

The Siemens logo is displayed in a white rectangular box in the upper left corner of the page. The background of the entire page is a photograph of a large industrial facility, likely a water treatment plant, featuring several large circular tanks with metal walkways and railings. In the distance, there are industrial buildings and tall chimneys under a clear sky.

SIEMENS

Technical
article

Automating with Mobile Communications – Industry 4.G

Networking of Automation Components using the Mobile Communications Standard of the fourth Generation

In the private sector, the mobile communications standard of the fourth generation – LTE (Long Term Evolution) – has already gained widespread acceptance. We benefit daily from the fast data throughput and high bandwidths of the new technology. For industrial operations, too, it is worthwhile to employ the new mobile communications standard for telecontrol applications and maintenance work.

Application Areas for Mobile Communications in Automation Technology

As part of the Industrie 4.0 initiative, the global networking of automation devices is progressing in large steps. The worldwide available mobile communications networks offer the possibility to quickly and cost-effectively interconnect machines and plants via the Internet or private networks (VPNs) – fully independent of how far apart they are.

To monitor and control decentralized and widely distributed automation stations from a control center, the connection of these stations via a mobile communications network is becoming more and more important within the framework of telecontrol.

Telecontrol to connect Outstations to the Control Center

Telecontrol as basis for connecting outstations to the control center – and especially for controlling and monitoring supply systems – is greatly gaining in importance.

Due to the fast pace of urbanization, the growing population, and the necessity to use energy more efficiently and purposefully, supply systems for water/wastewater, gas, and district heating are facing major challenges. Companies and plant builders will have to design these systems on a larger scale in the future, while maintaining or even increasing the high quality standard.

In this context, telecontrol plays an important role – it connects the outstations to the control center.

An essential component in the implementation of a telecontrol solution is the transmission of data from the station (RTU, remote terminal unit) to the control center. Due to the high demands on data consistency, buffering in case of a connection failure, and/or chronological integration of values, considerable effort by application engineers is required, if the implementation has to take place in the program. To meet all these demands even when connecting via mobile communications networks, components are necessary that not only match the current state of mobile communications technology, but also know the automation-specific requirements and have considered them in the product design.

Remote Maintenance – thought-out, worldwide, and secure

Almost all machine manufacturers and plant builders are now active worldwide and sell their products and services to customers in all regions of the world.

But regardless in which country the business transaction takes place – one thing is always the same: Customers attach particular importance to a quick and competent service that is guaranteed with the purchase of the product. Through it, problems in the machine or plant are recognized and remedied without major losses to their business. These maintenance services can become a lengthy and costly matter for the manufacturer or plant builder.

Especially when it involves machines and plants located in difficult to access areas, just a simple service call can quickly turn into a large-scale project.

A well thought-out and secure remote maintenance solution can save a lot of money in such cases: If the service technician can already perform an error analysis from her office or laptop via a remote connection, she can specifically prepare herself for the service call. If the error is a simple one, it might be possible to fix the issue remotely in a few minutes – without having to make a trip.

For machine manufacturers or plant operators wanting to offer a global maintenance service for their products, a worldwide remote maintenance solution based on LTE can represent an optimal solution.

The Advantages of LTE

When downloading data, the data speed of LTE is faster by about a factor of 100 compared to the GPRS data service, which has been used for a long time.

This allows maintenance access requests from the machine supplier to a customer on the other side of the globe to take place without disruptive waiting times or disconnections.

LTE also opens up new possibilities when it comes to regional availability. To begin with, the LTE availability was expanded in the places that belonged to the so-called “blank spots” on the DSL and mobile communications map. This was a requirement by the German Federal Network Agency when it awarded the corresponding mobile communications frequencies to LTE providers in the spring of 2010.

This now makes it possible to integrate remote automation solutions (e.g., wells, pumps, sewage treatment plants) into the central control centers via the mobile communications network for monitoring and control purposes.

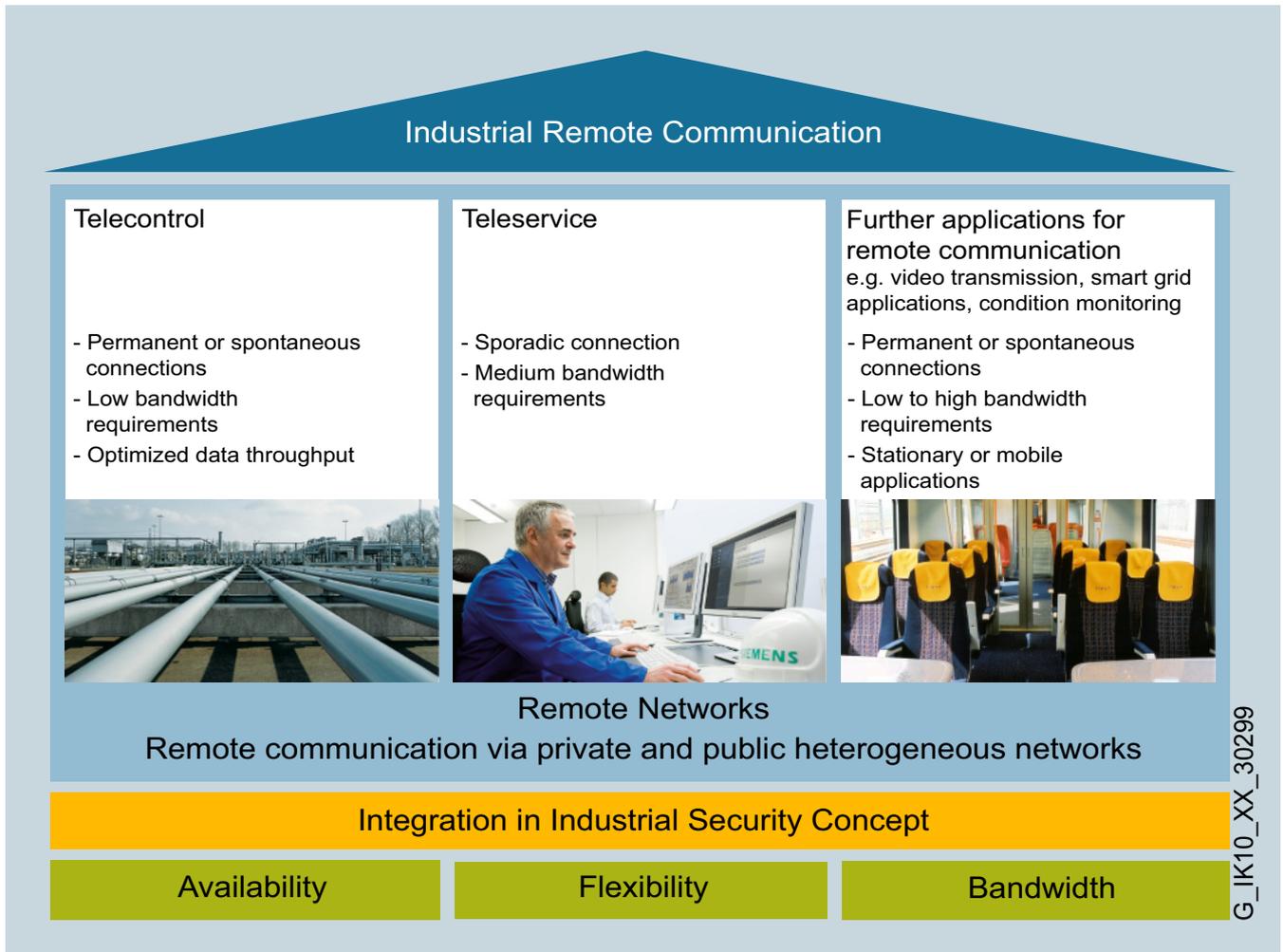


With LTE, remote wells in rural areas, silos, or sewage treatment plants can also be continuously monitored.

Industrial Remote Communication – comprehensive 4G Solutions

Siemens is continuously expanding its comprehensive telecontrol and remote maintenance portfolio – Industrial Remote Communication – to include the latest mobile communications standards. Thus, in addition to the wired solutions via DSL or Ethernet, LTE modules and routers are now also available for all telecontrol areas.

TeleControl Basic offers capabilities for small applications as well as extensive plants with up to 5,000 telecontrol stations. It is recommended for simple monitoring and control tasks, for the transmission of process data, as well as for remote diagnostics and remote maintenance. It provides a secure data communication and full remote access for engineering or maintenance functions. The connection of the control center to the outstation takes place via GPRS/Internet.



Efficient remote access with Siemens Industrial Remote Communication

TeleControl Professional is a comprehensive system for telecontrol solutions with a high degree of automation. The system supports a wide range of network structures, communication media, and telecontrol protocols. It is therefore suitable for sophisticated SCADA concepts in spread out process plants. Both solutions can be used independently of each other, or be combined in one project.

Teleservice is used for remote diagnostics and remote maintenance of remote machines and plants via dial-up networks, mobile communications, or the Internet. It contributes significantly to the reduction of travel and personnel costs for service calls.

For all products of SIMATIC S7 automation solutions, it is possible to set up a maintenance access or transmit measured values to a control center via mobile communications.

Conclusion

Mobile communications technology is developing rapidly – driven by the private consumer market. With the introduction of LTE, a great technological leap in data speed and area coverage has already taken place, which – under the right general conditions – can also be utilized in industrial environments for telecontrol and remote maintenance applications. Siemens offers an LTE connection specialized to its automation components, with which maintenance access, measured value transmissions, or even cloud-based analytical methods can be realized.



LTE connections for all SIMATIC S7-based automation devices

Security information

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept. For more information about industrial security, please visit www.siemens.com/industrialsecurity

Siemens AG
Process Industries and Drives
Process Automation
Postfach 48 48
90026 Nürnberg
Deutschland

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