

SAMARCO AUTOMATION SYSTEM CAN NOW CHANGE CONFIGURATIONS AT RUNTIME WITH ELIPSE FLEXCONTROL

Eclipse Software's platform lets teams create and replicate objects with no system downtime and expand the application without limits

Published on May 23, 2025

Needs

Samarco, a joint venture between Vale and BHP Brasil, is a privately held company operating in the Brazilian mining sector. Headquartered in Belo Horizonte (southeast Brazil), the company has operating units in the states of Minas Gerais and Espírito Santo. Its primary product is iron ore, the raw material used in steel production.



Samarco's Germano Complex (photo credit: Otávio Honorato)

Samarco needed a supervisory system that could be updated without stopping operations and remain compatible with the company's existing systems. It opted for Elipse FlexControl, the platform developed by Elipse Software. The new system was originally developed with Elipse E3, using a dynamic configuration created by IHM Stefanini. Elipse FlexControl integrated seamlessly into the company's ongoing modernization, bringing new native features that enhanced the existing solution.

Solution

The architecture of Samarco's supervisory control and data acquisition (SCADA) system was carefully designed to ensure efficiency and integration across its operations. It consists of three pairs of redundant servers, each running a specific Elipse FlexControl domain for a different macro area, plus an Elipse Plant Manager (EPM) server to store historical data.

A redundant pair of Windows Active Directory (AD) domain servers manages users and access control, adding an extra layer of security. The entire infrastructure runs in Samarco's virtual environment, using technologies such as vSphere and Dell servers. The FlexControl, EPM, and Windows domains play a key role in the interface, communicating with over 100 controllers installed in the processing plant, dam, reagent, mine, and crushing areas.

The upgrade also included adjustments to the application and to Elipse's HighPerformance library, and more than 300 process screens were updated. The result is a more efficient, streamlined operation that reduces costs with fewer servers (see image below).



Samarco's former and current SCADA system architecture

The SCADA system's core features are real-time data monitoring, process variable control, alarm management, historical data collection, performance

analytics, and reporting. Together, they support efficient, integrated management and help Samarco run its industrial processes safely and with consistent quality.



Samarco's Monitoring and Inspection Center

For maintenance, Elipse FlexControl improves operational efficiency and speeds up process fixes and updates because settings can be adjusted at runtime, without stopping the application. This flexibility makes the software versatile enough to meet Samarco's needs. Users can easily change colors and descriptions of commands and states, add interlocks and fault conditions, and edit analog and PID configurations.

After logging in to the Elipse FlexControl application, users choose a home screen for the area they want to monitor: the processing plant, reagents, mine, crushing, or dam. The crushing home screen, for example, provides access to more information about all its processes, analog values, and alarms, with alarms classified by severity (low, medium, high, and critical or trip). The home screens also provide access to the software's settings.

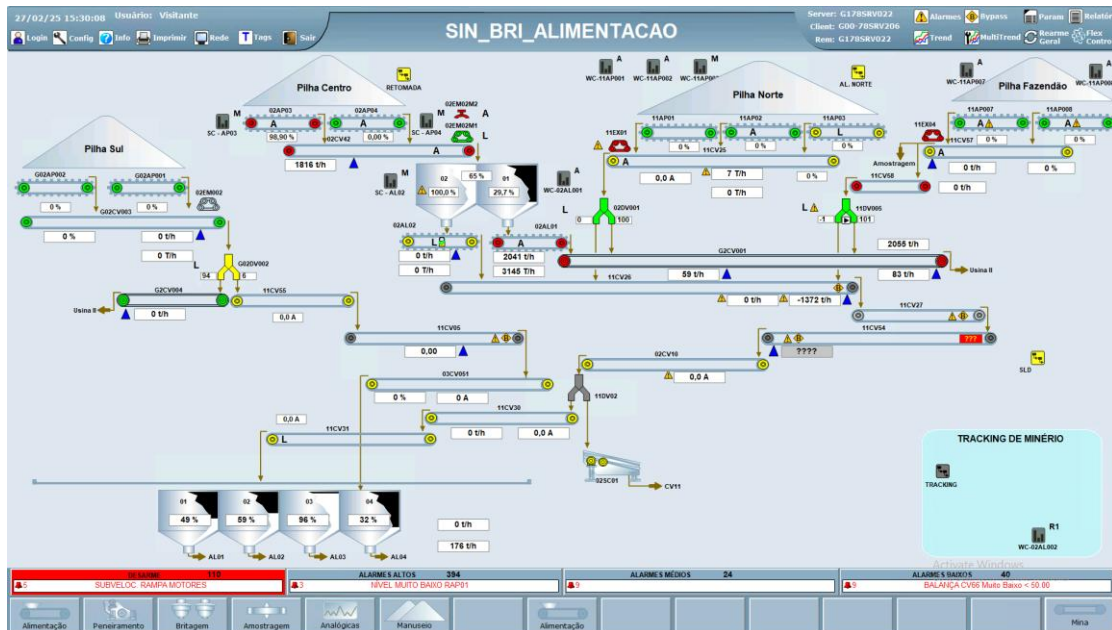


Crushing supervision home screen

Elipse FlexControl monitors the processes across Samarco's operations, from iron ore extraction at the mines to crushing, grinding, and chemical reagent treatment, which produce the final product sold to the steel industry. On the feed control screen, the software displays a representation of the process covering ore mining and its flow along the conveyor belts from the mines to the processing plant.

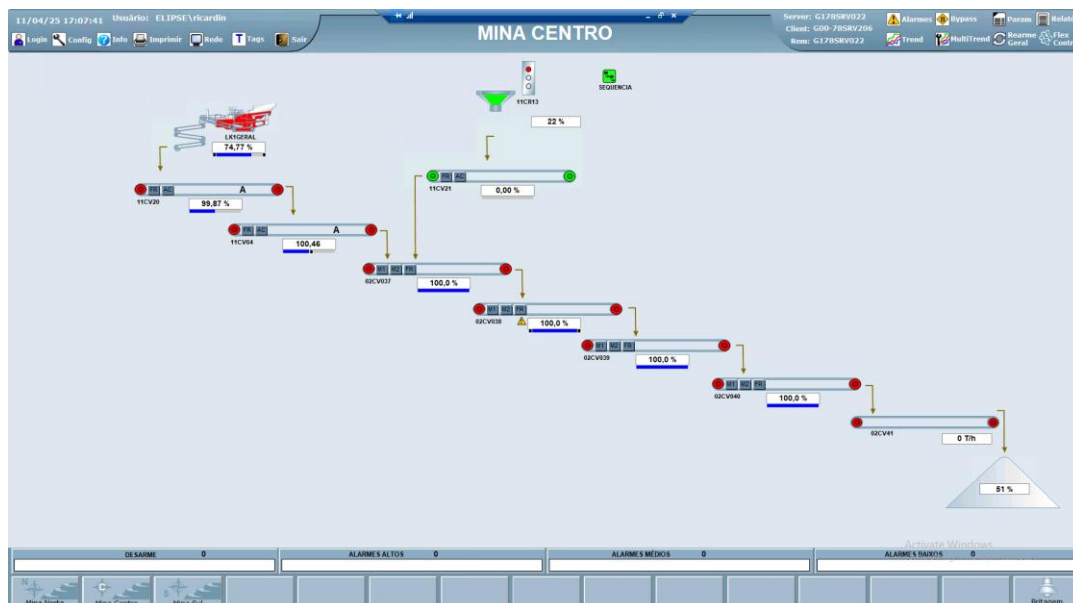
On this screen, users can check warning and alarm signals for the extractors and other equipment used in this stage. For example, a conveyor belt shown in red means it is running normally, yellow means it has a problem, and green means it is off with no problems.

This screen also lets users monitor the amount of ore on each conveyor belt, belt speed, and ore levels in the crushing silos. In addition, it indicates whether any equipment is locked out and shows the system's control mode (local or automatic).



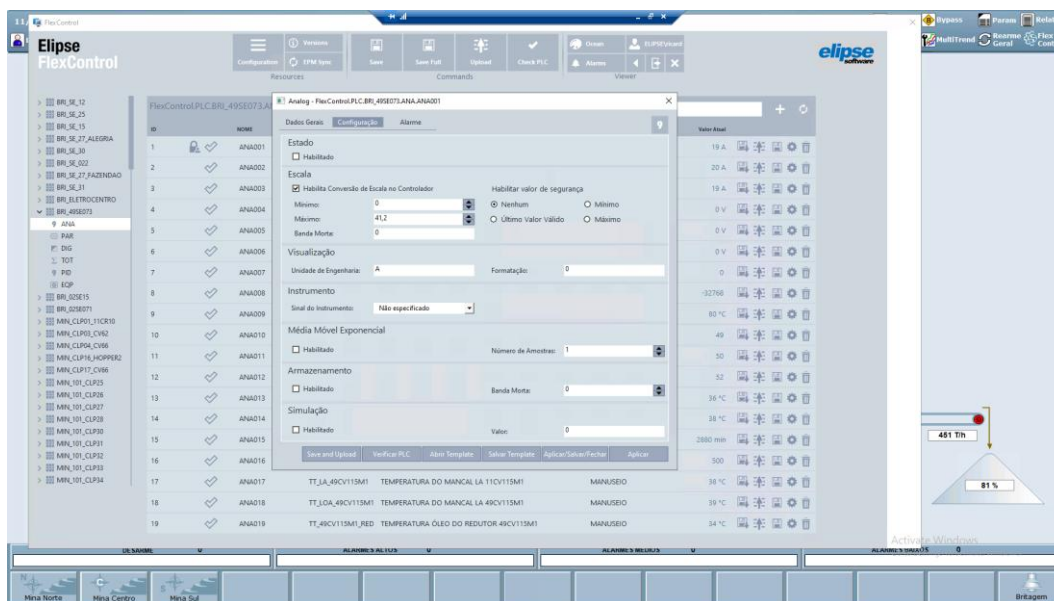
Ore feed control from the mine to the processing plant

Elipse FlexControl monitors each mine individually. The mine screen displays the ore load in the mobile crushers and dosing hoppers, along with belt status and speed. It also shows the amount of ore on the belts and at the mine and lets users reposition the belts on the screen (see image below).



Screen monitoring the extraction process

With Eclipse FlexControl, users can edit equipment configurations, PID settings, parameters, and digital and analog variables controlled by Samarco's programmable logic controllers (PLCs). They can also add new I/O points and devices at runtime, expanding the application without limits or interruptions.



Configuration screen for a crushing analog variable

Benefits

According to Júlio César Costa Xavier, Automation Technical Specialist at Samarco, the introduction of Eclipse FlexControl was a milestone in modernizing and standardizing the company's SCADA systems.

"Choosing a solution developed by Eclipse Software reassured us that we can count on continued support, regular updates, and full compatibility with existing systems, significantly overcoming the limitations of our previous tool," Xavier says.

Another key advantage Xavier highlights is the integration of the configuration and runtime phases into a single environment.

"This unification streamlined the interface between systems and increased the number of items that can be managed per entity, bringing more flexibility and scalability to the operation," he adds.

Other key benefits Eclipse FlexControl has brought to Samarco include:

- A fully native system that makes version upgrades easier, which helps keep security up to date.
- Operating system updates that do not freeze the application and also strengthen cybersecurity.
- A streamlined architecture with fewer servers, reducing costs.
- Easy creation of objects, equipment, and entities at runtime.

Datasheet

Client: Samarco Mineração S.A.

Solution provider: IHM Stefanini

Elipse products: Elipse FlexControl and Elipse Plant Manager (EPM)

Platform: Windows Server 2022 and Windows 10

Number of copies: 7 (6 Elipse FlexControl + 1 EPM)

Number of I/O points: 109,560

Drivers: GEETH, ABCIP, and ABDF1