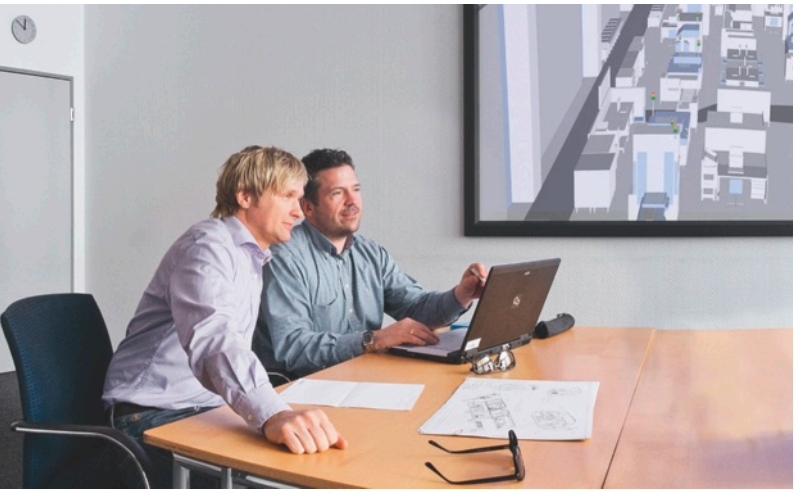

Answers for industry.

Integrated technologies, vertical market expertise and services for greater productivity, energy efficiency, and flexibility.

The Siemens Industry Sector is the world's leading supplier of innovative and environmentally friendly products and solutions for industrial companies. End-to-end automation technology and industrial software, solid market expertise, and technology-based services are the levers we use to increase our customers' productivity, efficiency and flexibility. With a global workforce of more than 100 000 employees, the Industry Sector comprises the Industry Automation, Drive Technologies, and Customer Services divisions, as well as the Metals Technologies Business Unit.

We consistently rely on integrated technologies and, thanks to our bundled portfolio, we can respond more quickly and flexibly to our customers' wishes. With our globally unmatched range of automation technology, industrial control and drive technology as well as industrial software, we equip companies with exactly what they need over their entire value chain – from product design and development to production, sales and service. Our industrial customers benefit from our comprehensive portfolio, which is tailored to their market and their needs.

Market launch times can be reduced by up to 50% due to the combination of powerful automation technology and intelligent industrial software from Siemens Industry. At the same time, the costs for energy or waste water for a manufacturing company can be reduced significantly. In this way, we increase our customers' competitive strength and make an important contribution to environmental protection with our energy-efficient products and solutions.

Industries

In the field of process instrumentation, process analytics and weighing technology, Siemens focuses on a number of key industries such as:

- Chemical
- Pharmaceutical
- Water/wastewater
- Mining, aggregates, cement
- Oil and gas/hydrocarbon processing
- Pulp and paper
- Food and beverage
- Marine








Process Instrumentation

Siemens offers a comprehensive range of process instruments for pressure, temperature, flow and level measurement. Pneumatic valve positioners, process controllers, process recorders and process protection devices complete the package. Whether you need a single instrument or a complete instrumentation package, Siemens is your professional supplier for any project.

Pressure Measurement

SITRANS P comprises a complete range of instruments for measuring gauge, differential and absolute pressure. In addition to high measuring precision and ruggedness, defining features include the convenience and functionality of a modular system as well as the perfect safety concept. We have a proven range of products for all pressure applications.

SITRANS P500
Digital transmitter for high precision applications with unmachted specifications for total performance and long term stability.


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Overview of the SITRANS P range:

SITRANS P MPS [1]

Convenient hydrostatic level measurement.

SITRANS P transmitter, MPS series, is used for hydrostatic level measurements. It is immersed in the process connected by a vented cable. The sensor has a stainless steel enclosure and is suitable for applications ranging from drinking water to corrosive liquids.

SITRANS P200/210/220 [2]

The fixed range transmitter for gauge and absolute pressure.

SITRANS P200: ceramic diaphragm
SITRANS P210: stainless steel diaphragm
SITRANS P220: stainless steel diaphragm fully welded

SITRANS P250 [3]

Fixed range transmitter for differential pressure.

The differential pressure will be detected with a ceramics sensor and transformed into an output signal of 4–20 mA-, 0 –5 V resp. 0 –10 V.

SITRANS P280 [4]

The SITRANS P280 is a WirelessHART pressure transmitter that provides all measured process values as well as diagnostic information, parameters and functions via wireless communication. The device is powered by an internal battery and designed for ultralow power consumption. The compact and rugged design makes it specially suitable for direct mounting on tanks and pipes in remote parts of plants, and on moving or rotating equipment for process monitoring or asset management applications.

Pressure Measurement

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SITRANS P Compact [1]

For the special requirements of the food and beverage, pharmaceutical and biotechnology industries.

The increased hygiene demands are satisfied by a range of stainless steel process connections. Cleaning and sterilization procedures (CIP, SIP) are standard practice.

SITRANS P300 [2]

offers measuring precision and ruggedness, and advanced operation. The SITRANS P300 was designed for the food and beverage industry as well as pharmaceutical processes. It is an integral component of the SITRANS P family because of its measurement deviation of less than 0.075 %, a hygienic stainless steel housing with laser-etched nameplate, and the proven SITRANS P DS III local operating philosophy.

The SITRANS P300 meets the requirements of the EHEDG, FDA and 3A. This makes it ideal for applications in the food and pharmaceutical industries.

You can read the process data via a HART, PROFIBUS PA or Fieldbus FOUNDATION protocol. The SITRANS P300 is also available combined with absolute or relative pressure measuring cells with flush mounted diaphragms. A wide range of process connections are available for the food and beverage, pharmaceutical, and paper industries, including threaded and flanged versions.

SITRANS P DS III [3]

Digital transmitters with integral diagnostics function, HART, PROFIBUS PA or Fieldbus Foundation communication, and convenient key operation. Within a range from 1 mbar to 700 bar, the SITRANS P DS III works well even with extreme chemical and mechanical loads or electromagnetic influences. It offers additional safety functions such as plant and self-monitoring, fault diagnostics and provides maintenance messages advising when the next calibration is due. The self-test function is unique for fail-safe operation. Measuring cells can be quickly and easily replaced so that on-site repairs are fast, simple and cost-effective. In addition to convenient local operation, SITRANS P transmitters can be connected to networks using the PROFIBUS PA, Foundation Fieldbus, or HART protocol.

SITRANS P DS III is designed for nominal pressures up to PN 420 (5800 psi). The wetted parts are available in stainless steel, Tantalum, Hastelloy®, Monel®, or gold plated. Explosion-proof versions are also available. The high safety level is documented by globally recognized certificates, including ATEX, SIL, CENELEC, FM, CSA, NEPSI. It is tested according to the NAMUR guidelines.

Hastelloy® is a registered trademark of Haynes International. Monel® is a registered trademark of Special Metals Corporation.

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SITRANS P500 [4]

Digital transmitters for high precision applications.

The SITRANS P500 ensures a maximum reference accuracy below 0.03 % of calibrated span up to a turndown of 10:1. Combined with its low static pressure and temperature errors, it guarantees a total performance of 0.09 % up to a turndown of 5:1 and 0.14 % up to a turndown of 10:1.

The excellent long-term sensor stability reduces recalibration costs and gives you the measurement that you can trust on the long run. The cutting edge design of the measurement cell allows use at process temperatures up to 257 °F (125 °C) without requiring a remote seal system.

In case of critical applications where fast response times are required the SITRANS P500 helps to keep your plant safe thanks to its step response time (T63) of only 88 ms.

The configuration of the device can be done via standard HART-protocol compatible tools and also using the local push buttons and LCD display.

SITRANS P500 offers an easy-to-understand multilingual plain text menu which includes a rich set of diagnostic features and a quick start wizard for a simple, error-free configuration. The graphic display of the transmitter can be used to show trends and enables process monitoring.

This transmitter is available for different ranges to be used for differential pressure and level applications. In addition the transmitter can be combined with different kinds of remote seals.

Remote seals [5]

The measuring possibilities of the SITRANS P line are extended by a wide range of remote seals. These seals are used when measuring hot, corrosive, highly viscous, or crystallizing material. The following types of remote seals are available:

- Flanges according to EN, ASME, and other connections, either rigid connection to the transmitter or via flexible capillary.
- Various filling liquids for temperatures of material up to 400 °C (750 °F).
- Various diaphragm material options.
- Special versions specific to each industry.

Temperature Measurement

The instruments in the SITRANS T line are true temperature measurements, even under extreme conditions. Whether high or low temperatures or hazardous areas, the SITRANS T with communications capability can meet all demands in a wide variety of industries.

SITRANS TS500
Temperature Sensors for a wide range of applications

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Whether you require a sensor, head, rail or field-mounted transmitter, or a complete measuring station – we can offer you this individually or as a complete package.
The cost-effective SITRANS T transmitters can measure accurately in any application, and can be connected simply and rapidly to thermocouples or resistance thermometers. You can set the parameters using the intelligent SIMATIC PDM software package in no time at all, and without input errors. The following units are available:

Transmitters for head-mounting

■ **SITRANS TH100 [1]**

Pt100 transmitter. Low-cost and compact, configurable using PC (SIPROM T).

■ **SITRANS TH200 [2]**

Universal transmitter, configurable using PC (SIPROM T). Cost-saving service features.

■ **SITRANS TH300 [2]**

HART universal transmitter, configurable using SIMATIC PDM or HART protocol. Cost-saving service features. Diagnostics and simulation functions, remotely or locally.

■ **SITRANS TH400 [2]**

Fieldbus transmitter in designs for PROFIBUS PA or FOUNDATION Fieldbus.

Configurable using SIMATIC PDM (PA) or AMS (FF). Comprehensive diagnostics and simulation functions, transmission of important device and process data over the bus cable.

Temperature Measurement


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Transmitters for rail-mounting

■ SITRANS TR200 [1]

Universal transmitter programmable via PC (SIPROM T). Cost-saving operational functions and diagnostics LED.

■ SITRANS TR300 [1]

HART universal transmitter configurable via SIMATIC PDM or HART protocol. Costsaving operational functions and diagnostics LED. Remote or local diagnostics and simulation.

■ SITRANS TW [2]

Universal 4-wire transmitter for rail-mounting with HART communication, comprehensive diagnostics and simulation functions, configurable using SIMATIC PDM, optional limit value relay.

Transmitters for field-mounting

■ SITRANS TF [3]

Transmitter for mounting in the field where excessive heat or vibrations are present at the measuring point; IP67 degree of protection, programmable, HART, PROFIBUS PA, FOUNDATION Fieldbus optional programmable digital display. Can also be used as remote display without transmitter for any 4 to 20 mA signal.

■ SITRANS TF280 [4]

is a WirelessHART temperature transmitter that provides all measured process values as well as diagnostic information, parameters and functions via radio. The device is powered by an internal battery and designed for ultralow power consumption. Its compact and rugged design makes it specially suitable for direct mounting on tanks and pipes in remote parts of plants, and on moving or rotating equipment for process monitoring or asset management applications.

SITRANS TS temperature sensors

SITRANS TS100 - cable sensors [5]

This cable temperature sensor product series comes with a direct mounted cable. As a basic or mineral-insulated version a wide field of application is supported. The installation is easy and flexible by using compression or soldering fittings. With the optional adapter surface measurement is simple to apply. The intrinsic safe version has the approval for operating even in zone 0 without an additional protection tube. In such application the excellent response time of the sensor will be an outstanding benefit.

SITRANS TS200 - compact sensors [6]

The compact temperature sensor series adds to the excellent benefits of our SITRANS TS100. Instead of the flexible cable, it comes with a fixed connection M12, Lemo etc.

SITRANS TS300 - for food and pharma [7]

Our food and pharma temperature sensor product series is featured with a wide range of appropriate process connections – the classical method. With the clamp-on temperature sensor Siemens strikes a new path. Comparable with built-in measurement regarding response time and accuracy the advantages especially at small pipe diameters are obviously. No welding and welding validation, no process disturbance, easy pigging, easy dismantling for recalibration.

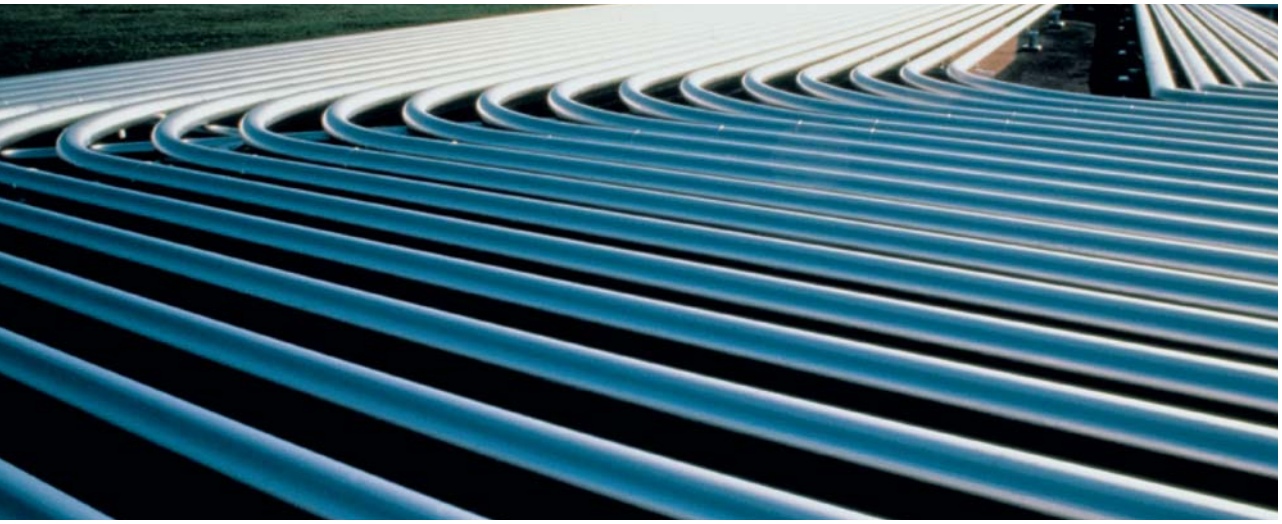
SITRANS T temperature sensors – special for high temperatures and flue gas [8]

Our flue gas resistance thermometers and straight thermocouples for combustion plants and furnances.

SITRANS TS500 - for pipes and vessels [9]

The industry temperature sensor series supports a wide field of measurements, from simple applications up to solutions for harsh environments. Designed as a modular system of tubular or barstock thermowell, extension, connection head and optional transmitter and display, the customers profit from the use of standard components for individual applications. Intrinsic safe versions are available as well as Ex d.

Flow Measurement



Choosing the right flowmeter for the right application can dramatically improve your bottom line. In all industries, Siemens offers a comprehensive selection of electromagnetic, Coriolis, ultrasonic, vortex, rotary piston and differential pressure flowmeters suitable for measuring a variety of liquids.

SITRANS FC430
The digitally based SITRANS FC430 features market-leading compactness, very high accuracy of 0.1%, low pressure loss, extremely stable zero point, best-in-class data update with 100 Hz high-speed signal transfer and the first SIL 3 certification on a Coriolis system. Unique support tools provide direct access to backup data, settings, certificates, and audit trails.

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SITRANS F M – Electromagnetic flowmeters

measure the volume flow of electrically conductive fluids like e.g. water, chemicals, food and beverage, slurries, sludge, paper stock, and mining slurries with magnetic particles are measured using SITRANS F M. The product range is divided into three types of electromagnetic meter:

Modular pulsed DC meters

SITRANS F M DN 2 to DN 2000 (1/12" to 78")

- Full transmitter program MAG 5000/MAG 6000/ MAG 6000 I compact or remote mounting.
- Multiple I/O as standard and communication modules PROFIBUS PA/DP, FOUNDATION Fieldbus, HART and Modbus® RTU.
- MAG 5100 W [1] sensor designed for water and wastewater applications.
- MAG 3100 P designed for process industry and the harsh requirements in the chemical industry.
- MAG 3100/MAG 3100 HT [2] sensor for general process industry.
- MAG 1100/1100 HT sensor for general process industries.
- MAG 1100 F [3] sensor for food and beverage and pharmaceutical industries.

Battery-operated water meters

MAG 8000 DN 25 to DN 1200 (1" to 48") [4]

Designed for the water industry, the MAG 8000 [4] program is a battery-powered solution that makes it easier than ever to install a reliable water meter virtually anywhere.

- Battery lifetime up to 6+ years.
- Mains powered 24 V AC/DC, 115 V AC/230 V AC with battery backup.
- IP68 (NEMA 6P) enclosure for sensor and transmitter in compact or remote version.
- MAG 8000 for abstraction and distribution network.
- MAG 8000 CT for revenue and bulk metering.
- MAG 8000 Irrigation for agriculture.

High-powered AC meters

TRANSMAG 2 911/E DN 15 to DN 1000 (1/2" to 40") [5]

Specially designed for heavy mining slurries with or without magnetic particles as well as the most difficult applications in the pulp and paper industry.

- A wide choice of corrosion-resistant liner materials.
- Heavy duty industrial enclosure.
- No movable parts.

Modbus® is a registered trademark of Schneider Electric.

Flow Measurement


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SITRANS F C Coriolis mass flowmeters

measure the direct mass flow rate of liquids and gases in almost any application.

It is a multivariable device delivering reliable information on mass flow, volume flow, temperature, density and concentration (e. g. Brix or Baume).

Flexibility and high performance with the MASS 6000 transmitter [4]

The flexible MASS 6000 transmitters are designed for high performance and easy operation ensuring a low cost of ownership.

Seamless integration with the SIFLOW FC070 module [2]

SIFLOW FC070 is a true multi-parameter Coriolis transmitter ready for quick installation and system integration into SIMATIC S7 and SIMATIC PCS 7 automation systems. SIFLOW FC070 is the most compact, space-saving and versatile module available.

Sensors meeting the toughest challenges.

Optimum measuring performance is achieved through an intelligent sensor design with a strong focus on safety, repeatability, and quality, enabling a high accuracy 0.1 % of rate with a large turndown ratio. Sensor of capacity ranges from few g/h to 510 000 kg/h (few oz/h to 1 124 300 lb/h), covering applications ranging from mini-plants to bulk loading.

The SITRANS F C sensors offer:

FCS400 sensors DN 15 - DN 80 in standard, hygienic (3A, EHEDG) and NAMUR versions [1]
0 to 136 000 kg/h (0 to 300 000 lb/h)

Fulfill the need for high performance at Chemical, Food & Beverage, Pharma and Hydrocarbon applications.

MASS 2100 DI 1.5 [3]
0 to 65 kg/h (0 to 143 lb/h):

Ideal for low flow applications measuring liquid or gas.

FC300 DN 4
0 to 350 kg/h (0 to 772 lb/h):

Low flow sensor with focus on compactness and machine integration.

MASS 2100 DI 3 – DI 40 [4]
0 to 52 000 kg/h (0 to 114 600 lb/h):

Medium range sensors for general purpose applications.

FCS200 DN 10 – DN 25 [5]
0 to 30 000 kg/n (0 to 66 138 lb/h)

Ideal for measuring in CNG (Compressed Natural Gas) applications.

Standard MC2 DN 50 – DN 150 and Hygenic version DN 20 – DN 80
0 to 510 000 kg/h (0 to 1 124 300 lb/h):

Large sensors offering ideal fit between size and maximum flow capacity.

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SITRANS F US ultrasonic flowmeters

are available as in-line and clamp-on versions. Both meter types can be used with homogeneous conductive and non-conductive liquids and gases (only clamp-on). In addition to standard volume flow, they can also provide information on media quality and temperature. Meter calibration can be certified to industry standards.

In-line ultrasonic flowmeters [6]

Ultrasonic in-line flowmeters are suitable for industrial applications with pipe sizes ranging from DN 50 to DN 1200 (2" to 48"). Full 2-track and 4-track sensors are available in combination with the SITRANS FUS060 transmitter.

- Option between mild and stainless steel sensors.
- Transducers can be exchanged without interrupting operation.

Retrofit flowmeter type, SONOKIT [7]

The SONOKIT system up to DN 4000 (160") is designed for in-line retrofitting on all existing pipelines as a 1-track or 2-track flowmeter. The unique design enables installation on empty pipes or pipes under pressure without process shut-down.

- Robust version can be buried and withstands constant flooding.
- Outstanding accuracy; the bigger the pipe, the more accurate the result.

SITRANS FUS380 [8] and FUE380

For the utility industry the 2-track flowmeters, SITRANS FUS380 and FUE380, are designed to measure water flow in district heating plants, local networks, boiler stations, substations and other general water applications.

- Custody transfer approvals for district heating custody transfer applications.
- Battery or mains power enables installation where needed. Battery lifetime up to 6 years.
- Ideal for energy metering together with the SITRANS FUE950 [9] energy calculator.

Flow Measurement


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Clamp-on ultrasonic flowmeters

The key feature of the clamp-on ultrasonic flow technology is the externally mounted sensors. They are quickly and easily installed on the outside of the pipe, making them the perfect choice for retro-fit applications and applications where corrosive, toxic or high pressure liquids and gases rule out the option of cutting the pipe. The technology provides highly accurate measurement of both liquids and gases on pipes ranging from DN 6 to DN 9140 (0.25" to 360") in size.

Clamp-on ultrasonic flowmeters are available in seven different families suitable for a wide range of industries and applications:

- SITRANS FUS1010 [1] for general industry
- SITRANS FUP1010 [2] portable meter
- SITRANS FUE1010 for HVAC
- SITRANS FUH1010 for hydrocarbon
- SITRANS FUG1010 for gas
- SITRANS FST020 [3] for basic water, wastewater and HVAC applications
- SITRANS FUT1010 [4] for hydrocarbon liquid and gas applications

Most families are available in single, dual or four channel configurations that offer great cost saving options. The dual channel version can be set up on two separate applications and can also provide arithmetic functions between the two channels. The 4-channel meter does not offer mathematical functions, but can monitor multi channels and paths.

The clamp-on ultrasonic flowmeters are also available as check metering kits for general liquid, water and wastewater, energy and gas applications. They all come in a sturdy rolling case, containing all the equipment necessary for performing flow measurement tasks. These kits are ideal for verifying existing applications regardless of measurement technology or application where no metering exists.

For the most basic flow applications, the SITRANS FST020 is the solution. It combines reliable measurement with simple configuration and set-up wrapped in a single channel design. It features an IP65 (NEMA 4X) enclosure, RS232 communication and the WideBeam flow measurement technology (optional).

The SITRANS FUT1010 is available in a liquid and gas version. With performance meeting OIML R 117 and API recommendations, the ultrasonic flowmeter can be used for numerous upstream, midstream and downstream measurement tasks. A wide variety of sensor sizes ensures availability for virtually any application, including custody transfer applications where the permanent TransLoc system allows laboratory calibration.


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SITRANS F X – Vortex flowmeters

provide accurate standard volumetric and mass flow measurement of steam, gases, conductive and non-conductive liquids. The Vortex flowmeter functions as an "All-in-one-solution" with integrated temperature and pressure compensation together with an optional energy calculation.

It is specially designed for applications that require reliable flow measuring independent of pressure, temperature, viscosity and density. This makes it perfectly applicable in especially the chemical industry, HVAC & power, food & beverage, oil & gas and pharma.

The SITRANS F X Vortex flowmeters are available as flanged or sandwich versions in the following configurations:

SITRANS FX300 [5]

- Volumetric flowmeter. Measurement of steam, gases, conductive and non-conductive liquids. Temperature compensation for saturated steam included in basic version as standard.
- Mass flowmeter. With pressure and temperature compensation for mass and standard volume flow measurement of gases or superheated steam. Integrated temperature and pressure sensors.
- Option with pressure sensor and isolation valve allows the pressure sensor to be shut off for the purpose of pressure or leak testing of the pipeline or for being exchanged without interrupting the process.

SITRANS FX300 dual transmitter [6]

- Dual measurement for twofold reliability.
- Redundant system with two independent sensors and two converters.

SITRANS LUT400 [7]

Reliable for open channel flow monitoring in water/wastewater and plant effluent applications. Non-contact Echomax series ultrasonic transducers are used to complete the control system.

SITRANS F R – rotary piston meters [8]

Used to measure the volume flow of conductive and non-conductive liquids. High viscosity media, acids and alcoholbased concentrates are accurately recorded. Even measurements subject to calibration standards can be undertaken. No inflow and outflow runs required.

SITRANS F O – differential pressure flowmeters [9]

Universal flow measurement for liquids, gases and vapors. Always provide accurate results even with large bores, high temperature and extreme pressure.

Level Measurement

Siemens level measurement instruments serve process industries worldwide, including water and wastewater, aggregate, cement, mining, dry-bulk storage, chemical, petrochemical, oil and gas, food and beverage, and pharmaceutical. A wide portfolio of technologies and products lets you choose the right solution for your application.

SITRANS LUT400
features industry-leading 1 mm (0.04“) accuracy, setup in under a minute, and intuitive local user interface navigation. The controller is compatible with the full line of Siemens Echomax transducers, with an operating range of 0.3 to 60 meters (1 to 200 feet), depending on transducer.
Key applications: wet wells, reservoirs, flumes/weirs, chemical storage, liquid storage, hoppers, crusher bins, dry solids storage

POINT LEVEL DETECTION

Vibration, rotary paddle and tilt

Siemens rotary or vibrating point level switches are a cost-effective solution for solids and liquids applications. Their robust design lasts in harsh and abrasive environments. They detect high, low, and demand levels in solids, liquids and slurry applications, specializing in low bulk density applications. We offer a wide variety of configuration options suitable for any environment. SITRANS vibration and rotary paddle switches are simple to use with no complicated setup or configuration. Standard aluminum enclosures and a wide variety of process connections provide exceptional resistance to mechanical forces, long service life, and low cost of ownership.

- SITRANS LPS200 [1] rotary paddle switch detects solids with densities as low as 15 g/l (0.94 lb/ft³).
- SITRANS LVL100 and LVL200 [2] vibrating level switches for liquid and slurry applications, including high, low, and demand level alarms and pump protection.
- SITRANS LVS100 and LVS200 [3] vibratory switch detects solids with densities as low as 5 g/l (0.3 lb/ft³).

Ultrasonic

Pointek® ULS200 [4] is a non-contacting ultrasonic level switch with two switch points, effective in bulk solids, liquids, and slurries, and is ideal for sticky materials.

Capacitance

Siemens Pointek inverse frequency shift capacitance point level switches provide accurate, reliable, and repeatable measurement in dusty, turbulent, and vaporous environments or applications with product buildup. Small changes in level create large changes in frequency. As a result Pointek devices have greater sensitivity and consistently outperform conventional devices. With their robust aluminum enclosures and process connections, Siemens Pointek switches are proven superior performers even in tough bulk solids applications.

- Pointek CLS100 [5] – compact 2- or 4- wire switch for level detection in constricted spaces, interfaces, solids, liquids, slurries, and foam.
- Pointek CLS200 and CLS300 [6] – level switch for detecting liquids, solids, slurries, foam, and interfaces even in demanding conditions where high pressure and temperatures are present.
- Pointek CLS500 [7] – level switch for critical conditions of more extreme temperatures and pressures.

Level Measurement

CONTINUOUS LEVEL MEASUREMENT

Sonic Intelligence® and Process Intelligence

Our patented Sonic Intelligence and Process Intelligence signal processing technologies were developed using knowledge provided by our field service engineers and data from devices installed in real applications. Siemens instruments offer the unique advantage of this technology. Both signal processing technologies differentiate between true echoes from the material and false echoes from obstructions or electrical noise. The sophisticated software is continually updated and supported by field data gained from more than a million applications. This in-depth knowledge and experience is built into the software's advanced algorithms to provide intelligent processing of echo profiles. The result is a repeatable, fast and reliable measurement you can trust.

Radar

Even in harsh process conditions, Siemens radar transmitters are virtually unaffected. Non-contacting radar technology means low maintenance and provides reliable continuous level measurement for short to long-range applications.

Siemens offers a variety of radar instruments. Process Intelligence signal processing software ensures reliable and accurate level measurement and features Auto False-Echo Suppression, a technique that can automatically detect and suppress false echoes from vessel obstructions. This ensures high performance and is easy to implement, using just a few parameter entries on the infrared handheld interface or via configuration tools such as SIMATIC PDM, Pactware, or AMS.

- SITRANS Probe LR [1] – Cost effective 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft).
- SITRANS LR200 [2] – 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure coating, build up, and agitation, to a range of 20 m (66 ft).
- SITRANS LR250 [3] – 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft). Ideal for small vessels and low dielectric media.
- SITRANS LR400 [4] – 4-wire, 24 GHz FMCW radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and high pressure, to a range of 50 m (164 ft). Ideal for low dielectric media.
- SITRANS LR460 [5] – 4-wire, 24 GHz FMCW radar level transmitter for continuous monitoring of solids in vessels to a range of 100 m (329 ft). Ideal for applications with extreme dust and high temperatures to 200 °C (392 °F) and very low dielectric media.
- SITRANS LR560 [6] – 2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids. Very narrow 4 degree beam angle with 3" lens antenna. For ranges up to 100 m (328 ft).


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Ultrasonic

Siemens is the world leader in ultrasonic level technology. SITRANS LUT400 is an easy to use and highly accurate level, volume and pump controller. For advanced solutions controllers are available with remotely mounted non-contacting ultrasonic transducers. Whether you select the transmitter or the controller you get a cost-effective non-contacting solution for a wide range of applications in virtually any industry.

- SITRANS Probe LU [7] – 2-wire, loop powered ultrasonic transmitter for level/volume/flow monitoring of liquids in storage vessels, simple process vessels, and open channels.
- SITRANS LUT400 [8] - Compact, single point ultrasonic controller for continuous level or volume measurement of liquids, slurries, and solids, and high accuracy monitoring of open channel flow.
- Rugged Echomax® transducers [9] are built for harsh environments. They are impervious to dust, moisture, corrosion, vibration, flooding, and extreme temperature. They are easy to install and virtually maintenance-free.
- HydroRanger 200 [10]– Level controller for up to 6 pumps including pump control, differential control, and open channel flow monitoring.

Level Measurement

[1]

Guided Wave Radar

uses Time Domain Reflectometry (TDR) to measure level by guiding an electromagnetic pulse down a probe (solid steel rod, steel cable or coaxial probe) toward the material. When the pulse reaches the material surface, the change in dielectric value between air and the material causes a portion of the pulse to reflect back toward the transmitter. Guided wave radar is unaffected by vapor, density, foam, dielectric fluctuations, temperature, and pressure changes, and works well for short and medium-range measurements, and materials with low dielectric constants such as liquified gases. Interface of two liquids (i. e. oil/water) can also be measured with both level and interface reported over the HART output.

- SITRANS LG200 [1] – Advanced loop-powered, guided wave radar level transmitter for liquids, slurries, interface and bulk solids with a dielectric of 1.4 and higher. The wide selection of models and echo-processing software ensure reliable measurement in liquids with corrosive vapors, foam, saturated steam, high viscosity, surface agitation, high fill/empty rates and varying dielectric or density. Measuring run of up to 22.5 m (75 ft), temperatures up to 427 °C (800 °F), and pressures up to 431 bar (6,250 psi).

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Capacitance

Our unique inverse frequency shift approach to capacitance technology ensures accurate, reliable, and repeatable measurement, even in dusty, turbulent, and vaporous environments, or in situations with product buildup. Because even a small level change creates a large change in frequency, our instruments provide better resolution and consistently outperform conventional devices. With special features such as Active-Shield technology, and modular probe options available on various models, they offer practical solutions to a wide variety of continuous level, and interface applications.

- SITRANS LC300 [2] is an inverse frequency shift capacitance continuous level transmitter for liquids and solids applications. It is ideal for industrial applications in chemical, hydrocarbon processing, food and beverage, mining, aggregate and cement industries. Patented Active-Shield technology protects the measurement from the effects of moisture, vapors, foam, temperature or pressure variations, and material buildup.
- SITRANS LC500 [3] is an inverse frequency shift capacitance level or interface transmitter with active shield for critical applications, such as high-pressure coalescers, FPSO ships, LNG processing plants, cryogenic materials, and offshore oil and gas platforms. It performs in liquids, solids, interfaces, and foam and is unaffected by vapors, product deposits, dust, or condensation and is highly resistant to toxic and aggressive materials. SITRANS LC500 is the right solution if you're looking for high-precision level or interface measurement under extreme conditions.

Hydrostatic

Low-cost level measurement for direct mounting or mounting with remote seals on tanks and vessels. SITRANS P MPS [4] and SITRANS P DS III [5] can handle extreme chemical and mechanical loads as well as electromagnetic interference. They are widely applied in the chemical and petrochemical industries.

Gravimetric

Gravimetric level measurement with SIWAREX [6] weighing technology offers highly precise measurement without material contact independent of medium temperature, tank shape, built-in parts and material characteristics.

Positioners

Positioners from Siemens have been guaranteeing safe and trouble-free operation around the globe for nearly 20 years. They accurately control every valve type and process, while handling special tasks with perfect reliability. We continually develop our product range to satisfy your exacting specifications and demands that your process requirements place on positioners.

SIPART PS2
State-of-the-art positioner with innovative features such as external non contacting position detection and many more.

[1]

[2]

[3]

SIPART PS2 [1] [2] [3]

is currently the most widely used positioner for linear and part-turn actuators in a wide range of process industries. The proven all-round design has a particularly flexible stroke range, intelligent diagnostics, and different communication protocols.

- Versions with external non-contacting travel sensors.
- High flexibility in the stroke range from 3 to 200 mm (0.1 to 7.9 inch) (more on request).
- Communication via PROFIBUS PA, FOUNDATION Fieldbus or HART.
- ExD explosion-proof version.
- SIPART PS2 is available in Macrolon, aluminum and stainless steel casings.
- SIPART PS2 prevents the closing of fittings during the solenoid valve test, or monitors open/close fittings as an "intelligent solenoid valve".
- Extreme low air consumption to minimize total cost of ownership.

Extended online diagnostics (both devices)

Our intelligent SIPART PS2 is equipped with comprehensive functionalities, and deliver diagnostic data on themselves, their environment and the valve and actuator. With these premium diagnostics, these positioners set the standards for cost efficiency, reduce maintenance requirements in the plant, guarantee safe process control, and provide high functional safety in emergency situations. The following valve and actuator failures can be detected.

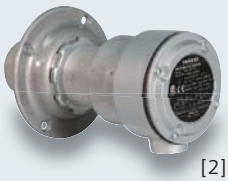
- Friction and clogging of a valve.
- Pneumatic leakage (e. g. tear in actuator membrane).
- Growing deposits in a pipeline or tear of valve plug for continuous processes.
- Wear and tear of valve seat or valve plug.
- Deposits or incrustations on valve seat or valve plug.
- Stiction of stuffing box.
- "Partial Stroke Test" (PST) for open/close valves (e. g. safety valves, ESD) and control valves.

Process Protection

Detect to protect your process. Detect flow problems, blockages, screen faults, machinery slowdowns, or burst filter bags. Process protection devices can be an early warning system to avoid costly process interruptions and breakdowns of equipment. Rugged construction makes them impervious to dust, dirt, buildup and moisture.

SITRANS AS100
Acoustic sensor for material flow monitoring with compact stainless-steel design.


[1]


[2]


[3]


[4]


[5]

MOTION SENSORS

Non-contacting motion sensors detect changes in motion and speed of conveying, reciprocating and rotating machinery.

■ Milltronics® MFA 4p with MSP or XPP probes [1]

This sensitive, single-setpoint motion sensor system can be used even in hazardous, high temperature, and harsh conditions because of its superior sensing probe design. The system protects equipment by detecting absence of motion, as well as underspeed or overspeed conditions.

■ Milltronics Millpulse 600 [2]

This heavy-duty 2-wire motion sensor provides a solid state switch output to PLCs when monitoring speed of rotating, reciprocating or conveying equipment.

■ SITRANS WM100 [3]

This heavy-duty, zero-speed alarm switch detects absence or presence of motion of rotating, reciprocating or conveying equipment.

ACOUSTIC SENSORS

■ Acoustic sensors for material flow monitoring

The SITRANS AS100 [5] acoustic sensor detects high frequency acoustic emissions from friction or the impact of dust, powders, granules and other solids in motion. It signals flow/no flow or high/low flow. It features compact stainless steel construction for harsh environments and non-invasive mounting. The SITRANS AS100 can be connected to a SITRANS CU02 [4], which processes signals from the sensor, providing relay and analog outputs for connection into a process, or it can be connected directly to a PLC analog input.

Supplementary Components

Supplementary Components are designed to work with most types of instrumentation to provide enhanced functionality such as seamless wireless communications, remote displays, and remote monitoring solutions. Customers can add Ethernet, web, logging and other functions to instruments.

SITRANS RD500
remote data manager provides remote monitoring solutions for instrumentation anytime, anywhere via the web.

[1]

[2]


[3]


[4]

REMOTE DIGITAL DISPLAYS

- SITRANS RD100 [1] loop powered remote display, and RD200 [1] universal remote digital displays make measurement data visible and accessible from a remote location. They can be used with all types of field instruments in varying process conditions, and are easy to set up and program. SITRANS RD200 includes freely available logging and monitoring software, allowing multiple displays to be monitored from one PC.

REMOTE DATA MANAGER

- SITRANS RD500 [2] is a remote data manager providing remote monitoring through datalogging, web access and alarming for instrumentation. It offers integrated web and ftp server, email and sms for alarming, and up to 2 gigabytes for data-logging of instrumentation with no programming required. It enables remote monitoring of inventory levels, process and environmental applications, and provides web access to most types of field instrumentation, including flow, level, pressure, temperature measurement and weighing. With SITRANS RD500 it is as simple as typing an IP-address in your web browser to access the data from remotely installed instrumentation. SITRANS RD500 collects and sends sensor data to logistics systems providing up to date, timely and accurate information used in decision making. Without the need for additional software you bring data from remote instrumentation via Ethernet or Modem (PSTN/GSM/GPRS) to your desktop, no matter where you are or where your instruments are.

WirelessHART Accessories

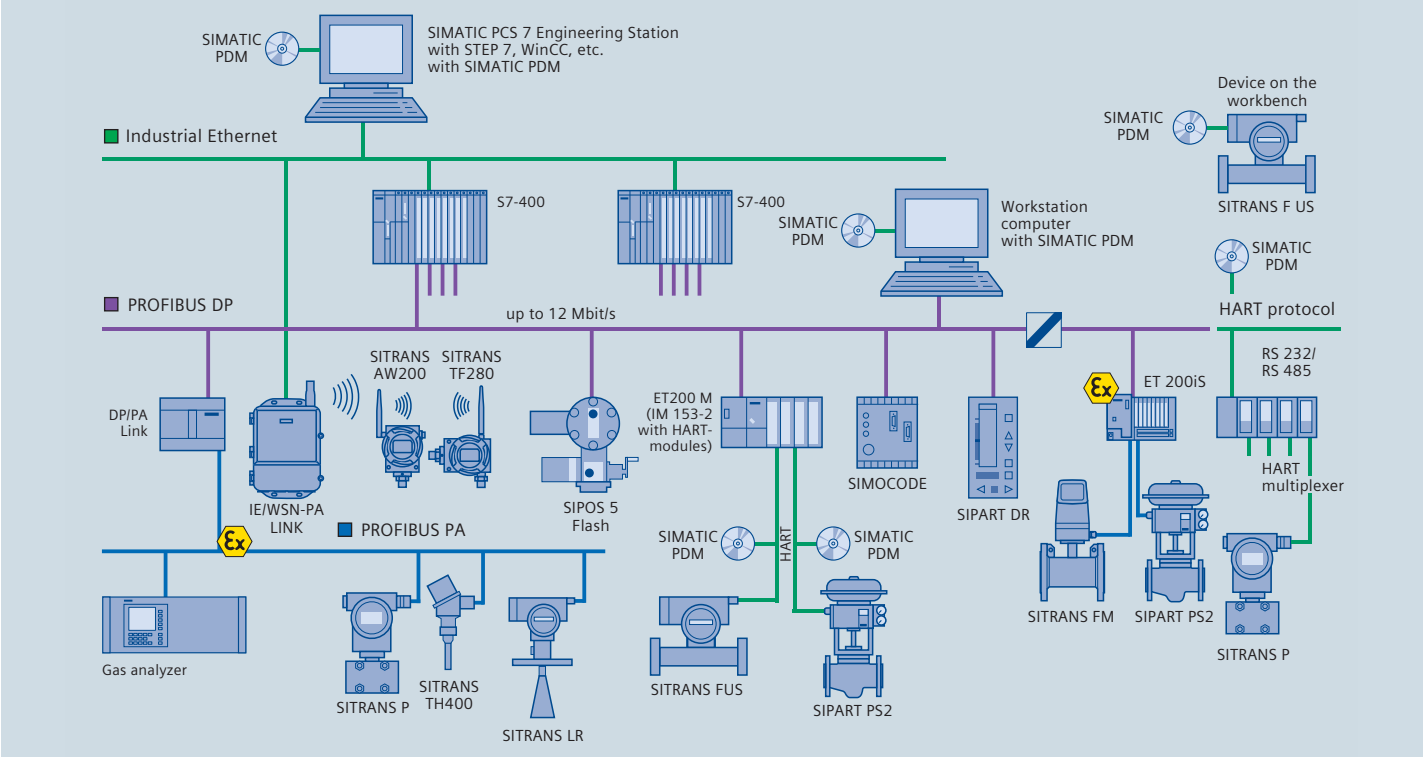
- The SITRANS AW200 [3] is a WirelessHART adapter which allows standard wired HART/4... 20 mA devices to be connected to a WirelessHART network. By installing the SITRANS AW200 on an existing analog-wired HART device, users can utilize all diagnostic information at the maintenance station without any risk of impairing operation. In the case of a new installation, various proven HART transmitters can be used in combination with SITRANS AW200 for efficient measurement implementation.
- The IE/WSN-PA LINK [4] is a WirelessHART gateway for connecting a WirelessHART network to a plant host application. With the integrated network manager it is easy to configure WirelessHART networks and optimize network performance and security settings.

The link also supports redundancy in both ways, to the WirelessHART network and to plant host applications. Funktion block libraries allow easy integration of WirelessHART into the process control system SIMATIC PCS 7 and into PLC families S7-300 and S7-400.

Communication and Software

Reliable communication between process devices and control systems is essential for efficient and safe processes. With different communication protocols and the necessary software Siemens offers the right tools to integrate their process instruments and analyzers into the world of process automation. The platform of Totally Integrated Automation from Siemens ensures a high level of transparency at all plant levels – from the field up to the production control level and the corporate management level.

SITRANS MDS
(Maintenance and Diagnostic Station) is a Windows-based application for retrieving and managing maintenance information from field devices.



SIMATIC PDM

SIMATIC PDM (Process Device Manager) is a universal, non-proprietary tool for the configuration, parameterization, commissioning, diagnostics and maintenance of intelligent field devices (sensors and actuators) and field components (remote I/Os, multiplexers, control room devices, compact controllers).

Over 1,200 process devices from more than 100 manufacturers are supported by SIMATIC PDM. The design and function of the devices can be described using the Electronic Device Description Language (EDDL), based on the leading EDD international standard (Electronic Device Description; IEC 61804).

SIMATIC PDM uses this to automatically create an easy-to-use interface providing the required information on the process devices. The latest release of this standard allows the implementation of state-of-the-art user interfaces:

– Intuitive Quick Start Wizards
– Enhanced graphical interface

Communication with process devices is by HART, PROFIBUS or alternative protocols. SIMATIC PDM can be used as a universal parameterization tool as well as in the integrated version in the SIMATIC Step7/PCS 7 environment.

SIMATIC PDM meets all requirements from field level to various types of industrial communication and central engineering service and maintenance.

Asset Management

comprises all activities and measures designed to maintain or increase the value of a plant. This primarily includes value-enhancing service and maintenance (plant-specific asset management) in addition to business management, process management and process optimization. Because of its comprehensive functionality SIMATIC PDM is particularly suited to provide the device data required for plant-specific asset management and transfer it to higher-level asset management systems in XML format via a uniform interface. However, SIMATIC PDM is much more than just a data logger for higher-level asset management systems. It offers a wide range of asset management functions as well.

Communication and Software

PROFIBUS

Decentralized automation solutions based on open field buses are currently standard in many areas of the production and process industry. The benefits of digital communication can be fully exploited in combination with field buses, including improved resolution of measurement values, diagnostics options and remote parameterization.

PROFIBUS is currently the most successful open field bus, providing a flexible platform for a variety of applications. Based on the IEC 61158 standard, it is a reliable investment and suitable for fast communication in production and process automation. It is the first field bus and meets the requirements of both sectors with the same communication performance.

PROFIBUS PA is tailored to the requirements of the process industry, handling both the power supply for the devices and communication between the devices and higher-level systems.

PROFIBUS PA is intrinsically safe and can be used in hazardous areas.

FOUNDATION Fieldbus

Field devices for measuring pressure, temperature, flow, level and actuators are also available for the intrinsically safe FF bus. Communication via FF is also based on the EDD standard and thus also offers the benefits of digital communication.

HART – field communication protocol

The HART® communication standard is used by more than 30 million installed smart process instruments with increasing numbers. The standard is managed by the HCF (HART Communication Foundation) and extends analog 4 –20 mA signals to modulated, industry-quality, digital HART signals. The advantage is the combination of tried-and-tested analog measurement-value transfer and simultaneous digital communication with bi-directional, acyclic transfer. This allows transfer of diagnostics, maintenance and process information from field devices to higher-level systems. Standardized parameter sets can be used for the non-proprietary operation of all HART devices.

Enhanced electronic device descriptions (EDD) are used to integrate HART devices into the SIMATIC PDM.

This ensures simple operation and commissioning of field devices, even in inaccessible locations.

WirelessHART

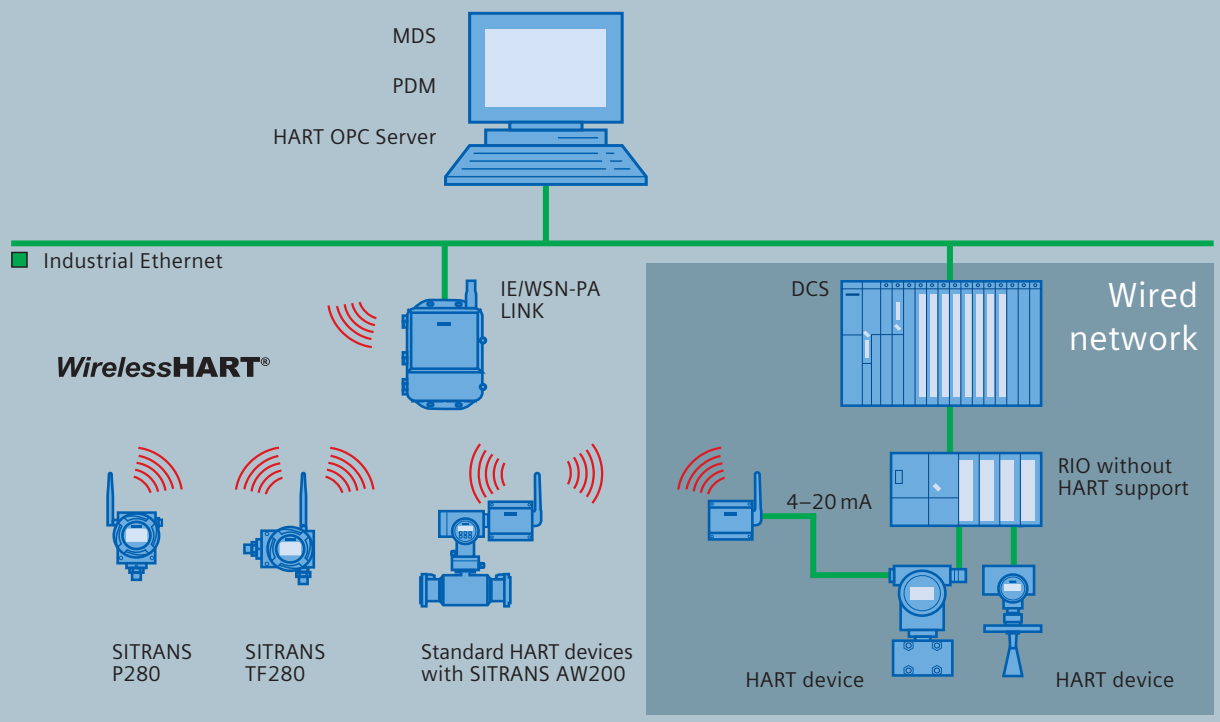
is an intelligent advancement of the proven 4 –20 mA HART technology released by the HART Communication Foundation (HCF) as part of Specification V7. WirelessHART is backward compatible with wired HART technology, and as such offers maximum protection for investments in hardware and software, tools and expertise. WirelessHART is designed to communicate measured process variables or setpoints via the network but also diagnostic and maintenance information and para-meters. WirelessHART uses state-of-the-art security technologies to ensure network and data protection. Theses are e.g. meshed network topology including redundancy, data encryption, message integrity, etc.

SITRANS DTM

Enhanced electronic device descriptions (EDD) are used to integrate field devices in SIMATIC PDM or other tools like AMS.
Some tools in the market like PACTware or Fieldcare are based on a technique called FDT (Field Device Tool). SITRANS DTM integrates EDDs from our devices in these FDT-based tools.

Emerson AMS

Many of Siemens HART and FF devices also have EDDs designed for AMS by Emerson.

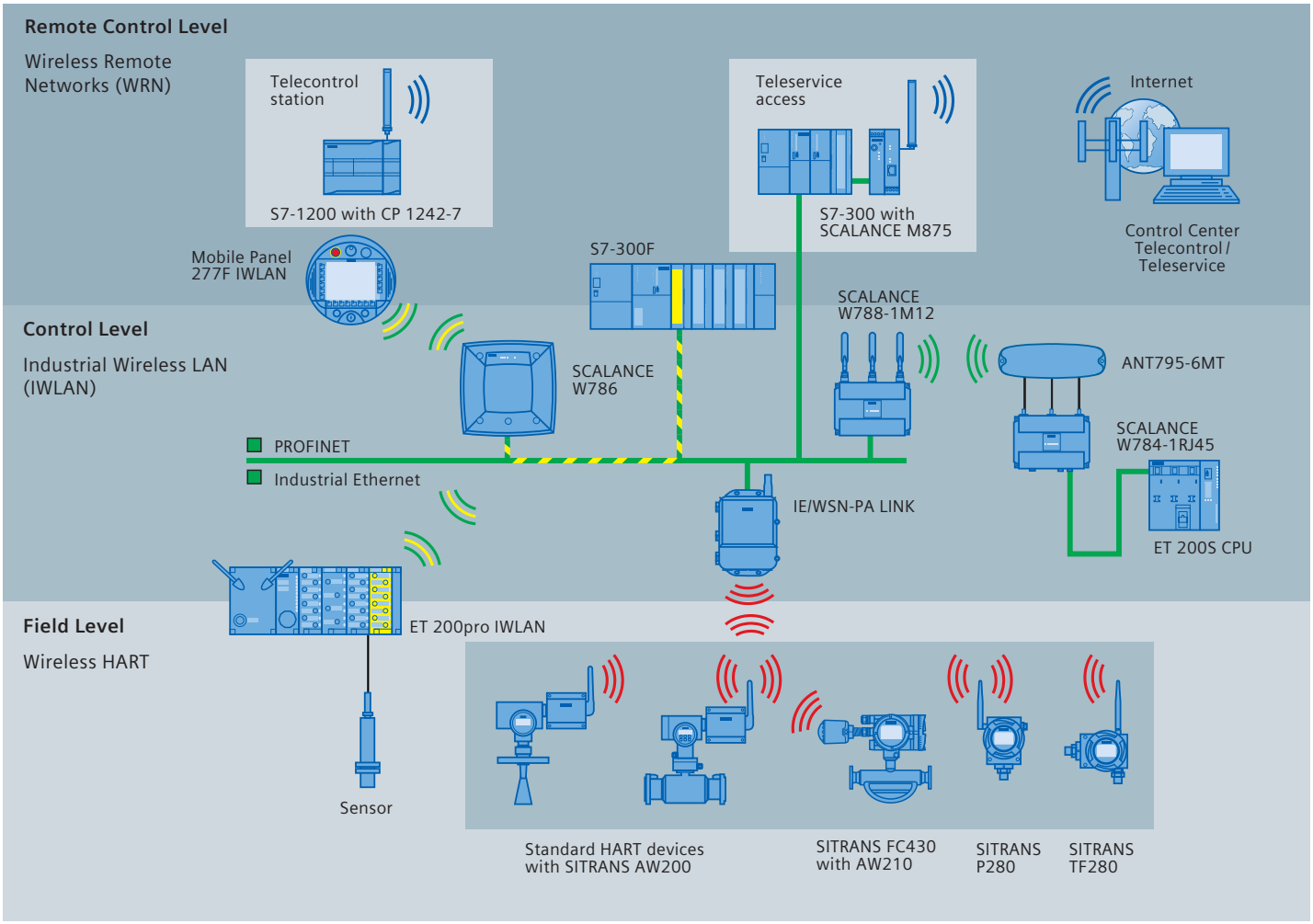


SITRANS MDS

(Maintenance and Diagnostic Station) is a Windows-based application for retrieving and managing maintenance and diagnostic information from field devices.

Features:

- Use of SIMATIC PDM to retrieve maintenance and diagnostic.
- All devices reachable by SIMATIC PDM are supported.
- Device list is shown in tree form, with properties and maintenance information in a column on the right-hand side.
- Selectable update interval for all devices.
- Visualization of the maintenance status with SIMATIC-specific icons or NAMUR (NE 107) icons.
- Archiving of recent events for each device.
- User-editable report.



WirelessHART®

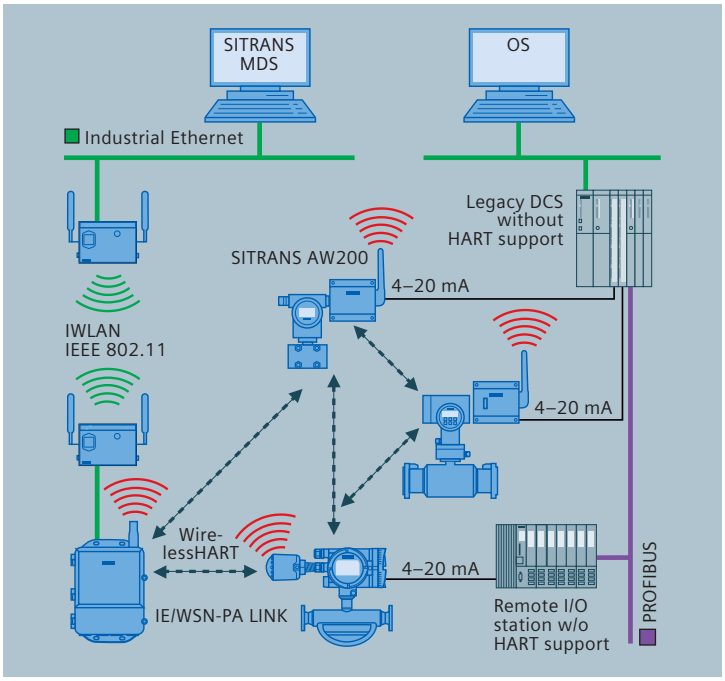
Success factor Industrial Wireless Communication

To achieve lasting success in the face of global competition, companies need to permanently improve their productivity while minimizing the total cost of ownership. This calls for new measures and new concepts.

Wireless solutions offer far more benefits than just the elimination of cabling and installation costs. Users profit e. g. from significantly faster commissioning and more efficient maintenance, as well greater flexibility and mobility. And wireless technology ensures improvement of production quality and safety in plants. In the end, all of these advantages add up to greater overall plant availability.

WirelessHART closes the gap of industrial wireless communication at field level in process automation.

Industrial Wireless LAN (IWLAN) and GSM/GPRS-based wireless wide area networks play a successful and important part at control and remote control level.



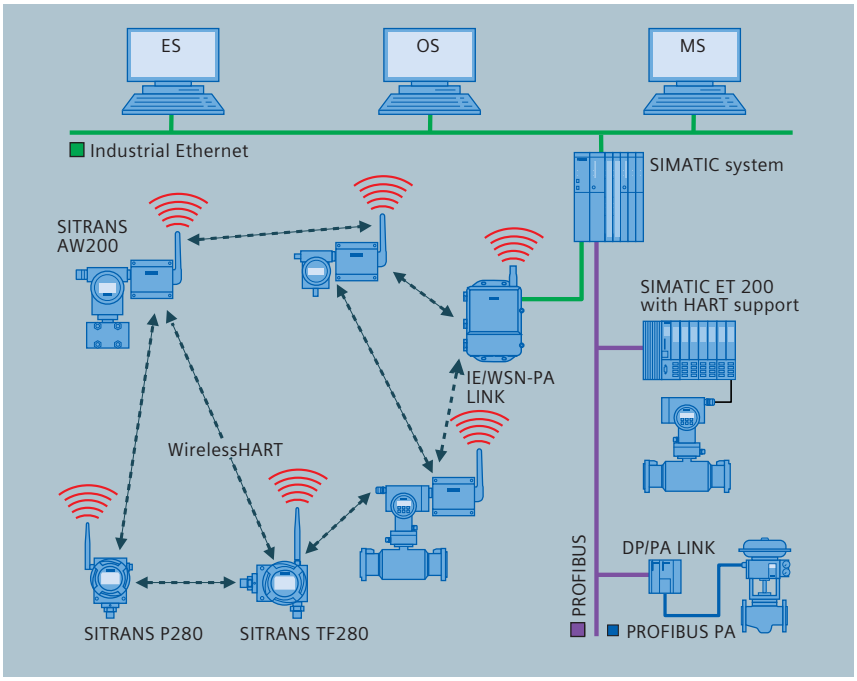
WirelessHART®

WirelessHART answers your challenge

opens up new communication options which were not practical or simply not possible in the past due to the operating environment or for economic reasons.

- **Flexible** for installation, replacement or upgrading; ideal for temporary measurements and for measurements on moving or rotating equipment.
- **Cost-efficient** for remote facilities and locations difficult to access due to the environmental or technical conditions: significant cost savings for cabling, commissioning and engineering, as well as reduced operating costs thanks to increased plant efficiency and lower maintenance expenditure.
- **Maintenance-friendly** thanks to access to valuable diagnostic information for enabling predictive maintenance strategies. Maintenance expenditure for cables and connections are a thing of the past, so too is the manual checking of the equipment status.
- **High plant availability and production quality** through optimized wireless installation, reduced black measurement points, higher transparency throughout the plant.

With our WirelessHART solutions, users profit not only from lower total cost of ownership, but also from significantly improved security, reliability and productivity.



The use of WirelessHART products in process industry applications can be classified as follows:

In many plants, HART devices are analog wired in a distributed control system (DCS). This means that a great deal of valuable diagnostic information in the field is not available from a central maintenance station and so devices must be maintained manually at regular intervals. This leads in turn to high maintenance cost and the risk of unscheduled downtimes.

Installation of a WirelessHART adapter on existing 4 – 20 mA HART instruments means that equipment information is accessible from maintenance station without changing the system that is running. Access to valuable diagnostic and device information offers a wide range of advantages, including higher process performance and reliability, improved maintenance approaches, etc.

WirelessHART solutions are considerably more cost-efficient and flexible than conventional concepts for improving production quality, plant safety or process transparency through the addition of new measuring points.

Problems with the physical wiring or cabling are a thing of the past when you use WirelessHART solutions. So too are high cabling costs for remote measuring points.

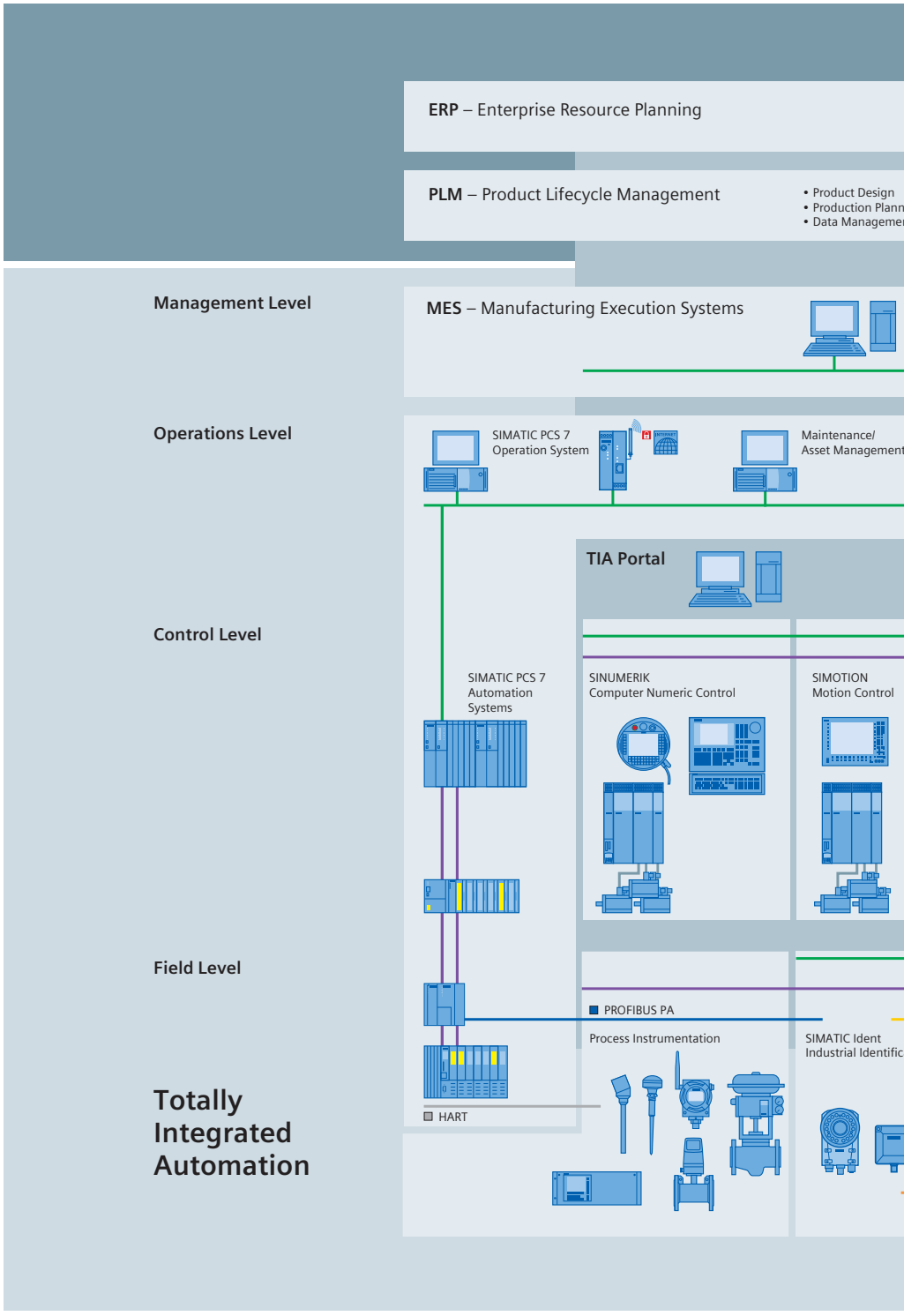
The optimum use of wired and wireless devices in one system creates the best basis for a new standard of performance in automation.

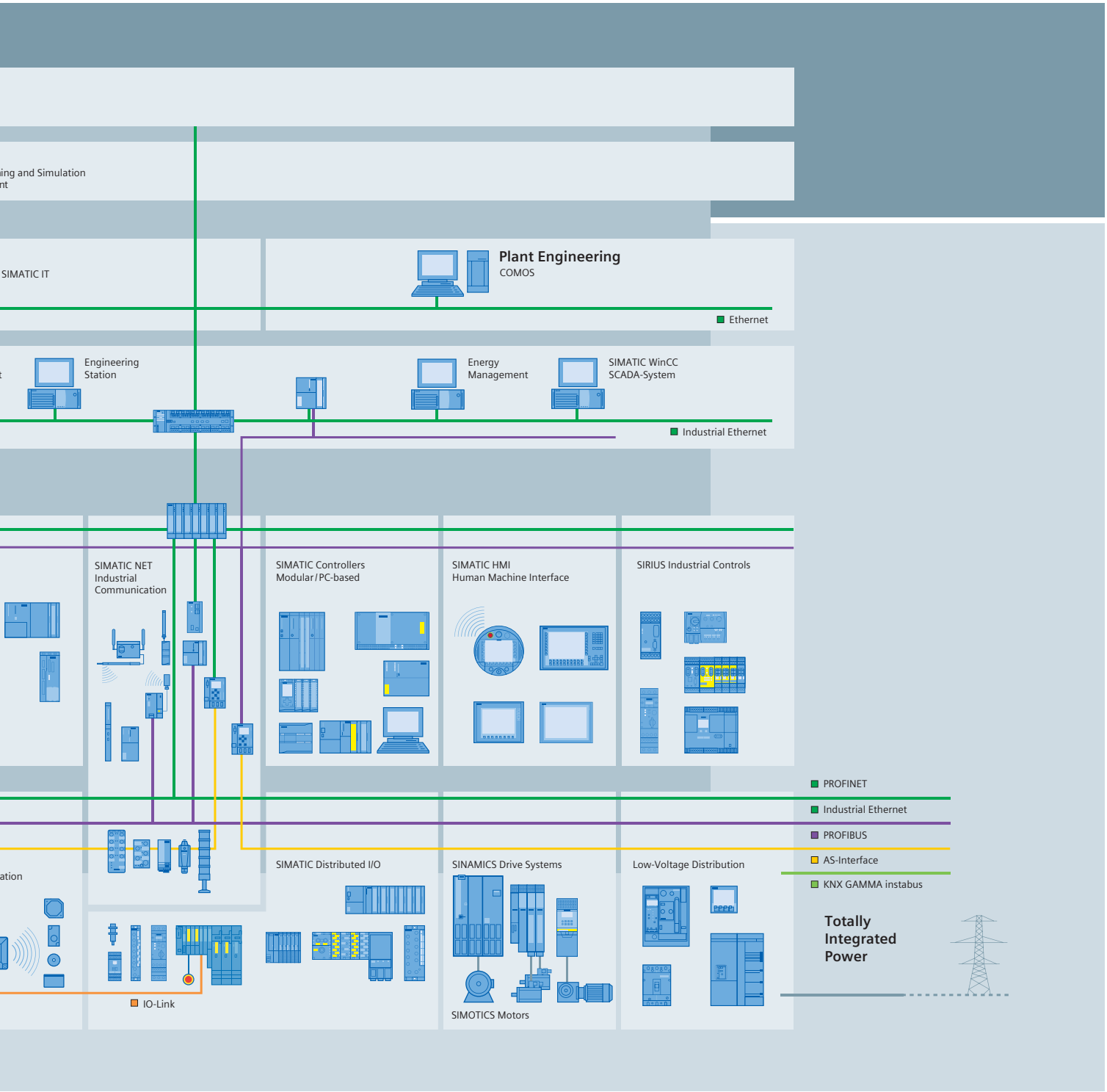
Totally Integrated Automation – TIA

is characterized by its unique degree of integration which ensures a high level of transparency at all plant levels – from the field level to the production control level and the corporate management level. This concept provides considerable benefits throughout the entire plant life cycle, from the initial planning and engineering stages, commissioning, operations and maintenance right through to modernization. The process instruments designed by Siemens have been perfectly integrated into the TIA concept.

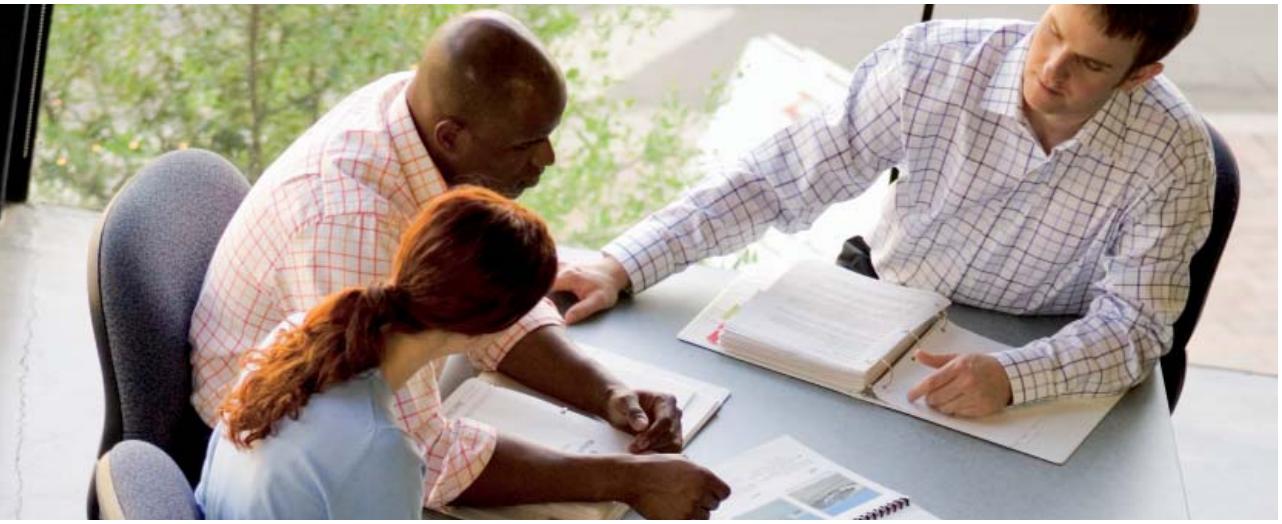
The SIMATIC PDM (Process Device Manager) is used as a central parameterization tool to allow the user continuous access to all the field devices of his plant.

Thanks to modern fieldbus communication like HART, PROFIBUS or FOUNDATION Fieldbus the field devices can be integrated into the overall plant. By integrating the devices into the PCS7 Asset Management system the user receives diagnostics information from the field devices whenever he needs it, allowing him to optimize the servicing and maintenance of his plant and avoid downtime.





Complete Solutions



Siemens offers a complete service package to assist you in engineering, designing, supplying, installing and commissioning measurement solutions for complete industrial plants. In addition, we guarantee seamless after-sales service based on user-friendly documentation of the solution and your plant.

Real-world measurement technology from Siemens is a multifaceted offering. For example, we provide all field instruments from a single source, as requested by many customers. Our "one-stop shopping" approach includes both sensors and actuators. Siemens supports integrated engineering of your complete process instrumentation all the way to integration with your process control system. Additional industrial components and systems integrate seamlessly into the overall plant and ensure smooth process flows.

Overview of our services portfolio:

- Plant engineering and scheduling by an experienced project management team.
- Specialists assist you in the selection and use of the field instruments.
- SIPLAN C/E is state-of-the-art software available for effective plant engineering and order processing. This program is also very useful for providing actual customer documentation.
- Plant documentation comprises:
  - Basic documentation, including device specifications, product and use lists.
  - Higher-level documentation, including plant, process, identification and grounding concepts.
  - Mechanical documentation, including setup and installation diagrams, hookups, cable routings.
  - Electrical documentation, including circuit and wiring diagrams, cable lists.
- Specification and delivery of all required process instruments.
- Intensive preparation for installation.
- Reliable supply of installation material.
- Installation and/or installation supervision.
- Commissioning and/or commissioning supervision.
- Comprehensive after-sales service.

Regardless of the solution we offer you, the focus is always on customer value.