

FAB\$ and LAB\$S

Ericsson's US 5G Smart Factory — Automating mmWave Base Station Production



To supply the rollout of 5G throughout North America, Ericsson has built an automated factory in Lewisville, Texas, shipping the first base station product less than a year after announcing its plans. Ericsson will invest some \$100 million in the 300,000 square foot factory, which will be fully automated by the end of the year.

Initially, the smart factory will build the 28 GHz Street Macro advanced antenna system, which is being deployed by Verizon in its 5G radio access network. The Street Macro base station comprises an active antenna and baseband processing in a compact housing, designed for mounting every few blocks in an urban or suburban environment where installation on rooftops or large towers is not practical.

The manufacturing flow begins with acceptance of the RF, digital and passive components used in the design, followed by surface-mount assembly, board-level test, assembly into the housing and final test of the complete base station. The surface-mount assembly and testing operations are currently automated, and the final assembly and packing the Street Macro for shipment will be automated by the end of the year. Autonomous mobile robots (AMR) shuttle the work-in-process (WIP) throughout the factory, and the staff — around 100 initially — will supervise the automation and manage the production flow to meet the demand from mobile operators.

As well as building base stations, Ericsson's 5G Smart Factory serves as a case study for how a 5G network can be used in an industrial application to provide flexibility in manufacturing and low latency connections for critical process steps. The internal 5G network uses Ericsson's own 5G equipment to provide a wireless IT backbone for the manufacturing workflow, connecting the AMRs to the assembly and test operations and transporting the WIP data.

Ericsson is committed to sustainability, so the facility was designed to receive a Leadership in Energy and Environmental Design (LEED) zero carbon certification — the first in the U.S. to be certified. The building diverts rainwater from the roof into 26,000 gallon storage tanks, and the collected water is used inside the building and to irrigate the landscape. Magnetic levitation chillers will reduce the energy used for heating and cooling, and solar panels are expected to generate 17 percent of the facility's electrical demand. Overall, the factory should be 24 percent more efficient than a comparable building.

To keep close to its markets and customers, Ericsson has built smart factories in Tallinn, Estonia; Nanjing, China; and Sao Jose dos Campos, Brazil. The Lewisville site establishes Ericsson's 5G manufacturing presence in North America. The U.S. facility came online so quickly because it was built using Ericsson's smart factory template. Erik Simonsson, who leads the Lewisville factory, came from Tallinn, and the U.S. team was trained by the Tallinn staff. Using virtual reality running on Ericsson's internal 5G network, the Lewisville team was "transported" to walk through the Tallinn factory and train on its capabilities and operations. The relationships established during these virtual exchanges have facilitated ongoing collaboration and knowledge sharing among the two sites.

Ericsson's decision to establish a 5G factory in the U.S. is a good move for the company, North American operators and mobile customers. FCC chair Ajit Pai commended Ericsson's commitment, saying "Building 5G equipment in the United States is good for our economy, good for the supply chain and good for the rapid rollout of the next generation of wireless connectivity in the United States."

www.ericsson.com/en/cases/2017/smartfactory