Efficient telecontrol with SINAUT
Modular, flexible, secure.
SINAUT Telecontrol

SINAUT Telecontrol (Siemens Network Automation) is based on SIMATIC. It supplements the SIMATIC system with corresponding hardware and software, and permits networking of individual components over a WAN (Wide Area Network).

Under the generic term WAN, the SINAUT system offers solutions for data transmission over classical WAN, such as copper dedicated line, telephone network, radio etc., but also over modern, IP-based WAN, such as broadband systems or the Internet.

To cover the different requirements, SINAUT Telecontrol has two independent systems:

- **SINAUT MICRO**
  Simple telecontrol system for monitoring and control of distributed plants using mobile radio communication (GPRS) on the basis of SIMATIC S7-200 and WinCC flexible or WinCC.

- **SINAUT ST7**
  Versatile telecontrol system on the basis of SIMATIC S7-300, S7-400 and WinCC/PCS 7 for fully-automatic monitoring and control of distributed process stations which exchange data between each other and one or more control centers using many different WAN media.

Although SINAUT ST7 and SINAUT MICRO are independent systems, they can be combined together in one plant. The combination is implemented in the control center’s PC.
Applications

SINAUT has proven itself in small plants with only a few stations but also in complex networks with many hundred stations.

■ Safe supply of private and industrial consumers with drinking water, gas or district heating over branched networks
■ Economical transportation of gas, oil or oil products through pipelines
■ Reliable recording and transmission of process data from environmental monitoring systems
■ Remote monitoring of wastewater systems
■ Control and monitoring of beacons, unit-type district heating power stations, conveyor systems or traffic systems
■ Networking of mobile stations such as track vehicles, public transport or ships if central monitoring and/or control is required for them.
SINAUT MICRO

SINAUT MICRO is appropriate where smaller amounts of data have to be transmitted to permit monitoring and control of remote stations using wireless techniques with the GPRS service of the GSM mobile radio network. Both stationary and mobile stations are easy to link to a master control center without radio know-how. 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, the online time is nowadays hardly of any importance for the calculation of charges. Tariffs based on data volume – which are becoming increasingly common with GPRS – limit the costs to the actually transmitted volume of information.

The SINAUT MICRO based on SIMATIC S7-200 offers the MD720-3 GSM/GPRS modem and the SINAUT MICRO SC software package. The software contains blocks for the S7-200 PLC with which data transmission and reception are easy to configure. The package for the control center PC contains a connection manager responsible for the connection between the control center and up to 256 S7-200 stations, and also an OPC server. The latter permits data exchange with an OPC client, e.g. WinCC or WinCC flexible, or with any other modern control center software which supports the internationally recognized OPC standard. If more than 256 stations are present, several OPC servers can be combined under one OPC client.

Convenient and reliable generation of alarms

For alarming the on-call service personnel, the additional package “Alarm Control Center Micro Edition” is recommended. Alarms that are received from the OPC server of the SINAUT MICRO SC can be transferred to up to four recipients (mobile phone, fax or printer).

The person responsible in accordance with the shift plan is always directly informed. If this person does not acknowledge the alarm in time, multi-level escalation management ensures that an alternative recipient can always be informed.

Securely over the Internet with integral VPN

The control center PC must be permanently accessible from the GPRS network. It is therefore directly connected to the GPRS provider over a dedicated line or, as a cheaper solution, permanently to the Internet, e.g. using DSL. In order to guarantee the required security with data transmission over the Internet, SINAUT MICRO provides its own VPN (Virtual Private Network). The GSM/GPRS modem then connects to the connection manager in the control center PC through a VPN tunnel. Both partners can exchange their data securely in both directions through this tunnel. This also allows cross connections between the stations, which is not possible directly with 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 VPN.
**Data communication**

The SINAUT MICRO SC software package includes a block library for the SIMATIC S7-200 PLC. Using these blocks and the MICRO SC software for the PC control center, users can implement the following types of data exchange:

*Data exchange between telecontrol station and control center*

*Data exchange between two telecontrol stations via the control center*

*Access to the S7-200 PLC per Teleservice*

Up to three telephone numbers can be saved on the SINAUT MD720-3 modem, from which a teleservice connection is permissible. If a call is made from one of the approved numbers, the MD720-3 interrupts the GPRS connection and provides the Teleservice connection to the PLC. The GPRS connection is re-established at the end of the Teleservice session.
The SINAUT ST7 telecontrol system is recommended for all applications where remote process stations are used connected to one or more control centers. SINAUT ST7 is based on the SIMATIC S7-300 and S7-400 systems as well as on WinCC/PCS 7. For communication over WAN, it supports these systems with the required hardware and software components. Versatility and modularity – both in the design of the process stations and in the selection and combination of the available networks and transmission paths – are two of the decisive advantages of this telecontrol system.

**Data communication**
Communication with SINAUT is event-controlled. Operators are therefore quickly provided with alarms, stati and values from the process even with narrowband networks or a large number of connected stations, and can influence the process control by entering commands or setpoints at any time. Parallel to this, important events can be sent to a mobile phone by SMS – if required also with an acknowledgment to the sending station. Direct data exchange between the process stations is also possible.

**Transmission networks**
SINAUT ST7 demonstrates its enormous versatility in the selection of the transmission network. In the classical WAN sector, these are:
- Dedicated lines (private or leased)
- Private radio networks (optionally with time slot procedure)
- Analog telephone network
- Digital ISDN network
- Mobile radio network (GSM)

With the exception of the private radio networks, SINAUT ST7 offers suitable modems for all classical WANs.

In addition to the use of these classical networks, SINAUT communication is also possible over IP-based WANs, namely:
- Via radio, by using special radio systems optimized for Ethernet, e.g. the network components of the IWLAN system SCALANCE W
- Via fiber-optic cables, e.g. by using the SCALANCE X switches with optical ports. Distances of up to 70 km can then be covered, or also in association with transmission systems such as PCM30 or OTN
- Via public networks and Internet using DSL and/or GPRS

All networks can be mixed in any manner in a SINAUT project. Star, line and node topologies can be designed, and also mixed configurations of these. A station can be linked to two transmission paths for redundant data transmission. The two paths can be of the same type or also different, e.g. dedicated line combined with telephone network or ISDN with DSL.

**Data security**
Comprehensive measures to prevent data falsification and loss are important components of the SINAUT ST7 system. The SINAUT ST7 telecontrol protocol guarantees that data reach the partner uncorrupted. To avoid data loss, each SINAUT ST7 TIM communications module has a large memory for several thousand data messages. Failure times in the transmission link or communication partner can then be covered. This memory is also an advantage for dial-up networks: The data connections which are otherwise required are reduced to a minimum.
Time synchronization

To enable subsequent and correct archiving of process data in the control center system, all data messages are already assigned a time tag at their place of origin. The complete network is automatically synchronized (controlled by DCF77 or GPS), including summer/winter time switchover.

SINAUT ST7cc control center system

The standard SINAUT control center is based on WinCC/PCS 7 which is expanded with the software SINAUT ST7cc. This processes the communication with the SINAUT stations. It supplies the archives with process data in line with the provided time stamp, and is also able to link sector-typical logging systems such as ACRON. The additional package “Alarm Control Center” is recommended for alarming the on-call service personnel over SMS, fax or e-mail. In order to increase the availability, the control center can also be designed as a redundant system in conjunction with the WinCC/PCS 7 redundancy package.

Linking of third-party control systems

Using the SINAUT ST7sc program package with the Data Access OPC interface, the SINAUT ST7 stations can also be linked to control systems from other vendors. ST7sc possesses 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 the configuring of the OPC interface is also simple and user-friendly. Depending on the required availability, SINAUT ST7sc can be linked to redundant or non-redundant clients.

Engineering

The engineering system based on SIMATIC tools permits graphic configuration of complete communications networks. The system automatically provides the configuration engineer with all possibilities of linking the individual PLCs. Also possible: multiple addressing of process data, for example to several control centers or stations. Plausibility checks and address comparisons help when configuring complex networks.

Remote programming and diagnostics

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

Future-oriented and economical

SINAUT ST7 is a telecontrol system produced on the basis of the SIMATIC S7 automation system, which resumes the successful properties of the previous SINAUT ST1 system based on SIMATIC S5, while continuing to evolve. The consistent use of the SIMATIC platform guarantees the long service life and economy of plant investments, and guarantees compatibility with previous and future systems.
Network solutions

Control center

SINAUT ST7cc

SINAUT ST7sc

S7-300 / C7

TIM 3V-IE

Adv.

S7-400

Node station

S7-300 / C7

TIM 3V-IE

Adv.

S7-400

stations

S7-400

S7-400

S7-400

S7-400

S7-400

S7-400

Optional local extension on all levels with additional SIMATIC components, e.g.:

Field devices (e.g. ET 200S, ET 200pro)

Operator control & process monitoring systems (e.g. SIMATIC HMI)

Drives (e.g. SINAMICS)

Measuring technology (e.g. SITRANS)

Industrial Ethernet (LAN, e.g. FO) and IP-based networks (WAN, e.g. DSL, GPRS, Internet)

Classical WAN (dedicated line, dial-up network, radio network)

Optional connection to Industrial Ethernet and IP-based networks

Optional connection to classical WAN

MPI-Bus

Network solutions with SINAUT ST7
Telecontrol networks

Telecontrol networks are usually inhomogeneous networks. Interfacing of the process stations to a telecontrol master station or to a control center system is usually over different types of network and not over a uniform communications medium. The SINAUT system is configured to combine many different transmission networks in a project, and to permit communication within the complete system independent of interfacing modes and gateways.

Dedicated lines

The classic copper dedicated line (communications cable with copper cores twisted in pairs) is still one of the most frequently encountered types of private dedicated lines. Using the SINAUT dedicated line modem, point-to-point connections as well as line and star network topologies can be implemented without problems. A distance of up to 34 km can be covered without amplification. Larger distances can be achieved using the modem as a repeater.

If a fiber-optic cable is present instead of a copper dedicated line, Industrial Ethernet technology is appropriate as the communications medium, for example the SCALANCE X switches for FOC. Distances of up to 70 km can be covered, and the same network topologies can be implemented as with copper dedicated lines. In addition, ring topologies are possible with a correspondingly higher security against cable interruptions.

The advantage of dedicated lines is the permanent accessibility of the process stations connected. Any data, events or alarms are transmitted immediately, and failures of stations or connections are rapidly detected and indicated to the operators. Furthermore, private dedicated lines offer a maximum degree of security since they are not publicly accessible.

Dial-up networks

If dedicated lines are not available, one can consider the use of a dial-up network. This is usually an analog or ISDN telephone connection, but GSM mobile radio networks can also be used for data transmission with a dial-up connection. However, since these are charged connections, data transmission must be optimized with regard to connection frequency and duration. Important information such as alarms requires immediate transfer, other information should be collected and transferred bundled once or several times a day. Of decisive importance is the addition of a time tag in the process station to ensure that the data can be saved correctly in the control center’s archive.

SINAUT ST7 offers corresponding modems for all dial-up networks. The TIM communications modules enable the buffering and cost-optimized transmission of data.
Network solutions

**DSL and GPRS**

A dial-up connection can, of course, only be used if the process permits a discontinuous connection. If a dial-up connection exists, but a continuous connection is required, a DSL connection may be the cost-effective alternative. If DSL is not available for the telephone connection, but GSM mobile radio with a sufficient field strength is available, a GPRS connection can be considered as an alternative.

Since DSL and GPRS connections are over the Internet, appropriate security measures must be taken. These are either made available as services by the respective provider, or the user provides appropriate protective measures himself, e.g. using the SCALANCE S security module or MD740-1 GPRS router with VPN function.

**Radio networks**

If none of the above-mentioned media is available, data transmission must be implemented using a private radio network. Radio sets are mostly used for normal serial communication. Depending on the country and region, there are licensed and license-free frequency bands which can be used for data transmission. The range of such radio systems can be up to 50 km or even more depending on the frequency and permissible output power, which usually requires visual connections to the individual stations or repeaters must be used.

The use of wireless LAN technology, e.g. the IWLAN components of the SCALANCE W system is appropriate for the local range. SCALANCE W can be used to implement redundant or non-redundant radio links up to a distance of several kilometers (visual connections necessary). In addition, further Ethernet radio sets are available on the market for lower transmission rates and larger ranges.

**SINAUT ST7 with SINAUT MD740-1: secure GPRS networking with mobile radio and Internet**
The control center

The standard SINAUT control center is based on the WinCC operating and monitoring system as well as on the PCS 7 process control system. Both systems can communicate with the plant subsystems over local broadband networks (Industrial Ethernet, PROFIBUS) or – in the case of long distances – over telecontrol networks. The SINAUT ST7 telecontrol system is adapted to the characteristic properties of the networks and is compatible with a great number of different transmission media. The system is therefore able to use billable connections in a cost-optimized manner or to hold data in a local buffer complete with a time stamp when links are temporarily disturbed or not always available for cost reasons, e.g. in case of a dial-in connection.

The interface between SINAUT and WinCC or PCS 7 is the SINAUT ST7cc software. It is directly installed on the WinCC/PCS 7 server or, in case of redundant servers, on both servers of a server pair. SINAUT ST7cc provides the control center system with a process image that contains the data received from the connected stations. Operator inputs are forwarded to the responsible instance that ensures their reliable transmission to the target station.

Time stamped data for entry in the archive is transferred from ST7cc to WinCC/PCS 7 via tag management. The process control system then enters it in the archive in accordance with the accompanying time stamp. Analog value and counter archives are, however, frequently compressed. For analog values, for example, the values are averaged over certain periods and for counter archives, hourly values or daily values are often required. Compression is not possible for an archive until all the values have been received for the respective compression period. SINAUT ST7cc performs this task and, bypassing tag management, it enters these values directly into the WinCC/PCS 7 archive.

For stations in which a large volume of buffered data is expected (e.g. in dial-up networks), ST7cc supports a prioritizing general request. The operator can use this to instigate an immediate transfer of the current process image from the station even when older process data is stored in the data buffer of the station. The buffered data is not transferred until after the current data has been transferred. As this is older information, ST7cc bypasses the process image to ensure that it is directly entered in the control center archive for analog or counter values and alarm logging.

If one of the two redundant servers fails or is switched off, ST7cc ensures consistent data synchronization following a restart. This comprises all the information that was received during the downtime, also the data whose time stamps precede the downtime but were received during the failure.

Instead of WinCC/PCS7, any other control center software can be used if this is configured as an OPC client. The SINAUT ST7sc software package as an OPC server is then used as the software interface between SINAUT and this control center. Data is transferred using the OPC standard “Data Access”. This interface represents an overwriting process image, so data for the OPC client can be lost. SINAUT ST7sc therefore features extensive buffer mechanisms which prevent data from being lost, e.g. if the OPC client fails. Direct archive entries in accordance with the accompanying time stamp, time-based archive compression and data update without gaps following failure of a redundant partner is, however, not possible in this arrangement and must be executed by the OPC client.
Solution examples – water/wastewater industry

Task definition
The complete water supply in a municipality as well as all wastewater plants are to be monitored and controlled in a common system. Wells and pumping stations must be networked for the water procurement, corresponding water treatment plants, pumping stations and high-level tanks must be incorporated for the water supply. The wastewater network consists of various measuring stations within the sewage system, several rain overflow basins and the central sewage treatment plant. Furthermore, wastewater must be pumped from lower-lying locations to the central sewage treatment plant using lifting and conveying equipments. The complete system is to be monitored and controlled from two control centers, one in the drinking water plant and one in the sewage treatment plant.

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 mainly linked using private dedicated lines (telecommunications cables), for which the SINAUT MD2 modem is used. Several more remote well stations and a number of high-level tanks are accessed using GPRS. The MD740-1 GPRS router is connected to the local TIM module over its Ethernet interface and provided with a GSM antenna.

The WinCC HMI system is used in the central waterworks and the PCS 7 process control system is used in the central wastewater treatment plant for both HMI tasks and process control of the wastewater treatment plant. Both process control systems are redundantly configured and are additionally equipped with the SINAUT ST7cc program package. This, in combination with the central telecontrol modules, processes 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.

Benefits
- Efficient and safe control of the complete drinking water supply and the wastewater network from redundant control centers
- Economical use of rain overflow basins and protection of sewage treatment plant during heavy rainfall
- High security and availability of communications network through use of private dedicated lines and GPRS technology
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 process, e.g. by opening and closing valves or by switching pumps on or off.

**Solution**

All process stations are controlled locally using a SIMATIC PLC. Integration into the remote monitoring and control is through SINAUT TIM modules and the serially connected radio sets. All stations are scanned from the telecontrol master station in polling mode over the radio system, and the production data that have changed is transmitted to the control center. The central TIM module receives the time from the GPS receiver, and uses it to synchronize the complete SINAUT system. All data are made available to the control center 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
Task definition
The gas distribution of a large supply area with several hundred municipalities is to be monitored and controlled. It is necessary to monitor the transfer stations, to record the transportation data, and to control pressure boosting and reducing stations as well as transfer stations to municipal or industrial consumers.

Solution
The process stations are controlled over a private radio system. Stations which cannot be reached by radio are integrated through DSL into the communications network with the control center. Important stations such as the transfer stations are additionally controlled through the telephone network as a redundant system. The TIM modules of the telecontrol master station route all data on to the SINAUT ST7sc program package which supplies the host control system over the OPC interface. Operator interventions can be made from here, or flow quantities and pressures controlled in the complete supply network.

Benefits
- Safe monitoring and control of the complete gas supply process
- Avoidance of contractual penalties through recording and adaptation of the importing and exporting quantities
- Reliable gas supply through archiving of historical values and derivation of consumption predictions
Migration – an investment for the future

Migration strategy

Many systems and plants must be expanded and modernized to ensure that companies can continue to provide products complying with 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 the plant owner 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 in close cooperation with the customer and his system integrators to elaborate an individual and future-oriented solution based on the state-of-the-art SINAUT telecontrol system – always under the directive:

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

Typical migration scenarios

A wide range of migration scenarios is possible depending on the specific technical and economical factors of a migration project. SINAUT ST7 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 by a new SIMATIC WinCC or PCS 7 system which is supplemented by SINAUT ST7cc, thus permitting adaptation to the current demands. SINAUT ST1 and ST7 stations, process I/O and application software are retained.

- Minimum costs
- Clear risk
- Extension of service life of complete plant
- New application possibilities
- Opening of system for IT world

Scenario 2: Expansion of an existing plant

The existing plant is initially retained, and is modernized by supplementing with further components/plant sections with SIMATIC S7 and SINAUT ST7.

- Simple, step-by-step expansion of plant capacity
- Clear risk
- Introduction of new technologies (e.g. HMI, Industrial Ethernet, DSL, radio links, cross 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 extensions can also force comprehensive modernization of the old system using the future-oriented SINAUT ST7 telecontrol system in association with SIMATIC WinCC. 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, radio links, cross communication)
- Opening of system for IT world
- Extension of service life of complete plant
- Reduction in number of system suppliers
- Elimination of bottlenecks and dependencies

Through the future-oriented SINAUT ST7 telecontrol system, 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.
Industry-compatible products for telecontrol
TIM communications modules

SINAUT ST7 is based on the SIMATIC S7-300 and S7-400 systems as well as on WinCC/PCS 7. SINAUT MICRO is based on the S7-200 as well as on WinCC flexible or WinCC. For communication over WAN, SINAUT supports these systems by the required hardware and software components. The following products are used with SINAUT telecontrol for communication over WAN:

- TIM communications modules
- Modems
- Mobile radio components (GSM/GPRS)
- Software
- Accessories

The SINAUT hardware components enable particularly reliable communication over the respective WAN, and are designed in line with industrial requirements.

The central component of the SINAUT ST7 hardware is the TIM communications module (Telecontrol Interface Module). This handles the data traffic for the S7 CPU or control center PC over the WAN, either with the SINAUT ST7 or SINAUT ST1 protocol.

The TIM is fitted in an S7-300 housing; it is available in three basic versions:

**TIM 3V-IE / TIM 3V-IE Advanced**

The TIM 3V-IE is a SINAUT communications module for the SIMATIC S7-300 or C7 compact unit. It has an RS232 interface to which an external modem can be connected. It additionally possesses an RJ45 interface which allows the SINAUT transmission over IP-based networks. The TIM 3V-IE is available in a standard and an advanced version.

**TIM 4R / TIM 4RD**

The TIM 4R is suitable for integration as a communications module into the SIMATIC S7-300 or C7 compact unit, and it can also be connected as a stand-alone device via MPI to one or more SIMATIC S7-300/400 units and to the ST7cc or ST7sc PC control centers.

It has two RS232/RS485 interfaces to which a suitable external modem can be connected. The two WAN networks can be different, e.g. dedicated line plus telephone network, and operated independently or in redundant combination.

The TIM 4R is also available with an optional DCF77 radio clock receiver (TIM 4RD). All stations in the SINAUT plant can then be supplied with the date and time from this module.

**TIM 4R-IE**

The TIM 4R-IE features two RS232/RS485 interfaces for SINAUT data transfer via classical WAN and two RJ45 interfaces for connection to IP-based networks (WAN or LAN).

The TIM can be used as communication processor in a SIMATIC S7-300 or C7 compact unit, but it is especially suitable as SINAUT communication processor for a SIMATIC S7-400 or control center PC (SINAUT ST7cc or ST7sc). In this case it is connected to the S7-400 or PC without an S7-300 CPU as stand-alone device over one of its two Ethernet interfaces.

The four transmission paths can be different and operated independently or in any redundant combination.
Modems and mobile radio components

Modems
Three modern variants are available for the SINAUT ST7 system, accommodated in an S7-300 housing like the TIM module:

- **MD2**
  Dedicated line modem for multipoint connection, tapping is possible, can also be used as repeater, max. 19,200 bit/s;

- **MD3**
  Modem for analog telephone network, max. 33,600 bit/s; can also be used as dedicated line modem for a point-to-point connection, max. 33,600 bit/s in the voice band

- **MD4**
  Modem for the digital ISDN network, max. 64,000 bit/s;

These modems can be connected to the serial modem interface of a TIM module.

The modems are supplied together with the respectively required WAN connecting cable. Cables for connecting the modems to a TIM must be ordered separately.

Mobile radio components
SINAUT offers two modems for data transmission using GSM mobile radio:

- **MD720-3 GSM/GPRS modem**
  Use with SINAUT MICRO:
  Data transmission using GPRS;
  To execute teleservice, the connection is temporarily switched from GPRS to CSD.
  Use with SINAUT ST7:
  Data transmission using CSD. Transmission of SMS messages, where receipt of the SMS can be acknowledged from the mobile phone. Sending of the SMS as fax, e-mail or voice mail is also supported by SINAUT ST7.

- **MD740-1 GPRS router**
  Use only with SINAUT ST7:
  Data transmission using GPRS. Since data transmission from the GPRS provider to the control center is frequently over the Internet, the MD740-1 has an integral VPN router and firewall. Optimally secure GPRS connections can then be established between the telecontrol station and the control center.

- **ANT794-4MR**
  Omnidirectional antenna suitable for use in GSM/GPRS networks (quad band). It can be connected directly to the two MD720-3 and MD740-1 GSM modems, and is suitable for indoor and outdoor use.
Software

Software for SINAUT MICRO

SINAUT MICRO SC is a comprehensive software package for PC and SIMATIC S7-200. By means of the OPC server, up to 256 SIMATIC S7-200 stations can be connected to a control center over GPRS. GPRS establishes a permanent, bidirectional and wireless online connection to the S7-200. All connections to GPRS stations are monitored in a clear manner by MICRO SC.

SINAUT MICRO SC software package comprising:
- Block library for SIMATIC S7-200 CPU
- OPC server software for the PC control center; for data exchange with an OPC client, e.g. WinCC or WinCC flexible
- Connection manager for the PC control center for establishing a secure GPRS connection with SINAUT MD720-3, for monitoring these connections, and for data routing in the case of cross communication between S7-200 and S7-200

An OPC interface to the control center is available for both the SINAUT ST7 and SINAUT MICRO systems. Therefore both systems can be combined and operated together in a third-party control system or in WinCC/PCS 7.

Software for SINAUT ST7

For SINAUT ST7, various software packages are available:
- Engineering software package for configuring and diagnosing SINAUT systems
- Software packages for connecting the SINAUT stations to the various control center systems:
  - The SINAUT ST7cc and SINAUT ST7sc software packages allow display and archiving of process data from SINAUT ST7 or ST1 stations in a control center system, permit control interventions in the process; they also take on the function of a telecontrol master station. Through simple configuration without detailed knowledge of SINAUT, it is possible to achieve significant time and cost savings.

SINAUT ST7 engineering software package

The SINAUT ST7 engineering software package with the following components is required for configuration, diagnostics and operation of the SINAUT ST7 system:
- SINAUT ST7 configuration and diagnostics software for installation on the programming device
- SINAUT TD7 library with blocks for the S7 CPU

The software package is a working package without licensing requirements which can be used for any number of SINAUT projects.

The configuration software permits uniform engineering of the complete communications network:
- The module manager handles display and parameterization of the TIM modules in HW-Config.
- The WAN network manager is responsible for display and parameterization of the WANs and their nodes in NetPro.
SINAUT ST7cc
With the addition of the SINAUT ST7cc software, SIMATIC WinCC or PCS 7 is the ideal control center system for both SINAUT ST7 and SINAUT ST1. It is specially designed for event-driven and time-stamped data transmission in the SINAUT ST1/ST7 system. It prevents loss of data which is possible in principle with cyclic polling of WinCC/PCS 7 and also enables loss-free and cost-optimized communication with stations that are connected over dial-up connections. In particular, ST7cc ensures the use of the correct event times supplied by the SINAUT stations for all messages and archive entries.
A high-availability ST7cc control center can be set up in conjunction with the WinCC/PCS 7 redundancy package. SINAUT ST7cc additionally assumes the function of a telecontrol center. There is therefore no need for a separate SIMATIC S7-CPU for this function.

SINAUT ST7sc
The SINAUT ST7sc SCADA Connect Software permits the connection of control center systems which can work as OPC clients to SINAUT ST7 or ST1, e.g.
- iFIX from Intellution
- InTouch from Wonderware
- OpenEnterprise from Bristol-Babcock
- Micro SCADA from ABB
- RESY-PMC from repas AEG
The "Item Buffering" function prevents data losses on failure of the OPC client or should SINAUT stations deliver data faster than can be transferred over the OPC interface.
System availability is increased by connecting two ST7sc systems operating in parallel to a redundant client system. SINAUT ST7sc additionally assumes the function of a telecontrol center. There is therefore no need for a separate SIMATIC S7-CPU for this function.

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 vagabond voltages on other cable sections are therefore prevented.
LTOP protects people 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 multipoint connections (two-wire in each case), or a combination of these two network topologies, in a telecontrol master station.

Radio clock components
- DCF77 indoor and outdoor antenna
- GPS receiver module

Connecting cables
A number of standard cables are available for connecting SINAUT 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.
Further information can be found on the Internet

- Visit us on our SIMATIC NET homepage on the Internet
  www.siemens.com/automation/simatic-net
  There you will find information on products and solutions, the latest information on SIMATIC NET, as well as events and technical publications.

- For a personal discussion, you can locate your nearest contact at:
  www.siemens.com/automation/partner

- In the A&D Mall you can place orders electronically via the Internet:
  www.siemens.com/automation/mall

Comprehensive parameterization and diagnostics functions (e.g. Web server, network management) are made available in various SIMATIC NET components (e.g. SCALANCE, OSM/ESM, CPs with IT functions) by means of open protocols and interfaces. These open interfaces provide access to the components, and this access could also be misused for dishonest activities.

When using the above-mentioned functions as well as these open interfaces and protocols (e.g. SNMP, HTTP, Telnet), it is therefore necessary to take appropriate security precautions to prevent illegal access to the components or to the network, especially from the WAN/Internet.

Automation networks should therefore be isolated from the rest of the company network using appropriate firewall systems, e.g. SCALANCE S.