

SUPERVISORY SYSTEM FOR THE SIRIUS SCIENTIFIC FACILITIES

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PÁTRIA AMADA



System Architecture Overview





Figure 1: Architecture, communication schema, and hierarchy pattern GUI.

Main properties

- Up to 100 web-based clients
- □ Up to 600,000 external tags connection and 200,000 internal tags
- □ Up to 200,000 discrete alarms
- □ Up to 128 S7 SIMATIC PLCs connection and 10 OPC UA clients
- □ EPICS data available from all installations with one OPC UA connection
- Node-RED program-based communication server extends the notifications possibilities to email, telegram, SMS, and others
- □ Main users are composed by the support groups





General and Radiological Protection Screens





Figure 3: General Sirius screen showing the status of beamlines, hutches, subsystems, and the frontend's gamma open authorization signal.

Figure 4: Radiological protection screen showing the status of beamlines, hutches, personal emergency buttons, and the frontend's gamma open authorization signal.







Power Distribution Screens





Figure 5: Electrical distribution general view showing the status of beamlines, hutches, electrical emergency buttons, and overview information's about the power being consumed by all beamlines.

Figure 6: Electrical distribution beamline view showing the status of the unifilar diagram, power consumption, UPS, and electrical emergency button.







Notifications



	ODSTSTEIN								Storage ring 🔵 70.2 mA	-
Attention required				\square	Log				7 Filter	
INSTALAT	TION TIME	TYPE	DESCRIPTION		INSTALATION	TIME	TYPE	DESCRIPTION		
CNB-ESD	03/05/2021 10:50	Radiation	High radiation - 12.4 uSv		CNB-ESD	03/05/2021 10:50	Radiation	High radiation - 12.4 uSv		
EMA-ESB	03/05/2021 10:50	PPS Fail	Emergency button pressed		EMA-ESB	03/05/2021 10:50	Hutch Status	Search performed by user Antônimus		
EMA-OEA	03/05/2021 10:50	PPS Fail	Emergency button pressed		RNG	03/05/2021 10:50	Beam Fail	High temperature in FDE		
EMA-OEA	03/05/2021 10:50	PPS Fail	Emergency button pressed		EMA-OEA	03/05/2021 10:50	PPS Fail	Emergency button pressed		
					CNB-OEA	03/05/2021 10:50	PPS Fail	Door lock trouble		
					CNB-OEA	03/05/2021 10:50	PPS Fail	Emergency button pressed		
					CNB-OEB	03/05/2021 10:50	PPS Fail	Door lock trouble		
					CNB-DEC	03/05/2021 10:50	PPS Fail	Emergency button pressed		
					CNB-DEC	03/05/2021 10:50	PPS Fail	Door lock trouble		
Ack					4					

Properties

- □ Alarms and notifications separated by general and individual per subsystem
- Notification's configurations and alarms acknowledgment restricted per user group
- Node-RED program in communications server provides an easy programmer interface to configure external notification such as Telegram messages, email, and SMS

Figure 7: Notification's screen illustrative image.





Figure 8: GUI Hierarchy pattern.

Figure 9: Node-RED program example on the external communication server.



Figure 10: Icons related to the notification's types possible by the communication server.



