

SPARCBOOK: A NEW ELECTRONIC BOOK

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Abstract

Many electronic books exist for logging the activity of an accelerator, but all of them are basically a translation of a paper book in an electronic format, with some extra features coming from the usage of a database for storing the information. SPARCbook is based on PostgreSQL, an open source database. A new, nice GUI has been developed for manually inserting data (both text and pictures) in the logbook and retrieving the old information, using several filters like date, author, or type of information. This GUI has been developed using HTML, PHP, and JavaScript, and it is quite similar to GUIs of already existing electronic logbooks. The peculiarity of SPARCbook is that it is also possible to insert information in the book from the control system of the accelerator, automatically or after a human decision. The SPARC control system is a distributed system, developed using LabVIEW, based on PCs and real-time CPUs. Information, tables, and graphs can be submitted from each CPU and from the central control system to SPARCbook making a query to PostgreSQL via TCP. That makes the system really powerful because any commercial CPU has TCP capability.

SPARC BOOK

SPARC is the new photoinjector that is currently under installation at Frascati INFN laboratory. The control system (presented in details elsewhere during this conference) [1] has been developed using Labview. It is based on several distributed processes: front-end CPUs continuously acquire information concerning the way the injector is working (i.e. ion pumps pressure values) and send them via TCP/IP to a higher level program that collects all the information and allows the operators to monitor the accelerator status. From the same high level program it is also possible to set several parameters (i.e. change power supply working sets).

For SPARC an electronic logbook is very important in order to document the life of the accelerator. During the installation phase main operations are recorded in the logbook in order to create a kind of history of the accelerator (who made what and when and how long it took), but also in order to record information that could be useful later (i.e. connector pin assignments). During the running phase, an electronic logbook is important in order to record daily life problems (i.e. something is broken or fixed) but mainly for recording the actual working point of the accelerator.

In order to have an easy to manage logbook, the beautiful old paper books have been substituted, since many years, by electronic books. The best solution is to have electronic books with a web-based interface.

Figure 1: Form for a new entry.

In Fig.1 you can find the form the operators have to fill in order to insert a new item in the SPARCbook. The author name is automatically generated when he/she logs in the logbook system. The date is the current date. A subject must be provided. It is possible to make a choice of the type of the entry (control system, linac, vacuum, undulators,...), its category (info, report, problem, other), and its level (warning, notice, fixed, alert). It is possible to add some text and up to 4 attachment files.

Figure 2: Form for finding old entries.

In Fig. 2 you can find the form for finding one or more entries from SPARCbook. You can make your search using several selections (author name, date, entry name, type of entry, keyword in the subject) and the type of output you want (full or summary format).

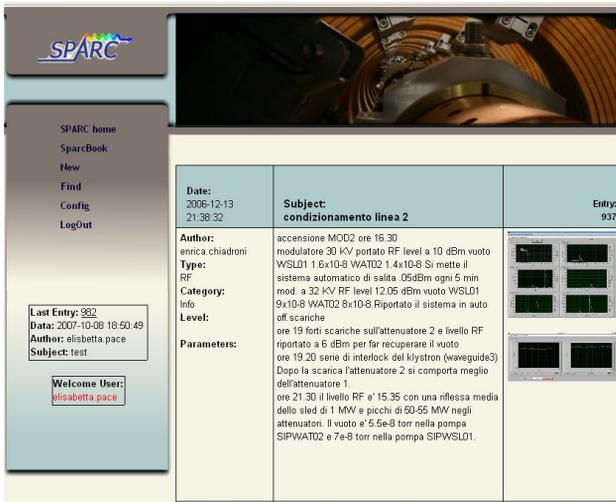


Figure 3: Full format SPARCbook entry.

The SPARCbook GUI is written in HTML, CSS, PHP, and Javascript.

But what is behind the GUI? For SPARC we made the choice of continuously record the status of the accelerator (power supplies, vacuum status, ...): all these information are written in a database. SPARC has chosen PostgreSQL at this purpose. Then it was obvious to use PostgreSQL also for recording the information coming from SPARCbook. Furthermore, PHP has special calls for reading/writing in a PostgreSQL table.

```
<?php
$connection = pg_Connect ("host=sparcserver1
dbname=sparc user=postgres");

$result = pg_Exec( $connection, "insert into
sparc_book.sparc_book (time, author, subject, infotype,
category, parameters, post_text, post_attachment, level) values
(now, '$author', '$subject', '$infotype', '$category',
'$parameters', '$post_text', '$post_attachment1', '$attach',
'$level');");

pg_Close($connection);
?>
```

Figure 4: PHP code for accessing PostgreSQL.

SPARCbook is not the unique electronic book with a web like graphical interface and based on a popular database. But SPARC wants more from a database. During the SPARC gun test (fall 2006) [2] it was obvious that, sometimes, either when there were main problems in the accelerator, either when very new exciting physical results have been measured, operators easily forget to

register items in the electronic book. Especially when it was important (from the offline analysis point of view) to register working points.

In order to help people to register important parameters in SPARCbook, some special programs have been inserted in the high level SPARC control system.

It is possible to read/write tables in a PostgreSQL database accessing it via TCP/IP, this possibility allowed us to implement special programs for automatically write very important notes in SPARCbook, eventually attaching graphs and tables.

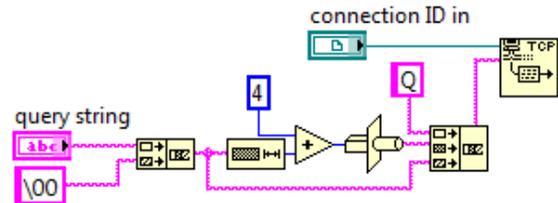
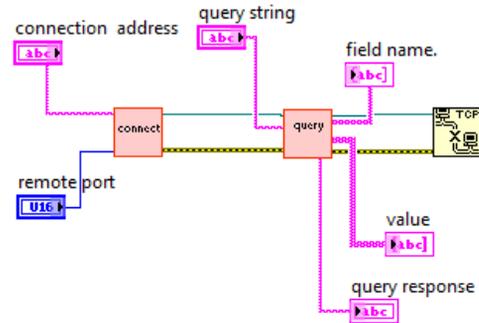


Figure 5: LabVIEW code for accessing PostgreSQL.

When SPARC will start to work, information will be automatically written about the working point of the accelerator (for example the values of the power supplies of all the magnets) before to start any operation.

During the day, other information will be easily inserted in the database. For example the operator using a special program will be able to generate plots of the vacuum status in different points and will be able to write in the electronic book the current status easily pushing a virtual button on the control panel. (Fig. 6).



Figure 6: LabVIEW control panel for creating an entry in SPARCbook.

This entry will be found in SPARCbook (Fig. 7)



Figure 7: SPARCbook entry automatically inserted by the SPARC control system.

STATUS OF THE ART

The experience with this manual and automatic electronic logbook seems to be really useful. The graphical interface has been released in a first version: we hope users will help us to improve it. The PostgreSQL – SPARCbook interface is running and has been largely debugged. The LabVIEW – SPARCbook interface is working and its insertion in the SPARC control system is under development.

ACKNOWLEDGEMENTS

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REFERENCES

- [1] G. Di Pirro, *et al.*, “SPARC control system”, this conference.
- [2] M.Ferrario, *et al.*, “Experimental results with the SPARC emittance-meter”, PAC07.