Industrial Remote Communication

Whether in factory automation, the process industry or public infrastructure sectors: Our comprehensive spectrum of products, systems and solutions for telecontrol and teleservice provide you with secure and cost-effective remote access to your widely scattered machines, remote plants, and mobile applications – regardless of their size.

Telecontrol
Involves the connection of distant process stations to one or more central control systems for monitoring and control.

Teleservice (remote maintenance/diagnostics)
Is data exchange with physically remote technical plants (machines, plants, computers, etc.) for the purpose of error detection, diagnostics, maintenance, repair, or optimization.

Further applications
The high bandwidths enabled by new transmission technologies and radio standards allow the transmission of ever greater volumes of data, including even high-resolution video clips. Using these technologies, new applications are opening up such as video transmission from trains, condition monitoring of wind power plants, smart grid management or building monitoring.

SIMATIC NET –
Industrial Communication from Siemens

Industrial communication is of central importance for high-performance automation applications. Its diversity is mirrored in the broad range of industrial communication solutions from SIMATIC NET that extends beyond Industrial Remote Communication and Industrial Wireless Communication: With PROFINET/Industrial Ethernet, PROFIBUS, AS-Interface and IO-Link, it covers all areas of industrial communication. The optimum solution is guaranteed for every application and every sector.
Telecontrol

Efficient telecontrol solutions

Industrial processes often range over large areas, even crossing national borders in some circumstances. For reliable monitoring, operators require secure and cost-effective access to their remote plants and machinery. With TeleControl Professional and TeleControl Basic, Siemens offers efficient telecontrol solutions for the most diverse applications. They allow outstations to be monitored and controlled from a central control point over a communications network.

TeleControl Basic:
For telecontrol solutions with a low level of automation; the system also supports a high number of outstations, and it is ideally suitable for controllers of the low-end performance range.

TeleControl Professional:
For extensive telecontrol solutions with a high level of automation; the system supports a host of network topologies and communication media.

Both solutions can be used independently or combined with each other.

The Siemens range encompasses a wide selection of perfectly matched system components and solutions for the control center, outstations and the network.

Our solutions for Telecontrol are based on SIMATIC, the leading automation system worldwide – and are therefore a part of Totally Integrated Automation (TIA), our open system architecture for plant-wide, uniform automation. TIA stands for the perfect interaction of all implemented components – and therefore creates a firm basis for a sustained increase in productivity.
TeleControl Basic

Reduced to the essentials

Optimal monitoring and control of outstations with small data volumes

TeleControl Basic is especially suitable for cost-effective monitoring and control of remote machines and plants, but also for connecting mobile stations using mobile wireless (GPRS). This telecontrol system is ideal for simple monitoring and control tasks, for transferring process data, and for remote diagnostics and maintenance.

Typical application areas are found in the control of process plants, the optimized operation of public facilities for water/wastewater treatment, energy distribution, and traffic monitoring, as well as in building management.

Solution blocks

TeleControl Basic for the system control center
TeleControl Server Basic is used as system control center software, functioning as OPC server to connect the HMI system (e.g. WinCC, PCS7 or WinCC flexible) with the substations. With the system control center software, up to 5,000 substations can be managed efficiently and cost effectively.

Remote stationary or mobile outstations are configured and engineered with SIMATIC STEP7 in the TIA Portal – conveniently and simply. OPC-Scout enables read/write access to the process data.

![TeleControl Basic](image)

### Application options for TeleControl Basic

<table>
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<th>Centrally controlled building management</th>
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<th>Remote monitoring of machines and automation equipment</th>
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<th>Other application options</th>
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- Traffic control systems | For example,  
- District heating networks  
- Wind power generation  
- Transformer stations  
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- Air-conditioning systems  
- Drink dispensers | For example,  
- Local public transport  
- Transportation  
- Ships on rivers and in coastal areas | For example,  
- Greenhouses  
- Level measurement in silos |
TeleControl Basic for the substations

The substations comprise a local SIMATIC S7-1200 controller that is characterized by its small and compact hardware design. Product highlights include the communications processors, e.g. the CP 1242-7 GPRS communications processor, that are available in the same design and enable reliable remote access.

SIMATIC S7-200 substations can also be connected to the system control center via an external communications processor.

The system enables both remote communication with a control center (service center), as well as direct communication between the outstations.

STEP 7 Basic V11 includes blocks for programming and configuring substations of the type SIMATIC S7-1200.

TeleControl Basic network solutions

Data is transferred wirelessly via a secure GPRS (General Packet Radio Service) connection. The CP 1242-7 communications processor makes wireless communication simple and flexible for SIMATIC S7-1200 stations. The CP is plugged straight into the SIMATIC S7-1200, and is connected to the CPU via the backplane bus.

For outstations based on the S7-200, the field proven MD720-3 serial modem is still available. The modem has an RS232 interface and is connected to the S7-200 controller using the Siemens PPI adapter.

The GPRS connection is permanently online, and reacts like a dedicated line. Data can be transmitted immediately, and the failure of a station is also recognized immediately. Although permanently connected, online time is nowadays hardly of any importance for the calculation of charges. GPRS tariffs with a guaranteed monthly data volume are becoming more established and enable long-term calculation of transmission costs. International approvals permit worldwide use.
Benefits
Highlights
The system is scalable from just a few telecontrol outstations all the way to 5,000.

Economical
• Savings in costs for constructing and maintaining your own wireless system because existing mobile wireless networks can be used in a communication system, even those from different service providers
• Favorable operating costs in the case of continuous or on-demand GPRS connections, and favorable GPRS volume tariffs

GPRS with its numerous advantages
GPRS is a global, public mobile wireless standard. The connection is permanently online, in other words, data is transferred immediately, making the failure of a station immediately detectable.

Convenient and reliable generation of alarms:
With TeleControl Basic, standby personnel can receive alarms directly via SMS messages. For this purpose, the CP 1242-7 can send a text message directly or receive one itself. A mobile phone or SIMATIC S7-1200 is the communication partner.

With integral security over the Internet
The control desk PC must be constantly accessible from the GPRS network. It must therefore be directly connected to the GPRS provider using a dedicated line, or in a lower-cost solution, permanently to the Internet, e.g. by means of DSL. In order to guarantee the required security with data transmission over the Internet, TeleControl Basic provides its own encryption. The GSM/GPRS modem then connects to the connection manager in the control center PC through a tunnel. Both partners can exchange their data securely in both directions through this tunnel. Direct communication is then possible between the stations, which would not be the case direct via GPRS. The connection manager is assigned a routing function for this purpose, i.e. it switches the data traffic between the stations through its own connection.

Wake-up function
• “Wake-up” of stations that change from standby mode to online mode for diagnostics purposes.
• The CP is woken up by its communication partner (e.g. TeleControl Server Basic) by means of a wake-up call or a wake-up text message to establish the connection between them.
• For security reasons, the communication partner must identify itself appropriately for the wake-up function, e.g. using the CLIP function.

Easily configurable
• Standard Engineering with STEP7, in other words, simple and fast programming, networking and commissioning
• Matched system components
• Easy and convenient configuration of the outstations – by multiple users simultaneously (multi-user capability)
• Remote maintenance and remote programming of the sub-stations during process operation

Teleservice function
The overall solution also includes the Teleservice function direct in STEP 7 Basic V11.0 for the CP 1242-7. In this way, internationally active plant and machine manufacturers have global access to remote machines or plants for remote diagnostics or maintenance.
Application example Agricultural irrigation

Task definition
Productive agricultural land must be irrigated automatically and efficiently, especially in the hot summer months.

Solution
The outstations of the irrigation system with the water valves each consist of a local SIMATIC S7-1200 controller with CP 1242-7 communications processor. The communication connection to the system control center is via GPRS. The entire irrigation system is controlled and monitored efficiently via the system control center with SIMATIC WinCC and TeleControl Server Basic.

Benefits
In contrast to the use of simple timers, irrigation can be carried out on-demand using a telecontrol solution based on TeleControl Basic. For this purpose, regional meteorological data is recorded and transmitted to the system control center via the TeleControl Server Basic software and secure GPRS connections.

There, a SIMATIC WinCC system processes the measured values, and automatically calculates the most suitable irrigation program for the current conditions. Reliable actual values from the urban area can be supplied by electromagnetic flow meters or pressure transducers – also from the Siemens portfolio.

A system like this is open to expansion by up to 5,000 outstations.
TeleControl Professional
Keeping extensive process plants under control from a distance

Siemens offers TeleControl Professional for fully automatic, efficient monitoring and control of remote process plants. The system connects local SIMATIC S7-300/-400 controllers with one or more process control centers on the basis of WinCC, PCS7, WinCC OA (Open Architecture) or third-party control systems via OPC. In oil and gas pipelines, the outstations and metering stations are frequently over a thousand kilometers away from the central plant or control center. A similar situation exists in the water supply and waste water treatment sector, in power generation and distribution, and in district heating supply. Telecontrol and remote monitoring of such widely spread process engineering plants depends on fast and flexible data communication, as well as maximum possible data security. TeleControl Professional is ideally suited to demanding SCADA (Supervisory Control and Data Acquisition) concepts. It has a modular design and can thus be used flexibly in accordance with the customer’s requirements.

Any combination of networks in the same project

Networking of the system control center with the outstations is carried out by means of a WAN (Wide Area Network). TeleControl Professional supports the most diverse network types and operating modes – including IP-based networks:

- Dedicated lines (copper and fiber optic cables)
- Private wireless networks
- Dial-up networks (analog, GSM)
- Ethernet wireless
- Industrial Wireless LAN (IWLAN)
- Fiber-optic conductors, e.g. through the use of SCALANCE X switches with optical ports – distances of up to 200 km can then be covered
- Public networks and the Internet using DSL, (E)GPRS, or UMTS

The networks can be optimally adapted to prevailing local conditions. TeleControl Professional allows the configuration of flexible network topologies (star, linear bus, and node topologies – or any combination of these). In addition, redundant couplings can also be implemented.

<table>
<thead>
<tr>
<th>Water</th>
<th>Oil</th>
<th>Gas</th>
<th>Energy</th>
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</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Water Pipe" /> For example,</td>
<td><img src="image2.png" alt="Oil Pipeline" /> For example,</td>
<td><img src="image3.png" alt="Gas Line" /> For example,</td>
<td><img src="image4.png" alt="Energy Plant" /> For example,</td>
</tr>
<tr>
<td>Drinking water supply</td>
<td>Drilling fields</td>
<td>Gas pipelines</td>
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</tr>
<tr>
<td>Water pipelines</td>
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<td>Wastewater treatment plants</td>
<td>Oil pipelines</td>
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</tr>
<tr>
<td>Sewage systems</td>
<td>Product pipelines</td>
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<tr>
<td>Storm-water overflow tanks</td>
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</tbody>
</table>

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Transmission protocols

Possible telecontrol protocols include the field-proven SINAUT ST7 protocol, the open DNP3 protocol, and the standardized IEC 60870-5 protocols.

Data security

Comprehensive measures to prevent data corruption and loss are essential components of the TeleControl Professional system. The telecontrol protocols guarantee that data reaches the partner uncorrupted. Each transmission module has a large buffer for several thousand data frames. Downtimes in the transmission link can then be bridged. Special IP-based networks are protected through dedicated VPN solutions/firewalls.

Fully automatic time stamp

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 changeover.

Fast and versatile data communication

Communication is event-controlled. Operators are therefore quickly provided with alarms, statuses and values from the process, and they can influence process control by entering commands or setpoints at any time. Parallel to this, important events can be sent to a mobile phone by text message – if required also with a direct acknowledgment to the sending station. Direct data exchange between the process stations is also possible.

Simple and cost-effective engineering

TeleControl Professional facilitates an integrated communications concept (TIA) and complete integration into the SIMATIC environment. The STEP 7 engineering system based on SIMATIC tools permits graphic configuration of complete communications networks, multiple addressing of process data, validity checks, and address comparisons.
TeleControl Professional

Keeping extensive process plants under control from a distance

Remote programming and remote diagnostics

Program modifications or remote diagnostics are easy to carry out in the communications network both in the commissioning phase and during operation, even without interrupting ongoing process data communication. This saves traveling times and maintenance visits.

Solution blocks

TeleControl Professional for the system control center

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.

A number of different variants can be selected as components of the central control center:

SINAUT ST7cc
- Program package based on WinCC
- Ideal for SINAUT ST7
- Can be designed as a single system or a redundant system
- Supplies the archives provided in WinCC with process data in accordance with the supplied time stamp of the outstations – and is also capable of interfacing to sector-typical logging systems (necessary for data archiving)
- Uses the same communication blocks as the lower-level telecontrol system for configuration. In other words, system-wide object-based communication, from the sensors in the process up to the screen contents and databases of the control system, saves time and costs.

SIMATIC PCS 7 TeleControl and SIMATIC WinCC TeleControl
- Based on WinCC and PCS 7, with added telecontrol interfaces
- Ideal for plants in which larger local automation tasks have to be combined with telecontrol interfaces
- SINAUT ST7, DNP3 or IEC 60870-5 protocols
- The engineering system is based on DBA (Data Base Automation) technology and has an extensive block library that also allows third-party telecontrol stations to be connected

Uniform process control for central and remote units

Connection to third-party control systems

Using the SINAUT ST7sc program package with the OPC interface, the Telecontrol stations with SINAUT ST7 can also be linked to control systems from other vendors. ST7sc has complex buffer mechanisms which prevent data loss, even if the OPC client fails. All process data is delivered with a time stamp, and configuration of the OPC interface is extremely user-friendly.

Telecontrol stations with DNP3 can be connected to any control systems, provided they are equipped with a DNP3 master interface. Telecontrol stations based on the SIPLUS RIC (Remote Interface Control) telecontrol system can be connected to any control systems equipped with interfaces that comply with the IEC 60870-5 standard.
TeleControl Professional for the substations

The substations for the TeleControl Professional system are based on SIMATIC S7-300 and S7-400. TIM (Telecontrol Interface Module) communication modules handle the data traffic here via the relevant communication network, and enable reliable transmission of the control and process data. Either the field-proven SINAUT ST7 protocol or the open DNP3 protocol can be used as the communication protocol. The TIM is mounted in a SIMATIC S7-300 housing.

Highlights of the TIM communication modules

- Data frame buffer for continuous recording of data including time stamp on the TIM if the communication path is faulty or a partner has failed, and to reduce connection costs for the dial-up network
- Simple configuration and operation without specialist IT knowledge
- IP communication via encrypted connections
- Flexible option for connection to any IP-based or conventional WAN
- Favorably priced station design

<table>
<thead>
<tr>
<th>TIM version</th>
<th>TIM 3V-IE</th>
<th>TIM 3V-IE Advanced</th>
<th>TIM 3V-IE DNP3</th>
<th>TIM 4R-IE</th>
<th>TIM 4R-IE DNP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIM for the control room</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>TIM for the outstations</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Data buffer</td>
<td>up to 16,000 frames</td>
<td>up to 32,000 frames</td>
<td>up to 50,000 data points</td>
<td>up to 54,000 frames</td>
<td>up to 200,000 data points</td>
</tr>
<tr>
<td>Controller</td>
<td>S7-300 S7-300F</td>
<td>S7-300 S7-300F</td>
<td>S7-300 S7-300F</td>
<td>S7-300 / S7-300F S7-400 / S7-400F PC</td>
<td>S7-300 S7-400 / S7-400F S7-400H</td>
</tr>
<tr>
<td>Interfaces</td>
<td>RS232 / Ind. Ethernet (RJ45)</td>
<td>RS232 / Ind. Ethernet (RJ45)</td>
<td>RS232 / Ind. Ethernet (RJ45)</td>
<td>2x serial (RS232, RS485) / 2x Ind. Ethernet (RJ45)</td>
<td>2x serial (RS232, RS485) / 2x Ind. Ethernet (RJ45)</td>
</tr>
<tr>
<td>SIPLUS RIC bundles:</td>
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</table>

Flexible connection option for external modems to every IP-based or classic network via different interfaces. The TIM 4R-IE version makes four transmission paths possible. These can all be different and operated independently of one another, but also in any redundant combination.

DNP3 version for TIM 3V-IE and TIM 4R-IE

The DNP3 versions are specially available for the outstations of the plant. They allow connection of the S7-300 or S7-400/-400H outstations to a control center with DNP3 master interface, e.g. PCS 7 and WinCC.

SIPLUS RIC bundles:

- SIPLUS RIC offers substations for the TeleControl Professional system. This allows substations to be established on the basis of SIMATIC for the telecontrol protocols IEC 60870-5-101, -103, -104. The SIPLUS RIC bundles generally comprise:
  - CPU
  - Interface/communication module
  - Memory Card
  - CD with library and license
**TeleControl Professional**

Keeping extensive process plants under control from a distance

**Application examples: Drinking water supply**

**Task definition**
The entire water supply for a community has to be monitored and controlled in one integrated system. The following plants have to be networked here:

- Water procurement: wells and pumping stations
- Water supply: elevated tanks, water towers
- Water treatment plants

**Solution**
All process stations are controlled locally by a SIMATIC PLC which also contains a TIM module for the telecontrol connection to the control centers. The stations are connected redundantly via the public telephone network (MD2 modem) and GPRS (MD741-1 GPRS router). The GPRS router is connected to the local TIM module via an Ethernet interface and provided with a GSM antenna.

The WinCC human machine interface system, supplemented by the SINAUT ST7cc program package is used in the central water plant. This, in combination with the central telecontrol modules, handles the data traffic with the stations. The data acquired in the stations is presented in individual process images or in message lines. Important process information is archived in accordance with the accompanying time stamp. Operators can directly intervene with the process using control commands or setpoint inputs, e.g. switch pumps on/off or activate gate valves.

The SCALANCE S security component guarantees secure communication without unauthorized access from outside.

**Benefits**
- Efficient and secure control of the entire drinking water supply system
- High level of security and fault tolerance of the communication network thanks to a redundant communication link
- Increased supply reliability with simultaneous reduction in operating costs

**Other application examples:**
These or similar applications are also conceivable in the wastewater sector: in wastewater treatment plants and sewage systems, for example. Even water pipelines can be monitored using TeleControl Professional.
Application example: Oil production

Task definition
In a widely distributed oilfield, oil is to be obtained from the earth using water injection procedures, and pumped through pipeline systems to a terminal. The injection equipment as well as more than 100 wellheads have to be monitored and controlled. A requirement is that pressures, temperatures and flows are measured on site and that functions can be derived from these values to control the exploitation and transportation processes, e.g. by opening and closing valves or by switching pumps.

Solution
All process stations are controlled locally using a SIMATIC PLC. Integration into the remote monitoring and control system is through the TIM modules and serially connected wireless devices. All stations are scanned from the telecontrol master station in polling mode over the radio system, and the modified production data transmitted to the control center. The central TIM module receives the time from the GPS receiver, and uses it to synchronize the complete telecontrol system. All data are made available to the control system by the SINAUT ST7sc program package. Operators are able to track each individual process station, or to intervene in the local process using control commands.

Benefits
• Safe monitoring and control of the complete oil exploitation process
• Effective use of transportation capacities
• Preventive maintenance through recording and transmission of machine runtimes

Other application examples
Similar system solutions are also used in the gas and energy sectors: in gas pipelines, gas preparation and supply, district heating supply, or power distribution.

![Water injection](water_injection.png) Water injection procedures for extracting crude oil
Remote Networks

Versatile telecontrol connections

Modems and mobile wireless components for the industrial environment establish the communication link between one or more control centers and the substations.

Siemens offers a complete range of products and solutions, including accessories, based on private dedicated lines, dial-up networks, or IP-based networks like DSL, (E)GPRS and UMTS.

Modems/mobile wireless components in detail

MD2 dedicated-line modem
- For point-to-point or multipoint connections on dedicated copper cables
- Can also be used as a repeater
- Max. 19,200 bps

MD3 dial-up modem
- For the analog telephone network
- Also suitable for use as a dedicated-line modem for point-to-point connections
- Max. 33,600 bps

MD720-3 GSM/GPRS modem
- Mobile wireless modem with RS 232 interface
- Supports the GSM services CSD (circuit switched data), SMS and GPRS
- Use: Data transmission via GPRS, sending of SMS; can be switched to CSD for remote maintenance (incoming call only)

IP-based communication

Connection of local networks by means of IP communication via WAN offers fast and mobile access for industrial remote communication or telecontrol applications.

IP-based communication provides greater availability of the remote link and a higher bandwidth of the data volumes to be transferred. This also enables the transfer of mass data or images. In addition, several terminal devices can be accessed in parallel. The use of these networks, however, requires the implementation of enhanced security measures (firewall, VPN). Siemens offers an integrated security concept including all the necessary accessories.

GPRS/UMTS components in detail

MD741-1 GPRS router
- Mobile wireless router with RJ45 interface
- Supports the GSM service GPRS
- Uplink: up to 118 kbps
  Downlink: up to 237 kbps
- High level of security thanks to integrated VPN router (IPSec) and firewall
- Use with TeleControl Professional, Teleservice and in other applications such as data transfer to mobile stations.

SCALANCE M873
- UMTS router (HSDPA), EGPRS, GPRS
- Uplink: up to 384 kbps
  Downlink: HSDPA up to 3.6 Mbps
- 1x antenna connection
- 1 x RJ 45 port with 10/100 Mbps
- Use with TeleControl Professional and Teleservice (remote maintenance and remote diagnostics)
**SCALANCE M875**

- UMTS router (HSDPA + HSUPA), EGPRS, GPRS
- Uplink: HSDPA up to 5.76 Mbps
  Downlink: HSDPA up to 14.4 Mbps
- Significantly shorter transfer times thanks to increased uplink bandwidth with HSDPA, and therefore suitable for broadband multimedia applications
- 2x antenna connection (antenna diversity) for more robust wireless transmission, even at higher data transfer rates
- VPN with IPsec
- 2 x RJ 45 port with 10/100 Mbps
- The extended temperature range of -30 °C to +75 °C enables use of SCALANCE M875 in outdoor applications
- Thanks to integral security functions in accordance with the Industrial Security concept (firewall and VPN with IP-Sec), SCALANCE M875 enables the protected connection of distributed automation cells
- Railway approval (EN 50155, e1/E1)
- Use with TeleControl Professional, Teleservice (remote maintenance and remote diagnostics) and in other applications such as video monitoring

**SCALANCE M – Designed for Industry**

- Low investment and operating costs for operator control and monitoring of wirelessly connected substations
- Reduction in traveling costs and personnel costs due to remote programming and diagnostics via mobile wireless networks
- Suitable for applications in the industrial and semi-industrial sector thanks to design and electrical properties
- User-friendly diagnostics via Web interface
- High degree of security due to integrated firewall
- Easy planning and commissioning of substations without special wireless expertise
- Suitable for use worldwide (note national approvals)

**SIPLUS extreme**

All modems and mobile wireless components (with the exception of SCALANCE M) are also available in SIPLUS extreme versions for extreme applications and environmental conditions.
Remote Networks

Versatile telecontrol connections

Use of SCALANCE X, SCALANCE W und SCALANCE S Standard Ethernet components

Industrial Ethernet components from the comprehensive SIMATIC NET product range are the obvious choice for establishing IP-based networks.

The fiber optic versions of the SCALANCE X Industrial Ethernet switches are especially suitable for transmission across long distances. Industrial switches are available in different enclosure designs and for distances up to 200 km.

The components of the SCALANCE W product family are eminently suitable for wireless connection via standard wireless systems based on Industrial Wireless LAN (IWLAN).

SCALANCE S components are used for optimal security in communication networks, allowing up to 128 VPN connections to be established simultaneously.

Special feature of GSM/GPRS/UMTS as a component part of Industrial Wireless Communication (IWC)

The modems and routers supplement the Siemens range of reliable, rugged and secure components for wireless communication. With Industrial Wireless LAN (IWLAN), increased system flexibility is achieved, service and downtimes are minimized, and processes can be structured significantly more efficiently. The primary benefit of wireless solutions is the simple and flexible availability of mobile stations that are difficult to access.
Telecontrol

Accessories

**ANT 794-4MR antenna (6NH9860-1AA00)**
- Omnidirectional, stationary quad-band antenna for GSM 850, 900, 1800, 1900 and UMTS 1900
- Shielded installation in the indoor and outdoor area
- Including 5m low-loss connecting cable permanently connected to the antenna
- For connecting to the following mobile wireless devices: MD720-3, MD 741-1, SCALANCE M873, SCALANCE M875

**ANT 794-3M antenna (6NH9870-1AA00)**
- Tri-band flat panel antenna for GSM 900, 1800, 1900 MHZ
- Shielded installation in the indoor and outdoor area
- Including 1.2m low-loss connecting cable permanently connected to the antenna
- For connecting to the following mobile wireless devices: MD720-3, MD 741-1

**LTOP overvoltage protection**
- An LTOP limits noise voltages and overvoltages on copper dedicated lines to a harmless level.
- The floating transformer additionally provides electrical isolation, and the transfer of voltages to other cable sections are therefore prevented.
- LTOP protects personnel and investments, and is therefore an essential safety element in private dedicated-line networks.

**Line transformer**
The quad transformer allows a star connection of up to four point-to-point or line connections (two-wire in each case), or a combination of these two network topologies, in a telecontrol master station.

**Connecting cables**
A number of standard cables are available for connecting telecontrol components to each other or to the respective WAN. Some of these connecting cables are already included with the hardware components, others can be ordered as required.
Telecontrol

IP-based communication opens up new application areas

Use in multimedia, e.g. video transmission via the mobile wireless network, video surveillance

These projects are characterized by permanently high bandwidth. For example, showing television programs to provide passengers with continual information in local public transport systems, or video monitoring on trains to guarantee passenger safety. Depending on the sensitivity of the applications, security and integrity must be guaranteed by suitable encryption of the data to be transmitted.

Benefits

- Video transmission in real time for enhanced passenger safety (video surveillance)
- Data connection for ticket machines, infotainment services, and Internet onboard
- Proactive monitoring of vehicle technology (telemetry)

Note:
With plant networking, suitable protective measures (including IT security such as network segmentation) must be taken to ensure safe operation of the plant. For more information on the topic of industrial security, go to www.siemens.com/industrialsecurity.

Migration –
The investment in the future

Migration strategy

Many systems and plants have to be expanded and modernized to ensure that companies can also satisfy tomorrow’s market requirements. However, since the installed basis of hardware, application software and know-how of the operating and maintenance engineers represents an enormous value, the safeguarding of investments for companies operating the plants is always assigned a high priority.

The success of migration is decisively determined by the provision of a technical solution optimally matched to customer requirements and the respective plant. The technical and financial risks must be minimized here and investments must be safeguarded for as long a period as possible.

Therefore Siemens considers its task to be close cooperation with customers and their system integrators to elaborate an individual and future-oriented solution based on the state-of-the-art TeleControl Basic und TeleControl Professional systems – always under the directive:

- Step-by-step system innovation
- Adaptable to the special conditions of the plant
- Flexible according to production demands

Central monitoring center

Control center

Temperature

Industrial Ethernet

VPN tunnel

Internet

Provider APN

UMTS

SCALANCE S612

SCALANCE X204-2TS

SCALANCE M875

SCALANCE X204-2TS

IP camera

IP camera

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Typical migration scenarios

A wide range of migration scenarios is possible depending on the specific technical and economical factors of a migration project. Telecontrol products offer the modularity and flexibility required for converting such scenarios.

Scenario 1: Replacement of existing HMI system by a WinCC/PCS 7 control center

If the HMI system is technically antiquated or too expensive with respect to spare parts, no longer complies with current directives and standards for operator workstations, or if functional expansions are required, it is relatively simple to replace the existing HMI system with a new SIMATIC WinCC or PCS 7 system, thus permitting adaptation to current demands. Telecontrol stations, process I/O, and application software are retained.

- Minimum costs
- Manageable risk
- Extension of service life of complete plant
- New application options
- Open system for the IT world

Scenario 2: Expansion of an existing plant

The existing plant is initially retained, and is modernized by supplementing with additional sections/units with SIMATIC S7.

- Simple, step-by-step expansion of plant capacity
- Manageable risk
- Introduction of new technologies (e.g. HMI, Industrial Ethernet, DSL, (E)GPRS, UMTS, wireless connections, direct communication)
- In conjunction with scenario 1, permits process control using a uniform HMI system

Scenario 3: Comprehensive modernization

Bottlenecks in the supply of spare parts, insufficient support, or the necessity for functional expansions can also force comprehensive modernization of the old system using the future-oriented telecontrol systems TeleControl Basic and TeleControl Professional in conjunction with SIMATIC control systems. Conversion may also be possible without interrupting operation. Further use of the existing I/O level is supported, and the investments made for wiring, hardware components or application engineering are safeguarded.

- Increase in performance
- Introduction of new technologies (e.g. HMI, Industrial Ethernet, DSL, (E)GPRS, UMTS, wireless, direct communication)
- Open system for the IT world
- Extension of service life of complete plant
- Reduction in number of system suppliers
- Elimination of bottlenecks and dependencies

With future-oriented telecontrol systems, innovative migration solutions and services, extensive know-how in process automation and migration, as well as the provision of permanent global service, Siemens proves its competence and offers the security of a reliable partner.
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