example, the file name of the export file as well as the format of the time entry in this specific file. This overview shows the possible formatting options.

Each character string consists of a series of formatting and pure text characters. The following lists all formatting characters.

| | |
|---------|---|
| d | Shows the day as a number without leading zero (1-31). |
| dd | Shows the day as a number with leading zero (01-31). |
| ddd | Shows the day as an abbreviation (Mon - Sun). |
| dddd | Shows the day as a complete name (Monday - Sunday). |
| dddddd | Shows the date in the format specified in the country settings of Windows as the short date format. |
| ddddddd | Shows the date in the format specified in the country settings of Windows as the long date format. |
| m | Shows the month as number without leading zero (1-12). |
| mm | Shows the month as a number with leading zero (01-12). |
| mmm | Shows the month as an abbreviation (Jan - Dec). |
| mmmm | Shows the month as a complete name (January - December). |
| yy | Shows the year as a two-digit number (00-99). |
| yyyy | Shows the year as a four-digit number (0000-9999). |
| h | Shows the hour without leading zero (0-23). |
| hh | Shows the hour with leading zero (00-23). |
| n | Shows the minute without leading zero (0-59). |
| nn | Shows the minute with leading zero (00-59). |
| s | Shows the second without leading zero (0-59). |
| ss | Shows the second with leading zero (00-59). |
| tt | Shows the time in the format specified in the country settings of Windows as the time format. |
| / | Uses the date separator specified in the country settings. |
| : | Uses the time separator specified in the country settings. |
| “xx” | Characters enclosed in quotes do not have an effect on the formatting and are treated as normal text. |

D Formatting Instructions for Time Entries

Here are some examples to illustrate the function of the formatting instructions. The examples assume that the current date is April 30, 2004 and the time is 10:15 and 30 seconds.

| Instruction | Output | Comment |
|------------------------|-----------------------|--|
| d.m.yy | 30.4.04 | - |
| d/m/yy | 30.4.04 | Same result as in example above. The character / instructs Centri-Log to use the date separator from the country settings in Windows. This is a period in this case. |
| dd.mm.yyyy | 30.04.2004 | - |
| dd. mmm yyyy | 30. Apr 2004 | - |
| dddd, dd.mm.yyyy | Friday, 30-Apr-04 | - |
| dddddd | Friday, 30 April 2004 | Here, the long date format from the country settings in Windows is used. |
| dd.mm.yyyy hh:nn | 30.04.2004 10:15 | - |
| dd.mm.yyyy hh.nn.ss | 30.04.2004 10.15.30 | - |
| dddd tt | 30.04.2004 10:15:30 | This formatting character string uses the short date format as well as the time format from the Windows country setting. |
| “It is “dddd | It is Friday | Text in quotes is ignored by Centri-Log. It is directly output. |

Note Since the characters / and : are used as formatting instructions, the following should be considered when defining the character strings:

- If you are using the Windows default date and time separators, then enter / and : into the character string as separators.
- If you do not wish to use the Windows default date and time separators, then enclose / and : in quotes.

The formatting hh:”nn”:”ss always uses the colon as separator. The formatting hh:nn:ss only uses the colon as long as it is defined as the time separator in the Windows country settings.

Formatting Instructions for Centrifuge Data

Control characters can be indicated when specifying the file name for run related logs, which are then implemented in the file name as the centrifugal address or information from the run count.

Each character string consists of a series of formatting and pure text characters. All formatting characters for the centrifuge data are listed below.

- z Indicates the address of the centrifuge using the specified number of digits. If several digits are to be used, the control character must be repeated accordingly.
- l Indicates the sequential number of the centrifugation run during the current day. If several digits are to be used, the control character must be repeated accordingly.
- k Indicates the total number of centrifugation runs of the current day. If several digits are to be used, the control character must be repeated accordingly.

Example:

If a file is to be generated for the centrifuge with the address 5, and if this is run number 7 of the centrifuge, and there were already 28 runs that day, then the formatting instructions are implemented as follows:

| Instruction | File name | Comment |
|---------------------|-----------------|---------|
| zz”_”ll”.HCP | “05_07.HCP | - |
| zzz”_”ll”_”kkk”.HCP | “005_07_028.HCP | - |
| “M”zz”L”ll”.HCP | “M05L07.HCP | - |

The control characters for the centrifuge data can be combined with the control characters for the time indication when determining the file name. The following figure depicts this window:

“M”zz”D”ddmm”.”lll becomes the file name M05D1906.007

Special barcodes to operate Centri-Log

Terminate input of blood bag data



ENDE

Abort process data input



ABBR

Repeat previous centrifugation



WDHL

Confirmation of error message



ACKN

Special run to check function (QCRUN)



QCRUN

Special run to pre-regulate temperature of centrifuge



PTMP

Special run for centrifuge function test



TEST

F Special barcodes to operate Centri-Log

Use centrifuge settings as default process definition



NONE

Manually unlock centrifuge



\$UNL\$

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