

SIEMENS



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Process Instrumentation, Process Analytics, Weighing Technology

Siemens – The One-Stop Shop
Issue April 2013

Answers for industry.



Content

Complete packages for field instrumentation and process analytics

■ Process Instrumentation

Pressure, temperature, flow, and level transmitters.
Positioners for pneumatic linear and part-turn actuators.
Process controllers and process recorders.

■ Process Analytics

Gas chromatographs and continuous gas analyzers

■ Weighing Technology

Components for weighing systems, including belt scales, weighfeeders, and solids flowmeters.
Instrumentation for process monitoring.
Communication and software for control, maintenance, and diagnostics.

Integrated engineering and standardization for field instrumentation and complete solutions for process analytics.



Introduction

Complete profitable solutions with optimized process instrumentation and process analytics

Competitive advantage in the process industry relies on the ability to make processes faster, more flexible, more efficient and, above all, more cost effective. Siemens is your partner integrating business processes across all levels, and helping you create your competitive advantage. Decades of experience in the measurement, analysis, and control of industrial processes form the foundation of unsurpassed expertise in all areas of process engineering. We are the global market leader in the process gas chromatography, level measurement, and positioners sectors.

Through continuous innovation and improvement of our product portfolio, we offer you reliable and profitable solutions for every process automation application. Whether the application requires individual customized products or a complete system solution – our field-proven “Totally Integrated Automation” platform means full integration into data management, communications, configuration and programming.

You can benefit from the versatility of our complete solutions for your process application, as well as from the openness of the systems. Thanks to the standard PROFIBUS, FOUNDATION Fieldbus or HART® communications interface, leading to the easy integration of existing and future components. Add to this our comprehensive services, including planning and competent technical consulting, commissioning and support in certification procedures, and maintenance and in-depth operator training. In short, Siemens is your one-stop partner for field instrumentation and analytics.

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



An aerial photograph of a rugged, mountainous landscape. The terrain is covered in dense, dark green vegetation, with rocky outcrops and ridges visible. A white rectangular text box is positioned in the upper left quadrant of the image. The sky is a clear, pale blue.

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 unmatched specifications for total performance and long term stability.



[1]



[2]



[3]



[4]

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



■ 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.



[4]



[5]

■ 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



[1]



[2]

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



[1]



[2]



[3]



[4]

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. Cost-saving 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.

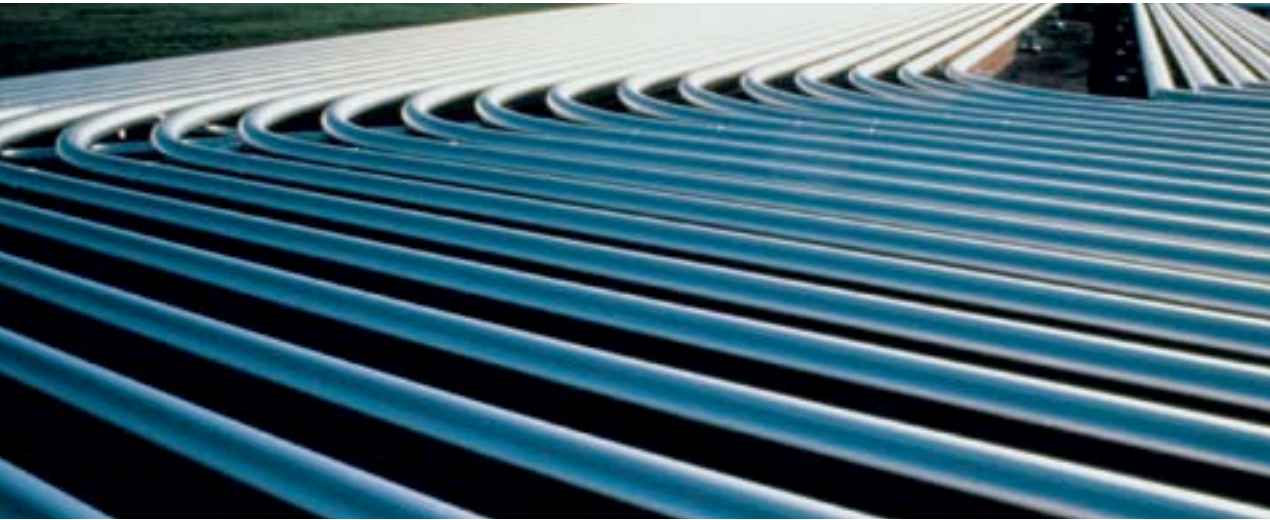
■ **SITRANS T temperature sensors – special for high temperatures and flue gas [8]**

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

■ **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

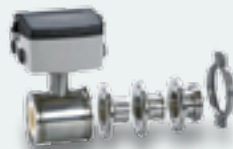
The digitally based SITRANS FC430 features market-leading compactness, very high accuracy of 0.1%, low pressure loss, extremely stable zero point, best-in-class data update with 100 Hz high-speed signal transfer and the first SIL 3 certification on a Coriolis system. Unique support tools provide direct 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 24V AC/DC, 115V AC/230V 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.

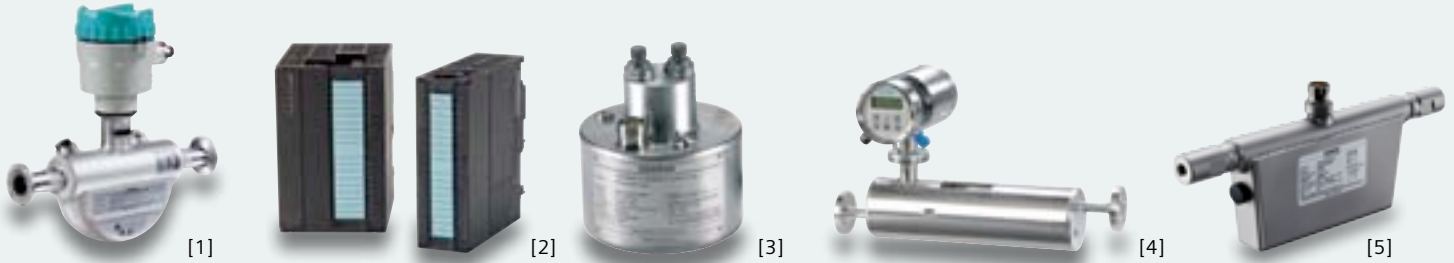
■ High-powered AC meters

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.

Flow Measurement



■ 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/h (0 to 66 138 lb/h)

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

■ Standard MC2 DN 50 – DN 150 and Hygienic 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.



[6]



[7]



[8]



[9]

■ 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



■ 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:

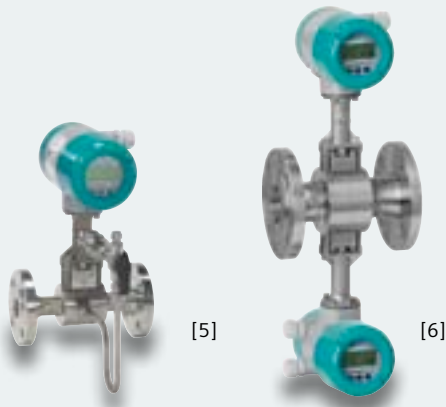
- SITRANS FUS1010 [1] for general industry
- SITRANS FUP1010 [2] portable meter
- SITRANS FUE1010 for HVAC
- SITRANS FUH1010 for hydrocarbon
- SITRANS FUG1010 for gas
- SITRANS FST020 [3] for basic water, wastewater and HVAC applications
- SITRANS FUT1010 [4] for hydrocarbon liquid and gas applications

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.



■ 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 alcohol-based 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



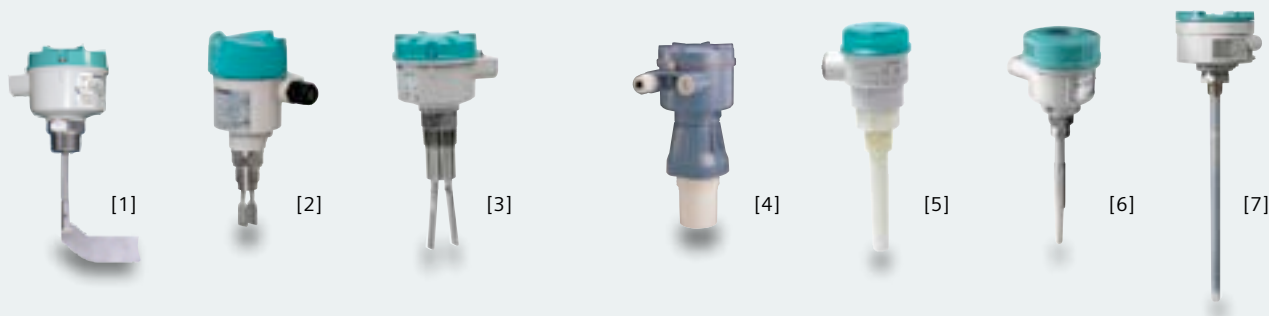
Siemens level measurement instruments serve process industries worldwide, including water and wastewater, aggregate, cement, mining, dry-bulk storage, chemical, petrochemical, oil and gas, food and beverage, and pharmaceutical. A wide portfolio of technologies and products lets you choose the right solution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

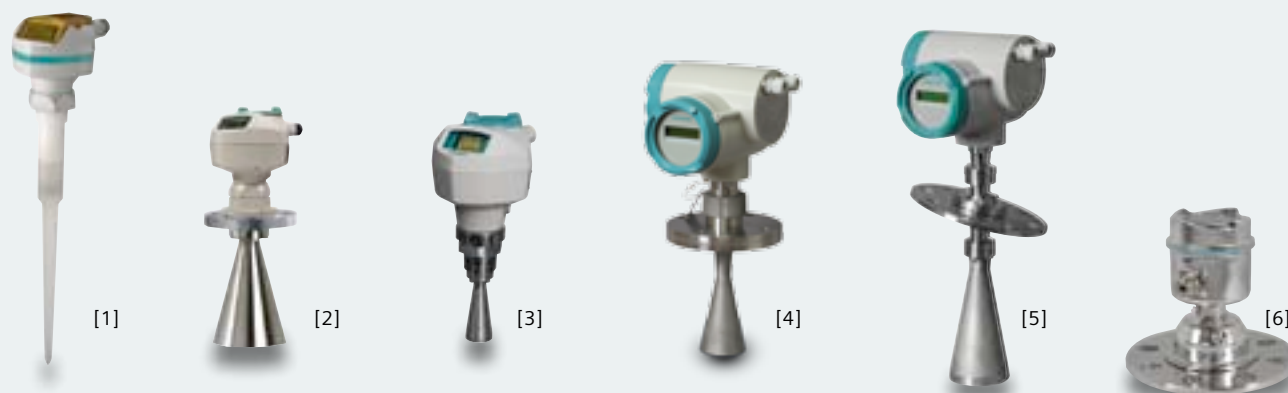
Pointek® ULS200 [4] is a non-contacting ultrasonic level switch with two switch points, effective in bulk solids, liquids, and slurries, and is ideal for sticky materials.

■ 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).



[7]



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[10]

■ 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.

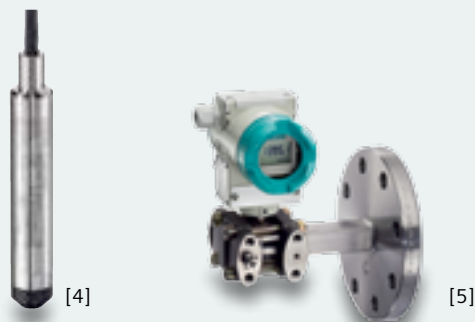
Level Measurement



■ 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).



■ 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.

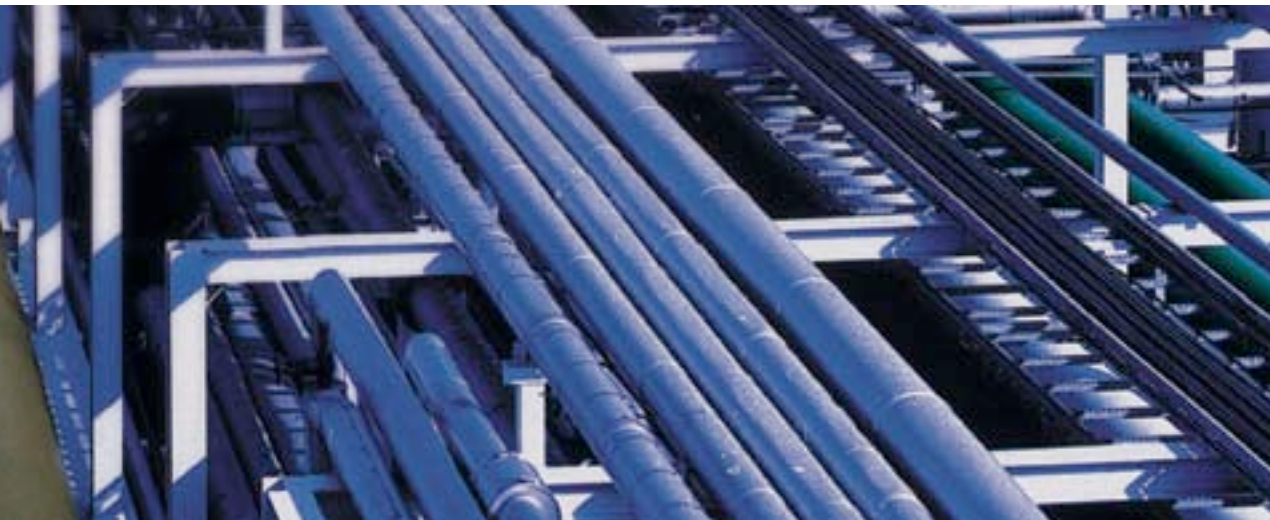
■ Hydrostatic

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.

Process Controllers



Installed in more than 250 000 control applications in industrial processes and in mechanical and systems engineering and other areas, the SIPART DR series is your solution for process control. The compact controllers with continuous output signal or step contact output have been designed especially for spacesaving panel mounting.



SIPART DR24

The unit for all process-specific tasks with up to four independent control loops.



Apart from their reliability, SIPART DR controllers excel due to their ease of use. Various software packages are available to make their handling easy and intuitive and to extend their scope of application. The standard version already offers comprehensive controller hardware. It can be upgraded quickly and easily for specific applications with a large number of optional input and output modules. Plug-in modules for communications over RS 232/RS 485 or PROFIBUS DP are also available. The following SIPART DR versions are available for different fields of application:

■ SIPART DR19 [1]

96 x 96 mm (3.8 x 3.8") format, for applications in mechanical and systems engineering, for thermal processes, in the steel and ceramics industry, in paint production, water treatment or bottling plants.

■ SIPART DR21 [2]

The ideal solution with comprehensive display functions for all standard tasks. Various control functions and status messages.

■ SIPART DR22 [3]

Solves complex closed-loop control tasks as single- or dual-channel controller, with additional computing functions in the input range.

■ SIPART DR24 [4]

The unit for all process-specific tasks including mathematical calculations, logic operations, open-loop controls and timecontrolled closed-loop controls. Up to four independent control loops.

Process Recorders

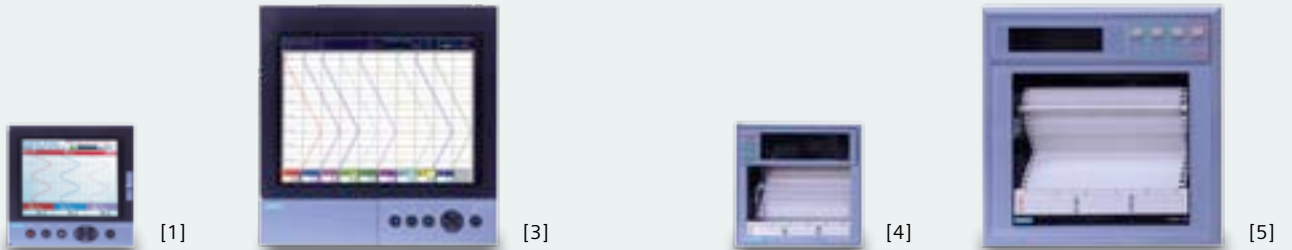


Highly complex processes in industry and research and development emphasize visualization and analysis. The SITRANS R process recorders offer state-of-the-art solutions for any measurement, monitoring and recording application.



SITRANS R230 [2]

The flexible solution with up to 18 general-purpose inputs.



SITRANS R process recorders are used in many industries, with applications covering all major industries and areas, including environmental protection. Whether the task includes the continuous monitoring of process quantities, plant maintenance, process optimization or troubleshooting, SITRANS R recorders offer a full line of solutions. This applies to use of the new SITRANS R display recorders and to the ink jet recorders.

DISPLAY RECORDERS

■ SITRANS R200 [1]

The cost-effective solution with up to 6 general-purpose inputs, 160x144 mm (6.3x5.7") front panel, 5,7" color STN display.

■ SITRANS R230 [2]

The flexible solution with up to 18 general-purpose inputs, 160x144 mm (6.3x5.7") front panel, 5.7" color TFT display.

■ SITRANS R260 [3]

The ultimate solution with up to 36 general-purpose inputs, 300x300 mm (11.8x11.8") front panel, 12.1" color TFT display.

All SITRANS R display recorders show data in real time and come with CompactFlash Cards for data storage.

INK JET RECORDERS

■ SITRANS R100/130 [4]

Multi purpose 6-channel ink jet recorder with universal inputs, clear recording in six different colors, 144 x 144 mm (5.7 x 5.7").

■ SITRANS R160 [5]

Multi purpose ink jet recorder with up to 12 channels, for use of universal inputs, clear recording in six different colors, 288 x 288 mm (11.4 x 11.4").

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.



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

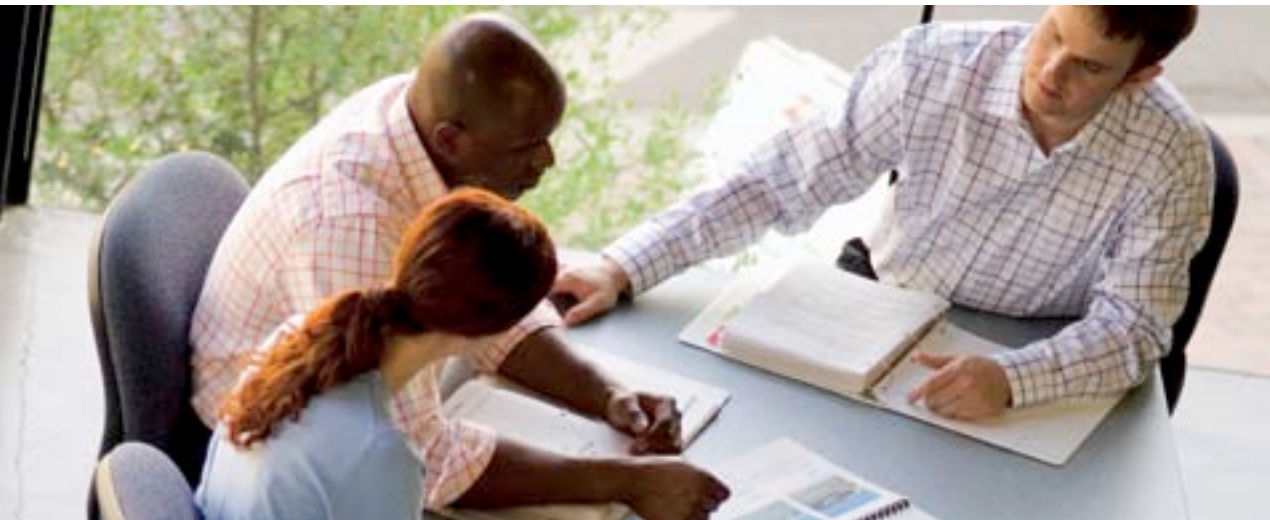
- SITRANS RD500 [2] is a remote data manager providing remote monitoring through datalogging, web access and alarming for instrumentation. It offers integrated web and ftp server, email and sms for alarming, and up to 2 gigabytes for data-logging of instrumentation with no programming required. It enables 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.

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.



Process Analytics

Siemens is a leading provider of process gas analyzers and process analysis systems. We offer our global customers the best solutions for their applications based on innovative analysis technologies, customized system engineering, sound knowledge of customer applications and professional support. And with Totally Integrated Automation, Siemens Process Analytics is your qualified partner for efficient solutions that integrate process gas analyzers into automation systems in the process industry.

Continuous Gas Analytics

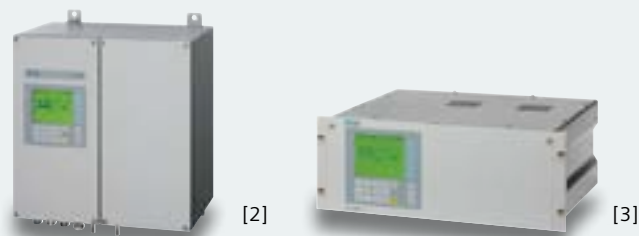


From emission monitoring in waste incinerators and power plants to gas analysis in the chemical industry to rotary kiln monitoring in cement plants, the highly accurate and reliable Siemens gas analyzers will always do the job.



SITRANS SL

Continuous gas analyzer with benchmark-setting in-situ technology for process control even under extreme measuring conditions.



The technology used in state-of-the-art process gas analyzers is determined by the needs of the specific application. Devices must be cost-effective, functional, space and energy-saving, and must provide just the right amount of power to meet all needs.

Siemens Process Analytics offers a wide and innovative portfolio designed to meet all user requirements for comprehensive products and solutions.

We combine outstanding expertise in developing high-performance analytical devices with in-depth application knowledge from many process industry applications.

The analyzers operate using a menu structure and are in accordance with NAMUR recommendations. The analyzers are easily integrated into the SIMATIC automation concept Totally Integrated Automation (TIA) and are programmed using SIMATIC PDM software and PROFIBUS DP/PA interfaces.

PROCESS GAS ANALYSIS – EXTRACTIVE

■ ULTRAMAT 23 [1]

is an innovative multicomponent analyzer for the measurement of up to 3 infrared sensitive gases using the NDIR principle plus O₂ using an electrochemical or paramagnetic Oxygen measuring cell.

The ULTRAMAT 23 is suitable for a wide range of standard applications, such as emission monitoring, furnace optimization, room air monitoring and other applications. Calibration using ambient air eliminates the need to use calibration gases.

The ULTRAMAT 23 is also available with build-in H₂S-sensor for Biogas applications.

SERIES 6

The Series 6 gas analyzers are comprehensive analyzers that meet the full range of requirements:

■ CALOMAT 6 [2] [3]

The CALOMAT 6 19" rack mount or as a field device uses the thermal conductivity method to accurately measure the composition and concentration of process gases. It is primarily designed for the measurement of hydrogen concentrations in inert gas such as blast furnace gas and carbon dioxide mixtures.

■ CALOMAT 62 [2] [3]

applies thermal conductivity detection (TCD) principles and is specially designed for use in applications with corrosive gases such as chlorine. The CALOMAT 62 measures the concentration of gas components such as H₂, Cl₂, HCl or NH₃ in binary or quasi-binary gas blends.

■ FIDAMAT 6 [1]

measures the total hydrocarbon content in air or even in highboiling gas mixtures. It covers nearly all requirements, from emission control to trace measurement of hydrocarbons in pure gas analysis and total measurement of high hydrocarbon concentrations, even in the presence of corrosive gases.

Continuous Gas Analytics



[1]



[2]



[3]

■ OXYMAT 6 [1] [2]

is an oxygen analyzer, optionally in 19" rack mount or in a robust field housing for installation in harsh environments. The OXYMAT 6 can be used for emission measurements for use in production process control and quality assurance. Due to its ultrafast response, the OXYMAT 6 is perfect for safety-relevant measurements. Its corrosion proof design also makes the OXYMAT 6 the analyzer of choice for analysis in the presence of highly corrosive gases.

■ OXYMAT 61 [1]

is a low-cost oxygen analyzer for standard applications. It can use ambient air as a reference gas that is supplied to the analyzer section by the internal pump.

■ OXYMAT 64 [1]

is a gas analyzer for the measurement of smallest oxygen concentrations in pure gas applications. Air separation plants and production of technical gases these are just a few examples where the OXYMAT 64 reliably detects small traces of oxygen.

■ ULTRAMAT 6 [1] [2]

is an analyzer in 19" rack mount or field housing. Measurement of up to four infrared active components in a single unit is possible. It can be used in all applications from emission measurement to process control, even in the presence of highly corrosive gases.

■ ULTRAMAT/OXYMAT 6 [1]

The Series 6 units can be combined in a 19" rack to form multi-component devices with ULTRAMAT 6 and OXYMAT 6 benches. This provides, with the smallest possible footprint, an infrared channel for the measurement of up to two IR components and a channel for oxygen measurement.

■ Ex-proof designs [2]

An additional purge monitoring unit makes the CALOMAT 6, OXYMAT 6 and ULTRAMAT 6 gas analyzers in field housing suitable for installation in hazardous areas. Measurements can include both non-flammable and flammable gases.

■ SIPROCESS UV600 [3]

is an extractive UV gas analyzer for simultaneous measurement of up to 3 components. The SIPROCESS UV600 is especially suitable to measure very low concentrations of NO, NO₂, SO₂ or H₂S. Simultaneous measurement of NO and NO₂ offers totalized NO_x determination without additional devices like NO₂ converters or CLD analyzers.

■ SIPROCESS GA700 [4]

The SIPROCESS GA700 device family is the latest generation of Siemens gas analyzers, and features a modular design. A ready-for-use analyzer comprises a base unit and one or two analyzer modules. Two versions of the base unit are available: a 19" rack mount housing with three height units and a housing for wall mounting. The communication interfaces present in the base units can be adapted to the respective process environment or the process control system using additional optionally available interface cards.

■ The OXYMAT 7 module is used to measure oxygen between 0 to 0.5% (smallest measuring range) and 0 to 100% (largest measuring range). It is designed for use at ambient temperatures up to 50°C and allows highly precise measurements through application of the paramagnetic alternating pressure principle. Due to the modular design, the OXYMAT 7 module can be combined with a further analyzer module in the same housing.



PROCESS GAS ANALYSIS – IN-SITU (TDLS)

■ LDS 6 [5]

The robust LDS 6 combines the compact and service-friendly design, simple operation and network capability of the Series 6 analyzers with the well-known exceptional performance data of in-situ gas analysis by using tunable diode laser spectroscopy (TDLS) and fiber optics. It can measure gases even under extreme conditions such as 1,200 °C (2,192 °F) or very high dust concentration with precise and reliable results. The LDS 6, for example, measures in-situ concentrations of O₂, NH₃, HCl, HF H₂O, CO or CO₂ in flue gas before and after gas cleaning. Applications in the chemical and petrochemical industries, for steel and metal production, as well as in cement or paper plants are a match for the LDS 6.

■ SITRANS SL [6]

combines the benefits of the proven referencing technology – with a direct operating mode as close as possible to the process. An integrated reference cell, filled with a non-interfering gas, which allows laser locking completely independent of process gas concentrations leads to utmost stable operation, negligible drift values and extended maintenance intervals. This patented feature guarantees reliable measurements of gas concentration even at values close to zero. SITRANS SL designed in a unique and compact design, including a local user interface (LUI) is the perfect solution for single point measurement applications in rough environments.

SITRANS SL is used for process control in the chemical industry, even in hazardous areas due to its EEx d design. It is also suitable for installation in SIL applications. Other applications are e. g. process optimization in the steel industry or combustion control in boilers or waste incinerators.

SERVICE AND MAINTENANCE

■ Analyzer System Manager (ASM)

The ASM is a PC-based HMI system for monitoring, testing and administration of analyzers in subsystems or in the complete plant. The relevant information of the analyzers is collected over common communications interfaces and saved in a central database. By means of the PC's user-friendly operator interface it is possible to access measured-value trends, device statuses and statistical evaluations, among others, or to start test routines for validation of the results. A comprehensive reporting module is available to document the evaluations.

The ASM is ideal for all systems and plants where high reliability of the measured values and documentation of the analyzer performances are required. Using the communications network, remote analyzers can also be monitored from a central workstation. The ASM is particularly suitable for use in the oil and gas, petrochemical, and chemical industries, and can be applied in new plants or also in existing plants to optimize the analyzer landscape.

■ SIPROM GA

The SIPROM GA software tool is designed for service and maintenance applications with our process gas analyzers. Integration into the Ethernet permits remote servicing and diagnostics over long distances.

■ SIMATIC PDM

SIMATIC PDM (Process Device Manager) is a universal, non-proprietary tool for commissioning, diagnostics and maintenance of gas analyzers and many field devices. The Software can be operated on any computer. It is also available as integrated version of SIMATIC PCS 7 and S7 controllers. More information is available in section communication and software.

Chromatography



Siemens application experience and innovative technology in the field of process gas chromatography helps us provide exceptional customer solutions. With our instruments we solve many different measurement problems in almost any industry – with high performance and in a best economical way.



SITRANS CV

Ultra compact gas chromatograph for reliable, exact and fast analysis of natural gas.



[1]



[2]

■ MicroSAM [1]

is the smallest explosion-proof on-line process gas chromatograph made by Siemens. State-of-the-art silicon-based micromechanical components allow miniaturization and increased performance at the same time. And MicroSAM is so easy to use and so rugged and small that it can be mounted right at the sampling point. Its performance profile is impressive:

- State-of-the-art technology drastically reduces cycle times, providing better information about the process.
- Valveless live sample injection and column switching.
- Multiple detection for verification of the results.
- Synchronicity: multiple analyzers can be connected in parallel for several sample streams, resulting in more information per time unit, a high degree of reliability should one of the systems fail, and easy implementation of redundant systems.
- Cost-effective and compact, saving installation, maintenance, and service costs.

■ SITRANS CV [1]

A gas chromatograph for reliable, exact and fast analysis of natural gas. The rugged and compact design makes the SITRANS CV suitable for extreme areas of use, e. g. off-shore exploration or direct mounting on a pipeline. Operation of SITRANS CV using CV Control software is simple, clear and easy to operate. The Software "CV Control" has been specially developed for the requirements of the natural gas market, e. g. custody transfer.

■ MAXUM edition II [2]

is very well suited to use in rough industrial environments and performs a wide range of duties in the chemical and petrochemical industries and in refineries. A wide selection of columns and detectors permits highly selective and sensitive analysis of multiple process components.

Benefits of MAXUM edition II:

- Flexible oven concept, temperature-programmable and energy-saving single or dual airless oven configurations.
- Wide selection of valve types for sample injection and column switching and thanks to live technique almost no dead volume.
- Parallel chromatography allows division of a single-train chromatograph analysis into multiple single trains.
- New guiding technology with modular design for fast maintenance and higher availability for measurement and for customers process optimisation.
- Open network with TCP/IP and Ethernet for communication with PCs, other chromatographs or a DCS. Result transmission with Multi-Master Modbus via TCP or serial ports.

Analytical Application Sets and Solutions



Our customers' requirements drive the solution. We offer you an integrated design covering the sampling point and sample preparation up to complete analyzer cabinets, for portable applications or for installation in a larger analyzer shelter. This includes signal processing and communications to the control room and process control system.

To offer solutions for your application needs, we rely on many years of worldwide experience in process automation and engineering and a collection of specialized knowledge in key industries and industrial sectors.

This ensures you will get Siemens quality from a single source with a function warranty for the entire system. You can rely on this portfolio for:

- Customized services and solutions from front-end engineering and design (FEED) up to fully air-conditioned analyzer shelters.
- Support during the approval phase.
- Preliminary and detailed planning with state-of-the-art tools and excellent documentation.
- System assembly and testing in Siemens facilities in the USA, Germany and Singapore.
- Experience with all relevant national and international standards.
- Commissioning by specialists all over the world.

- Tele-maintenance, on-site servicing, spare parts supplies and customized training.

■ Analytical Application Sets

are standardized system solutions for a number of specific applications. Siemens offers ready-to-use developed sets for various industries like cement, energy, natural gas, etc.

Standardized packages include the Set CEM 1 and Gasmet CEMS for the emission monitoring market. With the Set FLK a complete solution package is available for the cement market. Specifically designed for the natural gas market is the Set CV (calorific value). The Set CV covers various modules, which can be freely combined. For the monitoring of hydrogen-cooled turbo generators the Set GGA is the state-of-the-art solution. The Set BGA offers on a modular basis a standardized solution for the biogas market.

Our references speak for themselves. We would be pleased to demonstrate our expertise!



Weighing Technology

For many years now weighing equipment has been a core technology for ensuring quality and for controlling production processes in nearly every sector of industry. Siemens offers a comprehensive range of weighing products from the fully TIA-compatible SIWAREX weighing processor to heavy-duty weighfeeders. The flexible configurability of our products enables everything from simple platform weighing machines to gravimetric level measurement and highly complex automatic weighing machines to be implemented with minimal modification costs.

Weighing and Batching

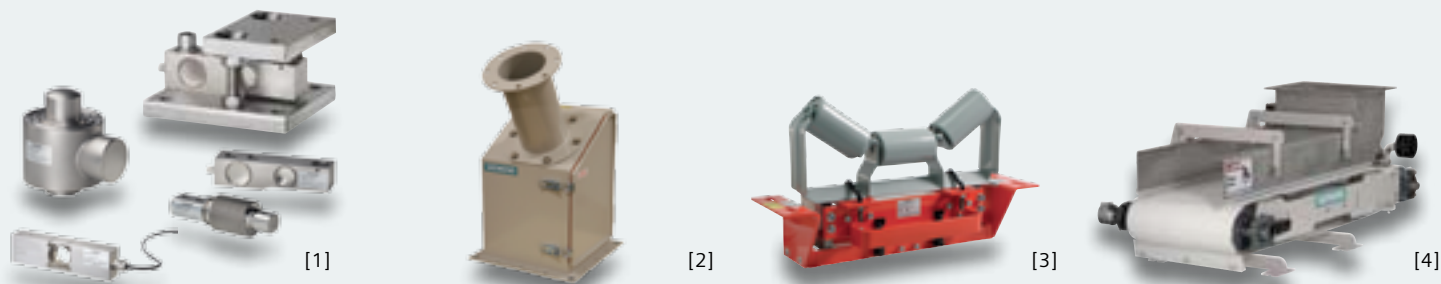


Weighing and batching systems play an important role in all sectors of production and process engineering. The SIWAREX load cells and electronic modules for weighing systems together with Milltronics belt scales, SITRANS weighfeeders and solids flowmeters provide an optimal weighing system for almost any imaginable task.



Milltronics MSI

heavy-duty, high accuracy full frame single idler belt scale which provides continuous in-line weighing on a variety of products in primary and secondary industries.



Sensors and continuous weighing devices

The load cells and other sensors can be used in a wide variety of sectors. They comply with the requirements of primary industries, and they have also proven their suitability in the food and beverage, chemical and petrochemical industries.

■ SIWAREX Load cells [1] and mounting elements

Multiple ranges of high quality load cells for almost any application you can think of. Naturally Siemens provides easy to use mounting devices to ensure proper installation of the load cells. The features of the portfolio are:

- High accuracy of 3000d according to OIML R60.
- Large measuring range from 3 kg to 500t. (6,6 lbs to 492 tons).
- Hermetically sealed, extremely long service life.
- Suitable for use in hazardous areas.
- Stainless steel or aluminium.
- Smart designed mounting devices for simple and safe installation.

■ Solids flowmeters [2]

Flowmeters provide continuous in-line weighing of dry bulk solids, freeflowing powders, or granular material. These flowmeters may be used for critical functions such as batch load-out and blending. Compact and high-capacity designs can suit any application.

■ Belt scales [3]

With a track record for consistent performance in harsh environments, Milltronics conveyor belt scales combine simple, drop-in installation, low maintenance (no moving parts) and repeatable accuracy for productive operations. The unique parallelogram style load cells ensure minimal hysteresis and superior linearity, and ignore all horizontal forces. All belt scale designs feature overload protection for the load cells.

■ Weighfeeders [4]

SITRANS weighfeeders provide precision weighing accuracy, improving blend consistencies, accountability, and record keeping. SITRANS weighfeeders are indispensable when automated production processes require continuous in-line weighing and feeding. These heavy-duty weighfeeders deliver, reliable, and uninterrupted service, and are virtually maintenance-free. From light to heavy industry-designed applications, SITRANS weighfeeders are engineered to the customer requirements.

Weighing and Batching



[1]



[2]



[3]



[4]



[5]

■ Dynamic weighing integrators

Milltronics BW500 [4], SF500 [5] and SIWAREX FTC [1] electronic integrators process the sensor signals into operating data for continuous in-line weighing and solids flow measurement. BW100 [6] and BW500/L offer economical, basic operation with belt scales. The BW500, SF500 and FTC can take over basic control functions traditionally handled by other higher level devices, like PID and batch control. Milltronics integrators display instantaneous readings of rate and total material flow for flowmeters or rate, total, load and speed for belt scales and weighfeeders.

■ SIWAREX weighing modules for SIMATIC automation systems

Further advantages result from complete integration of the SIWAREX weighing modules [1] [2] [3] [4] into the SIMATIC system platform. Using standard SIMATIC components, it is simple to adapt the weighing system to your individual requirements. In addition, standardized interfaces, totally integrated functions, and uniform tools enable cost-effective configuration.

■ SIWAREX module for SIMATIC S7-1200

The new SIWAREX weighing module WP231 [4] is SIWAREX's most flexible module ever. SIWAREX WP231 offers full integration into SIMATIC S7-1200 and through this is programmable via the Totally Integrated Automation (TIA) Portal engineering platform.

The ability to operate SIWAREX WP231 with or without SIMATIC PLCs offers you the flexibility and reliability you need.

SIWAREX summary

Performance features

- Integrated in SIMATIC S7
- High accuracy
- Legal for trade
- Graded scope of functions
- Suitable for hazardous areas

SIMATIC system environment

- Integration in S7-300/400, S7-200 and S7-1200
- Profibus/Profinet using ET200M or ET200S
- Integration in PCS 7



[6]



[7]

Scale types

The following scales can be designed using SIWAREX modules:

- Gravimetric level measurement
- Platform scales
- Batching and dosing
- Checkweighers
- Sacking and filling
- Beltscales
- Solid flowmeters
- Loss-in-weight
- Truck scales
- Many many more

Appropriate to requirements, the SIWAREX modules have been assigned approvals and certificates for the EU and also for various countries outside the EU.

The modules can also be used for force measurements.

Application software

Predefined SIMATIC projects "GETTING STARTED" are available for all new SIWAREX modules. These greatly simplify the specific application in SIMATIC. Further software packages provide complete applications – SIWAREX MULTIFILL for filling plants and SIWAREX MULTISCALE for batching plants.

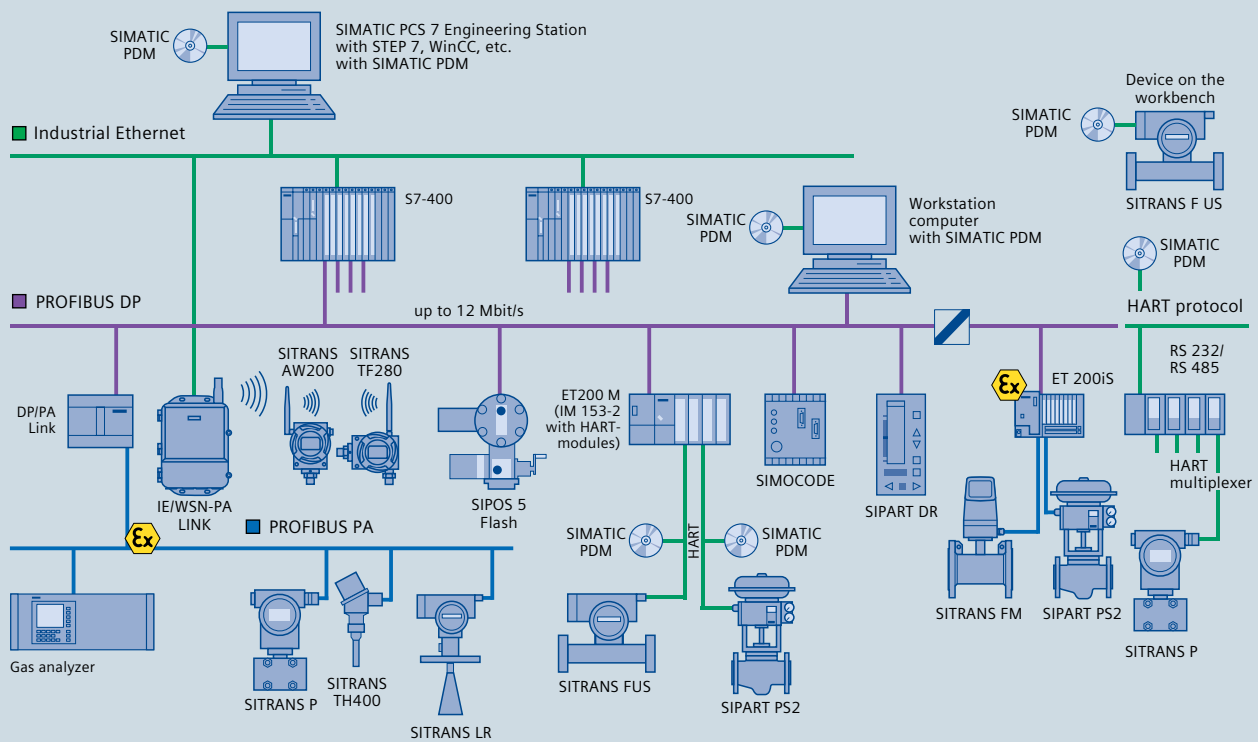
Communication and Software



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.



WirelessHART®



■ 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 parameters. WirelessHART uses state-of-the-art security technologies to ensure network and data protection. These are e.g. meshed network topology including redundancy, data encryption, message integrity, etc.

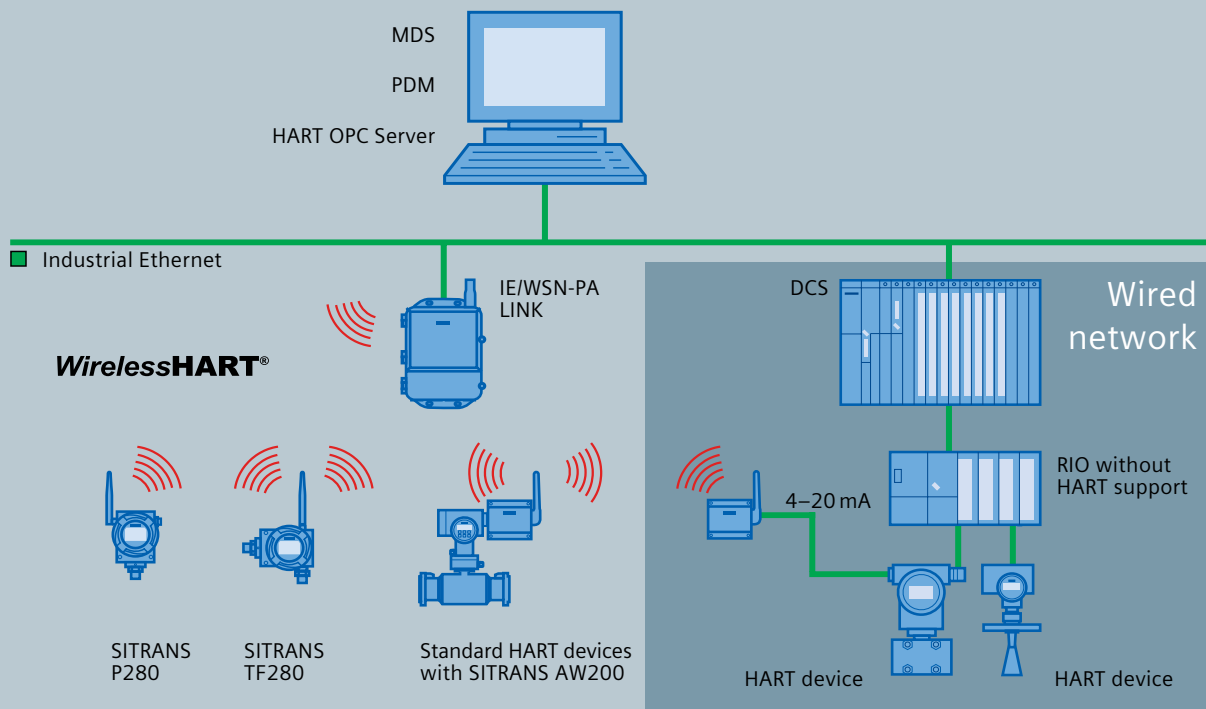
■ SITRANS DTM

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.

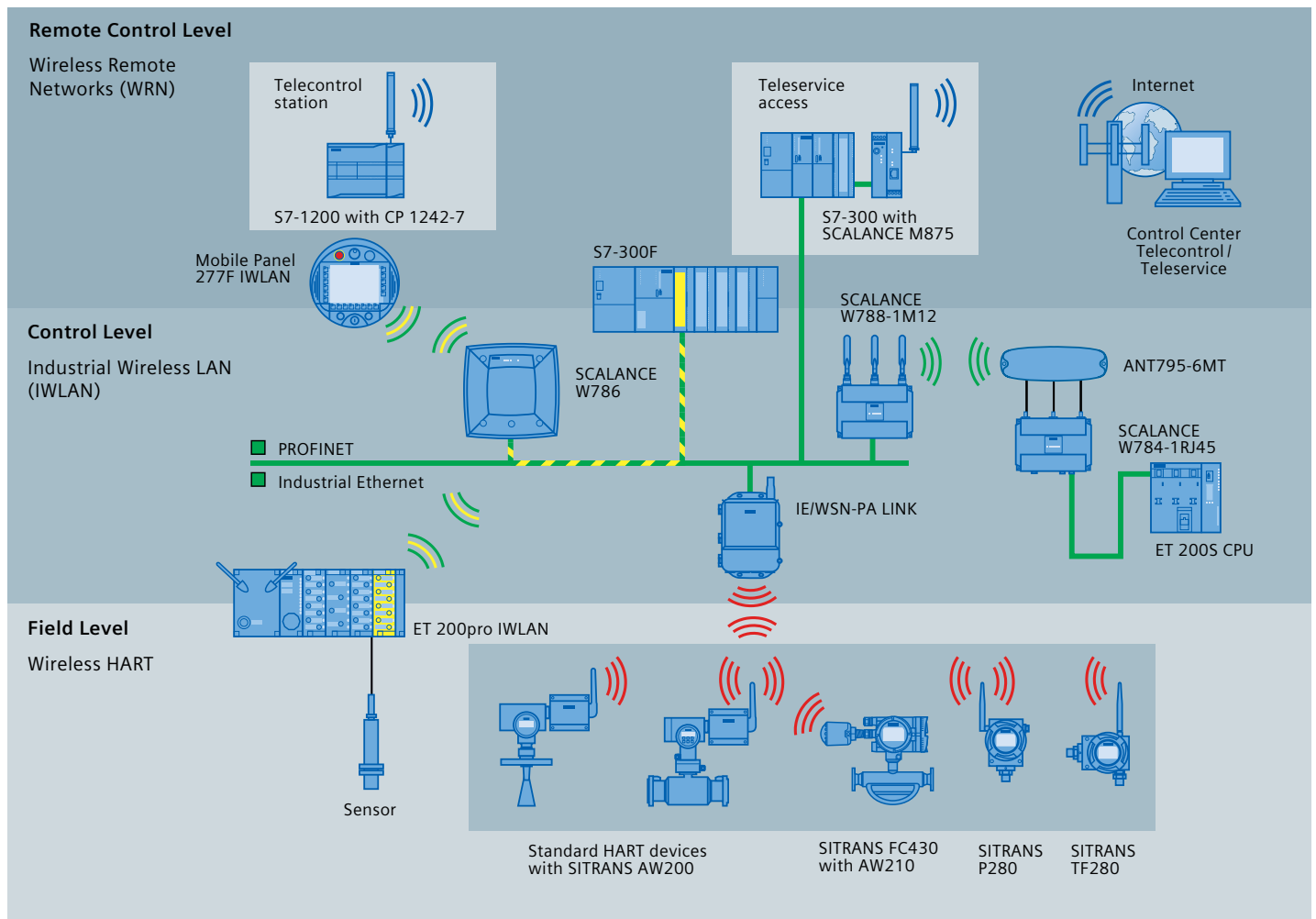


■ SITRANS MDS

(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®

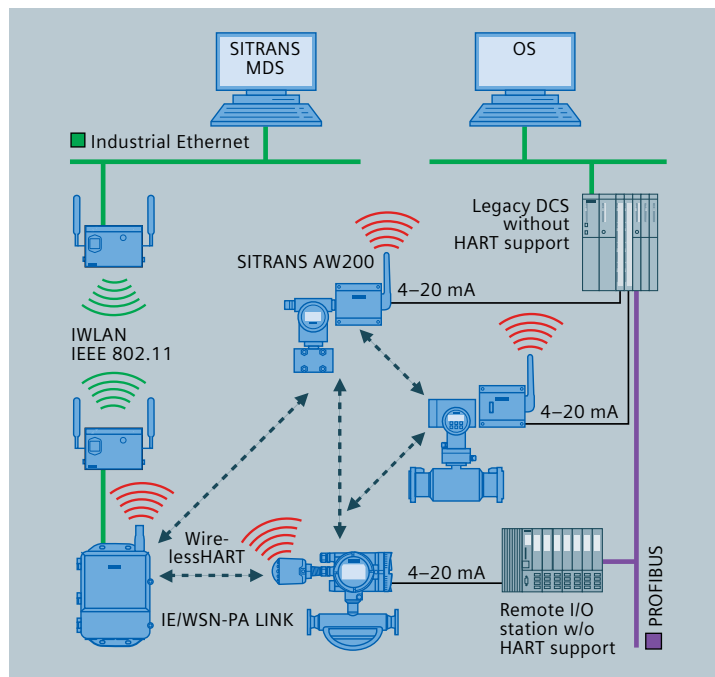
Success factor Industrial Wireless Communication

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.

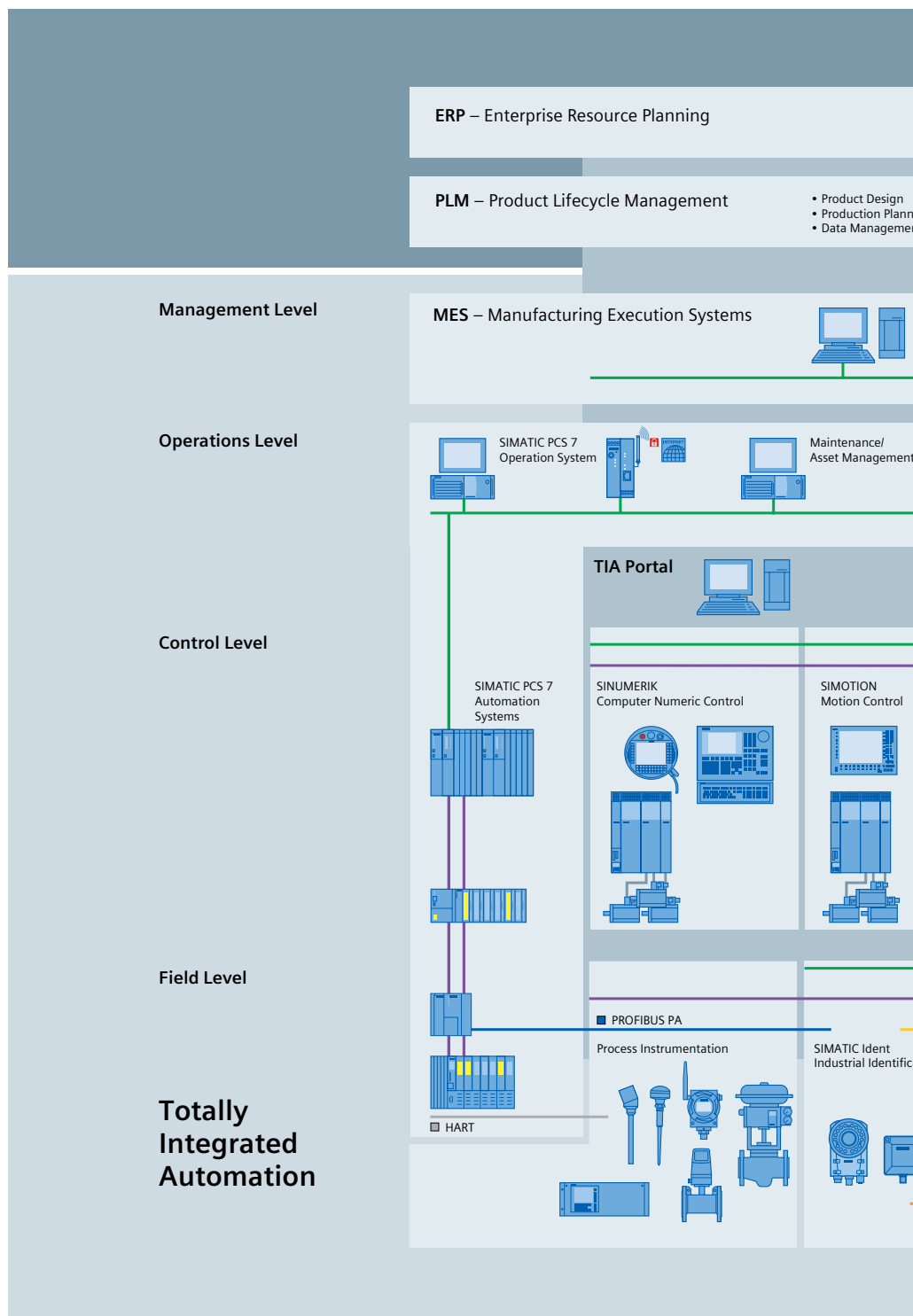
With our WirelessHART solutions, users profit not only from lower total cost of ownership, but also from significantly improved security, reliability and productivity.

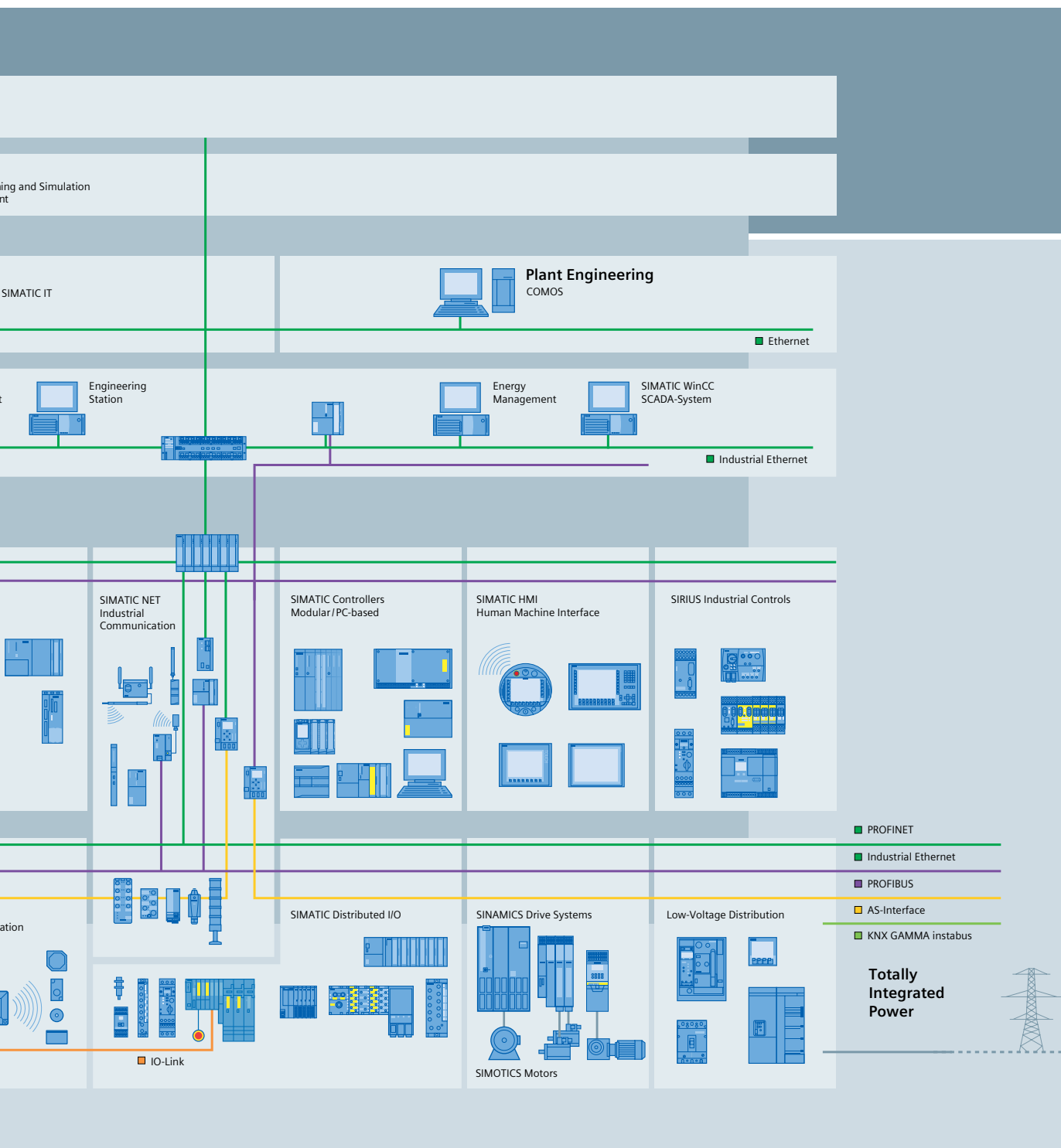
■ Totally Integrated Automation – TIA

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.





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