



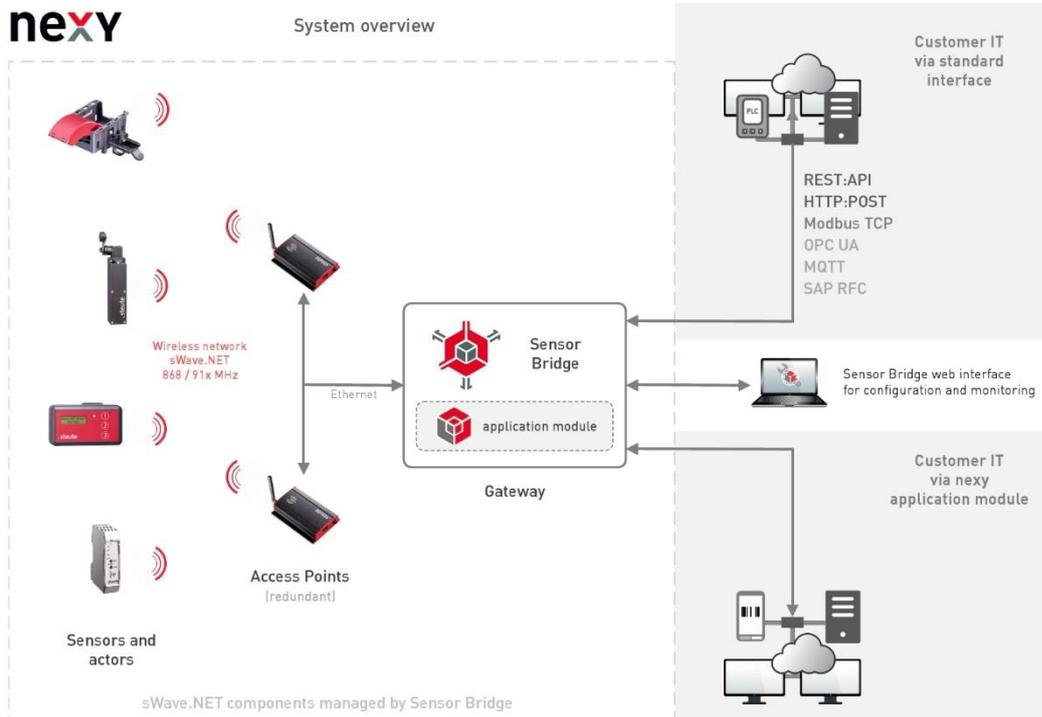
Remote control increases versatility

Wireless switches and sensors for industrial applications

Eliminating cables can be beneficial for many different switchgear applications, with some fields even demanding that electromechanical switches and sensors be cable-free. Depending on the requirements in question, the solution can also be a wireless network.

From cabled connections, to remote point-to-point communication, to wireless networks: these are the three stages marking the development of signal transmission in major steute switchgear series. It is not true to say that each stage replaced the one before it, but rather that each stage represented a whole new technology which was added to the existing product range. The first development step, from stage 1

(cabled) to stage 2 (remote), was taken by the company a full ten years ago. The basic idea was to provide users with reliable wireless switches and sensors for industrial applications which would facilitate greater assembly flexibility. This development step included self-sufficient wireless switches incorporating the energy-harvesting technology from EnOcean. Each switch generates the energy required to transmit



System overview of the nexy wireless network

the wireless signal from its own surroundings – for example from the kinetic energy released when its plunger is actuated.

However, this principle is not, or at least not wholly, suited to many industrial applications. It cannot be used, for example, when a confirmation signal is required or when the sensor status is to be regularly monitored. In such cases, both bidirectional communication and a battery are needed, and neither makes sense using the EnOcean technology.

In addition, due to their triple transmission of wireless signals with intermittent delays, the EnOcean wireless switching devices offer a good duty-cycle ratio, but quickly reach their limits when high quantities of switches and sensors and frequent transmissions are required. In order to achieve improvements in this area,

while at the same time maintaining very good low-power behaviour, steute then – still at the point-to-point stage – developed its own wireless technology: sWave.

Wireless switching devices for individual applications

The switchgear product range continued to expand, as did the variety of wireless systems. Various wireless technologies are now available, for example for very dense wireless networks or for high-interference environments. This development was also driven by customers, for example with a desire for a bidirectional wireless system or a signal to confirm receipt.

A modular concept for wireless switches and sensors was then developed in which different wireless standards (self-sufficient, bidirectional, with confirmation and/or status signals) could be combined

with different switchgear series – whether electromechanical or non-contact. In parallel, steute has gained approvals for its wireless technology in almost all industrial countries.

Point-to-point connections make way for networks

This wireless system was and is used intensively. But there was still a call for further development because some users had a high quantity of wireless switching devices within one shopfloor area, requiring installation of a correspondingly high number of point-to-point connections and wireless receiver units in their control cabinet.

Realisation of a wireless network in which an almost limitless number of wireless switching devices can be integrated is both simpler and cheaper. And so this was the third stage for steute.

From assembly to shipping: intralogistics applications

Here steute developed its own network protocol: sWave.NET. This system, with Access Points as routers in the field and an IoT Gateway for connection to the super-ordinate IT infrastructure of the user, can be configured to customer wishes. A leading German kitchen manufacturer, for example, uses this integrated technology in its dispatch hub. Using wireless control elements, staff can request the next consignment for shipping. An Andon display, which is also integrated in the system, shows the status of each order.

Desire for standardisation

Since each individual project required engineering, the desire soon arose for a standardised wireless system, and with its

nexy system steute has now also achieved this goal. The nexy system – stage four – is a wireless network solution integrating sensors, actuators and command devices.

These wireless end devices transmit and receive data via sWave.NET. The data are collected by Access Points and passed on to a Sensor Bridge, which then transfers the data to the IT system of the user. This facilitates uninterrupted communication from the shop floor to the management level of the company IT or beyond, into the IoT. Features of the latest nexy generation include an OPC-UA interface.

SAP updates "on air"

In the latest software version, the Sensor Bridge can also communicate with the SAP system of the user, while the connected nexy devices in the field receive new firmware updates "on air", in other words by radio waves. Sensors from other manufacturers can be equipped with an sWave.NET module and integrated in nexy wireless networks, making them also capable of receiving updates this way.

With these functions, nexy provides the user, or rather the IT of the user, with an overview of the entire company material flow at all times. This includes the current warehouse stock, as well as all intermediate and buffer storage facilities, plus the current locations and occupancy of transport units. Having this information available automatically and more or less in real time means that the production management system can plan in advance the materials requirements of machines and assembly points in accordance with the order data from the ERP system. This increases operational productivity and efficiency.

Target market: intralogistics

Operation of the nexy system is made easier for the user by the fact that steute has developed preconfigured interfaces for specific applications – for example material flow in eKanban systems, communication between automated guided vehicles (AGV) and stationary transfer points, as well as the "waking up" of AGV from their "deep sleep" mode. Renowned AGV manufacturers such as dpm Daum & Partner Maschinenbau are already using this system.

The advantages of the nexy wireless network include its very low power consumption and short reaction times. In addition, multiple applications – for example AGV, eKanban systems, tigger trains and/or Andon systems – can all be operated within a single wireless network. For these key areas, application-specific software is available, allowing the various functions to be preconfigured quickly and easily. For this reason, nexy is especially suited to the automatic monitoring of status changes in the flow of materials and parts across all storage facilities and assembly points.

Author:



Andreas Schenk
Product Manager Wireless
steute Technologies

Images: steute Technologies GmbH & Co. KG