Sigma Data Interface

Spincontrol S

www.sigma-zentrifugen.de

Quality Management
is mandatory

Standard operating procedures are ruling the work with laboratory equipment in many applications, and quality management is mandatory. The separation of blood components in a blood bank, in-vitro diagnostics applications and pharmaceutical production are among the most demanding examples.

A whole set of functions dedicated to quality management has been implemented in our centrifuges. Spincontrol S is a powerful controller for centrifuges, who's microprocessor enables both internal quality management functions as well as external communication with a laboratory information management systems (LIMS) for tracking, tracing and reporting.

With Spincontrol S the functions relevant for quality management are part of the instrument, i.e. can be used without the need for a separate computer.

Protection

Internal run-monitoring and access code

Internal Quality Management
The internal run-monitoring not only covers critical parameters such as temperature and imbalance detection, but also the continuous monitoring of the centrifugation speed and gives a visual OK-status to the operator after each run. This way 100% quality is ensured and deviations, for instance as potentially caused by temporary fluctuations of the mains voltage supply, are avoided. All system messages are shown on the display, and additionally an acoustical signal can be selected or read-out via RS232 is possible.

Operation safety is further enhanced by the fact that parameters, programs and the centrifugation cycle counter are stored in a non-volatile memory, i.e. kept even if the unit is not connected to mains voltage.

Access / Code Protection
Four different access / safety levels can be selected for controlling access via code protection. The code requirement can be set by the supervisor for excluding operators without code from:

- Save (parameters / program)
- Parameter (change)
- Load (program)
- Start (centrifuge)

Data Interface

Data Interface
The bidirectional RS232 interface is used for data retrieval and remote control, e.g. for operation as part of an automated line with robot un-/loading. The complete list of commands for data I/O can be found in the RS232-interface-specification document.

Process data output
Data can be read from the controller at any time. Among the many useful commands, "getlastrun" is most convenient, since it delivers a pre-configured short report with the relevant process data. In a blood bank application the report will also include up to 12 donation IDs and 1 operator ID.

Each centrifuge is identified by a user definable unique device name. The report will be sent automatically once the run is completed, or received upon sending the getlastrun command at any time; a relative time stamp is provided as well.
RS232 is a reliable standard interface and enables straight-forward connection to a central LIMS. The output of any parameter or the standard report is in ASCII. The two main options for organizing the data exchange are a) direct implementation of the necessary set of commands in the LIMS by the LIMS provider, or b) use of an application program on a PC (e.g. packing / scanner station), which makes the output of the centrifuges available as a file for the LIMS.
The software Sigma Data Suite by LabCraft provides a solution for automated read-out of the process data and saving to a file. Installation and administration of a separate computer with dedicated hardware or software is not required.

Data input
Input of all instrument parameters can be made via the interface for complete remote control of the instrument, as is standard for instance for integrated automation solutions with robot un- / loading of the instrument. Furthermore it is possible to load specific program numbers, send complete set of process parameters, and safe programs with specific name and number. Even user defined acceleration and deceleration curves can be sent and saved. This set of functions is extremely valuable for user facilities wanting to distribute a set of specific programs to a number of centrifuges, since it avoids the need for individual programming of each instrument.
Barcode information of blood bags and operator ID can be received from a central blood bag packing station.

Barcode reader
A barcode reader can be connected directly to an instrument equipped with the optional 2x RS232 board.
For the blood banks wanting to track record the blood centrifugation process a number of dedicated functions have been implemented. The intelligence of barcode verification is also integrated and does not require a separate computer. Spincontrol S is preconfigured to exclusively accept up to 12 donation IDs and 1 operator / staff ID according to ISBT 128; duplicates are automatically rejected.
A dedicated screen of the controller shows a list of the scanned information. For safety reasons the barcodes are kept until the command deletebarcodes is received.

Barcode supported production
The barcode scanner also adds a whole range of very useful features for production processes. All data input functions mentioned above can be done via a barcode (Code 128).
Loading a program can be made particularly easy, if the operator has a page with description and barcode commands, from which a program can be loaded via a simple scan of a barcode. This helps reduce potential user error while setting up the instrument.
Programming of several units with the same set of programs is similarly straight-forward. Once a barcode is created with the complete parameter set, including acceleration and decelerations curves, scanning the barcode will set all process parameters in one step.
A second barcode is used to assign program name and number, and safe the program.

These features enable an advanced mode of production quality management. The barcode for loading a program number, or for sending a complete set of process data to the centrifuge can also be attached as a label to the product to be centrifuged. This way the appropriate centrifugation process is firmly linked to the product, and user error is completely avoided.

Visual Feedback

Spincontrol S offers a number of outstanding features

Visual feedback
Providing visual information to the user is key for maintaining process quality. Spincontrol S offers a number of outstanding features. Most importantly this is the feature to give an individual descriptive name to each program, instead of just numbers. This is greatly helping the user to select the appropriate process.

Process library
The **process library page** 1 displays a list of all existing programs.
Program selection is particularly easy on this page by just highlighting the desired program and pressing START.
Once centrifugation is started the main page will appear and show al relevant parameters. In the lower part of the screen a **green progress bar** 2 show the percentage of the elapsed time.
Therefore this progress, or the time until the operator should come back to the centrifuge can be easily seen from a larger distance.
The **status lights (green, yellow, red)** 3 are an additional help supporting an effective work flow and convenient operation.

On-machine help
Help 4 can be activated to provide explanations to the user at any time while working with Spincontrol S.

Quality Reporting

Output data

Centrifuge name	Sigma-Centrifuge 01	
Barcode	Staff Member ID	Staff ID
Barcode	1	Donation ID
Barcode	2	Donation ID
Barcode	3	Donation ID
Barcode	4	Donation ID
Barcode	5	Donation ID
Barcode	6	Donation ID
Barcode	7	Donation ID
Barcode	8	Donation ID
Barcode	9	Donation ID
Barcode	10	Donation ID
Barcode	11	Donation ID
Barcode	12	Donation ID
Program	6	Fresh Whole Blood
Status of run	Completed	OK
Start time of last run	12 minutes 59 seconds ago	OK
Kind of last run	Normal run	OK
Total time	12 minutes 38 seconds	OK
Run time	600 seconds	OK
Speed	3949 1/min	OK
RCF	5005 x g	OK
Temperature	22 degree Celsius	OK
Rotor	11805	OK
Bucket	13860	OK
Acceleration	Curve 14	OK
Brake	Curve 12	OK

Note: Lines with barcode information will be shown only, if barcode information is available.

Sigma Data Suite

A link between the centrifugation data, as shown above, and the customer's data management system is realized by the software Sigma Data Suite by LabCraft. This software receives the data from the centrifuge, re-organizes the data by creating a list showing each Donation ID with the full set of parameters and the Staff ID, and finally saves the listing at user-definable location, from where it can be read into the customer's data management system.

Furthermore Sigma Data Suite provides visualization of the status of one or several Sigma centrifuges. This display provides great help to lab managers in optimizing both the workflow as well as utilization of the instruments.

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