

SIEMENS



Process Instrumentation, Process Analytics, Weighing Technology

Siemens – The One-Stop Shop
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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





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 P 500

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]

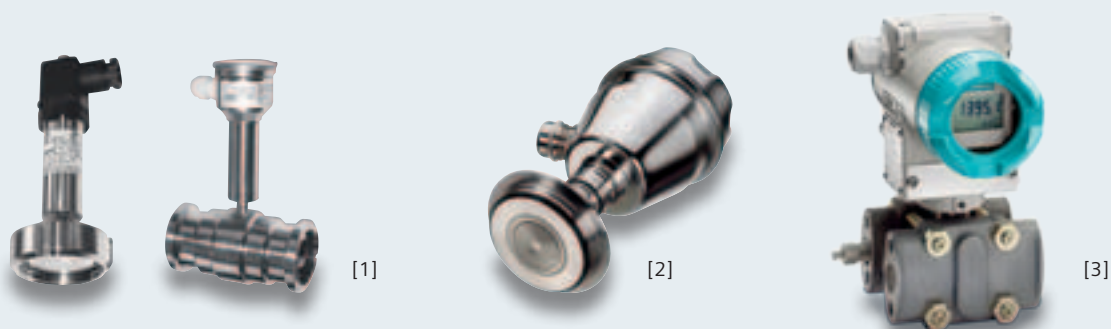
Fixed range transmitter for differential pressure.

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]

The SITRANS P300 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.



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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 for a 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 TH400

Fieldbus transmitter in designs for PROFIBUS PA or FOUNDATION Fieldbus.



[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]

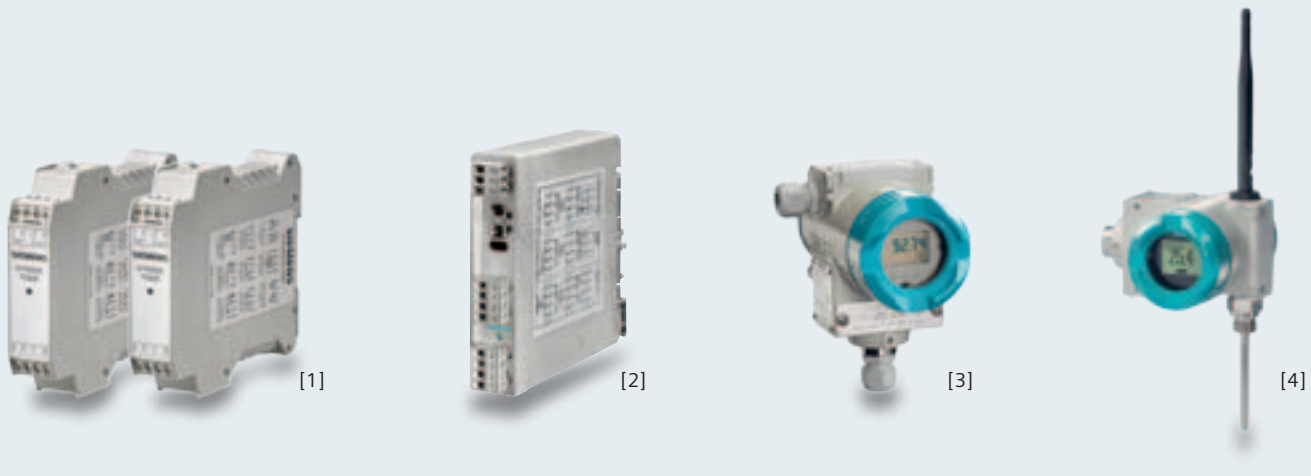
HART universal transmitter, configurable using SIMATIC PDM or HART protocol. Cost-saving service features. Diagnostics and simulation functions, remotely or locally.

■ 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



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]

The SITRANS TF280 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.



■ Temperature sensors

Selection of the correct temperature sensor.

Many resistance thermometer and thermocouple designs are available for use in the process industry. The materials, process connections, construction and accessories are appropriate for a wide range of process applications. Furthermore, our process engineers can help you select appropriate materials for thermowells and extensions or mounting types.

■ For piping and tanks. [8] [9]

Resistance thermometers for threaded, welded, or flange connection. Available with various tubular or barstock thermowells for maximum stress conditions.

■ For combustion plants and furnaces. [7]

Straight thermocouples and flue gas resistance thermometers.

■ For applications with high sanitary requirements according to EHEDG recommendations. [5] [6]

- Resistance thermometers for installation in pipes and tanks with hygienic process connections.
- Clamp-on resistance thermometers can be retrofitted without interfering with process operation, no dead volume.

■ For rooms with high humidity.

Room temperature sensor of Pt100 design.

■ For limited installation conditions.

Jacket thermocouples with attached cable, plug or connection head.

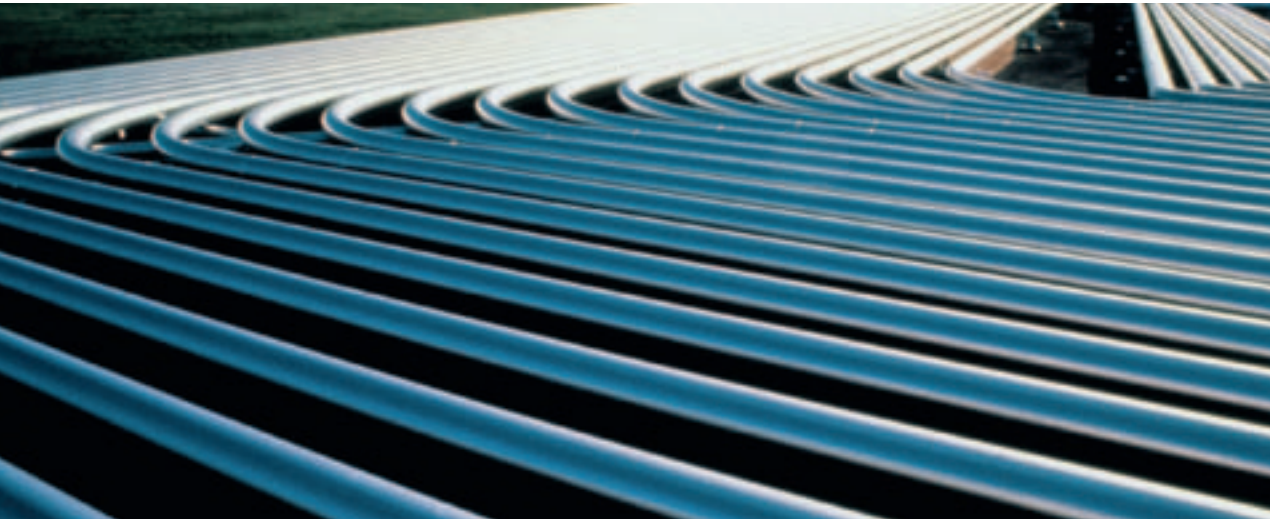
■ Accessories.

Measuring inserts and connection heads for your spare parts strategy.

Do you have a specialized application?

In the industrial temperature measuring sector, applications exist which require adapted devices. We will be pleased to help you with individual solutions.

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 F M MAG 8000

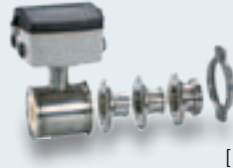
The battery-operated SITRANS F M MAG 8000 solution gives you the flexibility to install a reliable water meter virtually anywhere without sacrificing accuracy or performance.



[1]



[2]



[3]



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■ SITRANS F M – Electromagnetic flowmeters

SITRANS F M flowmeters measure the volume flow of electrically-conductive fluids. 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:

High-powered AC meters

TRANSMAG 2 911/E DN 15 to DN 1000 (1/1" 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.

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 1100/1100 HT sensor for general process industries.
- MAG 1100 F [3] sensor for food and beverage and pharmaceutical industries.
- MAG 5100 W [1] sensor designed for water and wastewater applications.

- MAG 3100P designed for process industry and the harsh requirements in the chemical industry.

- MAG 3100/MAG 3100 HT [2] sensor for general process industry.

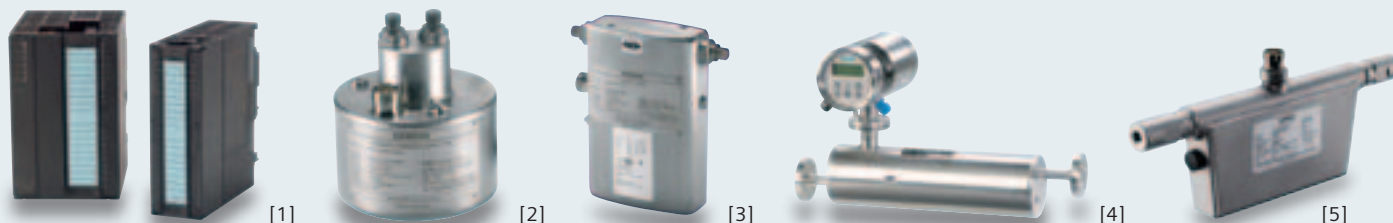
Battery-operated Watermeters

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.

Flow Measurement



The 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 Coriolis 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 Coriolis transmitter [1]

SIFLOW FC070 is a true multi-parameter Coriolis transmitter ready for quick installation and system integration. SIFLOW FC070 is the most compact, space-saving and versatile transmitter available.

Sensors meeting the toughest challenges

Optimum meter 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 range. Sensor 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:

MASS 2100 DI 1.5 [2]

0 to 65 kg/h (0 to 143 lb/h):

Ideal for low flow applications measuring liquid or gas.

FC300 DN 4 [3]

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 – 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 – 150 and Hygenic version DN 20 – 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 [6]

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

Ultrasonic in-line flowmeters are suitable for industrial applications with pipe sizes ranging from DN 50 to DN 1200 (2" to 48"). Full 2 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 is 6+ years.
- Ideal for heatmetering 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:

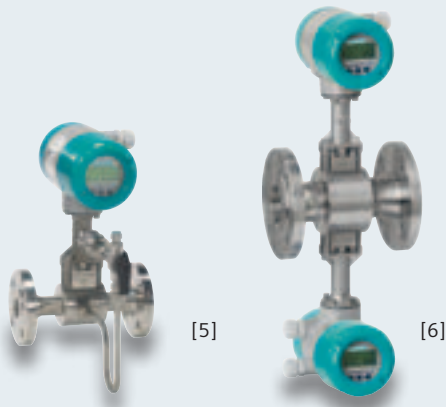
- SITRANS FUS1010 [1] for general industry
- SITRANS FUP1010 [2] portable meter
- SITRANS FUE1010 for HVAC
- SITRANS FUH1010 for hydrocarbon
- SITRANS FUG1010 for gas
- SITRANS FST020 [3] for basic water, wastewater and HVAC applications
- SITRANS FUT1010 [4] for hydrocarbon liquid and gas applications

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 math functions between the two channels. The same applies for four channel meters, which can monitor multiple lines and has multi-path functions.

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 R117 and API recommendations, the ultrasonic flow meter 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

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.

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 and conductive and nonconductive liquids.
- Mass flowmeter. Measurement with temperature sensor for saturated steam compensation as standard feature. Option with a pressure and integrated temperature sensors for compensation of gases, wet gases, mixtures or steam.
- Option within pressure sensor is the isolation valve allowing the pressure sensor to be shut off for the purpose of pressure and leak testing of the pipeline or for being exchanged without interrupting the process.

SITRANS FX300 dual converter [6]

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

■ OCM III – ultrasonic flow controller [7]

High accuracy 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.



MultiRanger 100/200

is a versatile short to medium-range ultrasonic single and multi-vessel level monitor/controller suitable for many applications found in a wide range of industries.



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).
- Milltronics Tilt Switch Probe [4]
Electro-mechanical tilt switch for point level detection, plug-chute detection, and feed loss detection on conveyor belts.

■ Ultrasonic

Pointek® ULS200 [5] 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 [6] – compact 2- or 4- wire switch for level detection in constricted spaces, interfaces, solids, liquids, slurries, and foam.
- Pointek CLS200 and CLS300 [7] – level switch for detecting liquids, solids, slurries, foam, and interfaces even in demanding conditions where high pressure and temperatures are present.
- Pointek CLS500 [8] – 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 and with material $dK > 2$. 4° narrow beam instrument with lens antenna. For ranges up to 100 m (328 ft).



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Ultrasonic

Siemens is the world leader in ultrasonic level technology. The SITRANS Probe LU is a reliable compact transmitter solution offering a level or flow output. 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.
- MultiRanger® [8] – Versatile short- to medium-range single- and multi-vessel controller for applications up to 15 m (50 ft).
- HydroRanger 200 – Level controller for up to 6 pumps including pump control, differential control, and open channel flow monitoring.
- SITRANS LUC500 – High-end duplex lift station controller for the water/wastewater industry.
- SITRANS LU series [10] – Long range level monitoring of liquids and solids, measuring up to 10 points to a range of 60 m (200 ft).
- 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.

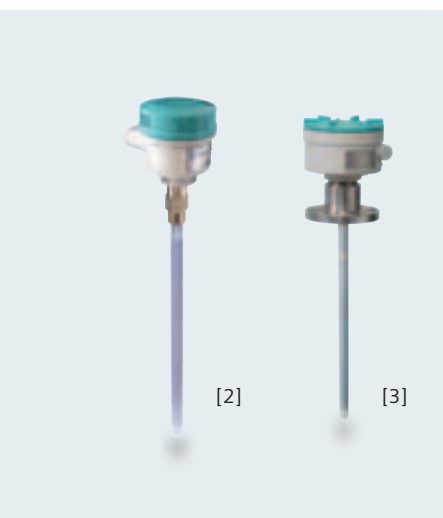
Level Measurement



Guided Wave Radar

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.

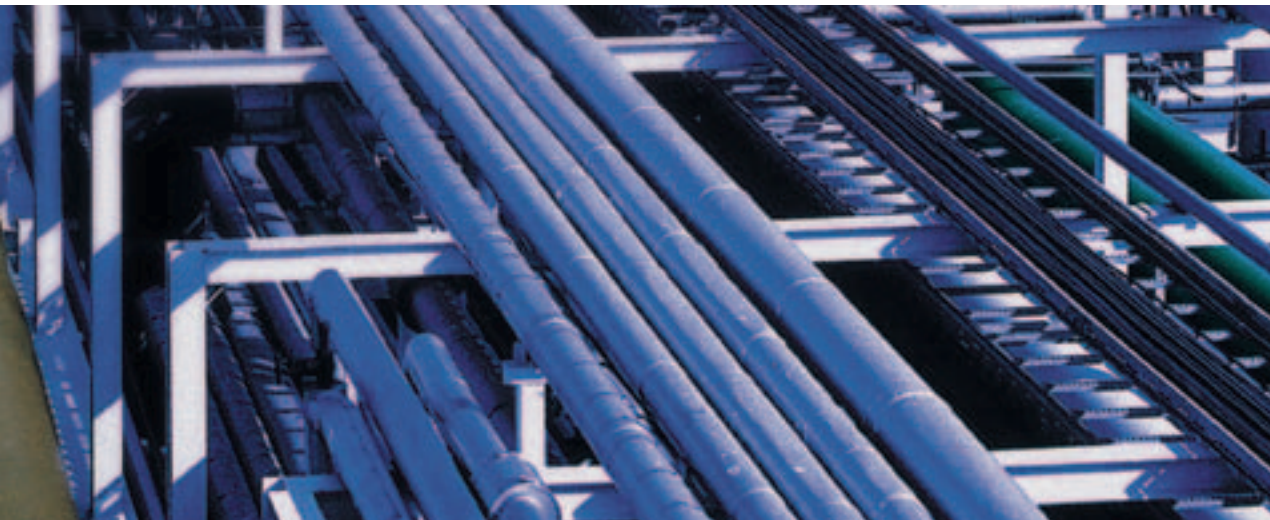
Hydrostatic

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

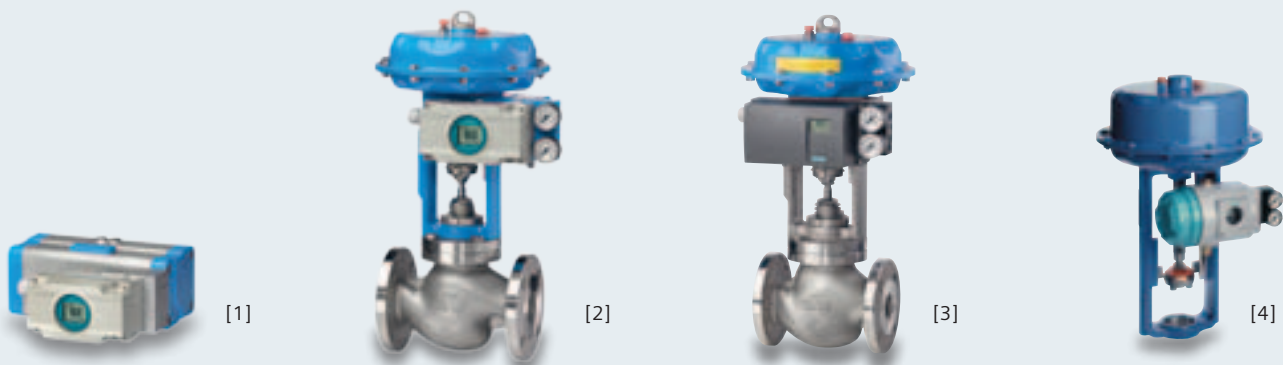


Positioners from Siemens have been guaranteeing safe and trouble-free operation around the globe for nearly 20 years. They accurately control every valve type and process, while handling special tasks with perfect reliability. We continually develop our product range to satisfy your exacting specifications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



SITRANS VP300

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



Our range of intelligent electropneumatic positioners for linear and part-turn actuators is represented by the names SITRANS VP300 and SIPART PS2. The two product lines optimally cover every application. Regardless of application; safe control of valves in chemicals and oil & gas, or precise control in pharmaceuticals or food; we offer the positioner solution for every valve. These include the most widely used electropneumatic positioner, SIPART PS2 and the new SITRANS VP300 for even more applications. Both offer fundamental features like: comprehensive functionalities, diagnostics capability, simple assembly, and fast commissioning.

■ SITRANS VP300 [1] [2]

The new SITRANS VP300 supplements our range of positioners for use in hostile environments, and with compressed air, which is frequently moist or contaminated. Innovative features such as non-contacting position detection and rugged mechanical connection via the OPOS interface not only mean that the SITRANS VP300 is particularly resistant to vibration, but also permit simple and fast assembly with just two screws.

- Standard aluminum enclosure to IP66/NEMA 4x protection.
- Non-contacting position detection (GMR effect).
- Rapid assembly through innovative OPOS interface.
- Simple operation using graphic display and menu prompting.
- Plain text in several languages.

■ SIPART PS2 [3] [4]

SIPART PS2 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.
- EExD 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".

■ Extended online diagnostics (both devices)

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, cavitation in pumps, 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 AS 100

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 AS 100 [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 AS 100 can be connected to a SITRANS CU 02 [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

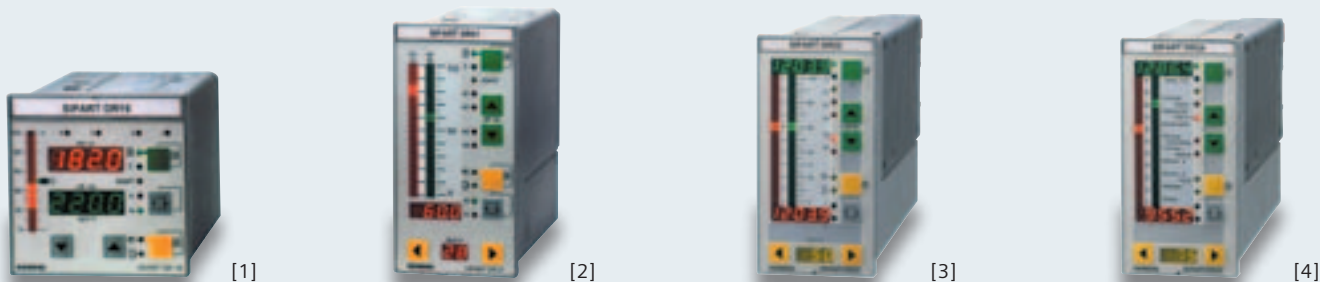


Installed in more than 250 000 control applications in industrial processes and in mechanical and systems engineering and other areas, the SIPART DR series is your solution for process control. The compact controllers with continuous output signal or step contact output have been designed especially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



SIPART DR 24

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

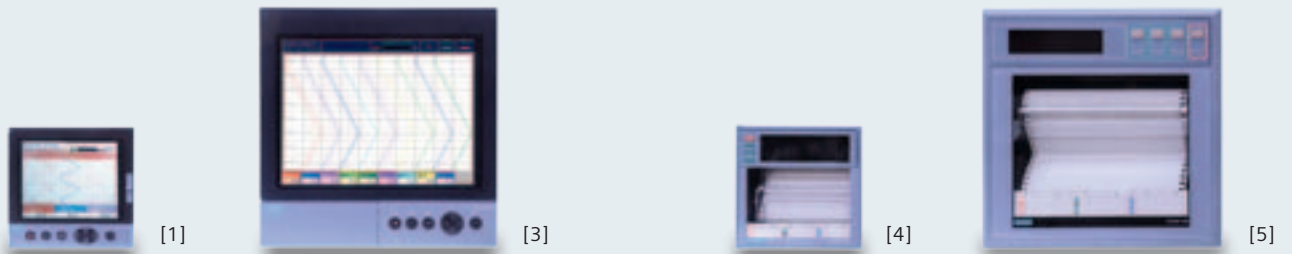


Highly complex processes in industry and research and development emphasize visualization and analysis. The SITRANS R process recorders offer state-of-the-art solutions for any measurement, monitoring and recording application.



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 200 [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.

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 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 analyzers into automation systems in the process industry.

Continuous Gas Analytics

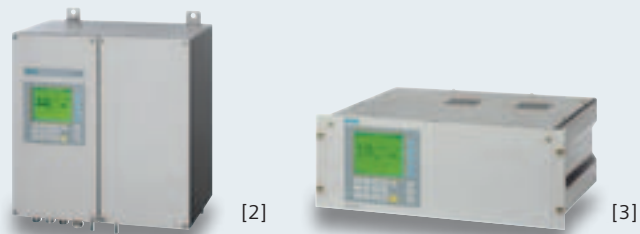
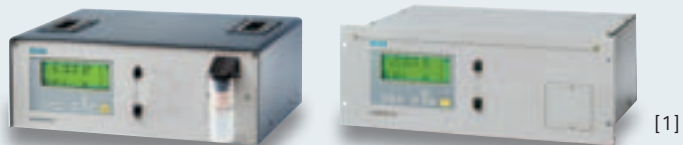


From emission monitoring in waste incinerators and power plants to gas analysis in the chemical industry to rotary kiln monitoring in cement plants, the highly accurate and reliable Siemens analyzers will always do the job.



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 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]

The ULTRAMAT 23 is a cost-effective multicomponent analyzer for the measurement of up to 3 infrared sensitive gases using the NDIR principle plus O_2 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 H_2S -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 [3]

The CALOMAT 62 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 H_2 , Cl_2 , HCl or NH_3 in binary or quasi-binary gas blends.

Continuous Gas Analytics



[1]



[2]



[3]

■ OXYMAT 6 [1] [2]

The OXYMAT 6 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 in applications including emission measurements for use in production process control and quality assurance. Due to its ultrafast response, the OXYMAT 6 is perfect for monitoring safety-relevant plants. 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]

The OXYMAT 61 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]

The OXYMAT 64 is a gas analyzer for the measurement of smallest oxygen concentrations in pure gas applications. Air separation plants, production of technical gases, welding in a protective atmosphere – these are just a few examples where the OXYMAT 64, a completion of the well-proven Siemens Series 6 of continuous gas analyzers, reliably detects small traces of oxygen.

■ ULTRAMAT 6 [1] [2]

The ULTRAMAT 6 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]

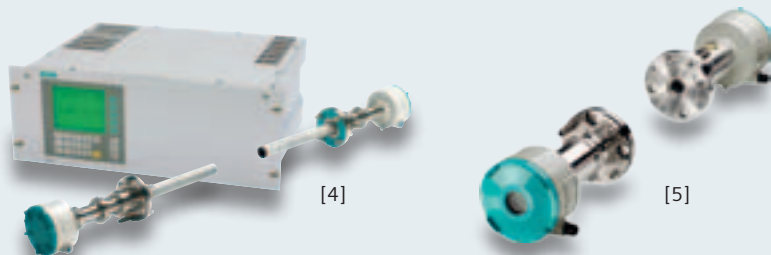
The Series 6 units can be combined in a 19" rack to form multi-component devices with ULTRAMAT 6 and OXYMAT 6 benches. This provides, with the smallest possible footprint, an infrared channel for the measurement of up to two IR components and a channel for oxygen measurement.

FIDAMAT 6

The FIDAMAT 6 measures the total hydrocarbon content in air or even in highboiling gas mixtures. It covers nearly all requirements, from the detection of trace hydrocarbon in pure gas analyses to total measurement of high hydrocarbon concentrations, even in the presence of corrosive gases.

■ Ex-proof designs [3]

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.



PROCESS GAS ANALYSIS – IN-SITU

■ LDS 6 [4]

The robust and reliable LDS 6 in-situ gas analyzer can measure gases even under extreme conditions. Precise and reliable results are obtained even at 1,200 °C (2,192 °F) or where the dust concentration is very high. The LDS 6, for example, measures in-situ concentrations of O₂ (Temp.), 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 [5]

SITRANS SL sets a new benchmark with insitu technology for process control – even under extreme measuring conditions. It offers proven technology integrated into a more compact in-situ gas analyzer design.

SITRANS SL 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. 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. Other applications are e. g. process optimization in the steel industry or combustion control in boilers or waste incinerators.

SERVICE AND MAINTENANCE

■ SIPROM GA

The SIPROM GA software tool is designed for service and maintenance applications with all process gas analyzers. SIPROM GA can control and monitor all functions of the analyzers as independent or networked units. Integration into the Ethernet permits remote servicing and diagnostics over long distances.

■ SIMATIC PDM

The SIMATIC PDM (Process Device Manager) tool allows operation of the gas analyzers from a control system like SIMATIC PCS7 or a separate PC.

Chromatography



Siemens application experience and innovative technology in the field of process gas chromatography helps us provide exceptional customer solutions. Small, compact, powerful, and cost-effective, MicroSAM is capable of performing accurate measuring tasks in virtually all industrial sectors.



SITRANS CV

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



[1]



[2]

■ MicroSAM [1]

is the smallest explosion-proof in-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 fast. The Software "CV Control" has been specially developed for the requirements of the natural gas market, e. g. custody transfer.

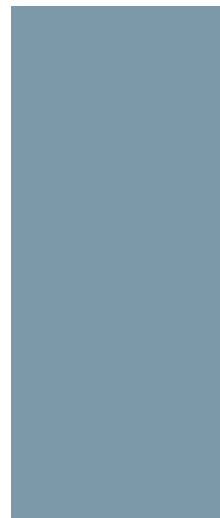
■ MAXUM edition II [2]

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 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 oven configurations.
- Valveless live sample injection and column switching.
- Parallel chromatography allows division of a single-train chromatograph analysis into multiple single trains.
- Open network with TCP/IP and Ethernet for communication with PCs, other chromatographs or a DCS.

Analytic 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.

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

■ Analytical application sets

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.



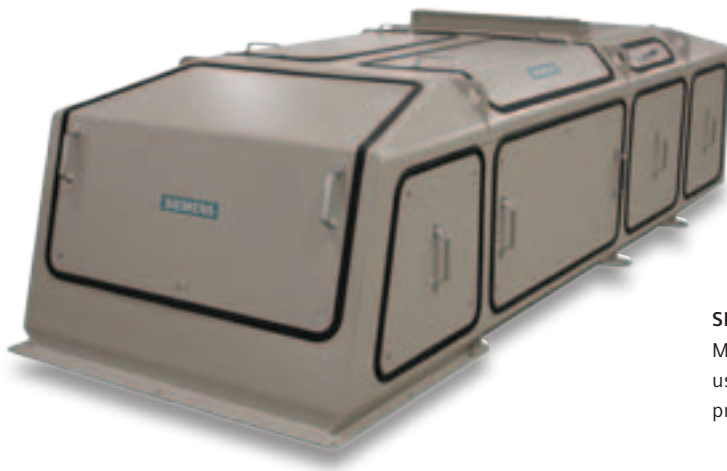
Weighing Technology

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.



SITRANS WW300

Medium- to high-capacity weighfeeder used for macro ingredient additives, proven in hundreds of applications.



[1]



[2]



[3]



[4]

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 load cells, suitable for almost any application you can think of. These are the features:

- High accuracy of 3000d according to OIML R60.
- Large measuring range from 3 kg to 280 t (13.2 lbs to 276 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 industry-designed applications, SITRANS weighfeeders are engineered to the customer requirements.

Weighing and Batching



[1]



[2]



[3]



[4]

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] 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 summary

Performance features

- Integrated in SIMATIC as function module (FM)
- High accuracy
- Legal for trade
- Graded scope of functions
- Suitable for hazardous areas

SIMATIC system environment

- Integration in S7-300/400 with several software packages
- PROFIBUS using ET200M or ET200S
- Integration in PCS 7
- Integration in S7-200, as an extension module (EM), SIWAREX can also be used for various applications in micro automation



[5]



[6]

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

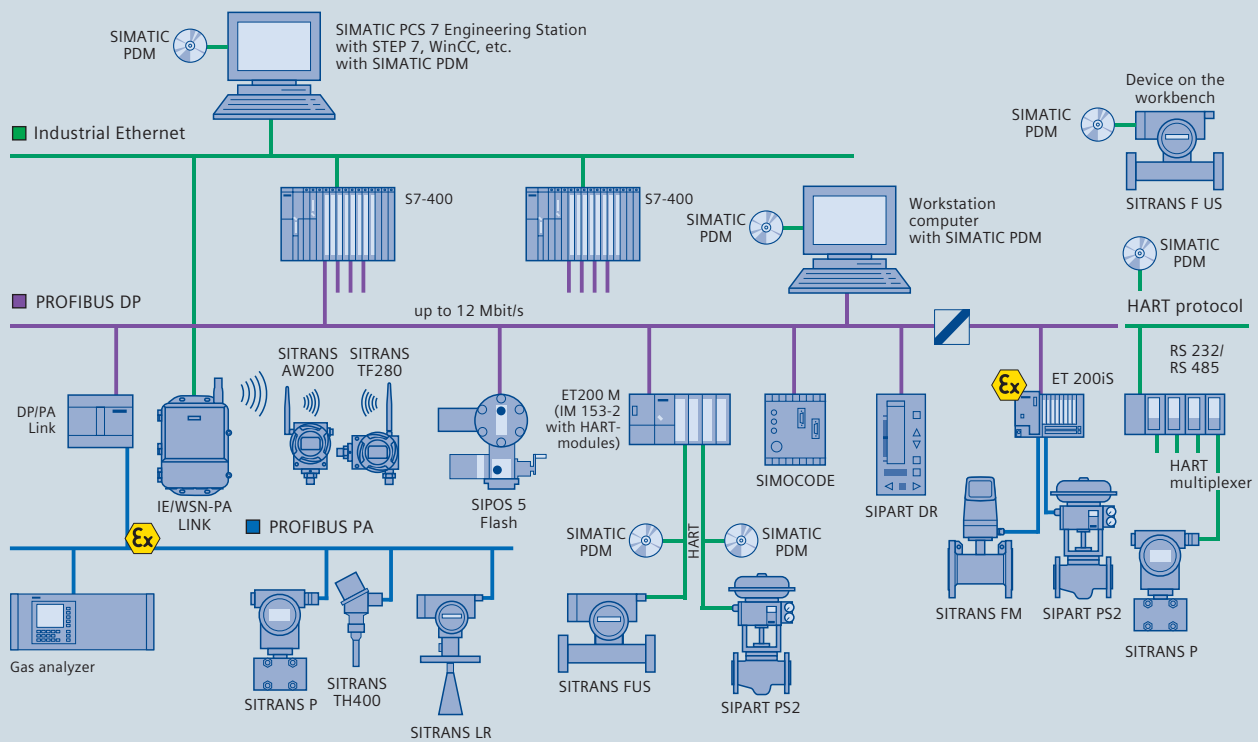


Reliable communication between process devices and control systems is essential for efficient and safe processes. With different communication protocols and the necessary software Siemens offers the right tools to integrate their process instruments and analyzers into the world of process automation. 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

The 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

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

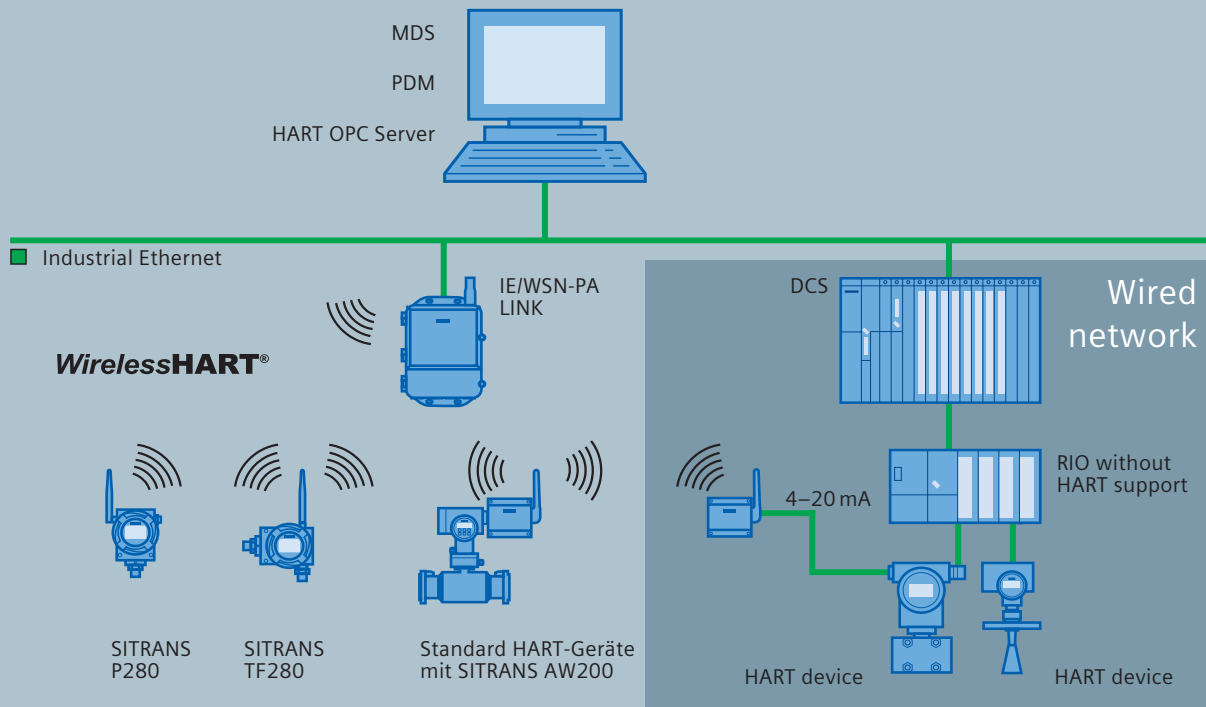
WirelessHART is an intelligent advancement of the proven 4–20 mA HART technology released by the HART Communication Foundation (HCF) as part of Specification V7. WirelessHART is backward compatible with wired HART technology, and as such offers maximum protection for investments in hardware and software, 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

SITRANS DTM is an EDD interpreter for field devices. It interprets and translates Enhanced EDDs which the customer can use in their Field Device Tool (FDT) such as PACTware or Fieldcare.

■ Emerson AMS

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

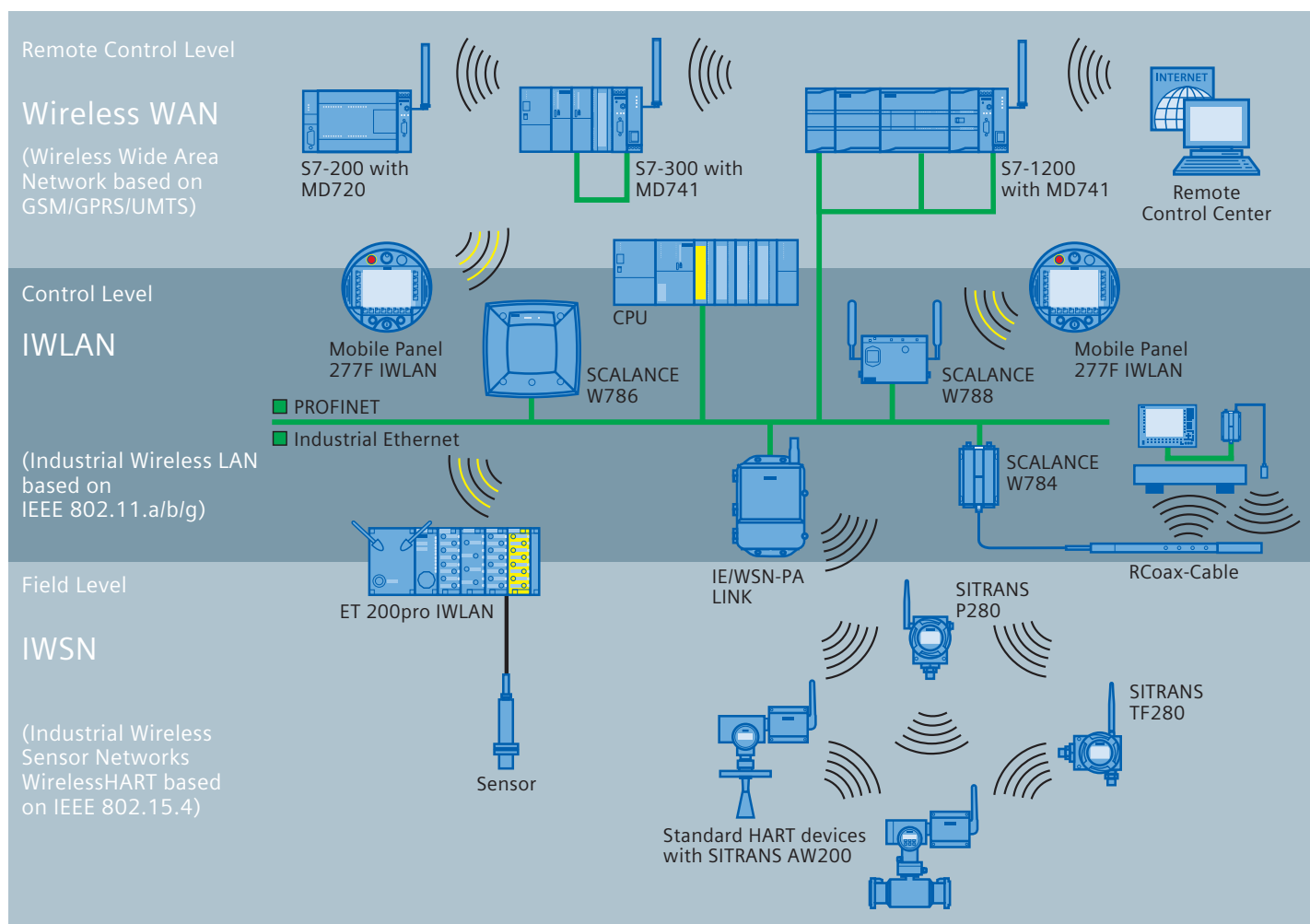


SITRANS MDS

The 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®

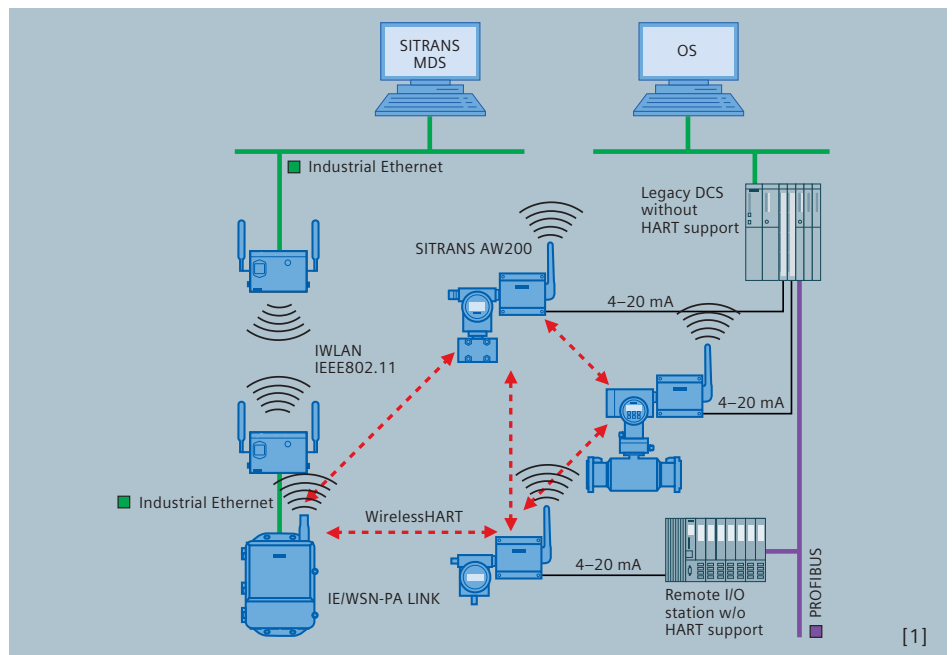
Success factor Industrial Wireless Communication

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.



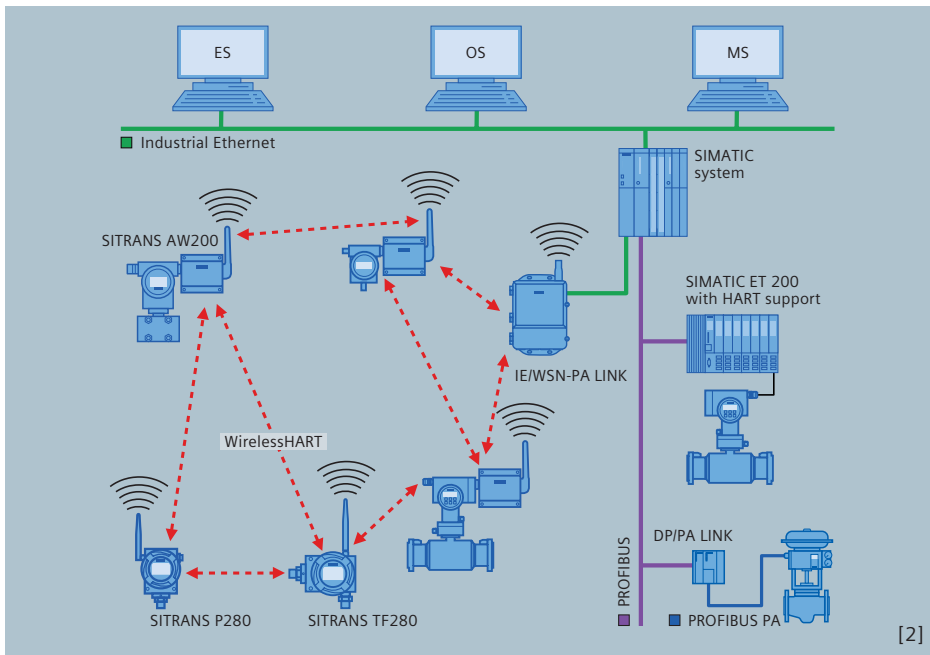
WirelessHART®

WirelessHART answers your challenge

WirelessHART 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.



[2]

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

Totally Integrated Automation 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.

Management Level

ERP – Enterprise Resource Planning

MES – Manufacturing Execution Systems

Operations Level

SIMATIC PCS 7
Process Control (DCS)

Control Level

Industrial Software for

- Product Design
- Production Planning
- Engineering

- Commissioning
- Operation
- Maintenance
- Modernization

SINUMERIK
Computer Numeric Control

SIMOTION
Motion Control

Field Level

■ PROFIBUS PA

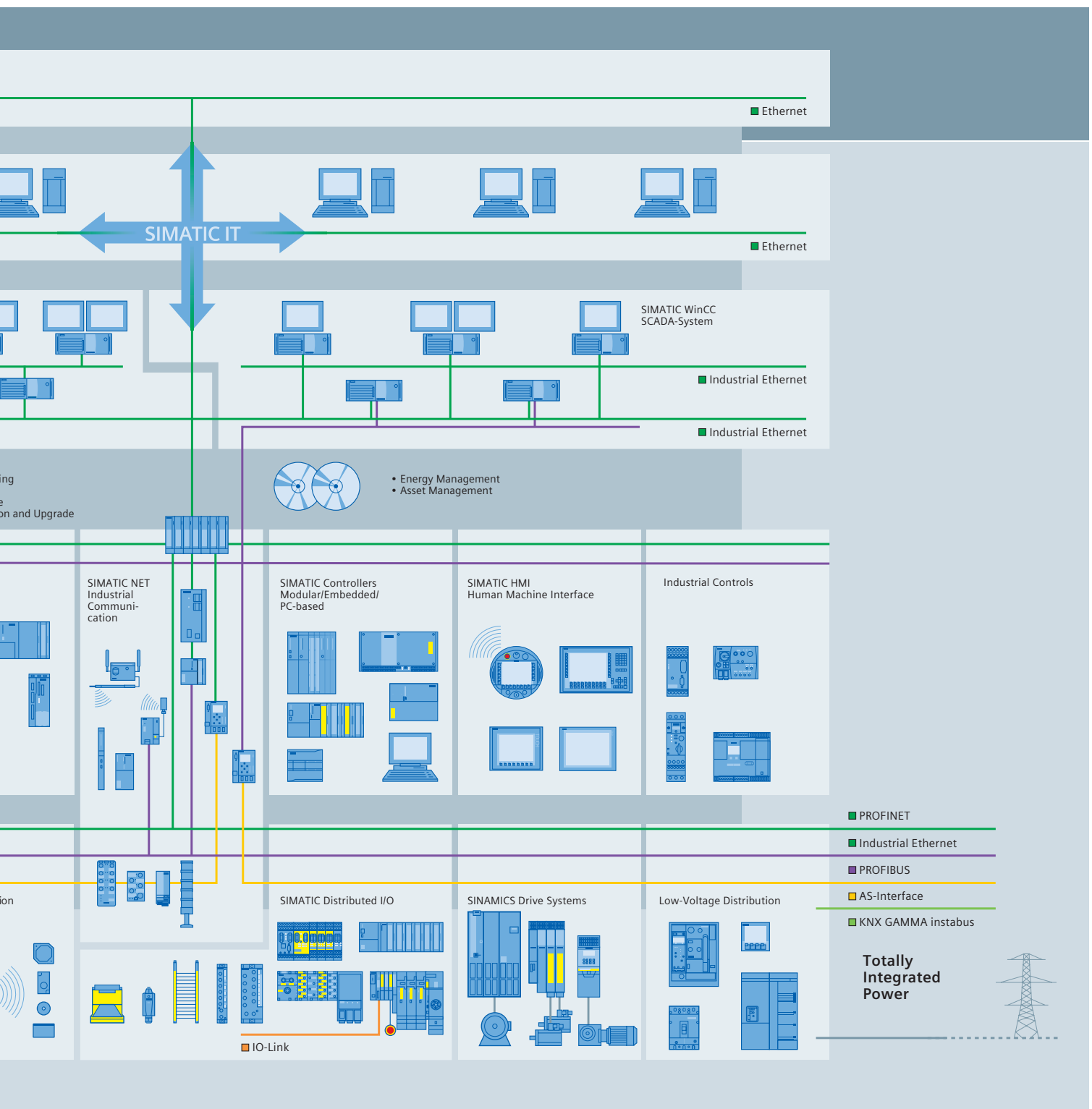


□ HART

Process Instrumentation

Industrial Identification

Totally Integrated Automation



Get more information:

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