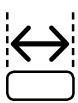




Robots Helping Robots: STL Uses HP SitePrint to Enable Geek+ AMR Navigation

STL partners with LE34, a certified HP SitePrint Service Provider, to precisely position QR codes for AMR navigation with ± 2 mm accuracy—cutting project schedules from weeks to days in warehouse automation.

Highlights



± 2 mm Accuracy

HP SitePrint delivers the ultra-precise tolerance required for reliable AMR navigation.



From weeks to days

Project timelines are reduced from several weeks of manual layout to just days with robotic printing.



QR Code Positioning for AMRs

SitePrint enables fast and accurate placement of fiducials that guide Geek+ robots in warehouse automation.

Project Background

Type of project

Installation of QR code navigation system for Geek+ AMR in warehouses.

Owner requirement

QR codes had to be positioned with ± 2 mm accuracy to guarantee safe and reliable AMR operation.

Scope of layout

1,500 QR code location printed across warehouses of 2,500m².

STL is a fast-growing system integrator providing turnkey intralogistics automation solutions across the Nordics. As the exclusive partner for Geek+ in the region, STL designs and installs robotic systems that include Autonomous Mobile Robots (AMRs) and goods-to-person solutions. There is a growing interest in AMR technology for warehouses and logistics centers, where they are used to transport goods efficiently and safely. Their navigation relies on precisely placed QR codes on the facility floor, which enable the robots to position themselves accurately during operations.



STL manages the complete lifecycle of customer projects, from solution design and implementation to commissioning and ongoing service. The company is always exploring the latest technologies to ensure projects are delivered on very short schedules and with the highest level of precision—two factors that are critical for their customers' operations.

In just over two years, STL has grown to 26 employees with offices in Sweden, Norway, Germany, and Denmark, serving leading customers in a wide range of industries.

The Challenge

One of the most critical steps in AMR deployment is the accurate placement of QR codes on warehouse floors. These codes must be installed with ± 2 mm tolerance. Any deviation risks severe consequences. Best case, robots stop unexpectedly, disrupting material flow. Worst case, robots collide while transporting loads of up to 1,200 kg on 3.6-meter-high shelves, creating both safety hazards and costly downtime.

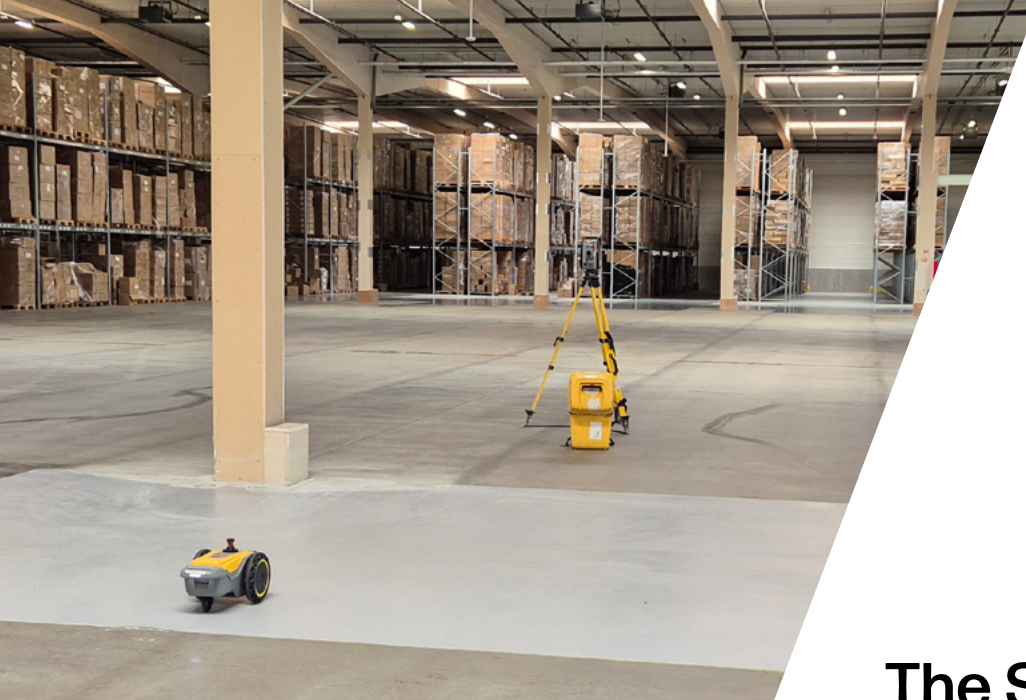
Previously, STL relied on manual layout methods such as handheld lasers, chalk lines, and extensive measuring. This required crews of 3–4 people working up to two to three weeks per project for facilities around 4,000 m². Despite the effort, ensuring 2 mm accuracy was extremely challenging with their traditional methods.



“It takes a lot of time and effort [with manual methods] to achieve a ± 2 mm accuracy. Before, we set out with a handheld laser and ink strings and a lot of measuring. It was very time-consuming, and we spent two or three weeks on marking one site like this. Now, with HP SitePrint we spend only one or two days.”

Michael Petersen, STL





The Solution

To overcome these challenges, STL adopted HP SitePrint as part of a new workflow in collaboration with their service provider, LE34. LE34 is part of the Global Network of HP SitePrint Service Providers, certified by HP for delivering top-quality layout services with the SitePrint robot. The process begins with LE34 performing a 3D laser scan of each facility, which allows them to detect clashes or mismatches with the customer's engineering drawings. By resolving these issues before arriving on site, STL saves significant time and avoids costly rework.

Once the layout is validated, HP SitePrint is deployed to print the QR code positions directly onto the floor with 2 mm accuracy—a level of reliability that is very difficult to achieve with traditional methods. This shift has transformed STL's operations: what once required up to two weeks of intensive manual work can now be completed in just two days of robotic printing.

The new approach has also reduced the size of on-site crews. Instead of three or four installers working for weeks, STL now requires only one supervisor, while LE34 manages the full service. This not only lowers costs but also ensures faster and more precise installations. Most importantly, the accuracy provided by SitePrint minimizes downtime and eliminates the risk of robot collisions, resulting in a safer and more reliable environment for STL's customers.

For this specific use case of printing fiducials for QR code positioning in AMR navigation, HP has developed specialized print settings fully customized for the application. SitePrint operates in a high-accuracy mode that tightens the standard tolerance of ± 3 mm down to ± 2 mm, achieved by applying more stringent parameters during the printing process. While this adjustment results in a slight reduction in layout speed, it is not a concern for STL. Even in high-accuracy mode, they are still achieving dramatic productivity gains compared to manual methods, while consistently delivering the extremely demanding ± 2 mm tolerance required for safe and reliable AMR operation.

Another innovation developed specifically for STL's projects is the ability to print a custom "K-shaped" character. This element is designed to be printed in a single pass and sized perfectly to accommodate the labels that carry the QR codes. As a result, STL can both ensure precision placement and streamline the workflow, further increasing the reliability and efficiency of AMR installations.

"For print we use maximum of two days with HP SitePrint, and normally we would have used like two weeks for this. And we know we're 100% reliable when we use it. There's no human factors in it. We know when the printing is done, it's accurate."

Michael Petersen, STL

Results with HP SitePrint



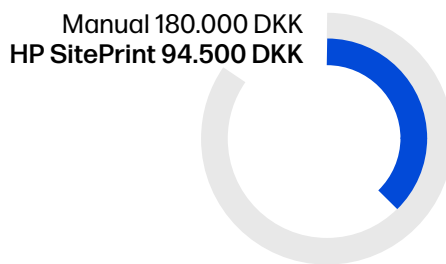
A recent project with Textile Logistics in Ikast, Denmark, clearly demonstrates the impact of HP SitePrint. In this case, STL was tasked with installing 1,500 QR codes across a 2,500 m² warehouse. Using their previous manual approach, the job would have required a crew of three to four workers and taken two to three weeks to complete. With the new workflow, however, the entire layout was transformed. The 3D scanning and preparation were completed within a week, and the actual QR code printing was finished in just two days, with only a single STL supervisor present on site while LE34 carried out the work.

Not only did they shorten the project schedule, but they also reduced operational expenses. By bringing in a specialized service provider with HP SitePrint, STL was able to reduce both crew size and the time spent on layout tasks. As a result, STL cut layout operational costs by nearly 50%.

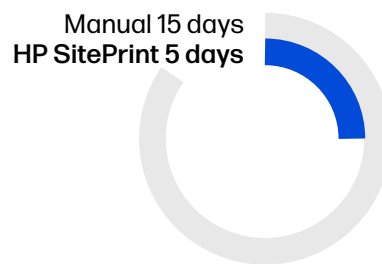
The results were not unique to this project. In another installation, STL and LE34 successfully deployed 4,000 QR codes in a 5,000 m² warehouse in just two days, showing that HP SitePrint is not only faster and more accurate but also fully scalable for large industrial facilities.



		Traditional	HP SitePrint
Job Data	Warehouse Size (m ²)	2.500 m ²	
	QR Code Location Marked	1.500	
	Crew Size	3	1
Cost Rates	Site Engineer Daily Cost (DKK)	4.000 DKK	15.000 DKK
	SitePrint Usage Fee (DKK/Point)	-	13 DKK
Time	Total Time (days)	15	5
Total Costs	Labor Cost	180.000 DKK	75.000 DKK
	SitePrint Usage	-	19.500 DKK
	Total Cost	180.000 DKK	94.500 DKK



47% cost reduction



9x more productive

Contact us

Want to learn more about how HP SitePrint can help your company achieve faster layout processes? Contact us to learn more.

Learn more at www.hp.com/siteprint

Please recycle this flyer. © Copyright 2024 HP Development Company, L.P.
c09218403 October 2025