SIEMENS

Industrial Remote Communication

Efficient remote access to plants, machines and mobile applications

SIMATIC NET

siemens.com/industrial-remote-communication

Success factor Industrial Remote Communication

Urbanization, globalization, population growth and climatic change demand new solutions from industry that extend far beyond conventional remote control and maintenance. The extended product range from Siemens supports a wide range of new applications alongside telecontrol and teleservice. Industrial Remote Communication offers the perfect solution for widely differing requirements with regard to availability, flexibility and bandwidth. These may be in factory automation, the process industry or in public infrastructure sectors, but also in areas such as mobility and energy supply – Industrial Remote Communication provides access to widely distributed machines, plants and applications of different sizes, both securely and economically.

Telecontrol

Telecontrol is the connection of process stations that are distributed over a wide geographical area to one or more central process control systems for the purpose of monitoring and control. Various different transmission components in the Remote Networks product spectrum support remote communication over various public and private networks. Event-driven or cyclic exchange of process data is performed using special telecontrol protocols and permits efficient control of the overall process.

Siemens supplies perfectly interacting system components and solutions for the control centers, outstations and networks. Configurations can then be perfectly adapted to meet customer requirements. Our product range also gives you maximum investment security – because, even during development of our products and systems, we consider their long lifetime and migration capability.

Teleservice

Teleservice involves data exchange with distant technical systems (machines, plants, computers, etc.) for the purpose of error detection, diagnostics, maintenance, repair or optimization.

Teleservice solutions from Siemens ensure efficient, economical diagnosis of distant plants, saving working time and traveling costs – at minimal engineering costs. Further application possibilities: advanced planning and implementation of preventive maintenance measures, optimization of subsystems and controllers by means of remote programming, or loading the latest program modules.

More applications for Industrial Remote Communication

Modern mobile communications technology increases bandwidths, data security and availability and minimizes installation time and costs. The new mobile radio routers are ideal for setting up remote communication with mobile subsystems or moving objects, such as trains or buses. This can support the centralized acquisition and evaluation of video data to enhance passenger safety (video surveillance) as well as providing connections to ticket machines, infotainment services and Internet on board.

And that's not all: Industrial Remote Communication enables the early detection of servicing and maintenance requirements for wind farms (condition monitoring) or transmission of status data from distribution stations and substations in the energy supply system (smart grid applications). It is also used in object and building monitoring for access control.

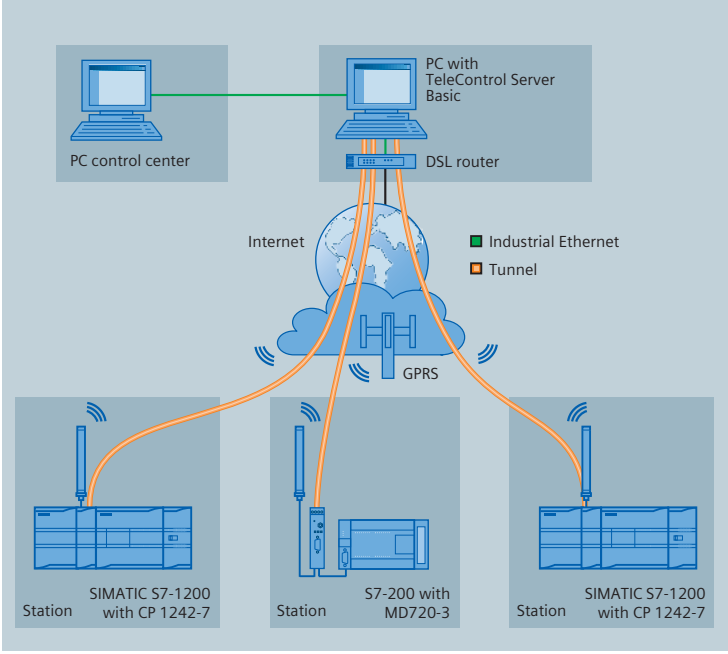
Part of Totally Integrated Automation

Our solutions for Industrial Remote Communication are based on SIMATIC, the leading automation system worldwide – and are therefore a part of Totally Integrated Automation, our open system architecture for plant-wide, seamless automation. Totally Integrated Automation stands for the perfect interaction of all implemented components – and therefore creates a firm basis for constantly increasing productivity.

Telecontrol

Indispensable for wide-ranging demands

Industrial plants frequently span large areas, in some cases, extending beyond national boundaries. This is when efficient telecontrol, with our innovative solutions, pays for itself: It allows outstations to be monitored and controlled from a central control point over a telecommunications network. We offer you solutions for small systems with minimal functional scope (TeleControl Basic) as well as for extensive process plants with a high degree of automation (TeleControl Professional) – solutions that can be implemented independently and also combined.



Reduced to the essentials – TeleControl Basic for simple tasks

With TeleControl Basic, we are offering you a system that is not only ideal for simple monitoring and control tasks, but also for the transmission of process data and for remote diagnosis and remote maintenance via GPRS and the Internet. Typical application areas are maintenance, the control of process plants and optimized operation of plants to achieve energy savings. The software and control concept is as well suited to the smallest applications with few stations as to large-scale projects, e.g.:

- Plants in the water supply, water treatment or environmental sectors (e.g. irrigation systems)
- Centrally controlled building management (e.g. lighting, heating)
- Control and monitoring of traffic technology (e.g. traffic light systems, tunnel projects)
- Monitoring of energy supply systems for measuring consumption and controlling costs (e.g. district heating networks, wind power generation)
- Remote monitoring of machine control systems and automation equipment (e.g. air-conditioning systems, vending machines)

Efficient and economical

TeleControl Basic connects the control center via the TeleControl Server Basic control center software to the substations that are based on SIMATIC S7-1200 and S7-200 controllers. Wireless GPRS technology is available as the transmission medium. A substation can communicate remotely with a control center (service center) as well as with other substations.

Small-scale applications with few outstations can therefore be implemented as well as large-scale plants comprising up to 5000 outstations. International approvals permit worldwide use.

GPRS with numerous advantages

- The worldwide mobile telephone standard for many providers
- Constant online connection with low-cost GPRS tariffs
- Data can be transferred immediatly
- Station failure can be detected immediately

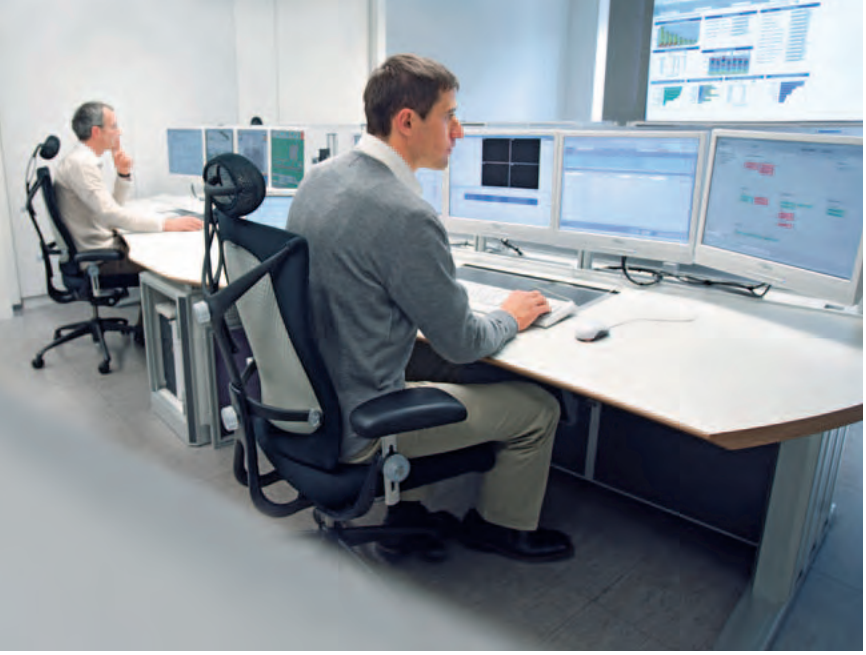
Economical

- Low investment costs
- No investment necessary for the communications infrastructure, because GPRS/Internet is available worldwide

Easy configurable

- Quick and easy commissioning thanks to perfectly interacting system components
- Easy and convenient configuring of the outstations – by several users simultaneously (multi-user capability)
- Changes and expansions are possible during normal operation at any time
- Convenient and reliable generation of alarms
- Alerting of standby personnel through multi-level escalation management
- Interfacing to the control center software, e.g. WinCC over OPC interface

The complete solution also includes the teleservice function. This gives internationally active plant and machine manufacturers, for example, worldwide access to the S7-1200 stations.



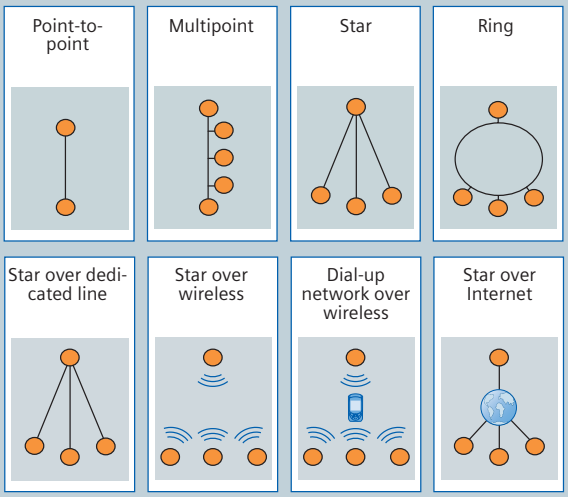
TeleControl Professional – Managing large-scale plants from a distance

In oil and gas pipelines, the outstations and metering stations are frequently over a thousand kilometers from the central plant or control center. A similar situation exists in the water supply and wastewater treatment sector, in power generation and distribution and in district heating supply. With our telecontrol solutions, we are offering you an innovative system for demanding monitoring and control tasks in widely spaced process plants with stringent demands on availability and data security.

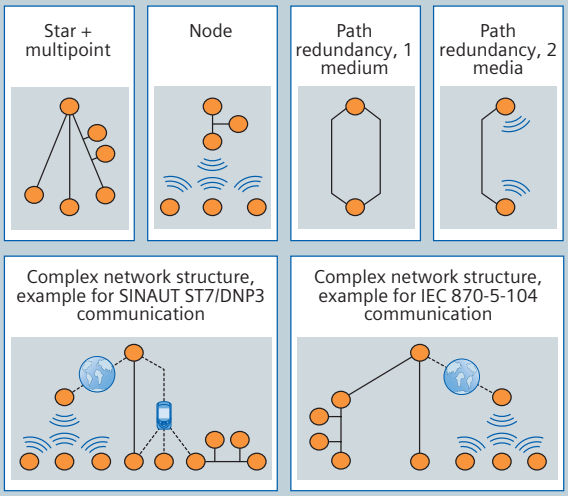
Modular building block system with considerable advantages for plant operation

TeleControl Professional is our enhanced remote control system for the extensive applications of the process industry. From SIMATIC PCS 7, SIMATIC WinCC or WinCC OA (Open Architecture) control systems or non-Siemens control systems using OPC, outstations based on SIMATIC S7-300 and S7-400 can be monitored and controlled efficiently. The outstations and substations can communicate with each other as well as with one or more control centers. TeleControl Professional has a modular design throughout and can be used with extreme flexibility in accordance with the customer's requirements.

Topology: Basic types and media variants



Topology: Combinations



Transmission networks to match requirements

TeleControl Professional demonstrates its enormous versatility in the selection of the transmission network.

Variant 1: Communication over classical networks
- Dedicated lines (copper and fiber-optic cables)
- Private radio networks
- Analog telephone networks

Variant 2: Communication over IP-based networks
- Ethernet radio
- Industrial Wireless LAN
- Fiber-optic cable
- Public networks and Internet by DSL, GPRS, EGPRS, UMTS

The security of tried-and-tested transmission protocols

The well-proven SINAUT ST7 protocol or the standardized DNP3 or IEC 60870-5 protocol can be used for transmission.

Any combination of networks in the same project

Our system enables star, line and node topologies or any combination of these to be configured. One station can be linked to the service center via two networks to permit redundant data transmission. These can be of the same or different types.

Fast and versatile data communication

Communication is event-controlled. If an event occurs, the operating personnel are informed immediately and can then intervene in the process quickly (e.g. using commands or setpoint inputs). Parallel to this, important events can be sent to a mobile phone by SMS – if required also with a direct acknowledgment to the sending station.

Maximum data security

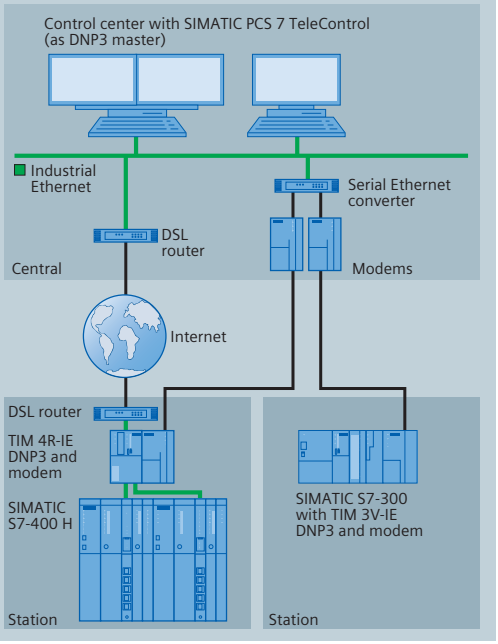
In our telecontrol solution, comprehensive measures to prevent data falsification and loss are important components of the system. Each transmission module has a large memory for several thousand data frames. Downtimes in the transmission link can then be bridged. Special IP-based networks are protected through dedicated VPN solutions.

Fully automatic time stamping

To enable subsequent and correct archiving of process data in the control system, all data frames are assigned with a time stamp at their place of origin. The entire network is synchronized automatically – including daylight saving time changes.

Extreme ambient conditions

Variants of the TeleControl Professional outstations are also offered for use under extreme environmental conditions (SIPLUS extreme components).



Interfacing to control systems

Using the SIMATIC PCS 7 or SIMATIC WinCC control systems, automation of centralized plants and monitoring of decentralized, distributed subsystems can be combined in a single system. In this way, machines and plants can be operated and monitored from a single control desk, and they can be configured using a single engineering system. Integration in Totally Integrated Automation also facilitates extensive savings in investment, operating and service costs.

Operator control and monitoring with SIMATIC WinCC: SINAUT ST7cc
For the data archiving which is essential in many sectors, the SINAUT ST7cc program package supplies the archive made available in WinCC with process data in accordance with the time stamp supplied by the outstations – and is also able to interface with sector-typical logging systems. The configuring tool of SINAUT ST7cc uses the same communication blocks as the underlying telecontrol system. The resulting object-based communication, from the sensors in the process through to the screen contents and databases of the control system, saves time and costs.

Interfacing to SIMATIC PCS 7 TeleControl and SIMATIC WinCC TeleControl
SIMATIC PCS 7 TeleControl and SIMATIC WinCC TeleControl use the SINAUT ST7, DNP3 or IEC 60870-5 protocols for communication with the outstations. The engineering system is based on DBA technology (Data Base Automation) and is equipped with an extensive function block library which also supports interfacing to telecontrol stations from other vendors.

Interfacing to control systems from other vendors

... with ST7sc over OPC interface
Using the SINAUT ST7sc program package with the OPC interface, the SINAUT ST7 stations can also be linked to control systems from other vendors. ST7sc has complex buffer mechanisms which prevent a data loss even upon failure of the OPC client. All process data are delivered with a time stamp, and configuration

... with DNP3
Telecontrol stations with DNP3 can be connected to any control systems, provided that they are equipped with a standard-compliant DNP3 master interface.

... with IEC protocol
Telecontrol stations on the basis of SIPLUS RIC (Remote Interface Control) can be connected to any process control systems with a standard-compliant IEC 60870-5 interface. Starting from the SIMATIC ET 200S as a mini controller through to the high-availability system SIMATIC S7-400H, SIPLUS RIC offers functionality and modularity for all systems. Due to the internal time stamp, no data is lost even if the connection is temporarily interrupted.

Intelligent tools for effective engineering

Our innovative engineering system builds on SIMATIC tools and supports the graphical configuration of complete communication networks. The system automatically provides the configuration engineer with all possibilities for linking in data from individual PLCs. Multiple addressing of process data is also possible – for example to several service centers or stations. Plausibility checks and address comparisons help when configuring complex networks.

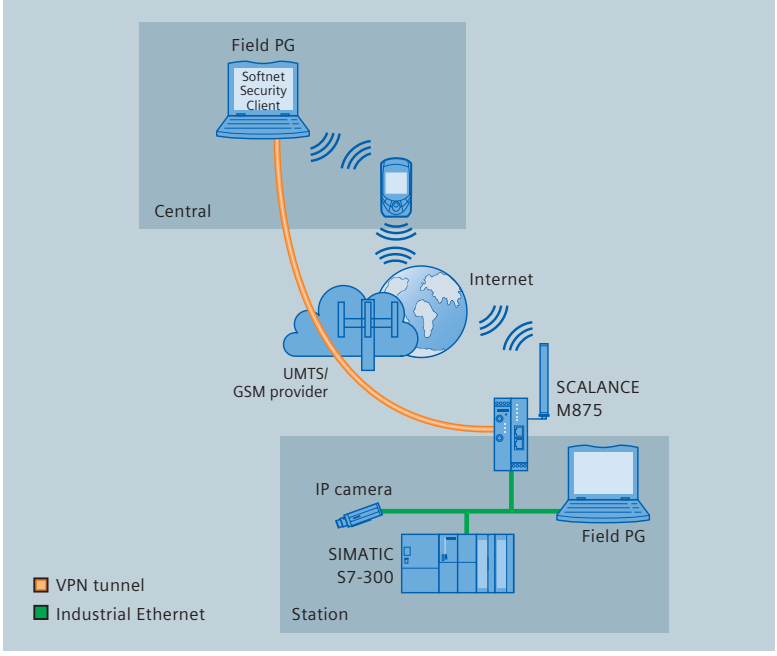
Programming can be performed remotely

Both in the commissioning phase and during operation, program modifications or remote diagnostics are easy to carry out in the distant stations by remote access via the communication network – without interrupting ongoing process data communication. This saves traveling time and site maintenance visits and also creates the requirements for completely new service concepts.

Teleservice

Fewer downtimes and increased productivity

Teleservice not only allows distant machines and plants to be maintained economically, the overall maintenance and servicing requirements can be established in advance, preventing plant downtime. Should a fault occur despite this preventative action, teleservice will support localization and rapid troubleshooting of the fault. Further advantages: the ability to exchange status information and, where necessary, to optimize processes.



Simply respond faster

Teleservice enables plants to be diagnosed and maintained from anywhere in the world, over the telephone network. Furthermore, it is also possible to make corrections to the user program, set parameters and transfer data. This plays an important part in reducing service deployments on site – by as much as 60%. The associated travelling and personnel costs are also saved. Teleservice also facilitates a much quicker response to any disruptions.

The new trend: Teleservice over the Internet

Optimum teleservice depends on reliable, continuously available, secure, low-cost data connections. Remote Networks is the complete Siemens product range for your secure teleservice solution over the Internet:

- For permanent links, or simultaneous access to several plants, a solution comprising the security and communication components SCALANCE S and SCALANCE M is recommended, both on the service and plant side.
- For versatile remote maintenance from any Internet connection – whether in the office, home office or hotel room – Softnet Security Client is the right software solution for establishing a secure connection to the plants.
- For plants without a wired network connection, the mobile radio routers for GPRS or UMTS provide access to the service center for remote maintenance. In all cases, communication is reliably protected by means of authentication and encryption over a VPN tunnel (Virtual Private Network) to block external attacks.

SIMATIC TeleService: Perfectly interacting components ...

- TeleService adapters can be combined with different types of modem, such as ISDN and GSM
- TeleService software with access data management enables easy connection to the automation components.

... and diverse function blocks

- **Remote maintenance**
  You can dial into a plant over the telephone system to read out status information and make corrections to the user program.
- **Remote connection**
  Data transmission over the telephone network is possible, as well as coordination of the process data exchange between several automation systems, if required.
- **Send an SMS or e-mail from the plant**
  You can send text messages and e-mails via the SIMATIC Controller.

SIMATIC IPC Remote Manager

This software package enables the realization of central service concepts for remote access to SIMATIC IPCs. System faults or program errors can then be rectified from a control desk, or BIOS and program updates can be installed.

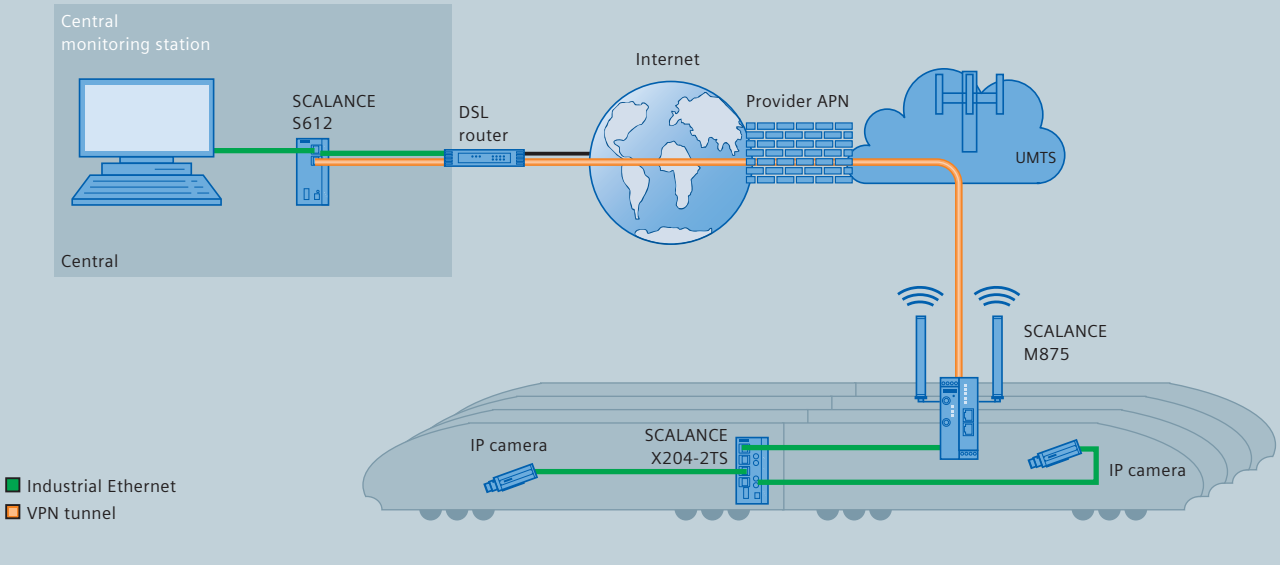
SIMATIC Remote Support Services

Our service concept offers a secure, high-performance platform for remote access to machines and plants. Effective support is provided by the integration of Shared Experts from Siemens and the company's own specialists.

New applications

Industrial Remote Communication creates new possibilities

New mobile radio technologies and broadband Internet support further applications such as video transmission, condition monitoring and smart grid applications, as well as object and building monitoring. Constantly widening opportunities for communication over Remote Networks provided by increases in bandwidth, higher availability and falling costs result in lots of new solution concepts.



Video surveillance

Modern industrial radio routers are ideally suited to use in moving objects such as trains or buses. They support bandwidth-hungry applications, such as real-time video transmission, from the passenger cell (video surveillance) and can therefore enhance passenger safety. The video data for all vehicles is monitored and processed in a control center. Data transmission for ticket machines, infotainment services and on-board Internet, as well as monitoring of the vehicle engineering (telemetry) are possible.

The UMTS router SCALANCE M875 has high uplink and downlink data rates that support a wide range of data services with wide bandwidths over mobile communications networks to and from vehicles. The antenna diversity of SCALANCE M875 improves the quality of the connection during the journey. Sensitive data can also be transferred in a secure VPN tunnel.

Condition monitoring

Wind power plants are getting bigger and bigger, and their efficiency is steadily improving. This results in ever-increasing complexity, however. Plants require continuous monitoring in order to identify the need to replace wear parts well in advance. This increases the availability of the turbines and also ensures the legally required safety level. The SCALANCE M components for mobile radio networks are particularly suitable for connecting the wind farms to a control center. They are characterized by high data rates, high levels of data security and low installation costs. Continuous condition monitoring increases availability for many other capital goods and reduces maintenance costs at the same time. Data is continuously collected and evaluated for this purpose. Environmental data such as temperature, pressure and air humidity is acquired to ensure that capital goods only operate within the specified tolerance range. Complex measuring techniques, such as spectrum analysis, are also used to determine the condition of moving parts. A number of applications demand centralized evaluation and presentation of the measured data, due to their distribution over a wide area, for example. Distributed capital goods are therefore continuously monitored and the collected data is transmitted to the control center via Remote Networks. This places high demands on the bandwidth of data transmission as well as on the environmental conditions.

Smart grid applications

Energy networks will undergo considerable change over the next few years and decades. Until now, power generation, distribution and consumption have been largely independent of each other. The base load has been supplied by large power plants, and demand peaks and dips mastered by gas-fired power stations and pump storage systems respectively. The energy networks of the future will have to respond more intelligently, largely as a result of the increasing use of regenerative energy sources. Distributor and local network stations will be automated and interconnected. The status data for the respective stations will be continuously acquired and transferred to central control desks using SCALANCE M over Remote Networks at optimum bandwidth.

Object and building monitoring

With the increasing expansion of cellular networks and the resulting higher bandwidths, new possibilities open up for centralized monitoring of security-sensitive objects, plants or buildings, either through data interfacing for access control, event-driven single-image transfer, or online surveillance by video camera.

Industrial Remote Communication

Telecontrol

- Permanent or spontaneously established connections
- Lower bandwidth requirements
- Optimized data throughput

Teleservice

- Sporadic connection establishment
- Medium bandwidth requirements

Further applications for Remote Communication
Such as video surveillance, smart grid applications, condition monitoring

- Permanent or spontaneously established connections
- Lower to higher bandwidth requirements
- Stationary and mobile applications

Remote Networks
Remote communication over private and public, heterogeneous networks

Integration in the industrial security concept

Availability	Flexibility	Bandwidth

Industrial Remote Communication:
Products for worldwide access to distant plants, remote machines and mobile applications.
Siemens offers the right solution for every application.

With SIMATIC NET, Siemens offers a comprehensive range of products for configuring Remote Networks

Security components

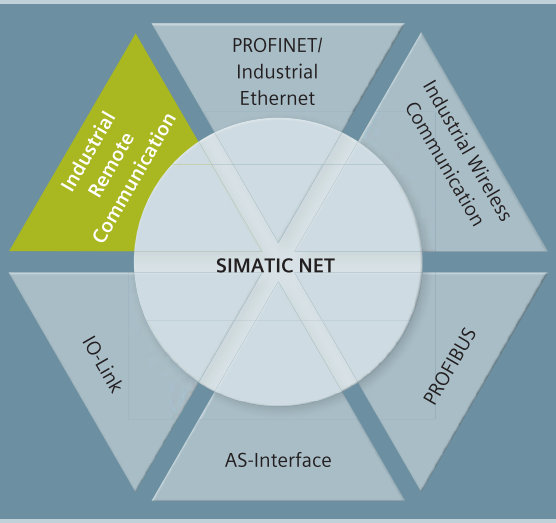
With IP-based Internet and mobile radio networks, higher security measures such as firewalls and VNP are often required. In many cases, not only company-internal Intranet connections are used, they are also supplemented with connections over DSL, GPRS, EGPRS or UMTS (3G). An extensive range of security components is available for this purpose.

GPRS/UMTS routers

These products make it possible to utilize the public cellular networks that are available worldwide. They provide a low-cost alternative to constructing your own wireless network. The new high-performance UMTS router SCALANCE M875 is characterized by a wide bandwidth, high performance and speed as well as an extended temperature range. The router is also equipped with functions for building up a secure data connection.

Industrial Ethernet network components

If local cable connections (fiber-optics) are available in addition to the public dedicated lines or telephone network, Industrial Ethernet switches of the SCALANCE X product series can be used to configure the network infrastructure. The fiber-optic variants available are ideal for large distances of up to 200 kilometers. The wireless components of the SCALANCE W product family are also available for configuring wireless LAN infrastructures. The maximum distances for these products are much lower at one to two kilometers, but within this range they offer an alternative to public cellular networks with a considerably higher bandwidth.



SIMATIC NET –
Industrial communication from Siemens

Industrial communication is a key component of high-performance automation applications. The wide portfolio of SIMATIC NET solutions that go beyond Industrial Remote Communication and Industrial Wireless Communication reflects the diversity possible: With PROFINET/Industrial Ethernet, PROFIBUS, AS-Interface and IO-Link, all areas of industrial communication are covered. Whatever the application or sector, the optimum solution is always available.

Further information

More about SIMATIC Net:
www.siemens.com/simatic-net

Information and ordering platform:
www.siemens.com/automation/mall

All you need to know about
Industrial Remote Communication:
www.siemens.com/remote-communication

Service & Support

Whether you need a service specialist or a spare part, a product expert for advice, or you simply have a question to ask, contact Customer Support – the team for your success. For support with planning and designing your project: from detailed actual state analysis and objective definition through advice on products and systems, as far as creating the automation solution. Online Support will provide all the technical information you need! Our Online Support is fast and effective – and available round the clock, worldwide and in five languages. Comprehensive information is available for accessing at any time of day over the Internet at:
www.siemens.com/automation/service&support

Note:
Appropriate protective measures including IT security such as network segmentation must be implemented to ensure safe operation of the plant. For further information on industrial security, visit:
www.siemens.com/industrialsecurity

Siemens AG
Industry Sector
Industry Automation
P.O. Box 48 48
90026 NUREMBERG
GERMANY

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