



**SIEMENS**

*Ingenuity for life*

## Setting the standard with measuring systems

Process instrumentation, process analytics,  
weighing technology – The One-Stop Shop

[siemens.com/processautomation](https://www.siemens.com/processautomation)

# How to optimize processes with our automation and instrumentation portfolio

High-quality processes are crucial in the process industry. Only then do you get the required results. And it is only then that plants work efficiently and therefore productively.

Process instrumentation and analytics as well as weighing technology all play a crucial role here. They measure, analyze, regulate and control industrial processes and thus contribute to increasing the efficiency of process plants and improving their product quality.

Benefit from the versatility of our holistic solutions for your process tasks – with integrated solutions from a single source. Benefit from the openness of the systems. And from constant innovations and comprehensive services.



Process Instrumentation



Weighing Technology



Process Analytics



Communication and Software

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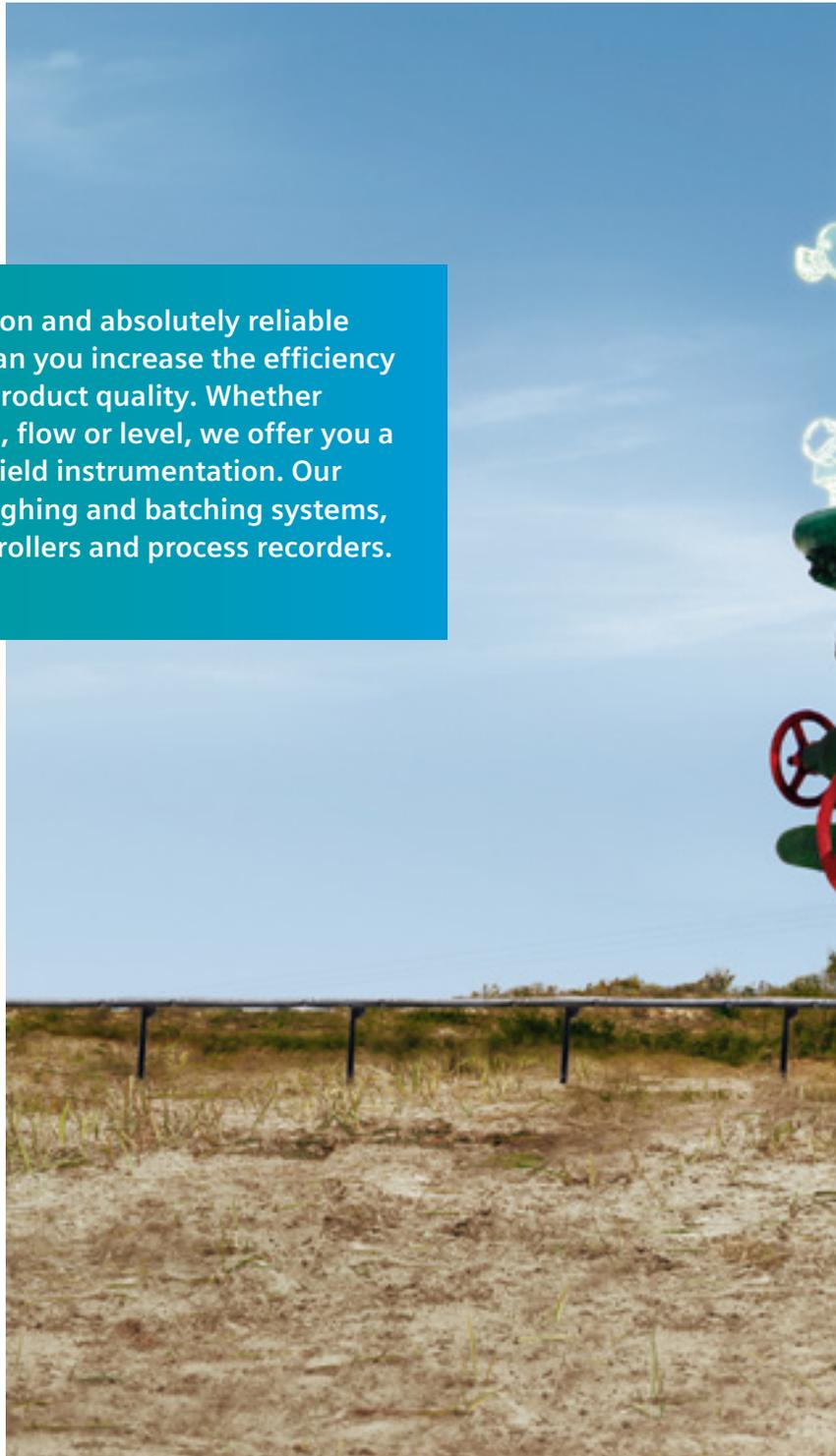


In the areas of process instrumentation and process analytics as well as weighing and dosing systems, our main focus is on the process industries, such as the chemical, oil & gas and hydrocarbon processing, water and wastewater, pharmaceutical, mining, aggregates, cement, pulp and paper, food and beverage, and shipbuilding industries.



# How to increase process efficiency and product quality

In field instrumentation, maximum precision and absolutely reliable measurement results are key. Only then can you increase the efficiency of your process plants and improve their product quality. Whether you're dealing with pressure, temperature, flow or level, we offer you a globally unique range of transmitters for field instrumentation. Our comprehensive portfolio also includes weighing and batching systems, pneumatic valve positioners, process controllers and process recorders.





# Pressure measurement without ifs and buts: SITRANS P

SITRANS P is a complete range of measurement instruments for measuring relative pressure, differential pressure and absolute pressure. In addition to high measuring accuracy and ruggedness, the modular system features superb operating convenience and functionality as well as a perfect safety concept.



**SITRANS P500** – Digital transmitter for high-precision applications with unparalleled specifications for overall performance and long-term stability

- Deviations from the characteristic curve of less than 0.03% of the calibrated measuring range for different pressure and level requirements
- Design of the measuring cells allows for use with media temperatures of up to 125 °C even without the use of a remote seal system
- Good step response time (T63) of only 88 ms ensures plant safety in critical applications
- Device configuration via standard HART protocol-compatible tools or directly on-site with local operation and LCD display
- Graphics-enabled display shows curve and trend diagrams for goal-oriented process monitoring



#### SITRANS P310

- Suitable for installation in SIL 2 measuring circuits according to IEC 61508 / IEC 61511
- Digital transmitter with built-in HART diagnostic functions
- Comprehensive certificates and approvals, such as ATEX Ex i, Ex d, Ex nA/ic, FM, CSA
- Variants for relative pressure and differential pressure measurements



#### SITRANS P DS III

- Suitable for installation in SIL 2 measuring circuits according to IEC 61508/IEC 61511
- Digital pressure transmitter with numerous diagnostic and simulation functions for measuring relative, absolute and differential pressures as well as flow and fill levels
- HART, PROFIBUS PA or FOUNDATION Fieldbus communication
- For extreme chemical and mechanical loads as well as electromagnetic influences
- Additional safety features such as plant and self-monitoring, error diagnostics and notification of the next calibration date
- Unique self-test function for fail-safe operation



#### SITRANS P410

- Suitable for installation in SIL 2 measuring circuits according to IEC 61508/IEC 61511
- Digital transmitter with increased measuring accuracy
- Built-in diagnostic functions for HART, PROFIBUS PA or FOUNDATION Fieldbus communication
- Enhanced measuring accuracy of 0.04%
- Design variants for relative and differential pressure measurements
- SITRANS P DS III certification (e.g. ATEX Ex i, Ex d, Ex nA/ic, FM, CSA)



#### SITRANS LH100/LH300

- Suitable for applications ranging from drinking water or wastewater up to corrosive liquids thanks to stainless steel enclosure
- Rugged submersible sensors for hydrostatic level measurement
- Installation possible in pipes with 1" inner diameter



#### SITRANS P200/210/220

- Single-range transmitter for relative, absolute and hydrostatic pressure
- Pressure sensors: Stainless steel sensors (SITRANS P210 and SITRANS P220) as well as sensors with ceramic membrane (SITRANS P200)
- Conversion of measured pressure into either 4–20 mA or 0–10 V signal



#### SITRANS P280

- WirelessHART pressure transmitter for process monitoring or asset management
- Wireless data transmission
- Battery operated with extremely low power consumption
- Direct mounting possible on containers and pipes in remote parts of the plant as well as on moving or rotating devices thanks to compact and rugged design



### SITRANS P compact

- Analog transmitter for absolute and relative pressure
- Hygienic design in accordance with EHEDG, FDA and GMP recommendations
- Stainless steel process connections and enclosure
- Measurement deviation  $\leq 0.2\%$



### SITRANS P300

- More than 90 different process connection variants offer the highest degree of flexibility
- Versatile communication connection via HART protocol, PROFIBUS PA or FOUNDATION Fieldbus
- Fulfills EHEDG, FDA and 3A requirements
- Maximum measurement deviation of 0.075%
- Can be combined with flush-mounted absolute or relative pressure measuring cells



# Because every degree matters: SITRANS T

SITRANS T products are the temperature measurement professionals, even in extreme conditions. Whether used in hot, cold or hazardous environments – the communicative SITRANS T meets all expectations. And whether you're looking for sensors or transmitters for head, rail or field mounting – all are available individually or as complete measuring points. Our cost-effective SITRANS T transmitters offer high precision in every application and are quick and easy to connect to thermocouples or resistance thermometers. The SIMATIC PDM intelligent software package permits parameterization in just minutes, and input errors are avoided.



**SITRANS TS500** – Temperature sensors for pipes and containers – from simple applications to solutions for harsh environments

- Modular system with protective pipe made of pipe or solid material, extension, connection head, and optional transmitter or display
- Version for intrinsic safety, flameproof and nonsparking are available

### Transmitters for head mounting



#### SITRANS TH100

- Pt100 transmitter
- Low-cost and compact
- Configurable using PC (SIPROM T)

#### SITRANS TH200

- Universal transmitter
- Configurable using PC (SIPROM T)
- Cost-saving operational features
- Diagnostics LED

#### SITRANS TH300

- HART universal transmitter
- Configurable using SIMATIC PDM or HART protocol
- Cost-saving operational features
- Remote or local diagnostics and simulation
- Diagnostics LED

#### SITRANS TH400

- Fieldbus transmitter
- For PROFIBUS PA or FOUNDATION Fieldbus
- Configurable with SIMATIC PDM (PA) or AMS (FF)
- Extensive diagnostics and simulation functions
- Transmission of important device and process data over the bus cable

### Transmitters for rail mounting



#### SITRANS TR200

- Universal transmitter programmable with a PC (SIPROM T)

#### SITRANS TR300

- HART universal transmitter configurable using SIMATIC PDM or HART protocol

#### SITRANS TW

- Universal transmitter for four-wire system
- Cost-saving operational features
- Diagnostics LED

Transmitters for field installation



**SITRANS TF**

- IP66/67/68 degree of protection
- Used where there is excessive heat or vibration at the measuring point
- HART/PA/FF communication
- Optional programmable digital display
- Can be used as a remote display without transmitter



**SITRANS TF280**

- WirelessHART temperature transmitter for direct mounting on containers and pipes in remote parts of the plant as well as on moving or rotating devices thanks to the compact and rugged design
- Used for process monitoring or asset management
- Wireless transmission of measured process values
- Battery operated with extremely low power consumption

**SITRANS TS temperature sensors**



**SITRANS TS100**

- For multiple applications
- Supplied with directly installed cable
- ATEX and IEC EX approvals; can be operated in Zone 0
- Wide range of options thanks to modular principle



**SITRANS TS300**

- Clamp-on temperature sensor
- Design meets EHEDG recommendations and is therefore suitable for use in the food and beverage and pharmaceutical industries
- Replaceable measuring inserts



### SITRANS TS200 compact design

- For multiple applications
- Compact design with directly installed fixed connection (M12, Lemo, etc.)
- ATEX and IEC EX approvals; can be operated in Zone 0
- Wide range of options thanks to modular principle

### Transmitters for fiber-optic temperature measurement



### SITRANS TO500

- Fiber-optic temperature transmitter
- Diameter of sensor measuring probe < 2 mm
- Up to 48 measuring points per sensor measuring probe
- Simple and low-cost installation thanks to rolled sensor measuring probe



# Everything flows: SITRANS F

Whether measuring gas, liquids, or steam – choosing the right flowmeter is decisive for productivity. This is where the SITRANS F line comes in. Our portfolio contains the right flowmeter for every application and medium, with a variety of solutions suitable for measuring liquids, gases and steam in every industry.



#### SITRANS FC410

- Sizes from DN 15 to DN 80 in standard, hygienic (3A, EHEDG) and NAMUR versions. Compact mounted
- Solid performance with mass flow accuracy 0.10% and density accuracy available 0.5 kg/m<sup>3</sup>
- Robust frame construction, isolates from external noise and vibrations and secures no twisting of the tubes
- Marine approvals: Germanischer Lloyd/Det Norske Veritas, Bureau Veritas, Lloyds of London, American Bureau of Shipping
- Direct integration into automation systems. Communication via Modbus RTU with SIMATIC as well as other PLCs and distributed control systems
- Transmitter design enables the most compact Coriolis system in the world

## SITRANS F C

### Coriolis mass flowmeter

The SITRANS F C multivariable devices measure the direct mass flow rate of liquids and gases in almost any application. They deliver reliable and repeatable information on mass flow, volume flow, temperature, density, and concentration (e.g. Brix or Plato). They are available in sensor, transmitter, and flowmeter system versions. Fulfill requirements for high performance in oil & gas, chemical, food & beverage, pharmaceutical, and hydrocarbon applications.



### SITRANS FC430

- Innovative and user-friendly transmitter, with audit trails, trend curves and advanced diagnostic functionalities
- Sizes from DN 15 to DN 80 in standard, hygienic (3A, EHEDG) and NAMUR versions remote- or compact-mounted
- Solid performance with mass flow accuracy 0.10% and density accuracy available 0.5 kg/m<sup>3</sup>
- Robust frame construction, isolates from external noise and vibrations and secures no twisting of the tubes



### SITRANS FC300

- Compact sensor with rugged, space-saving sensor design in stainless steel for all applications
- Optimal hygiene, safety, and CIP cleanability for the food & beverage industry as well as pharmaceutical applications, thanks to single-tube construction without internal welds, reductions, or flow splitters
- Easy installation using a Plug & Play interface
- Combined with MASS transmitters to make a complete flowmeter: SITRANS F C MASS 6000 for general industry applications and SIFLOW FC070 for direct integration into SIMATIC-based systems



### SIFLOW FC070

- Quick installation and integration of the multiparameter transmitter into the SIMATIC system
- Most compact, space-saving, and versatile transmitter on the market

### SITRANS FCS200

- Fits in where space is crucial, providing extra flexibility in any compressed natural gas (CNG) application for both new installations and replacements
- Available in DN 10 to DN 25 and easy to install, with a wide range of different connections available
- Broad application fit within dispensers, compressors and distribution
- Easy adaptable as sensor is available with a wide range of standard gas process connectors to meet virtually any market requirement



## SITRANS F M

### Electromagnetic flowmeters

The task of an electromagnetic flowmeter from the SITRANS F M product family is to measure flow volume of electrically conducting fluids such as water, chemicals, food and beverage, slurries, sludge, paper stock and mining slurries with magnetic particles. The SITRANS F M product range is divided into three meter types:



### 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-mounted
- Multiple I/O as standard and communication modules PROFIBUS PA/DP, FOUNDATION Fieldbus, HART and Modbus RTU are available
- MAG 5100 W 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 sensor for general process industries
- 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")

- Battery-powered solution that makes it easier than ever to install a reliable water meter virtually anywhere
- Battery lifetime up to 6+ years
- IP68 (NEMA 6P) enclosure and sensor painting according to ISO 12944 class C4M corrosivity for burial and submerged applications
- Easy installation with straight inlet/outlet
- Rich add-on communication modules: Modbus RTU, Encoder card, GSM/GPRS module/3G module

### MAG 8000 with GSM/GPRS module or 3G module

- Rich data transmission protocols supported by GSM/GPRS module/ 3G module: SMS, e-mail on SMTP protocol, e-mail on SMTPS protocol (TLS/SSL-based encryption)\*, FTP, FTPS (TLS/SSL-based encryption)\*
- Configurable analog input for external ratiometric pressure transmitter in parallel with flow measurement (2-in-1 solution), or 4–20 mA alarm signal input for external tamper and flooding detector
- Real-time clock synchronization with Internet NTP server with adjustable time zone setting\*\*
- Synchronization of data transmission at customer-specified time point
- Real-time SMS notification for MAG 8000 alarms



### High-powered AC meters TRANSMAG 2 / 911/E DN 15 to DN 1000 (1/2" to 40")

- Specially designed for heavy mining slurries with or without magnetic particles as well as the most difficult applications in the pulp and paper industry
- Wide choice of corrosion-resistant liner materials
- Heavy-duty industrial enclosure
- No movable parts
- Transmitter featuring high measuring performance, fast response to flow step changes, fast dosing applications, high immunity to process noise, easy installation and maintenance through digital signal processing technologies
- Safety integrity level: SIL 2 & SIL 3

### SITRANS F US ultrasonic flowmeters

Our ultrasonic flowmeters deliver extremely accurate results in a wide range of conductivities, viscosities, temperatures, densities and pressures. This makes them the optimal choice for measuring a variety of process industry applications. SITRANS F US ultrasonic flowmeters are available in in-line and clamp-on versions. Both meter types can be used with homogeneous conductive and non-conductive liquids, and the clamp-on version can also measure gases.



#### In-line ultrasonic flowmeters

- Suitable for industrial applications with pipe sizes from DN 50 to DN 600 (2" to 24") (larger sizes on request)
- Available in 2-path sensors in combination with SITRANS FUS060 transmitter
- 1-path and 4-path systems on special request also available in combination with the SITRANS FUS060 transmitter
- Option between mild steel and stainless steel on request
- Sensors can be exchanged without interrupting operation



#### SONOKIT Retrofit flowmeter type

- The SONOKIT system is designed for in-line retrofitting on all existing pipelines up to DN 3000 (120") as a 1-track or 2-track flowmeter
- Flexible SITRANS FUS060 transmitters with HART or PROFIBUS PA (up to DN 3000/120")
- The unique design enables installation on empty pipes or pipes under pressure without process shutdown
- Robust version can be buried and withstands constant flooding
- Outstanding accuracy; the bigger the pipe, the more accurate the result
- 4-path systems (up to DN 1500/60") are also available on special request



### SITRANS FUS380 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
- Also suitable for chiller plants (including glycol mixes without type approval)
- Custody transfer approvals for district heating custody transfer applications (MID MI-004). Sizes range from DN 50 to 1200 (2" to 48")
- Battery or mains power enables installation where needed. Battery lifetime up to 6 years
- Ideal for energy metering together with the SITRANS FUE950 energy calculator
- With heatmeter type approval (MID MI-004)

### Clamp-on ultrasonic flowmeters

The externally mounted sensors of Siemens clamp-on ultrasonic flowmeters are quickly and easily installed on the outside of a pipe, making them the perfect choice for existing applications or where corrosive, toxic or high-pressure fluids rule out the option of cutting the pipe. The cost-efficient technology provides highly accurate measurement of both liquids and gases on pipes ranging from DN 6 to DN 10000 in size.



#### SITRANS FS230

- Digitally based system featuring market-leading accuracy of 0.5 to 1% of flow rate
- Best-in-class 100 Hz data update rate reliably detects even the smallest changes in flow
- WideBeam® transit-time technology allows for measurement of virtually any liquid, even those with high levels of aeration or suspended solids
- Large graphical display with intuitive navigation, multiple setup wizards and patented pipe configuration menu
- SensorFlash® microSD card stores all operational data for easy device transfer and servicing
- Application examples include raw and potable water, effluent, district heating and cooling, hydroelectricity and nuclear feed water



#### SITRANS FUP1010

- Portable flowmeter for maximum versatility plus battery power for field use
- Operable in WideBeam transit time or Doppler mode, making it suitable for virtually any liquid
- Ideal for general flow survey work where high accuracy is required
- Offered in single- and dual-path configurations in a weatherproof enclosure
- Also available as pre-configured liquid check metering kit for water and wastewater industry



#### SITRANS FUE1010

- Thermal energy flowmeter for HVAC applications
- Ideal for revenue grade sub-metering and energy efficiency distribution monitoring, with a real-time coefficient of performance (COP) for HVAC systems
- Offered in single- and dual-path configurations and with the choice of a wall mount or portable enclosure
- Also available as portable pre-configured HVAC metering kit
- Application examples include chilled and hot water sub-metering, condenser water, glycol, thermal storage and lake source cooling



#### SITRANS FUH1010

- Ideal for crude oil, refined petroleum and liquefied gas applications
- Available in versions for standard volume, precision volume and interface detection
- Measurement of flow, density and temperature, as well as mass output
- Available in single-, dual- and four-path configurations
- Two enclosure versions: wall mount and wall mount explosion-proof



#### SITRANS FUG1010

- Ideal system for natural and process gas applications such as check metering, flow survey verification, lost and unaccounted for (LAUF) gas analysis, and production and storage
- Uses internal AGA-8 table for fixed gas composition to compute standard volume
- Complies with AGA-10 speed of sound measurement practices
- Available in single-, dual- and four-path configurations
- Wall mount and wall mount explosion-proof enclosures available



#### SITRANS FST020

- For the most basic flow applications
- Combines reliable measurement with simple configuration and setup in a single-channel design
- IP65 (NEMA 4X) enclosure, RS 232 communication and optional WideBeam transit-time flow measurement technology



#### SITRANS FUT1010

- For hydrocarbon applications and available in a liquid and gas version
- Innovative TransLoc system permanently mounts the sensors, allowing for laboratory calibration
- Available with ATEX (PED), FM, CSA and CRN approvals, making it suitable for numerous upstream, midstream and downstream measurement tasks requiring very high accuracy
- Available in dual-, three- and four-path configurations and in a wall mount or wall mount explosion-proof enclosure

### SITRANS F X – Vortex flowmeters

Vortex flowmeters provide accurate volumetric and mass flow measurement of steam, gases, and both 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 well suited for such industries as chemical, HVAC & power, food & beverage, oil & gas, and pharmaceutical. SITRANS F X vortex flowmeters are available as flanged or sandwich versions in the following configurations:



#### SITRANS FX300

- Volumetric flowmeter. Measurement of steam, gases, and both 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

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



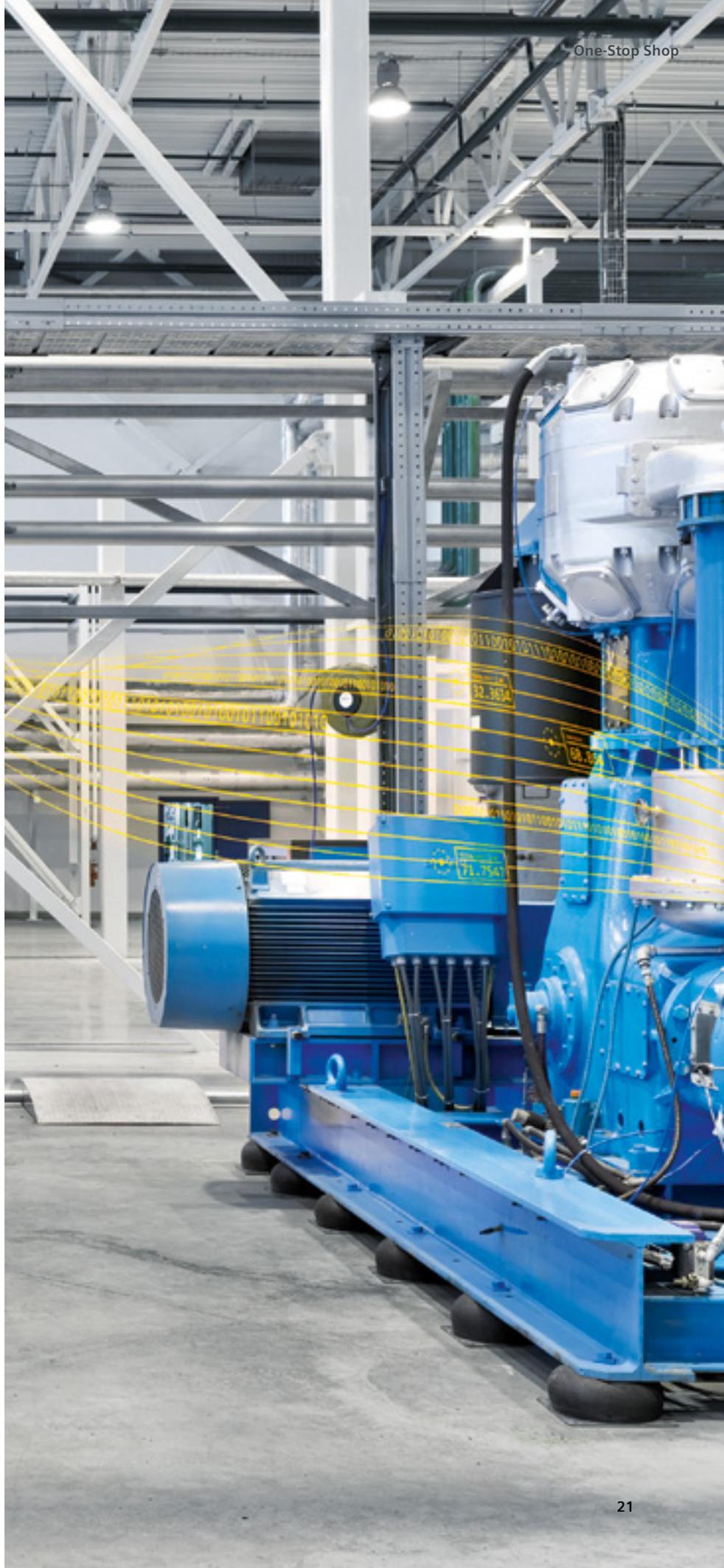
#### SITRANS FX330

- Integrated pressure and temperature compensation for lower installation costs and increased accuracy
- Integrated reduction of nominal diameter results in a large turndown ratio, reducing installation costs and potential for leakage
- Provides redundant storage of all calibration and configuration data within the display memory and the electronics module
- Designed from the ground up to be fully compliant with the IEC 61508 SIL 2 safety standard
- Cost-efficient energy calculation including net heat measurement



**SITRANS FO –  
differential pressure flowmeters**

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



# Always on the level

Indispensable in numerous applications in the process industries:  
Whether point level detection or continuous level measurement,  
our comprehensive offering has the right solution for your application.



**SITRANS LR560** – The robust level transmitter for continuous monitoring of solids and liquids

- 2-wire, 78 GHz FMCW for ranges up to 100 m
- Very narrow 4-degree beam angle with 3" lens antenna
- Aiming flanges, easy to install
- Process Intelligence integrated and plug and play performance



#### SITRANS LR250

- For liquids and slurries in storage and process vessels with high temperatures and pressures
- Also for corrosive or aggressive materials and hygienic or sanitary requirements thanks to the new flanged and hygienic encapsulated antennas
- 2-wire, 25 GHz pulse radar level transmitter to a range of 20 m



#### SITRANS LR200

- Ideal for process vessels with turbulence, heavy deposit, as well as with high temperatures and pressures to a range of 20 m
- 2-wire, 6 GHz pulse radar level transmitter for liquids



#### SITRANS Probe LR

- 2-wire, 6 GHz pulse radar level transmitter to a range of 20 m
- For the simple monitoring of liquids and slurries in storage vessels with nominal pressure and temperature

#### Continuous level measurement

Continuous level measurement constantly monitors dynamic processes. The measurements are transmitted as an analog signal or digital value. We offer a wide range of transmitters based on a variety of technologies, including ultrasonic, radar, guided wave radar, capacitance, gravimetric, and hydrostatic processes.

#### Sonic Intelligence and Process Intelligence

The signal processing technologies differentiate between the true echo from the material and false echoes from obstructions or electrical noise. The sophisticated software is 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.

#### Radar level measurement with intelligent signal processing

- Non-contacting and low-maintenance
- Microwaves require no carrier medium, for precise measurements even under harsh process conditions
- High performance and easy implementation using just a few parameter entries on the infrared handheld interface or via configuration tools such as SIMATIC PDM, Pactware, or AMS



#### SITRANS LR460

- For bulk solids in vessels and ideal for applications with extreme dust and high temperatures to 200 °C and with media with a low bulk density/low dielectric properties
- 4-wire, 24 GHz FMCW radar level transmitter to a range of 100 m



#### SITRANS LR260

- For solids and liquids in storage vessels with extreme levels of dust and in gas hazardous areas
- 2-wire, 25 GHz pulse radar level transmitter to a range of 30 m with quick update time

### Point level detection

We offer you a comprehensive portfolio for extremely reliable and precise point level detection. Our wide selection includes ultrasonic, rotating, and vibrating level switches as well as RF capacitance switches with inverse frequency shift technology that are cost-effective and suitable for virtually all applications, from bulk solids to liquids.

### Vibrating, rotary paddle

- Especially suitable for low bulk density applications
- Ideal for use in harsh and abrasive environments, thanks to their rugged design
- For detecting high, low, and demand levels in solids, liquids, and slurry applications
- A wide variety of configuration options makes them suitable for any environment
- Simple to use with no complicated setup or configuration
- Standard aluminum enclosures and high-grade steel process connections provide exceptional resistance to mechanical forces, a long service life, and low cost of ownership



#### SITRANS LPS200

- Rotary paddle switch that detects solids with densities as low as 15 g/l
- Motor protection
- SIL 2 certification for best-in-class reliability and performance



#### SITRANS LVL100 and LVL200

- Vibrating level switches for liquid and slurry applications, including high, low, and demand level alarms and pump protection



#### SITRANS LVS100 and LVS200

- Vibrating level switches that detect solids with densities as low as 5 g/l
- Best-in-class sensitivity detection



#### Pointek ULS200 Ultrasonic

- Non-contacting ultrasonic level switch with two switch points
- Ideal for sticky materials and an effective solution for bulk solids, liquids and slurries

## Capacitance

Pointek capacitance point level switches with inverse frequency shift technology provide accurate, reliable and repeatable measurement results even in dusty, turbulent and vaporous environments or in applications with product buildup. Small changes in level create large changes in frequency. Consequently, Pointek devices have greater sensitivity and consistently outperform conventional devices. With their rugged aluminum enclosures and process connections, Siemens Pointek switches are proven superior performers in liquids, solids, slurries, and interfaces.



### Pointek CLS100

- Suitable for level detection in constricted spaces, interfaces, solids, liquids, slurries, and foam
- Compact 2-wire or 4-wire switch



### Pointek CLS200 and CLS300

- Suitable for detecting liquids, solids, slurries, foam, and interfaces even in demanding conditions where high pressures and temperatures are present



### Ultrasonic level measurement

Whether short or long range – our market-leading ultrasonic level measurement is an extremely cost-effective solution. It's also suitable for harsh environmental conditions such as vibrations or dust. The non-contacting technology is used in numerous industries to monitor liquids, bulk solids, and slurries.



#### SITRANS LUT400

- Compact, single-point, ultrasonic controllers for continuous level or volume measurement of liquids, slurries, and bulk solids, and high accuracy monitoring of open channel flow
- Industry-leading 1 mm accuracy, setup time of less than a minute
- Intuitive navigation via the local user interface
- Compatible with the entire line of Siemens Echomax ultrasonic sensors with a 0.3 to 60 m range



#### HydroRanger 200

- Level controller for up to six pumps, including pump control, differential control, and open-channel flow monitoring



#### SITRANS Probe LU

- 2-wire, loop-powered ultrasonic transmitter for level/volume/flow monitoring of liquids in storage vessels, simple process vessels, and open channels up to 12 meters (39.4 ft) tall



#### SITRANS LU150 / SITRANS LU180

- Suitable for general applications with liquids, slurries, and bulk solids in open or closed vessels up to 5 m (16.4 ft) tall
- Compact, short-range ultrasonic level transmitter
- General purpose or intrinsically safe, two-wire, 4 to 20 mA loop-powered

### Guided wave radar

This technology uses time domain reflectometry (TDR) to measure levels by guiding an electromagnetic pulse down a probe (solid rod, cable or coaxial probe) toward the material. When the pulse reaches the material surface, the change in dielectric value between the 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 or pressure changes, and works well for short- and medium-range measurements of materials with low dielectric constants such as liquefied gases. The interface between two liquids (e.g. oil/water) can also be measured with both level and interface reported via various communication protocols.

**SITRANS LG series:**



**SITRANS LG240**

- For use in hygienic and corrosive applications

**SITRANS LG250**

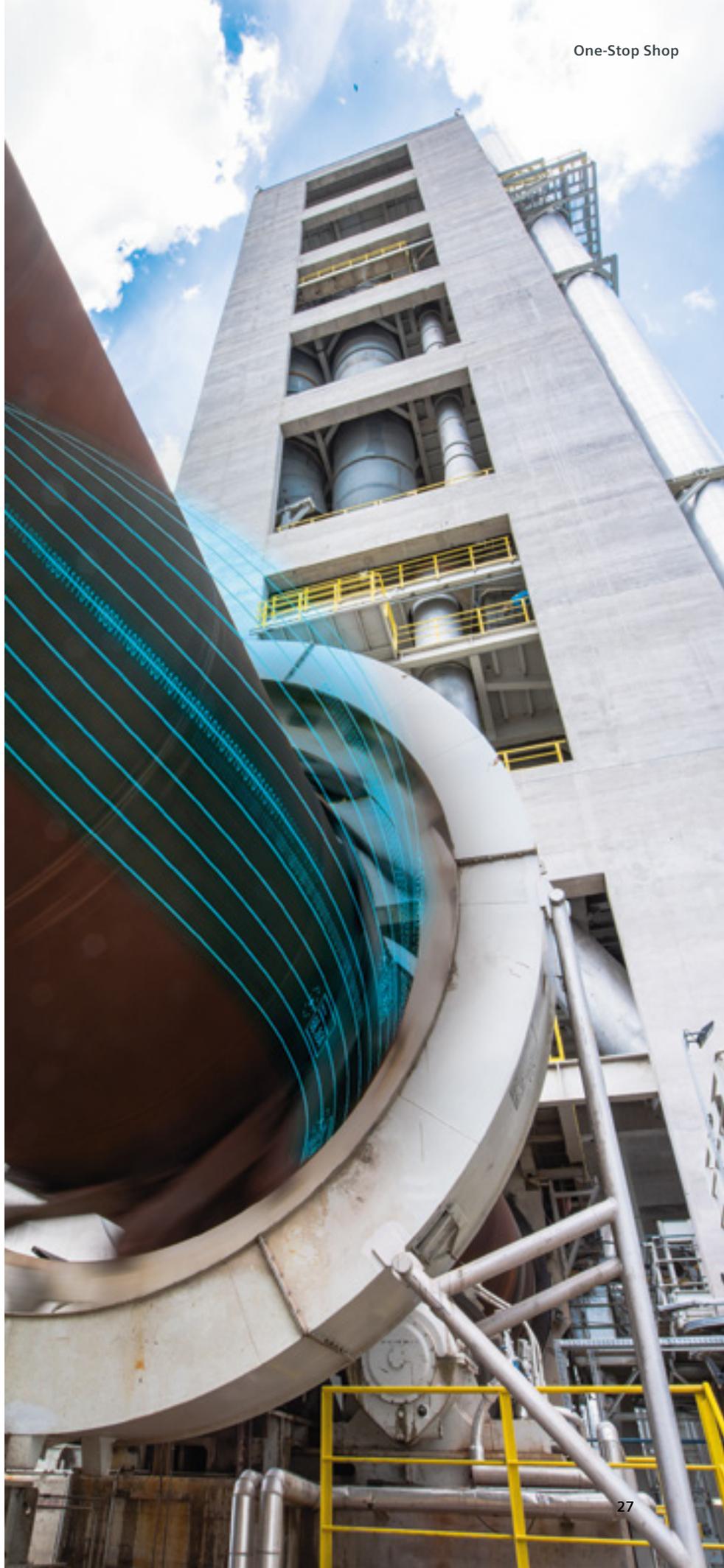
- Highly flexible solution for liquid level and interface applications. Extremely versatile for many applications

**SITRANS LG260**

- Ideal for measuring the level in medium-range solids applications, including grains, plastics, and cement

**SITRANS LG270**

- Offers configuration options for extreme conditions, including high temperature and high pressure applications



### Continuous capacitance

Our unique inverse frequency shift approach to capacitance technology ensures accurate, reliable and repeatable measurements, 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, they protect the measurement from the effects of moisture, vapors, foam, temperature and pressure variations, and buildup. Together with the modular probe options available on various models, they offer practical solutions to a wide variety of continuous level and interface applications.



#### SITRANS LC300

- Ideal for standard and industrial applications in the chemical, hydrocarbon processing, food and beverage, mining, aggregate and cement industries

### Hydrostatic

Low-cost level measurement for direct mounting or mounting with remote seals on tanks and vessels



#### SITRANS LH100 and SITRANS P DS III

- Suitable for a wide range of applications in the chemical and petrochemical industries
- Highly resistant to extreme chemical and mechanical loads as well as electromagnetic interference

### Gravimetric

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



### SIWAREX WP321

- Technology module for the SIMATIC ET 200SP distributed I/O system
- For level measurements in silos and bunkers; convenient and seamless integration of platform scales directly into the automation environment



# The diagnosis: first class

They ensure safe and trouble-free procedures in a wide variety of process industries around the world: positioners precisely control the entire range of valves and master even special tasks with absolute reliability. At the same time, we have continued to expand our proven range of products throughout the years – always based on your needs.



SIPART PS2 – State-of-the-art positioners with innovative features such as non-contact position detection, booster options and extended diagnostics



### SIPART PS2

- Most widely used positioner for linear and part-turn actuators
- Generates diagnostic data for itself, its environment as well as valve and actuator
- Easy installation and fast commissioning
- Reduced maintenance required in the plant
- Safe process control
- Versions with external non-contacting travel sensors
- High flexibility in the range of stroke from 3 up to 200 mm
- Communication via PROFIBUS PA, FOUNDATION Fieldbus or HART
- Ex d explosion-proof version
- Makrolon, aluminum or stainless steel enclosure

- Fail-in-place function: Prevent valves from closing during a power failure. Alternatively, the fail-safe function makes sure that the valve moves to the safety position
- Integrated booster option for quick control of large drives
- Extended diagnostic options such as Valve Performance Tests (VPT) detect the maintenance requirements of the valve during scheduled plant standstills
- Low operating costs thanks to minimal air consumption

- High functional safety in emergency situations. The following valve and actuator failures can be detected: Sluggish valve movement, pneumatic leakage (e.g. tear in membrane), pipe blockage or valve plug tear with continuous processes (C processes), valve seat or valve plug wear, deposits or caking at the valve seat or valve plug, stuffing box stiction, "Partial Stroke Test" (PST) for open/closed valves (e.g. safety valves) and for servo solenoid valves
- 316L stainless steel enclosure for nearshore, offshore as well as oil and gas applications in hazardous areas

# Early detection protects your process

Process protection devices can be used as early warning systems to avoid costly interruptions and breakdowns of equipment. They detect flow problems, blockages, screen faults, machinery slowdowns, or burst filter bags. Their rugged construction makes them impervious to dust, dirt, buildup, and moisture. Installed in a million 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 specially designed for space-saving panel mounting.



**SITRANS AS100** – Acoustic sensor used for solids flow detection, featuring a compact, stainless steel construction for harsh environments and non-invasive mounting

- Detection of high-frequency acoustic emissions from friction or the impact of dust, powders, granules, and other solids
- Signaling of flow/no flow or high/low flow
- Connectable to SITRANS CU02, which processes signals from the sensor
- Provision of relay and analog outputs for connection into a process, or direct connection to a PLC analog output

### Acoustic sensors

Non-invasive acoustic sensors detect inaudible, high-frequency acoustic emissions generated by friction and impact, caused by materials in motion.



#### SITRANS DA400

- Acoustic analyzer for the condition monitoring of oscillating displacement pumps
- Simultaneous and continuous monitoring of up to four independent delivery valves
- Easy system operation and configuration either locally by LCD and keyboard or via PROFIBUS DP/PA

### Motion sensors

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



#### Milltronics MFA 4p

- Plant protection through the detection of absence of motion, as well as underspeed or overspeed conditions
- Probes usable in hazardous, high-temperature, and harsh conditions, thanks to its superior design
- With MSP or XPP probes



#### SITRANS WM100

- For detecting the absence or presence of motion of rotating, reciprocating, and conveying equipment
- Heavy-duty alarm switch

### Process controllers

SIPART DR controllers are outstanding thanks to their extreme reliability and 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 that can be upgraded quickly and easily for specific applications by means of 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.



### Process recorders

SIREC D200, 300, 400 display recorders are used for continuous monitoring of process quantities, plant maintenance, process optimization, or troubleshooting. With these, we offer you a full line of state-of-the-art solutions for the most demanding requirements.



# Expand as you go

Integrated communication down to the field level is becoming an increasingly important factor for the success of our customers. Availability of the instruments in automation solutions at all times is necessary to gather information about the state of the plant from the existing data, and to derive the correct maintenance measures with regard to time and scope. This is not a problem with our modern solutions. Even proven plants that have been running for many years can be expanded with a small investment in such a way that the most important data is available – not only locally, but with secure worldwide access if required.



**SIMATIC RTU3030C** – The compact remote terminal unit monitors remote measuring points, even in locations where no power supply exists.

- Easy configuration using a web browser instead of programming
- Flexible power supply from batteries, solar energy or 24 V DC
- Energy-optimized operation and integrated energy management for connected analog and digital sensors
- Integrated UMTS modem for secure communication (TeleControl Basic, DNP3 and IEC 60870-5-104)
- Extended temperature range from  $-40$  to  $+70$  °C as well as optional additional enclosure in IP68





### SITRANS RD500

- Remote monitoring of inventory levels as well as process and environmental applications
- Collection and saving of measured values for flow, level, pressure, temperature and weighing
- Integrated web server for easy configuration without programming
- E-mail and text message notifications for alarm messages
- Flexible data transmission worldwide



### SITRANS AW200

- Connection option of up to four HART devices in multi-drop mode
- Support of 4–20 mA devices without HART
- Power supply of the connected field device via an integrated battery

### Remote digital display

The universal remote digital displays allow remote display of and access to measurement data.



### SITRANS RD100 and RD200

- Suitable for level, flow, pressure, temperature and weighing applications
- Can be used in a large variety of environments (low/high temperatures, hazardous areas)
- Simple programming and installation



### SITRANS RD300

- Ideal for flow rate, total and control applications as well as for use with most field devices
- Data logged and displayed on the PC with the free RD software

### Remote data manager

Remote data managers facilitate remote monitoring through data logging, web access and alarm event processing of the integrated devices.

### WirelessHART components

WirelessHART enables the integration of measuring points that could not be implemented before due to the operating environment or for economic reasons. In addition to the SITRANS TF280 transmitters for temperature measurement and SITRANS P280 for pressure measurement, the SITRANS AW210 and SITRANS AW200 WirelessHART adapters integrate instruments with HART capability as well as analog devices that do not support HART communication. Access to diagnostic data can be implemented with these adapters at low costs in most cases, especially when the control system does not support integrated HART communication.



### SITRANS AW210

- Access to all online values (process values/diagnostic information) and parameters of the connected devices
- Supply via 4–20 mA loop when used in a maintenance environment
- Use in hazardous areas even with Ex d
- Possible to connect up to eight HART devices in multi-drop mode
- Support of 4–20 mA devices without HART

### IE/PB Link PN IO

- Can constitute the gateway between PROFINET and PROFIBUS
- From the IO-controller viewpoint, all DP slaves are treated like IO devices with a PROFINET interface
- Use as a data records router for the parameter assignment of field devices via SIMATIC PDM (Process Device Manager) in all plants with PROFIBUS DP



## How to meet all your weighing and dosing requirements

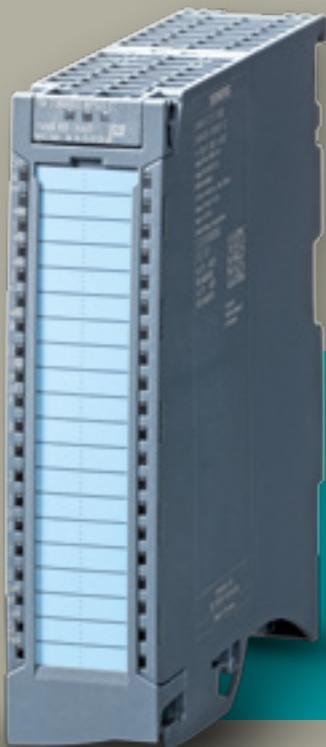
Weighing and dosing processes are of great significance in many areas of industrial production. Whether for filling food and beverages containers or preparing recipes for chemicals and pharmaceutical products: With our solutions you can count on absolute reliability and highest precision.





# Available for all requirements

The flexible design of our products makes it possible to implement weighing solutions from simple platform scales and gravimetric level measurement up to highly complex automatic scales with minimal conversion costs. Using SIWAREX load cells and electronic modules for weighing systems together with Siemens Milltronics belt scales and SITRANS weigh feeders and solids flowmeters, you can design an optimal system for practically every task.



**SIWAREX WP521 ST/WP522 ST** – The first electronic weighing systems for the SIMATIC S7-1500 automation system

- Optimal for use in platform scales as well as for level monitoring of silos and bunkers and in hazardous areas
- Technology modules for the SIMATIC S7-1500 Advanced Controller family
- Two versions: the single-channel design SIWAREX WP521 ST for one-scale systems, and the SIWAREX WP522 ST two-channel design for two-scale systems



#### SIWAREX WP241

- Electronic weighing system especially designed for belt scale applications including in hazardous areas
- Simulation mode allows for function tests without operating the belt scale
- Full integration into SIMATIC S7-1200 and TIA Portal, stand-alone operation without SIMATIC CPU is possible
- Modbus TCP/IP and Modbus RTU interface are pre-installed and included in scope of delivery, as are digital and analog interfaces
- Digital and analog interfaces on board



#### SIWAREX WP321

- For level measurements in silos and bunkers; convenient and seamless integration of platform scales directly into the automation environment
- Technology module for the SIMATIC ET 200SP distributed I/O system
- Easy commissioning using the SIWATOOL software; no knowledge of SIMATIC required
- The configuration package and the "ready to use" example application allow for rapid development and implementation of customer- or industry-specific solutions

#### End-to-end automation

Whether central or distributed: our electronic weighing systems set standards. We offer integrated solutions for seamless integration into the SIMATIC automation system under the name SIWAREX – for hazardous areas, too. The weighing system can be easily adapted to meet your individual requirements with the SIMATIC standard components. Moreover, standardized interfaces, integrated functions and uniform tools allow for cost-effective configuration. Whatever your choice, you can count on a high degree of precision with SIWAREX and benefit from testing according to OIML as well as a finely graded range of functions.



#### SIWAREX WP231

- Weighing module for level monitoring of silos and bunkers, use in platform scales as well as for weighing in hazardous areas
- Can be fully integrated into SIMATIC S7-1200 and therefore also programmed in the TIA Portal
- Can be operated without SIMATIC CPU



#### SIWAREX WP251

- Electronic weighing system for completely independent control of dosing and filling tasks
- Trace function: All saved process values and corresponding states can be displayed, analyzed and, if required, edited in spreadsheet programs with SIWATOOL V7
- Full integration into SIMATIC S7-1200 and TIA Portal, stand-alone operation without SIMATIC CPU is possible
- Modbus TCP/IP and Modbus RTU interface are pre-installed and included in scope of delivery, as are digital and analog interfaces
- Digital and analog interfaces on board

### Load cells

The SIWAREX load cells are continuous measuring instruments designed for use in many areas. They meet the requirements of heavy and basic industries, and have proven themselves in food, chemical and petrochemical applications.

#### SIWAREX load cells

- Suitable for operation in hazardous areas
- Large measuring range from 3 kg to 500 t
- Hermetically sealed for maximum service life
- Options with double-break contact and for high temperature ranges are available
- Smart-design fastening parts for simple and safe installation
- High degrees of protection (IP)



### Weighing terminals



#### SIWAREX WT231

- Combination of powerful SIWAREX WP231 weighing electronics and Touch Panel with application-specific user interface in one product
- Stand-alone solution independent of automation solution and therefore ready to use
- All settings and parameters for applications in the areas of level measurement and platform weighing machines can be made via the Touch Panel
- Comprehensive diagnostics options, such as checking the weight course and monitoring and reporting limits
- Diverse interfaces such as Modbus TCP/IP and Modbus RTU as well as digital and analog interfaces are included in scope of delivery



#### SIWAREX WT241

- Combination of flexible, high-resolution belt scale weighing module and Touch Panel with application-specific user interface
- Stand-alone solution independent of automation system and therefore ready to use
- Simulation mode allows for complete application test – even without a connected belt scale or speed sensor
- Flexible parameterization of digital inputs and outputs for a wide range of functions
- Diverse interfaces such as Modbus TCP/IP and Modbus RTU as well as digital and analog interfaces are included in the scope of delivery



**Transmitters for dynamic weighing systems**

Milltronics BW500, SF500, SIWAREX FTC and WP241 electronic transmitters process the sensor signals into operating data for continuous in-line weighing and material flow measurements.

- BW500/L offers economical and basic operation with belt scales
- Milltronics BW500 and SF500 can take over control functions that are traditionally handled by higher-level controllers, such as PID or batch controllers
- The Milltronics transmitters offer direct display of flow rate and total material flow for flowmeters, and show the flow rate, total flow and speed for belt scales and weigh feeders



**Belt scales**

Milltronics MSI is an extremely robust, single-idler precision belt scale that provides continuous weighing of a variety of products in both the primary and secondary industries.

- Milltronics belt scales weigh raw materials, check inventories and monitor production processes
- Reliable performance under harsh conditions
- Easy installation and low maintenance overhead (no moving parts)
- Repeatable accuracy in productive operation, as well as minimal hysteresis and maximum linearity independent of horizontal forces thanks to unique parallelogram design of the load cells
- Overload protection for the load cells



**SITRANS weigh feeders**

- Highest weighing accuracy ensures optimization of mixing, process sequences and balance calculations
- Reliable and continuous performance
- Virtually maintenance-free
- From light to heavy industrial-grade applications, engineered to customer requirements



**Solid flowmeters**

- For continuous measurement of the throughput of dry bulk materials, free-flowing powders or granulates
- Also for critical functions such as batch loading processes and mixing processes



# For efficient gas composition analysis

Innovative analysis technology. Customized system design. Sound knowledge of customer applications. As a leading supplier of process analyzers and process analysis systems, we offer our global customers the optimum solutions for their gas analysis.





# Processes under control

From flue gas monitoring in refuse combustion plants and power plants up to gas analysis in the chemical industry or the monitoring of rotary kilns in cement works – our high-precision, reliable analyzers get the job done.

Our comprehensive range of process analytic products meets all your requirements for complete measuring instrument solutions. Device operation is menu-driven and designed in accordance with NAMUR guidelines.



**SIPROCESS GA700** – The new standard for flexibility in gas analytics. Depending on the measuring task, the SIPROCESS GA700 can be individually adapted to the respective requirements of the process by fitting selectable modules.

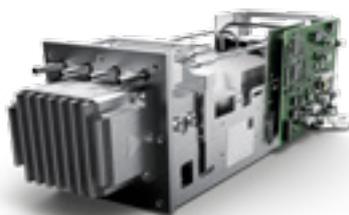
- The simple operating concept: Plug & Measure
- Reliable measurement, optimized for numerous applications with internal correction of cross-interference
- An analyzer consisting of a basic device and one or two analyzer modules is ready for measurement
- The basic device is available either as a 19" rack version with three height units or with housing for wall mounting
- The communication interfaces present in the basic units can be adapted to the respective process environment or process control system using optional interface adapters

The new SIPROCESS GA700 series for gas analysis lets you accommodate up to two modules in a single enclosure: either in a housing for wall mounting or in a 19" rack-mounted enclosure with three height units.



#### Overview of wall- and rack-mounted enclosure options:

- The wall and rack enclosure with IP65 degree of protection has ATEX and IEC Ex approval
- With its Ex p degree of protection, the pressurized wall unit can be operated in combination with an approved purging unit in Zone 1, with combustible or non-combustible sample gases
- With its Ex nR degree of protection, the gas-proof wall unit can be operated in Zone 2 with sample gases whose concentration is below the lower explosive limit (LEL)
- The 19" rack housing with Ex nA degree of protection can be operated with a suitable outer housing in Zone 2 with combustible or non-combustible gases



#### SIPROCESS GA700 – ULTRAMAT 7

- For boiler control measurements in incineration plants or process gas measurements in chemical plants
- High measurement accuracy with complex gas mixtures according to dual-beam NDIR method
- Integrated option for interfering gas correction
- Equipped with preventive maintenance function



#### SIPROCESS GA700 – CALOMAT 7

- With thermal conductivity detector for quantitative determination of H<sub>2</sub> and He in binary or quasi-binary gas mixtures
- Wide range of applications with up to three applications per module
- Measuring range 0–0.5% (smallest measuring range) or 0–100% (largest measuring range)



#### SIPROCESS GA700 – OXYMAT 7

- For measurement of oxygen concentrations
- Measuring range 0–0.5% (smallest measuring range) or 0–100% (largest measuring range)
- Extremely high measuring accuracy with paramagnetic alternating pressure principle
- For ambient temperatures up to 50 °C





**CALOMAT 6**

- Suitable for installation in Ex Zone 1 or 2
- For all areas of gas purity measurement up to use in processes for controlling production methods
- Easy integration into the automation network by means of various interfaces and PDM parameter assignment and operation



**OXYMAT 61**

- Oxygen analyzer for standard applications
- Can be operated with ambient air as the reference gas that is passed to the analyzer unit by the built-in pump



**FIDAMAT 6**

- Measures total hydrocarbon concentration in the air or in gas mixtures with high boiling points
- Ideal solution for almost all measurement needs – from emission control to measurement of hydrocarbon traces in pure gas analyses up to measurement of high hydrocarbon concentrations even in the presence of corrosive gases



**CALOMAT 62**

- For measuring the concentration of gas components such as H<sub>2</sub>, Cl<sub>2</sub>, HCl or NH<sub>3</sub> in binary or quasi-binary mixtures
- Uses the principle of thermal conductivity (TCD) and is especially designed for measurements in corrosive gases, such as chlorine



**OXYMAT 64**

- Gas analyzer for measurement of very low oxygen concentrations
- For air separation systems or technical gas production

### Process gas analysis – Extractive

With extractive measuring procedures, the sample to be analyzed is extracted from the process line and supplied preconditioned to the analyzer via a sample line and a sample preparation system.



#### ULTRAMAT 23

- For a variety of standard applications, such as emission control, optimization of firing systems or room air monitoring
- Innovative multi-component gas analyzer
- For measuring up to three infrared-sensitive gases by means of the NDIR principle, as well as oxygen through the use of electrochemical or paramagnetic oxygen measuring cells
- Calibration using ambient air eliminates the need for expensive calibration gases
- Also available with installed H<sub>2</sub>S sensor for biogas applications



#### ULTRAMAT 6

- Can be used from emissions monitoring to process control, even with highly corrosive gases
- Analyzer in 19" rack design or field housing
- Measurement of up to four infrared-sensitive components in a single unit



#### ULTRAMAT/OXYMAT 6

- Combines the features of the ULTRAMAT 6 and OXYMAT 6 in a 19" analyzer
- Extremely space-saving and compact design



#### Ex versions

- Possible with an additional monitoring unit for CALOMAT, OXYMAT and ULTRAMAT gas analyzers in field housings
- Measurement of non-flammable and flammable gases



#### SIPROCESS UV600

- Particularly suitable for measurement of very low concentrations of NO, NO<sub>2</sub>, SO<sub>2</sub> or H<sub>2</sub>S
- UV gas analyzer
- Measurement of up to three components simultaneously
- Simultaneous measurement of NO and NO<sub>2</sub> allows determination of the NO<sub>x</sub> total concentration without need for additional devices such as NO<sub>2</sub> converters or CLD analyzers

# Process gas analysis – In-situ (TDLS)

In-situ analytical procedures conduct physical measurements directly in the process gas line. In contrast to extractive gas analysis, a sample is not taken. Process data can be generated without contact and in real time.



## SITRANS SL

- Reliable measurement of gas concentrations even with values in the zero range through patented technology
- Diode laser gas analyzer for measurement of flue and process gas concentrations in the chemical industry, including in hazardous areas
- Operation directly at sensor with built-in local user interface (LUI)
- Integrated reference cells facilitate “laser locking” completely independent of the process gas concentration, resulting in extremely stable operation, negligible drift and long maintenance intervals
- Ideal for single measurements in harsh environments

In-situ analytical procedures feature physical measurements within the flow of process gas directly in the actual process gas line. This means gases can also be measured under extreme conditions. Gas measurements with diode lasers are characterized by exceptional selectivity and flexibility. Neither high process temperatures nor high and varying concentrations of particles in the gas influence the quality of the results.



#### LDS 6

- Combines the compact, maintenance-friendly design, simple operation and network capability of the 6 series analyzers with the proven, exceptional performance of in-situ gas analysis using tunable diode laser spectrometers (TDLS) and fiber optics
- Precise, reliable measurement of gases even under extreme conditions, e.g. up to 1200 °C or with very high dust concentrations
- Measurement of O<sub>2</sub>, NH<sub>3</sub>, HCl, HF, H<sub>2</sub>O, CO or CO<sub>2</sub> in flue gas, e.g. before and after gas purification
- Applications in the chemical and petrochemical industries, in steel and metal production, and in cement and paper plants

# Comprehensive portfolio

You can benefit from our many years of experience and innovative technologies in the field of process gas chromatography. We can offer you the perfect solution for any situation. Our powerful and efficient products solve a wide variety of measuring tasks in many different sectors.



**SITRANS CV** – Ultra-compact gas chromatograph for reliable, precise and quick analysis of natural gas and biogas

- Gas chromatograph for reliable, precise and quick analysis of natural gas and biogas
- Rugged and compact design for extreme conditions, on offshore platforms or when directly mounted to the pipeline
- Simple and quick operation by means of "CV Control" software
- Automatic optimization of measuring methods achieves exceptional measurement quality



### MicroSAM

- Small explosion-proof online process gas chromatograph for the chemical, oil and gas, iron and steel, and metals sectors
- Extremely easy handling as well as mounting option directly at the gas sampling point
- Drastically reduced cycle times using the latest technology for better information about the process
- Valveless live injection and column switching for clear reduction of complexity and maintenance requirements
- Multiple devices can be connected in parallel for several sample streams – resulting in more information per time unit, enhanced safety should one of the systems fail, and easy implementation of redundant systems



### MAXUM edition II

- Used for measuring the chemical composition of gases and vaporizable fluids
- The process gas chromatograph is the result of decades of experience and technological developments and is a leader in the industry when it comes to flexibility, versatility and reliability
- Developed especially for the rough process environment, for use either directly online in the process or close to the process
- Areas of application: chemical, oil & gas, water/wastewater, energy and automotive industries
- Extremely rugged with specially designed hardware and software, simultaneous applications, parallel chromatography and reduced analysis times



- With MAXUM modular ovens, parallel chromatography simplifies even the most complex analytical systems and significantly reduces measuring times
- Modular design for quick maintenance and greater availability during measurement and process optimization
- Open network with TCP/IP and Ethernet for communication with PC workstations, other chromatographs or a process control system

# Analytical application sets trend toward standardization

The same application is required time and again in different branches of industry. To minimize effort, we have developed standardized system solutions for industry-specific applications. These complement the range of individual system solutions. Ready-to-use systems also help minimize the technical risk for customers.



## Set CEM CERT

- Reliable, continuous emission measurement of the components CO, NO, NO<sub>2</sub>, SO<sub>2</sub>, CO<sub>2</sub> and O<sub>2</sub>
- Modular analysis system for cold-extractive measuring tasks
- Simple operation and calibration by means of an operator panel integrated in the cabinet door
- The innovative CEMS is tested and certified according to EN 15267 and EN 14181 and is suitable for IED 2010/75/EU applications
- Up to three analyzers possible, based on IR, UV, paramagnetic and electrochemical sensors



### Set CEM 1

- Efficient emission measuring system for continuous measurement of CO, NO, NO<sub>2</sub>, N<sub>2</sub>O, SO<sub>2</sub>, CO<sub>2</sub>, O<sub>2</sub>, HCl, HF, NH<sub>3</sub> and H<sub>2</sub>O
- The proven ULTRAMAT 23 and LDS 6 analyzers are at the core of the system
- Attractive price-performance ratio
- High degree of flexibility through system integration of all ULTRAMAT 23 module versions



### Set CV

- Modular set for determining natural gas quality based on SITRANS CV
- Compact and rugged design for indoor and outdoor installation
- ATEX 2G explosion protection
- The SITRANS CV analyzes 11 natural gas components in 180 s and determines the calorific value, relative density and Wobbe Index



### Set GGA

- The GGA Set is a complete solution for monitoring hydrogen-cooled turbo generators
- Easy handling based on two redundant analyzers
- Cost-efficient solution that is safe to operate and has low initial investment costs
- High-precision and reliable purity monitoring of hydrogen with the CALOMAT 6 analyzer
- Measurement of CO<sub>2</sub> and argon as an inert gas is possible



### Set BGA

- The BGA Set is based on the four-component ULTRAMAT 23 gas analyzer with selectable equipment and I/O components
- Safe monitoring and measurement of the major biogas components CH<sub>4</sub> and CO<sub>2</sub> and critical associated components O<sub>2</sub> and H<sub>2</sub>S
- TÜV-tested design with high safety standard
- Modular sample preparation for interfacing of multiple measuring points can be configured
- Very rugged and durable industrial design

# How key industries benefit from single-source analyzers

Siemens offers a complete service package as well as all measuring instruments to assist you in engineering, designing, supplying, installing and commissioning measurement solutions for complete industrial plants. Our "one-stop shop" concept supports selection of all process instrumentation all the way up to integration with your process control system. Additional industrial components and systems are easily incorporated into the overall plant and ensure smooth process flows. In addition, user-friendly documentation of the plant ensures seamless after-sales service.



Individual solution concepts – Continuous planning from the sampling point, including sample preparation, up to the complete analysis system in a cabinet or large shelter



**Overview of our services portfolio:**

- Customized services and solutions from front-end engineering and design (FEED) all the way to the fully air-conditioned shelter
- Plant engineering and scheduling by an experienced project management team
- Specialists assist you in the selection and utilization of the field instruments
- Support during the approval phase
- Preliminary and detailed planning with state-of-the-art tools and complete documentation
- System assembly and testing in own system houses in the United States, Germany and Singapore
- Experience with all relevant national and international standards
- Commissioning in the field and start-up by specialists all around the world
- Remote maintenance, on-site service, spare parts supplies and goal-oriented training

# Keeping a clear overview with the Analyzer System Manager (ASM)

Operators of industrial plants often wonder whether unusual measured values are the result of a plant problem or whether they have been generated by a faulty analyzer. The Analyzer System Manager (ASM) offers comprehensive data collection and validation functions that provide definite pointers to help with this situation.

Historical, current and statistical data indicate the maintenance required for the analyzers and the trustworthiness of the measurement at any time.



Scalable operator control and monitoring system for overseeing and evaluating analyzers, sample preparation systems and analyzer shelters



Operator control and monitoring system for optimizing the analyzer landscape in new and existing plants. PC-based system for monitoring, testing and management of gas analyzers in subsystems or complete plants.

#### Software

##### Analyzer System Manager (ASM)

- Collection of important analyzer performance data over a variety of traditional communication interfaces and storage in a central database
- Access to measured value trends, device status data and statistical evaluations, etc. as well as test routines to validate results
- Animated views of sample preparation systems and analysis shelters with status information/measured values of installed sensors
- Comprehensive reporting module is available for evaluation documentation
- State-of-the-art network solutions in a client-server architecture support even complex plant structures with distributed workstations



## How to implement multiple standards with just one solution

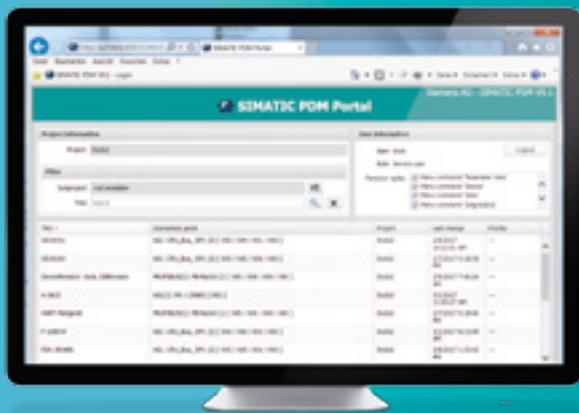
Depending on industry and region, multiple communication protocols are often used – even in the most modern automation solutions. The largest variety can be found when connecting the field level to the control level. It is imperative to connect these different protocols seamlessly with one another and ensure transparent transitions for users. We provide a large variety of hardware and software components to ensure you always find the optimum solution.





# Device integration from the field to the world

Our process instruments support all major industry standards for modern fieldbus communication, such as HART, PROFIBUS, FOUNDATION Fieldbus and Modbus, and are therefore suitable for use in all automation solutions. Additional benefits are provided by our SIMATIC PCS 7 process control system and the SITRANS Library, including increased transparency and integration of specific functions for our devices from the SITRANS and SIPART product families that already exist in your plant. These days, it is an absolute must that each device is accessible at all times. Whether the device is local, the centerpiece of a plant or on the other side of the globe – flexibility, security and control at all times are no longer just optional extras. We can provide you with the components you need to accomplish this goal.



## SIMATIC PDM (Process Device Manager) – Easy device integration with significant benefits

- Flexible tool for operation of more than 4,000 different field devices and other automation components over the entire life cycle of your plant
- Universal implementation as a central, integrated tool in a Maintenance Station or directly connected to a local field device
- Graphical user interface and intuitive Quick Start wizards for configuration, parameterization, diagnostics and maintenance
- Supports all important industry standards for modern fieldbus communication, such as HART, PROFIBUS, FOUNDATION Fieldbus and Modbus
- Client-server architecture enables flexible use with consistent data management that is always up-to-date

### SITRANS Library

- Easy use of device-specific functions and data from devices of the SITRANS and SIPART product families, such as dosing or totalizers in solutions with SIMATIC PCS 7
- Library with device-specific function blocks, block symbols and faceplates
- Fully compatible with SIMATIC PCS 7 Standard Advanced Process Library (APL) throughout the entire life cycle, from engineering to running of the plant

### Central maintenance even for third-party systems

#### SIMATIC PDM (Process Device Manager)

SIMATIC PDM, with its more than 4,000 integrated field devices, also comes into its own as a central maintenance station in control solutions from other manufacturers.

- Connection to existing PROFIBUS segments over IE/PB Link PN IO
- Direct connection to HART devices with HART multiplexer or WirelessHART SITRANS AW210 adapter
- Supports all important industry standards for modern fieldbus communication, such as HART, PROFIBUS, FOUNDATION Fieldbus and Modbus
- Client-server architecture enables flexible use with consistent data management that is always up-to-date

### Secure worldwide accessibility of devices and systems

Global communication requires a high level of security. Key aspects of transmitted data are confidentiality, authenticity, sender verification and availability. Virtual Private Networks (VPN) with the highest level of encryption are often used. With SINEMA RC it is easy to set up such a global infrastructure due to the availability of all necessary components for wireless and wired-based communication. This means you can access your units and plants installed around the world in no time.

#### SINEMA RC (Remote Connect)

- Management platform for remote networks enables easy remote access for teleservice or remote maintenance
- Establishment of encrypted connections with OpenVPN with just one mouse click
- Protocol-independent, IP-based communication
- Virtual Network Computing (VNC) enables customer service control and problem analysis on site

## Fieldbuses

### Introduction to the digital world

Distributed automation solutions based on open fieldbuses are standard today in many sectors of the production and process industries. Only in conjunction with fieldbuses can the advantages of digital communication be fully realized, including better transmission of measured values while maintaining the original accuracy, diagnostic options and remote parameterization. Field devices are optimally integrated into the entire plant thanks to modern fieldbus communication such as HART, PROFIBUS and FOUNDATION Fieldbus as well as Modbus TCP and RTU. Since the devices are integrated into SIMATIC PCS 7 Asset Management, users have access to diagnostic information from the field devices at all times, enabling them to optimize maintenance and service of their plants and prevent downtime.

### PROFIBUS

- Industry standard IEC 61158 for numerous applications in the production and process industries
- PROFIBUS DP as fast system bus for connection of remote I/O stations, such as ET 200
- PROFIBUS PA for use in hazardous area with simultaneous supply of the devices
- PROFIsafe for secure communication (safety levels up to SIL 2) parallel to standard communication on one cable

### PROFINET

- PROFIBUS International open Industrial Ethernet standard for automation
- Uses TCP/IP and IT standards, such as virtual LANs; offers real-time Ethernet capability and integration of fieldbus systems
- Enables synchronization and determinism of the fastest processes

### FOUNDATION Fieldbus

- Open standard of the FieldComm Group (FCG)
- In addition to actuators, field devices for measurement of pressure, temperature, flow and level are available for the intrinsically safe FF bus

### HART – Field communication protocol

- Industry standard IEC 61158 with more than 30 million installed devices
- Expands the analog 4–20 mA current loop with industry-standard digital communication
- Combination of proven analog transmission of measured values and simultaneous digital communication with bidirectional, acyclic transmission
- Transmission of diagnostics, maintenance and process information from field devices to host systems

### WirelessHART

- Wireless standard based on the HART protocol since HART V7.0
- Transmission of up to eight process values without loss in accuracy
- Complete wireless access to diagnostic and maintenance information as well as parameters over the wireless network
- The latest security technologies for protection of network and data
- Ideal for measurements of moving, rotating or hard-to-reach equipment such as tanks and silos or for temporary measurement applications

### Modbus RTU

- Industry standard IEC 61158
- For widely distributed serial industrial communication
- Supported by SIMATIC PDM
- Data are transmitted cyclically between the Modbus master and one or more Modbus slaves

### Modbus TCP

- Industry standard IEC 61158
- Multi-master system
- Homogenous transition from Modbus TCP to lower-level Modbus RTU networks possible (Modbus RTU device address must always be specified in addition to the IP address)
- Modbus RTU devices are usually integrated into the SIMATIC PCS 7 via Modbus TCP and a type CM101 converter
- Auxiliary components allow for central accessibility of all Modbus RTU devices downstream from a CM101 with SIMATIC PDM

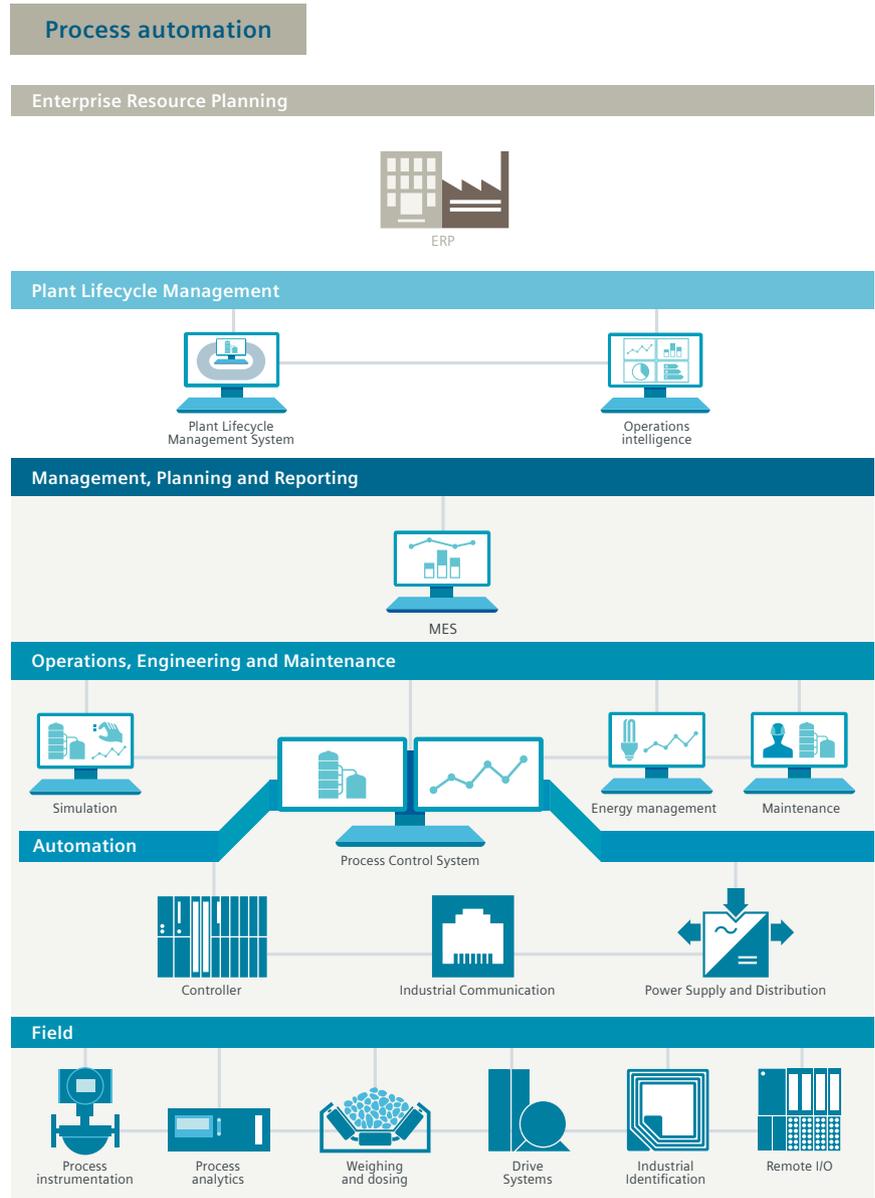
### SITRANS DTM

Two technologies are available today for the description and integration of field devices and other automation components: the Electronic Device Description Language (EDDL) and the so-called Field Device Tool (FDT). A device described with EDDL is represented as EDD; a software component developed with FDT is represented as a Device Type Manager (DTM). A DTM can represent one or more devices. Parameterization of the Field Device Tool/Device Type Manager (FDT/DTM) technology for Siemens devices observing international standards.

- SITRANS DTM is a certified DTM
- Supports many devices from the SITRANS product family
- Uses EDDs for the devices and provides all required aspects of the device integration via the FDT interface
- Can be used in so-called FDT Frame applications such as FieldCare or PACTware

### Totally Integrated Automation – TIA

In light of the growing complexity of machines and plants along with rising engineering costs, efficient engineering is a key factor for success in the manufacturing industry. Totally Integrated Automation, industrial automation from Siemens, makes engineering efficient. The open system architecture covers the entire production process and ensures the efficient interaction of all automation components. This is achieved with consistent data management, global standards, and uniform hardware and software interfaces. These common features minimize the engineering overhead, thus reducing costs, shortening the time-to-market and increasing flexibility.



Added value in all automation tasks



**Published by  
Siemens AG 2017**

Process Industries and Drives  
Östliche Rheinbrückenstr. 50  
76187 Karlsruhe  
Germany

Article No.: PDPA-B10232-00-7600  
Dispo 27900  
WS06176.0  
Printed in Germany  
© Siemens AG 2017

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