Soitec

BUSINESS CASE

• SEMICONDUCTORS • INDUSTRY 4.0 • DIGITAL TWIN

Testimonial from **Dany Adolphe**, IT Architect at Soitec

"Thanks to Agileo Automation's digital twin, we were able to fully test the interface with our new automated wafer loading robot before integrating it into our production line."

A wafer loading robot delivered with its own SECS/GEM connection and **digital twin**

Significant time saved on the need to develop an in-house simulator

More successful tests conducted without interrupting manufacturing before cleanroom integration

The client: Soitec

A world leader in semiconductors with six manufacturing sites located around the world, Soitec generates more than €1 billion in annual revenue. For more than 30 years, the company has been developing semiconductors for electronic equipment manufacturing aimed at three strategic markets – mobile communications, automotive / industry, and smart objects.

To prepare for the integration of a new automated SOI wafer loading robot into its production lines based in Bernin, France and Singapore, **Soitec has relied upon Agileo Automation's digital twin and SECS/GEM connectivity solution.** The company had three key objectives: Eliminate the workload associated with the development of an in-house simulator, create a comprehensive work environment to **allow the completion of multiple tests without interrupting production**, and benefit from an interface based on the same software as the wafer loading robot control system to faithfully emulate its motions.

Let's take a look back at this collaboration with the testimonial of Soitec IT Architect Dany Adolphe who managed the project.

Lighter workloads for in-house developers

After a first implementation in France, Soitec decided to add an automated LISA-AE 300 wafer loading robot manufactured by R2D Automation to its production line in Singapore. **"Under normal circumstances, Soitec developers would have to create a simulator for each new piece of equipment before integrating it into the production line.** This allows our team to carry out tests without disrupting manufacturing, but requires development and fine tuning time," explains Adolphe.

The automated wafer loading robot ordered from R2D Automation is an exception to the rule. "It comes with **its own digital twin developed by Agileo Automation** which saved us at least five days of development time," a significant saving for Soitec. "In addition to simulator development, we also gained time on integration tests that are broader and more varied." Without a digital twin, the same tests would have taken several weeks.

Successful production deployment

Unlike the simulators usually created by in-house developers, Agileo's digital twin comes from the same A²ECF-SEMI framework as the automated wafer loading robot control system. **"Agileo's strength is to make both SECS/GEM and GEM300 drivers available to facilitate the interface of the wafer loading robot with the MES and the digital twin for testing.** Therefore the digital twin is much closer to reality and covers all of the wafer loading robot motions."

We significantly increased the number of tests we could carry out in simulation settings before the final integration of the tool into our cleanroom. "Test scenarios come back with limited bad variables, we get fewer errors, and tests are therefore more precise and relevant," adds Adolphe.

Benefits

- Significant time savings for in-house developers
- Ability to carry out more tests of higher quality before integrating tools into production
- An agile, flexible, and scalable development process

About Agileo Automation

A long-standing expert in the semiconductor industry, Agileo Automation facilitates the interconnexion between the operating parts of factory floor tools and IT systems on manufacturing sites. At the heart of Industry 4.0, the company's A²ECF-SEMI framework ensures the precise coordination between the products to be manufactured, production orders from the MES, and the operating parts of factory tools. Agileo Automation assists industrial equipment suppliers with developing digital twins relying directly on the protocols for controlling automated robots and the mechatronic systems that they provide.

These combined factors enable the "secure deployment of the new tool," according to Adolphe. **"Thanks to the digital twin, we avoided interrupting production to conduct testing. We can therefore perform as many tests as we wish until we are certain that the cleanroom transition can be seamlessly completed."**

Accurate and scalable development

Under normal circumstances, Agileo develops its simulators in collaboration with tool suppliers for end-user industrial companies to use them as is. **However in this case, Agileo worked directly with Soitec. "It was important for us to work hand in hand with Agileo because we needed flexibility and precision,"** comments Adolphe. "We beta-tested the automated wafer loading robot software and with our regular feedback contributed directly to its development. Agileo could then make the improvements needed very quickly."

All developments were carried out with standardization in mind. **"Although the automated wafer loading robot is very specific, the Agileo team have always sought to operate their SECS/GEM interface in a standard format.** They were careful not to hardcode their solution to meet our needs which will in turn facilitate the scalability of the R2D Automation wafer loading robot control software."