

## CASE STUDY

## Siemens pushes the digital factory boundaries with NavVis' immersive digital twin technology



*Point cloud of the Siemens' factory scanned with the NavVis Indoor Mobile Mapping System M6*

### Introducing the Siemens Electronics Works Amberg Factory

The Siemens Electronics Works, located in Amberg, was founded in 1989 and manufactures a range of SIMATIC products, for example, programmable logic controllers and human machine interfaces. The Amberg site is widely recognized as a world leading digital factory, pioneering digitalization initiatives to drive efficiencies and shorten time to market. The Siemens Amberg teams' single-minded focus on driving continuous improvements has reaped significant results. Without increasing the scale of the production area- 10,000 square meters- and with almost no change to staffing levels, the factory has increased its production volume 13-fold since 1990. Such efficiency gains have also increased production flexibility, enabling the factory to manufacture over 1000 product variants per day and one product per second. Siemens has since rolled out the digital factory best practice pioneered at Amberg to two sister locations.

Siemens Electronics Works Amberg continues to push the boundaries of digital factory innovation and recently completed a project with NavVis to implement a fully immersive digital twin of the indoor space within the Amberg factory.

### Challenge

As with all manufacturing facilities, there are multiple stakeholders and parties interested in seeing and gaining an in-depth understanding of the as-is state of the Siemens Amberg factory. Planners need accurate data & context for assembly line relocation projects, both for initial planning, as well as implementation when tendering the necessary suppliers. Keeping track and accurately documenting the multiple incremental shop floor changes implemented to respond to new market demands or drive greater efficiency can be an incredibly challenging task. Of course, this is only amplified in a factory

as fast-evolving as Siemens Electronics Works Amberg. Siemens also frequently invite potential customers to visit their Amberg site, running over 400 factory tours a year. Tours are conducted on a balcony above the shop floor for safety reasons, as well as to avoid disrupting production schedules. However, with a birdseye view from the balcony, it can be difficult to provide the full picture, for example taking a closer look at specific machines.



*Photo of the Electronics Works Amberg from the visitors balcony. Source: [www.siemens.com/presse](http://www.siemens.com/presse)*

### Solution

Siemens approached NavVis to investigate how our NavVis Digital Factory Solution could enable them to build a digital twin of their factory space. Their first idea was to quickly generate a point cloud of their production space, planning to import this rich point cloud data to create a CAD model of their factory. The unique NavVis Indoor Mobile Mapping System enabled them to scan 10,000 sqm in one day minimizing interruption to production.

But it was when the team first reviewed their immersive factory digital twin in NavVis IndoorViewer that the extensive value of the NavVis Digital Factory Solution truly became apparent. Combining accurate point cloud data with 360° panoramic images, NavVis IndoorViewer provides an immersive 3D walkthrough, that enables the user to interact with a space exactly as they would do in person. All required stakeholders can instantly review the factory as-is state, at the click of a button, from any browser or device.



Screenshot of the NavVis IndoorViewer, showing the Siemens production site and a custom measurement.

## Result

Siemens are now using their factory digital twin of the Electronics Works Amberg for a number of different use cases, as well as planning for future potential applications and integrations.

**Assembly Line Planning & Relocation:** Assembly planners managing machine relocation between sister factories were able to speed up planning, better utilize factory space and significantly reduce travel costs. On average, four assembly lines measuring 60-70 meters are relocated each year. Previously, a move from Amberg to another production facility meant that colleagues would be flown over to Amberg to collect all the information needed to effectively implement the line within their own plant. If more detail was required post the first visit, multiple follow up trips would also then potentially be scheduled.

With NavVis IndoorViewer, Amberg planners are able to share a link to the exact location of the affected line in their factory digital twin, so their colleagues from another locations around the globe could review the current set up and take measurements as and when they needed, virtually.

The factory digital twin also facilitates supplier conversations during implementation, enabling assembly planners to show rather than explain the necessary requirements.

**Virtual Factory Tours:** As mentioned, Siemens Electronics Works Amberg runs over 400 tours each year with prospective customers to showcase their pioneering digital factory operations. With NavVis IndoorViewer, Siemens is now able to supplement the view from the visitors' balcony with greater detail around specific machines and lines, using the digital twin to zoom in on specific areas of interest. The team present the pertinent details of their factory operations via touch-enabled terminals situated on the balcony, running NavVis IndoorViewer. In future, it is expected that 15-20% of the on-site factory tours could be replaced entirely by virtual tours.

**IoT Integration:** Finally, the Siemens team have connected live feeds of production performance & quality data with NavVis IndoorViewer Points of Interest. Points of Interest can be used to highlight and collate related information on important elements within the factory, for example key machines and assembly lines. Siemens integrated their IoT data here with the ambition to use their NavVis digital twin as a holistic visual interface for their digital factory, helping users to intuitively navigate the large number of IoT data streams.

**Next Steps:** To keep their factory digital twins up to date, Siemens plans to scan their factory in Amberg with the NavVis M6 Indoor Mobile Mapping System multiple times a year. And, after a successful implementation in Amberg, the NavVis Digital Factory Solution is now being rolled out as a repeatable model to sister factories.



Thomas Meier, Head of Technology Excellence, uses the NavVis IndoorViewer to show production details during a guided factory tour.

**“With NavVis, I always have my factory in my pocket”**

**Thomas Meier**  
Head of Technology Excellence