SUCCESS STORY

Industry-leading automation technology for Brazilian paper mill

ABB PLC & Drives guarantee high precision

01 Piquiri Papeis paper mill in Campina do Simão
© Piquiri Papeis

"ABB is the industry leader in Pulp and Paper automation. We have had a high acceptance rate of the products with our clients, because of their high accuracy and exceptional productivity growth. We are very pleased to be able to offer them a 100% ABB solution for which we receive extremely positive feedback."

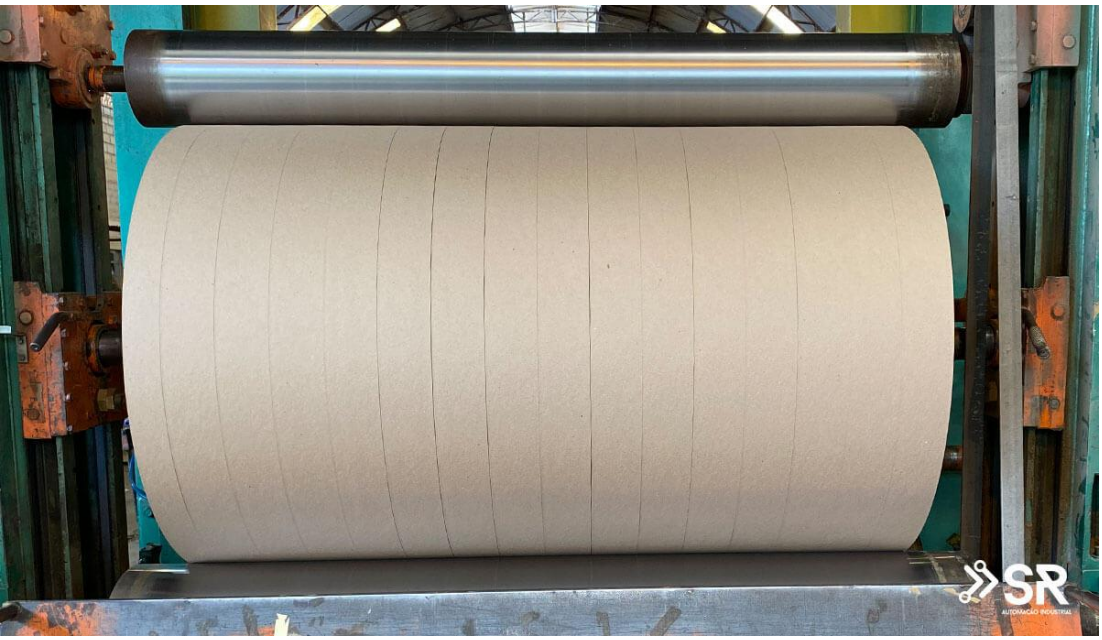
Paola Beatriz Sardá,
Automation Project Engineer at SR Automação.

SR Automação is a highly specialized Brazilian system integrator providing consulting and implementation services on automation systems in the pulp and paper industry. They have been in the pulp and paper market since 2001, working only with ABB products since then. As pulp and paper processing is a very complex process where factors such as precise drive speed have a huge impact on paper quality, it is essential to have a thorough understanding of all the process steps. SR Automação has this expertise and is the only system integrator in the segment offering a 100% ABB automation solution comprising drives, programmable logic controllers (PLCs), human-machine interfaces (HMIs) and low-voltage equipment.

In a 2-year megaproject with Piquiri Papéis, a paper mill specialized in processing recycled paper and based in Campina do Simão, the interior of the Brazilian federal state of Paraná, SR Automação implemented an automation solution in several stages which has boosted the performance enormously: Thanks to new motors, drives, and control technology, motor power was boosted by 245%, production capacity was increased by 60%, while energy consumption increased by only 37%. With this, the ratio between energy cost and revenue was improved by an astonishing 8%.

Implementation in phases to see return on investment
A couple of years ago, Piquiri Papéis did not have an automation system, managing all the different process steps in this highly complex application via basic logic and simpler equipment. They were aware of the risks and inefficiencies that this produced and were therefore looking for an automation expert who could propose a solution. The approach to implement the automation system in several phases allowed Piquiri Papéis to try out ABB's technology on one part of the process and see the improvements first-hand before changing the other parts of the process. This approach furthermore meant that the investment could be staged rather than having to invest the whole amount at once.

The first motor that was automated was the "flat table", where an ACS880 drive was installed. In this process stage, the stock consists of 92% water and 8% pulp, and the drive considerably stabilized this stage of the process. As the first results were really convincing, by now, 32 drives have been installed only for the paper machine.
At later stages such as the winder system when the ready-made cardboard gets wound onto market-ready rolls, synchronization and stable speed are indispensable so that the newly produced paper does not break. The ABB ACS880 drive is the only one in the market with direct torque control (DTC) technology, which is essential for the precise control of the winder. This really improves the quality and efficiency of the process. Before the ABB drives were installed, the paper machine ran at 120m/s – now it can do 280 m/s, which means it has more than doubled the speed.



02 Paper winder
© SR Automação

A programmable logic controller for high-precision processes
The AC500 PLC controls the drives via a PROFINET connection. It receives data from the actuators, analytical measurements of the levels in the tanks, it processes the state of flow of the pipes, and the speed, torque and current of the drives. It triggers adjustments of the drive speed, the consistency of the pulp, and the amount of water as needed, and is therefore essential for a stable process. Stability in the process directly translates into quality of the paper product because stable pre-processing makes the paper more resistant. Therefore, the AC500 plays a pivotal role in the whole process which now runs fully automatically, and which can deal with all types of recycled paper as input. The process can not only be controlled via ABB's CP600 HMIs used in the paper mill, but the AC500 PLC can also connect to the Cloud via MQTT or OPC UA. This way, Piquiri Papéis can now access both historical and real-time performance data, monitor the machine status from afar, and undertake preventive maintenance.

Nowadays, Piquiri Papéis has in all its processes (boiler, pulp preparation, paper machine and winder) 63 drives, 4 AC500 PLCs, 368 I/O buses, 4 HMIs, and two SCADA systems.

"ABB's automation solution, proposed and implemented by SR Automação's CEO and senior programmer Marco Sardá, has allowed us to increase our production capacity by 60% while improving our production quality at the same time. The system is very easy to handle, and we are extremely happy to have found a reliable product provider who really understood our needs."

Guilherme, CEO of Piquiri Papéis

03 Control cabinets for drives and PLC
© SR Automação

ABB Automation Products GmbH
Eppelheimer Str. 82
69123 Heidelberg, Germany
https://www.new.abb.com/plc/