

A.15: Development of a web server for sputter ion pump power supplies Indus-2

Several Sputter Ion Pumps (SIP) are used to achieve ultra-high vacuum (~1x10⁻¹⁰ mbar) in the beamlines and front-ends at Indus-2. There are nearly 100 SIP power supplies at Indus-2 which are operating round the clock to maintain the ultra-high vacuum in the front-ends and beamlines. A stack of 5-6 power supplies is located in the Indus-2 experimental hall near each front-end. A regular monitoring and recording of the current/vacuum information from these power supplies was till recently carried out as a regular activity by the respective beamline in-charges. To remove all types of manual dependence for this important data collection, a web-server based application has been developed for round the clock recording of the data and monitoring the status of the installed power supplies, at an interval of one second.

A dedicated separate local area network has been implemented for the operation of the SIP power supplies. This is in addition to the front-end and laboratory area networks. A personal computer is configured to act as the server PC, which communicates with all the installed power supplies over TCP/IP network. The architecture of this system is shown in Fig. A.15.1. Each power supply has a unique IP address and they are physically connected to an Ethernet switch. The IP addresses of the supplies are configurable. The server PC sends an instruction packet (which contains IP address, Machine number and MAC address) to a switch on the network. The SIP power supply responds to the server PC by sending the status information of current, high voltage, pressure, and trip time to the server PC.

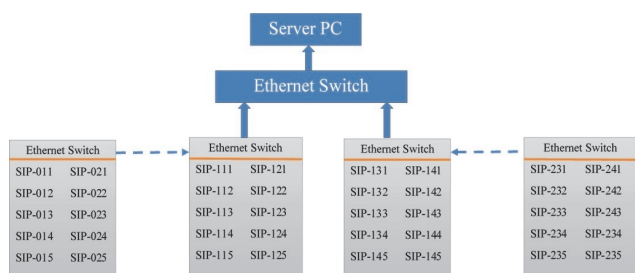


Fig. A.15.1: System architecture of the web server based data acquisition system

A web server application for monitoring the SIP power supplies has been developed using window based Microsoft Visual Studio 12 (based on .NET framework). The database of the power supplies is maintained by Microsoft SQL Server. The website has been created in ASP.NET using “C sharp”. The software is based on “ajax” control for getting the live status. A part of the Graphical User Interface of the web server is as shown in Fig. A.15.2.

IP	FE	SIP	Pressure	Current	Voltage
192.168.120.011	FE01	SIP1	6.52E-12mb	0.08uA	6.1kV
192.168.120.012	FE01	SIP2	3.49E-09mb	0.70uA	6.4kV
192.168.120.013	FE01	SIP3	1.53E-09mb	5.83uA	6.6kV
192.168.120.014	FE01	SIP4	1.59E-09mb	6.03uA	6.3kV
192.168.120.015	FE01	SIP5	9.08E-10mb	3.85uA	6.3kV
192.168.120.031	FE03	SIP1	1.58E-08mb	11.38uA	6.2kV
192.168.120.032	FE03	SIP2	2.67E-08mb	17.25uA	6.2kV
192.168.120.033	FE03	SIP3	3.28E-08mb	20.35uA	6.2kV
192.168.120.034	FE03	SIP4	3.13E-08mb	19.58uA	5.8kV
192.168.120.035	FE03	SIP5	1.46E-08mb	10.65uA	6.1kV
192.168.120.041	FE04	SIP1	5.83E-09mb	5.13uA	6.3kV
192.168.120.042	FE04	SIP2	3.55E-09mb	3.45uA	6.1kV
192.168.120.043	FE04	SIP3	3.20E-06mb	786.25uA	6.1kV
192.168.120.045	FE04	SIP5	4.27E-09mb	4.00uA	5.6kV
192.168.120.046	FE04	SIP6	1.81E-08mb	12.65uA	6.0kV
192.168.120.051	FE05	SIP1	3.00E-08mb	62.68uA	6.3kV

Fig. A.15.2: Table showing a part of the data acquired through the software

The salient features of this system include the following: a) An administrative login facility for switching ON/OFF the power supplies in order to enhance the security of the system, b) Facility of addition and removal of power supplies in the database through administrative login, to help in incorporating changes in the on-field configuration with minimum modifications, c) Data saving facility both, at the server as well as at client PC, and d) Date-wise data storage of all the installed power supplies, to help in tracing the origin of faults.

The faulty power supply can be removed from the database by selecting the IP address of the supply and pressing delete switch as shown in Fig. A.15.3. Once the switch is pressed the confirmation message popups “Are you sure and wants to delete”. After confirming the same the power supply is deleted from the database.

		Delete	
	IP	FE	
<input type="checkbox"/>	192.168.120.011	FE01	
<input type="checkbox"/>	192.168.120.012	FE01	
<input type="checkbox"/>	192.168.120.013	FE01	
<input type="checkbox"/>	192.168.120.014	FE01	
<input type="checkbox"/>	192.168.120.015	FE01	
<input type="checkbox"/>	192.168.120.031	FE03	
<input type="checkbox"/>	192.168.120.032	FE03	

Fig. A.15.3: Delete faulty pump supply from database

The system has been in regular operation since Oct. 2015.

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