



**SIEMENS**

**PROCESS INSTRUMENTATION**

# **Setting the standard with measuring systems**

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

[www.usa.siemens.com/processautomation](http://www.usa.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

<b>Process Instrumentation</b> .....	04
Pressure Measurement .....	06
Temperature Measurement .....	10
Flow Measurement .....	14
Level Measurement .....	20
Positioners .....	26
Process Monitoring .....	29
Additional Components .....	30
Monitoring Apps .....	32
<b>Weighing Technology</b> .....	34
Electronic Weighing Systems .....	36
<b>Process Automation</b> .....	40
<b>Process Analytics</b> .....	42
Continuous Gas Analyzers – Extractive .....	44
Continuous Gas Analyzers – In-situ .....	48
Process Gas Chromatographs .....	50
Analytical Application Sets .....	52
Solution Concepts .....	54
Software .....	56
<b>Process Overview</b> .....	58
Siemens Industry Online Support .....	60
Sitrans IQS .....	62
<b>Industry Services for Process Instrumentation</b> .....	64
Remote Services .....	66



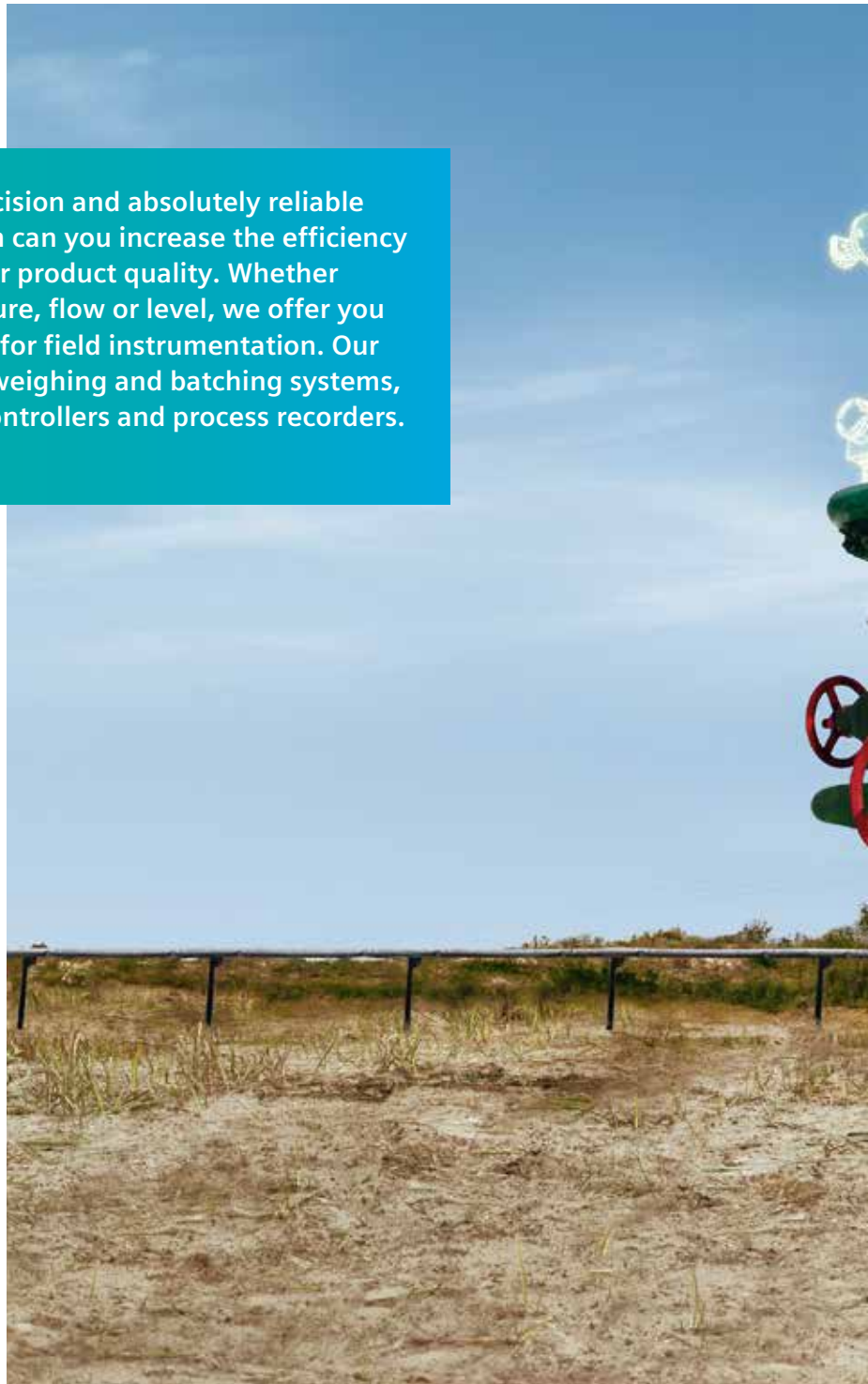


In the areas of process instrumentation and process analytics as well as weighing and dosing systems, our main focus is on the process industries, such as the chemical, oil & gas and hydrocarbon processing, water and wastewater, pharmaceutical, mining, aggregates, cement, pulp and paper, food and beverage, 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 P320/420's user-friendly features include a new enhanced HMI. The large display, shows the device's status at a glance. Setup is convenient and quick, thanks to four-button programming, text-based menus, and NAMUR NE107 support.

The devices are suited for applications where safety is critical: in industries such as chemical, oil and gas, and power generation.

Both pressure transmitters have an increased proof test interval over other devices on the market, significantly lowering maintenance costs with testing periods of up to fifteen years rather than every two.



### SITRANS P320

- High measuring accuracy of 0.065%
- Developed according to IEC61508 standards for SIL2/3
- Enhanced HMI display: large and improved display with NAMUR NE107
- 4-key operation via text-based menus
- Remote safety handling



### SITRANS P420

- High measurement accuracy of 0.040%
- Ready for digitalization - internal recording of measured values. 1500 points for trend logging, event counters and limit monitoring.
- Developed according to IEC61508 standards for SIL2/3
- Enhanced HMI display: large and improved display with NAMUR NE107
- 4-key operation via text-based menus
- Remote safety handling
- Deviations from the characteristic curve of less than 0.03% of the calibrated measuring range for different pressure and level requirements



### SITRANS P500

- 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
- Fast step response time (T63) of only 88 ms ensures plant safety in critical applications
- Graphics-enabled display shows curve and trend diagrams for goal-oriented process monitoring



#### 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/P210/P220


- Single-range transmitter for gauge, 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 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 gauge pressure measuring cells

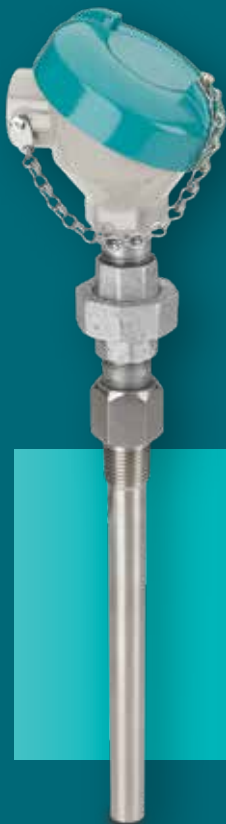




Every process in your plant brings with it specific requirements. That's why SITRANS P pressure transmitters offer a complete range of measuring products with different levels of performance and varying load capacities. From hygienic requirements to heavy industry and harsh conditions, SITRANS P has the right instrument and materials for every application.

# 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 T500** – Temperature sensors for pipes and vessels – from simple applications to solutions for harsh environments

- Modular system with thermowell made of tubular or barstock 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 single input transmitter
- Diagnostics LED
- Supports four-wire Pt100
- 4–20 mA
- Low-cost and compact



### SITRANS TH320

- Universal single input transmitter
- Diagnostics LED
- Supports four-wire RTD/TC/mV and resistances
- Supports Callendar-van-Dusen
- HART 7 + SIL 2/3 (IEC 61508)
- 4–20 mA
- Interface for local HMI



### SITRANS TH420

- Universal dual input transmitter
- Hot backup function
- Diagnostics LED
- Supports two four-wire RTD/TC/mV and resistances
- Supports Callendar-van-Dusen
- HART 7 + SIL 2/3 (IEC 61508)
- Interface for local HMI

### 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 TR320

- Universal and single input transmitter
- Diagnostics LED
- Supports four-wire RTD/TC/mV and resistances
- Supports Callendar-van-Dusen
- HART 7 + SIL 2/3 (IEC 61508)
- 4–20 mA

### SITRANS TR420

- Universal dual input transmitter
- Hot backup function
- Diagnostics LED
- Supports two four-wire RTD/TC/mV and resistances
- Supports Callendar-van-Dusen
- HART 7 + SIL 2/3 (IEC 61508)

## Transmitters for field installation



### SITRANS TF with TH400

- Field enclosure for PROFIBUS PA or Foundation Fieldbus temperature transmitters
- IP66/67/68 degree of protection
- Used where there is excessive heat or vibration at the measuring point
- Dual chamber design for additional protection



### SITRANS TF320/420

- Stainless steel or aluminum enclosure
- Temperature field transmitter for multiple applications
- Configurable via local display
- Full redundancy via hot backup function (TF420)
- SIL 2/3 certified
- HART 7
- 4...20mA
- Combined types of protection



### SITRANS TS Thermowell

- Wide range of lengths and materials
- Comprehensive coverage of applications
- Customer-specific options are possible
- High stability by high-quality materials
- Comprehensive material and quality controls available



# 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 five different flow technologies available to suit a wide range of operating conditions: Coriolis, electromagnetic, ultrasonic, vortex and differential pressure.



## SITRANS FC310

- Sizes from DN 15 to DN 150 in standard and DN 25 to DN 80
- Compact-mounted
- Solid performance with mass flow accuracy of 0.1% or 0.2% and density accuracy of 2 kg/m<sup>3</sup>
- Robust frame and housing isolates from external vibrations, creating an ideal measurement environment with no twisting
- Direct integration into automation systems
- Communication via Modbus RTU, ProfiBus, and Hart
- Compact transmitter design developed for skids and other applications with limited space

### SITRANS F C Coriolis mass flowmeters

The SITRANS F C multivariable devices measure the direct mass flow rate of liquids and gases in most any application; Delivering reliable and repeatable information on mass flow, volume flow, temperature, density, and concentration (e.g. Brix or Plato). They fulfill requirements for high performance in oil & gas, chemical, food & beverage, pharmaceutical, and automotive applications etc.



#### SITRANS FCS330

- Innovative and user-friendly transmitter, with audit trails, trend curves, datalogger, and advanced diagnostic functionalities
- Sizes from 1/2" to 6" in standard versions. Remote- or compact-mounted
- Solid performance with mass flow accuracy of 0.1% or 0.2% and density accuracy of 0.002 g/cc
- Robust frame and housing isolates external vibrations, creating an ideal measurement environment.



#### SITRANS FC300

- Compact 0.16 inches rugged sensor design in stainless steel suitable for low flow applications
- Optimal 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



#### SITRANS F C MASS 2100 Low Flow

- Single tube in sizes from 1/16" to 1/2"
- Withstands pressure rates up to 14,695 PSI
- Ideal for a broad range of low-flow applications within the automotive, chemical and food & beverage industries



#### SIFLOW FC070

- The first flow transmitter designed for direct integration into SIMATIC automation systems
- Among the most compact, space-saving, and versatile transmitters on the market
- Can be paired with the FC300, MASS 2100, or FCS200 sensor



#### 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 0.4, 0.5, and 1.0 inch and easy to install, with a wide range of different connections available
- Broad application fit within dispensers, compressors and distribution

**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.



**Modular pulsed DC meters:  
SITRANS F M MAG (DN 2 to DN 2000)**

- Full transmitter program includes MAG 5000/MAG 6000/MAG 6000 I; compact- or remote-mounted
- Multiple I/O as standard and communication modules PROFIBUS PA/DP, DeviceNet, FOUNDATION Fieldbus, HART, and Modbus RTU are available
- MAG 5100 W sensor for water and wastewater applications
- MAG 3100 P sensor for process industries 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/MAG 8000 CT  
(DN 25 to 1200)**

- Battery-powered solution that makes it easier than ever to install a reliable water meter virtually anywhere
- Battery lifetime up to 15 years\*
- IP68 (NEMA 6P) enclosure and sensor painting in accordance with ISO 12944 class C4M corrosivity for burial and submerged applications
- Easy installation without straight inlet/outlet
- Rich add-on communication modules: Modbus RTU, Encoder card, 3G/UMTS module

**MAG 8000 with 3G/UMTS module**

- Rich data transmission protocols supported by 3G module: SMS, secured e-mail and secured FTP
- Built-in Remote Qualification Certificate enables comprehensive device diagnostics and off-site audits
- 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
- MAG 8000 clock synchronization with Internet NTP server featuring adjustable time zone setting ensures that measurement data is always accurately time-stamped
- Single SMS synchronizes the data transmission time for all MAG 8000 devices in field
- Real-time SMS notification for MAG 8000 alarms



**High-powered AC meters:  
TRANSMAG 2/911/E  
(DN 15 to DN 1000)**

- Specially designed for heavy mining slurries with or without magnetic particles as well as the most difficult applications in the pulp and paper industry
- Low conductive medias  $\geq 1 \mu\text{S/cm}$  ( $0.1 \mu\text{S/cm}$  depending on medium)
- No movable parts
- Stable zero point/pulsed alternating field for accurate flow signal and excellent signal strength
- SmartPLUG concept
- Comprehensive self-diagnostics

\*for 4 D-cell external battery pack



### SITRANS FM Verificator

Validates the performance of your electromagnetic flow meters on-site

The Verificator provides key benefits and the precision you need in your vital flow measurement:

- In-situ check of performance without interrupting the flowmeter installation
- Fully automated – no manual setup or data input – with predefined factory acceptance levels
- No expensive removal or installation costs
- Results in less than 15 minutes
- Full verification report

The Verificator confirms accurate performance for the following SITRANS F M transmitters and sensors:

- MAG 5000/6000
- MAG 1100
- MAG 1100 F
- MAG 3100
- MAG 3100 P
- MAG 5100 W



The SITRANS F M Verificator can be used in:

1. New applications: approve new installations with certificate for handover
  2. Existing applications: ensuring correct product quality and continuous accuracy
- For ISO 9000 and ISO 14001 documentation a MAG Verification Certificate can be printed as handover from contractor to end user.

### SITRANS F S clamp-on ultrasonic flowmeters

The externally mounted sensors of the SITRANS F S 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 liquids in pipes ranging in size from 0.5" to 394" in diameter.



### SITRANS FS220

- Cost-efficient system offering the most commonly required measurement functions
- Consistently high accuracy of 1% of flow rate and 0.25% repeatability according to ISO 11631
- Enhanced zero stability results in minimal need to set a zero point
- WideBeam® transit-time technology allows for measurement of virtually any liquid, even those with 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
- Suitable for multiple sectors requiring budget-conscious liquid flow instrumentation, including water and wastewater, power, HVAC and chemical industries



### SITRANS FS230

- Digitally based system featuring market-leading accuracy of 0.5% to 1% of flow rate
- Suitable for hazardous and non-hazardous locations
- Best-in-class 100 Hz data update rate quickly and 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 and programming wizards along with a patented pipe configuration algorithm
- SensorFlash® microSD card stores all operational data for easy device transfer and servicing
- Application examples include chemical, hydrocarbon applications water and wastewater, HVAC, hydroelectricity, coal natural gas and nuclear power

### Differential pressure flow transmitter

Pair a differential pressure transmitter with any primary flow element

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



#### Vortex flowmeter: SITRANS FX330

- Accurate measurement of steam, gas conductive and non-conductive liquids
- Integrated pressure and temperature compensation for lower installation costs and increased accuracy
- Large turndown ratio, reducing installation costs
- 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
- Remote version available with cable length up to 50 m



# 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 world's first 78 GHz level transmitter

- 2-wire, 78 GHz FMCW for ranges up to 100 m (328 ft)
- Very narrow 4-degree beam angle with 3" lens antenna
- Aiming flanges with purge, easy to install
- Process Intelligence integrated, and plug and play performance

### 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.

### 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, SITRANS DTM/ PACTware, or AMS



#### SITRANS LR460

- 4-wire, 25 GHz FMCW radar level transmitter up to a range of 100 m
- For bulk solids in vessels and ideal for applications with extreme dust and high temperatures up to 200°C and with media with a low bulk density/low dielectric properties



#### SITRANS LR260

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



#### SITRANS LR250

- 2-wire, 25 GHz pulse radar level transmitter up to a range of 20 m
- 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 flanged and hygienic encapsulated antennas



#### SITRANS LR200

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

### SITRANS LR100 Series

Bluetooth connectivity for easy setup with SITRANS Mobile IQ and approved for open air applications.



#### SITRANS LR100

- 2 wire loop-powered, 80 GHz radar transmitter for continuous level measurement of liquids and slurries to a range of 8 m
- Chemically resistant PVDF enclosure
- Compact design fits in limited space installations



#### SITRANS LR110

- Versatile version and compact radar transmitter for continuous level measurement of liquids, slurries, and solids to a range of 15 m
- +/- 2 mm accuracy and zero near range distance yields optimum inventory management capability
- 4 to 20 mA/HART or 4-wire, Modbus HART 7.0 or Modbus RTU communication for intelligent integration



#### SITRANS LR120

- Compact radar transmitter for continuous level measurement of liquids, slurries, and solids to a range of 30 m
- 4° narrow beam and longest range version to 30 m.
- Submergence shield accessory prevents build up on sensor during flooding conditions

### Ultrasonic level measurement

Our market-leading ultrasonic level measurement is an extremely cost-effective solution. The self-cleaning face makes it suitable for harsh environmental conditions. The non-contacting technology is used in numerous industries to monitor liquids, bulk solids, and slurries.



#### SITRANS Probe LU240

- Cost-effective, compact, intelligent level solution for liquid chemical inventory, monitoring small process vessels, and level monitoring measurement in the environmental industry.
- Easy commissioning with setup wizard
- Measurement ranges from 3, 6 or 12 m



#### SITRANS LU150/SITRANS LU180

- Suitable for general applications with liquids and slurries 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



#### 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
- Intuitive navigation via local user interface

### 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 chemicals, hydrocarbon processing, food and beverage, mining, aggregate, and cement industries

### Guided wave radar

SITRANS LG guided wave radar transmitter for a range of contact level and interface applications from general to harsh conditions and everything in between. Little to no configuration, you'll be operational in minutes, saving you time and money.

Extreme process conditions don't stand a chance, and these transmitters feature SIL options for applications requiring functional safety. Advanced diagnostics including trending, profiles, and event logging give you the data you need at every step of your process. Rapid response times and advanced echo processing deliver accurate and reliable readings over the full application range, even in small containers and in low dielectric constant material. And with field-replaceable and adjustable probes, if your process changes, your measurement device can, too.

#### 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

#### All versions include:

- Automatic buildup suppression
- Remote display and electronics optionsw
- 2 mm accuracy
- Backlight with full graphic display, top or side mountable
- SIL 2/3 approved
- Field-replaceable probes
- Quick setup wizards
- USB service port option



## Hydrostatic

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



### SITRANS LH100, LH300 and SITRANS P320

- 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 with SIWAREX WL200 load cells

- Large measuring range from 0.3 kg to 500 t
- Hermetically sealed for maximum service life
- Options with redundant design and for high temperature ranges are available
- Smart-design fastening parts for simple and safe installation
- High degrees of protection (IP)
- Certified in accordance with OIML R-60

## 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 point level, interface detection, dry run, and safety back-up applications including bulk solids, liquids and slurries.

### 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
- Stainless-steel, aluminum, and plastic enclosure options and high-grade steel process connections provide exceptional resistance to mechanical forces, a long service life and low cost of ownership
- Options for SIL 2 / redundant SIL 3



### 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
- Options for fail-safe rotation monitoring and alarming



### SITRANS LVL100 and LVL200

- Vibrating level switches for liquid and slurry applications, including high, low, and demand level alarms and pump protection
- Wide application range including high temperatures and pressures, hygienic versions, large variety of enclosure materials, SIL 2/redundant SIL 3 options and remote testing





#### SITRANS LVS100 and LVS200

- Vibrating level switches that detect solids with densities as low as 5 g/l
- Best-in-class sensitivity detection
- Ability to handle and monitor buildup
- Options to detect solids interface within a liquid



#### 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

#### RF Capacitance

Pointek RF capacitance point level switches measure interfaces, solids, liquids, slurries, and foam. The inverse frequency shift technology provides accurate and reliable 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 or chemically resistive plastic enclosures and wide variety of process connections, Siemens Pointek switches are compatible with most applications.



#### Pointek CLS100

- Suitable for level detection in constricted spaces
- Sensguard protection of probe for harsh and abrasive environments and chemically resistive probe types available
- Compact 2-wire or 4-wire switch

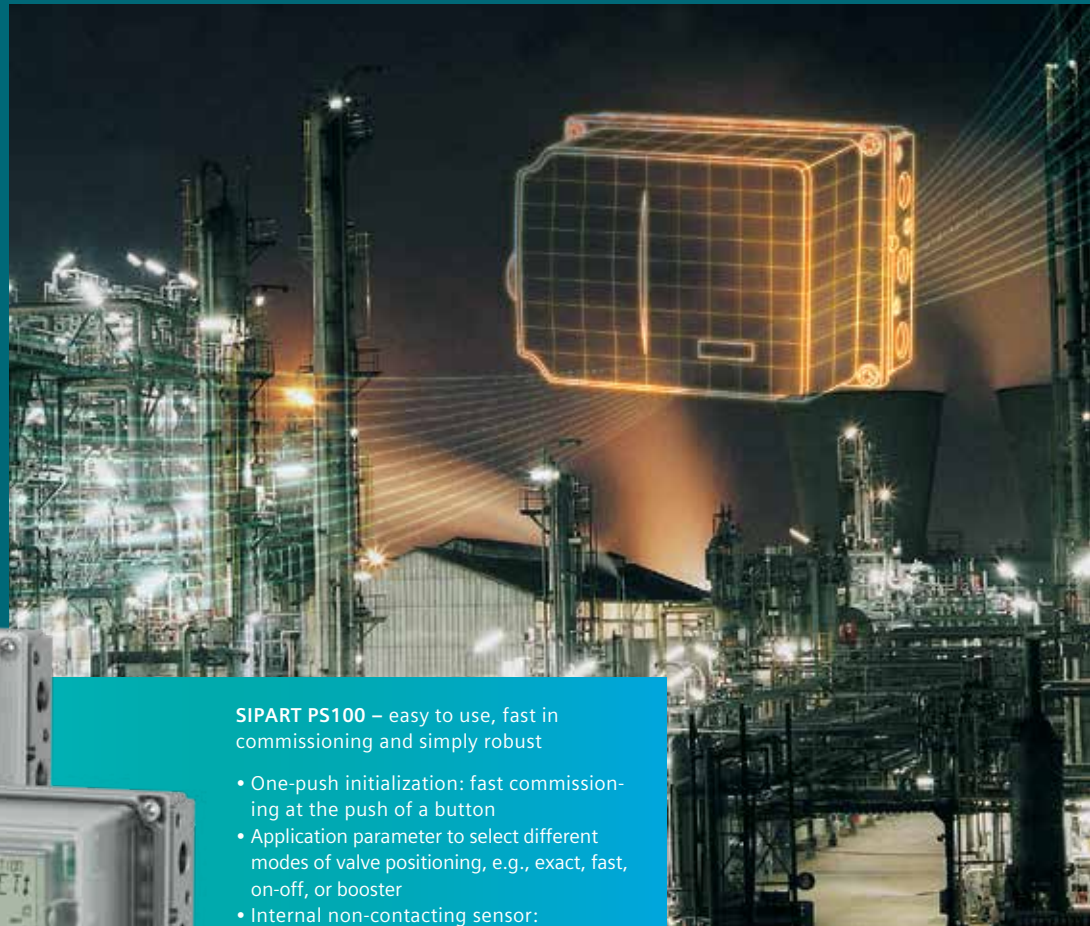


#### Pointek CLS200 and CLS300

- Suitable for level detection in demanding conditions with high pressures and temperatures
- Suitable for aggressive applications including very high temperatures and pressures
- SIL 2 options
- Smart PROFIBUS versions with digital display
- Remote operation via PROFIBUS for status and function testing
- Remote detection of buildup and monitoring of other process condition changes

# Always in pole position: SIPART Positioners

As the interface between control system and valves, positioners play an important role in ensuring reliability and optimal performance in process plants around the world. Our proven portfolio with the SIPART PS2 precisely controls the entire range of valves and masters even special tasks with absolute reliability. In addition, we have now introduced our new SIPART PS100 – to precisely meet your application requirements.



**SIPART PS100** – easy to use, fast in commissioning and simply robust

- One-push initialization: fast commissioning at the push of a button
- Application parameter to select different modes of valve positioning, e.g., exact, fast, on-off, or booster
- Internal non-contacting sensor: non-wearing and vibration resistant
- Non-corrosive sound absorber for use in harsh environments
- Plain-text display with status icons in accordance with NAMUR NE 107 and four operation buttons



### SIPART PS2 – More functions, more possibilities

The SIPART PS2 comes with an extensive range of functions and diagnostic capabilities, which we improved even further:

- Optional pressure sensors: improved valve diagnostics and parameter monitoring
- Ready for digitalization: Fast and predictive determination of valve maintenance requirements using the valve monitoring app
- Regular partial stroke tests: ensured movement of emergency shut-down (ESD) valves and other open/close valves in the event of an emergency
- Fail in Place: the valve remains in its last position upon loss of electrical and/or pneumatic power
- Fail Safe: the valve moves to the safety position; also suitable for SIL2 applications
- Valve performance tests (VPT): immediate, on-site assessment of valve maintenance requirements



### Positioner with remote control electronics

- Suitable for use in environmental conditions with high-energy radiation

### Positioner with various external position transmitters

- Easier access to positioner for valves at not easily accessible locations

### Process Device Manager



### SIMATIC PDM Maintenance Station V3.0 Plant asset management for smart field devices

Field devices are the eyes and ears of automation. The failure of a valve positioner, temperature, flow or pressure sensor can quickly lead to serious malfunction of the process. With SIMATIC PDM Maintenance Station V3.0, Siemens offers the right solution for efficiently monitoring the condition of smart field devices, irrespective of the automation and control systems used.

- Stand-alone maintenance station for diagnostics and condition monitoring of field devices with EDD/FDI technology
- Use as stand-alone maintenance station for small and medium-sized facilities (up to 500 tags per maintenance station) in process and production automation
- (Additional MS's can be added to increase tag count.)
- Subsystem-specific use in large facilities
- Central data access point of plant data for cloud based apps
- Permits simultaneous access for 30 independent PDM web-clients users



### SIPART PS2 – The all-around positioner

The SIPART PS2 has grown to become the most widely used positioner for linear and part-turn actuators. It is constructed to meet a wide variety of requirements:

- Polycarbonate, aluminum, or stainless steel enclosure
- 316L stainless steel enclosure for nearshore, offshore as well as oil and gas applications in hazardous areas
- Ex d explosion-proof version
- Communication via PROFIBUS PA, FOUNDATION Fieldbus, or HART
- Integrated booster option for quick control of large drives
- Low operating costs thanks to minimal air consumption

# 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
- Compatible with 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.



#### SITRANS WM300 MFA

- Motion failure alarm (MFA), differential speed detection (DSD), and non-contacting tachometer (NCT)
- Multiple alarming powered by 4 relays for over- or under-speed conditions from the sensors
- Intuitive programming thanks to a simple menu structure, along with an on-board display and push buttons



#### 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 their 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, and 400 display recorders are used for continuous monitoring of process quantities, plant maintenance, process optimization, or troubleshooting. Our complete range of process recorders offers 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 3010C/ RTU3030C** – The compact remote terminal units monitor 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
- Secure communication (TeleControl Basic protocol, SINAUT ST7, DNP3 and IEC 60870-5-104) via the integrated UMTS modem (RTU3030C) or via LAN port (RTU3010C) in addition to a SCALANCE S or SCALANCE M.
- Extended temperature range from –40 to +70 °C as well as optional additional enclosure in IP68

### Remote digital display

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



### SITRANS RD100

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



### SITRANS RD200 and RD300

- Universal and full-featured versions
- 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 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.



### SITRANS RD150

- Remote display with loop-power-suitable for monitoring and full configuration of connected sensors
- Ease of use through 4 button menu driven display
- Support for multiple HART sensors with HART Multi-drop
- Flexible mounting options

### 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
- Support for 128 conventional IO, Modbus RTU, and Modbus TCP devices

# Track Your Process and Instrument Health From Your Fingertips

Siemens Remote Monitoring Apps offer our customers the ability to both make process measurements and to remotely monitor the activity and health of that instrumentation without the need for SCADA systems or other expensive process control room products. By utilizing Siemens' ability to offer unparalleled flow, level, pressure, temperature, and weight measurement as well as valve control, we can provide a broad range of process measurements and offer unequalled monitoring of the health and performance of those products.



Through the use of Siemens Mindsphere, information can be uploaded to the cloud and then used to provide you with real-time monitoring of multiple assets, retrieving real-time data from multiple remote sites for your user group, anywhere and any time. In addition, you can receive alarms, alerts and notifications without delay. And all this can be sent directly to your pc, tablet or phone.





### **Safety and Security**

Siemens family of monitoring apps are read only, with information coming from Mindsphere and its secure transfer of information. In addition the apps are designed for one administrator who has final say as to who in the user group can see what information and alarms, how the information is presented to the remainder of the users and how the alarms and notifications are structured. This assures that your information remains in your control at all times. Choose the communications infrastructure to suit your needs.

Siemens industrial wireless communications can provide the link between field instrumentation data and the MindSphere cloud. Our mobile wireless routers enable data transfer to MindSphere in remote locations and come with options for multiple cellular communications standards including LTE, UMTS, and GSM. This extended offering ensures the best signal for data transfer and the most reliable network for installations. Siemens adheres to the highest security standards in network security, and all communications solutions are encrypted with firewall protection to defend against unauthorized access and cyber threats. No matter the size of the network, our scalable and secure industrial communications technology is capable of delivering the solid foundation required for safe and efficient process monitoring.



### **Monitoring App User Groups Are Defined By You**

The size of your user group, how your information is transferred to the Mindsphere Cloud and how often your information is updated is designed by you. We customize to your requirements in order to provide the best solution for your monitoring needs and budget. Whether you have one user or 100 or more, and if you need your information updated once a day or multiple times per minute, Siemens can provide a subscription plan and app tailored to provide you the visibility you need for your operation.



## How to meet all your weighing and dosing requirements

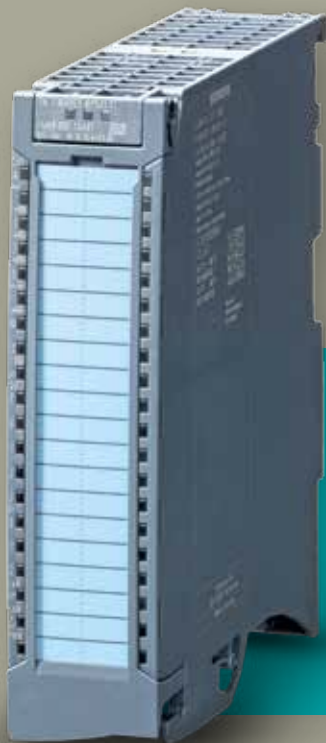
Weighing and dosing processes are of great significance in many areas of industrial production. Whether for filling food and beverages containers or preparing recipes for chemicals and pharmaceutical products: With our solutions you can count on absolute reliability and highest precision.





# 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 weighing controller 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 module 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
- Simulation mode allows for a full function test even without a connected belt-scale
- Full integration into SIMATIC S7-1200 and TIA Portal, stand-alone operation without SIMATIC CPU is possible
- Factory-provided interfaces such as Modbus TCP/IP and Modbus RTU as well as digital and analog interfaces



#### SIWAREX WP321

- For level measurements in silos and bunkers; convenient and seamless integration of platform scales directly into the automation environment
- Up to 600 Hz sample rate
- Technology module for the SIMATIC ET 200SP distributed I/O system
- Easy commissioning by HMI or by SIWATOOL (no prior knowledge of SIMATIC required)
- The ready-to-use sample application enables fast development and implementation of customer- and industry-specific solutions
- Seamless integration into PCS 7 via dedicated add-on package

#### 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. 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 certifications 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
- Certified according to OIML R-76 – legal for trade as NAWI



#### 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
- Factory-provided interfaces such as Modbus TCP/IP and Modbus RTU as well as digital and analog interfaces
- Certified according to OIML R-51, R-61, R-76, and R-107 – legal for trade as NAWI, AGFI, ACI, DTI

## Load cells

The field-proven SIWAREX WL200 load cells are the perfect choice for reliable weight measurements. A wide range of designs, capacities, and certificates guarantee a perfect fit for all requirements.

### SIWAREX WL200 load cells

- Large measuring range from 0.3 kg to 500 t
- Hermetically sealed for maximum service life
- Options with redundant design and for high temperature ranges are available
- Smart-design fastening parts for simple and safe installation
- High degrees of protection (IP)
- Certified in accordance with OIML R-60



## 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 cours and monitoring and reporting limits
- Diverse factory-provided interfaces such as Modbus TCP/IP and Modbus RTU as well as digital and analog interfaces



### 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 factory-provided interfaces such as Modbus TCP/IP and Modbus RTU as well as digital and analog interfaces



### Integrators for dynamic weighing systems

Our electronic transmitters process the sensor signals into operating data for continuous in-line weighing and material flow measurements.

- BW500/L and SIWAREX WT241 offer economical and basic operation for belt scales, incl. display of flow-rate, load, speed, and totalized material for belt scales and weigh-feeders. Easy and comfortable operating and programming can be performed by the integrated keypad.
- BW500 and SF500 (for Solids flowmeter) are advanced integrators with additional control functions such as PID or batch controllers. BW500 also offers legal-for-trade options for belt scales like MID or NTEP.
- SIWAREX FTC is a SIMATIC based integrator for belt scales and solids flowmeter with high functionality, fully integrated into SIMATIC and PCS7 by S7-300 or ET-200M. Programming and visualization can be done by existing HMIs of the PLC or by Notebook.
- SIWAREX WP241 is a SIMATIC S7-1200 based integrator with high functionality for belt scales, fully integrated into PLC. Programming and visualization can be done by existing HMIs of the PLC or by Notebook.



### 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
- Market-leading 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
- Integrated overload protection for the load cells
- More approvals than any other belt scale in the world



### Weighfeeders

- Highest weighing accuracy ensures optimization of mixing, process sequences, and balance calculations
- Reliable and continuous performance
- Virtually maintenance-free
- Various designs engineered to customer requirements



### Solids 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



### SIWAREX WP351:

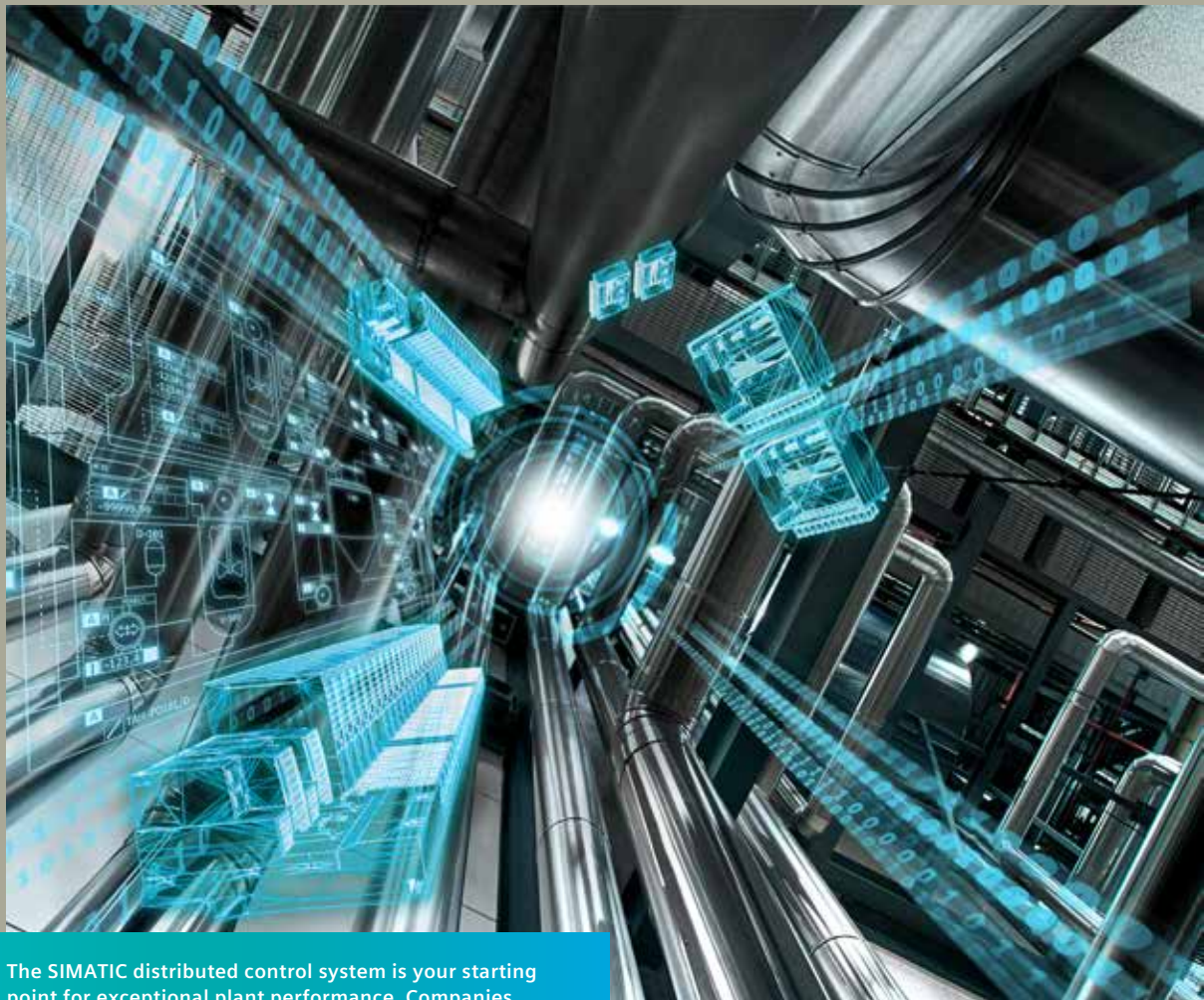
#### Compact weighing module

- Weighing module for use in batching, filling, and checkweighing systems
- Intelligent firmware enables the weighing process to be controlled and optimized entirely from the weighing module
- Up to 1000 Hz sample rate
- Technology module for the SIMATIC ET 200SP distributed I/O system
- Easy commissioning by HMI or by SIWATOOL (no prior knowledge of SIMATIC required)
- The ready-to-use sample application enables allow easy implementation of customer and industry-specific solutions
- Connection to any standard, strain gauge load cell

# Distributed Control Systems

Greater flexibility in process automation Providing continuous operation, maintaining consistent product quality, and reducing plant costs are only a few of the many challenges that the process industry is facing today.

Distributed control systems play an important role in helping you meet these challenges head-on. Siemens' flexible DCS offering enables you to respond quickly to constantly changing market requirements, whether you have a small laboratory application or a large plant network.



The SIMATIC distributed control system is your starting point for exceptional plant performance. Companies wanting to stay ahead of rapid changes and increasing complexities within the process industry must rely on process control technology that is flexible and future-proof.



## Distributed Control Systems



### SIMATIC PCS 7

SIMATIC PCS 7 is a state-of-the-art distributed control system (DCS) with more than 20 years of proven process control. Future proof and fit for digitalization, this reliable, safe, and rugged system supports flexible plant architectures, virtualized solutions, and other key features such as:

- Continuous, batch, and sequential control
- Integrated control and process safety
- Batch management
- Advanced process control
- Energy management solutions
- Integrated asset management
- Cyber security
- High performance graphics
- Alarm management



### SIMATIC PCS neo

- SIMATIC PCS neo is an innovative distributed control system (DCS) that offers companies in the process industry unique opportunities in the age of digitalization. Key features include global web-based collaboration in engineering and operations and a single, intuitive user interface for all automation tasks as well as:
  - Browser based system access
  - Zero installation clients
  - Remote and mobile operation capabilities
  - Object-oriented, single database
  - Scalable plant architectures
  - Multiuser engineering
  - Late hardware binding
  - Integrated Virtual Controller
  - Built-in cyber security
  - Centralized software administration and user management

## Hardware



### S7-410 Controller

The S7-410 Controller is the fastest and most powerful controller on the market - offering flexible, high availability performance for process automation. It covers all applications, application scopes, and performance ranges with a single hardware and firmware platform.



### SIMATIC ET 200SP HA

SIMATIC ET 200SP HA is the most powerful and compact distributed I/O for the process industries. It is ready for use inside and outside the control cabinet and can be expanded in small steps: modules for digital and analog inputs/outputs, safety technology, motor starts, and more. Frequency inverters and other technology components ensure that you can equip your I/O system with the appropriate signal and functional modules.



### SIMATIC Compact Field Unit

The SIMATIC Compact Field Unit (CFU) combines the digital fieldbus with traditional I/Os and is suitable for use directly in the field. This unit significantly reduces the footprint of the entire I/O system by offering new perspectives on simplicity and flexibility. The device also reduces error potential during operation, simplifies plant expansions and modernization, and reduces the cost of hardware FAT.



## 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 incinerators and power plants up to gas analysis in the chemical industry, the emission monitoring of combustion engines or the monitoring of rotary kilns in cement works – our high-precision, reliable analyzers get the job done even for corrosive gas streams.

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.



The Series 6 is the standard for flexibility in gas analytics. Depending on the measuring task, the Series 6 can be individually adapted to the respective requirements.

- Proven reliability of analytical technology for clean or corrosive gas streams
- 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
- Available either as a 19" rack version or with wall mounting housing
- The communication interfaces can be adapted to the respective process environment or process control system

The Series 6 for continuous gas analysis let you accommodate up to two modules in a single wall mount and one module in a 19" rack-mounted enclosure.



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

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



#### ULTRAMAT 6

- For boiler combustion control, vent gas or process gas measurement for bio gas and in steel and chemical plants.
- High measurement accuracy with complex gas mixtures according to dual-beam NDIR method
- Sample is not coming in contact with measuring sensor
- Integrated option to compensate for interfering gas correction



#### OXYMAT 6

- For measurement of oxygen concentrations
- From smallest measuring range of 0-0.5% up to 0-100%
- Extremely high measuring accuracy with paramagnetic alternating pressure principle
- Sample is not coming in contact with measuring sensor
- For ambient temperatures up to 50 °C



#### CALOMAT 6

- 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% up to 0–100%



#### FIDAMAT 6

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

Specific analyzer configurations are available to provide more economical or fewer number of analyzers for specific measurements that are utilized more often.



#### 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 61

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



#### OXYMAT 64

- Gas analyzer for measurement of very low oxygen concentrations
- In non flammable or hydrocarbon gases
- For air separation systems or technical gas production



#### ULTRAMAT 23

- For a variety of standard applications, such as emission monitoring, combustion optimization or ambient 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



#### ULTRAMAT/OXYMAT 6

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

**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 for a wide variety of measurements sensor for biogas applications

•



**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



**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



**SIPROCESS UV600**

- UV gas analyzer
- Particularly suitable for measurement of very low concentrations of NO, NO<sub>2</sub>, SO<sub>2</sub> or H<sub>2</sub>S
- Measurement of up to three components in one analyzer
- Simultaneous measurement of NO and NO<sub>2</sub> allows determination of the NO<sub>x</sub> total concentration



**NOXMat 600**

- Chemiluminescence gas analyzer
- Utilized for emission monitoring
- Measurement of NO and NO<sub>x</sub> at sub ppm concentrations
- Auto Ranging and Auto Calibration

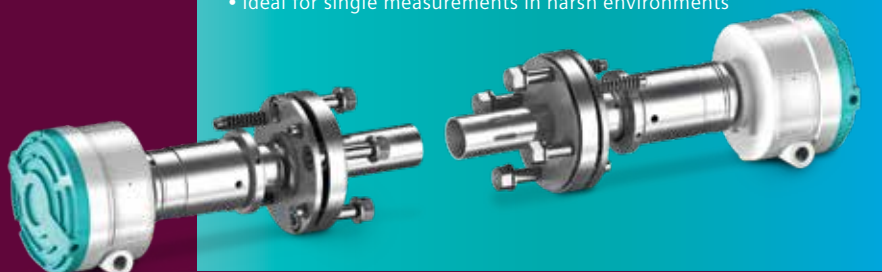
# Process gas analysis – In-situ or Extractive with Tunable Diode Laser (TDLS)

The laser can perform in-situ physical measurements even in the process gas line. In contrast to extractive gas analysis, a sample is not extracted. If that is not possible, the measurement is performed extractive in a process slip stream. Process data can be generated without coming in to contact with the sample and in real time.



## SITRANS SL

- Reliable measurement of gas concentrations even with values close to zero range through patented technology
- Often utilized for measurement of O<sub>2</sub>
- Diode laser gas analyzer for measurement of flue and process gas concentrations in the chemical industry, including in hazardous areas
- User interface directly at sensor with built-in local user interface
- 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





Analytical measurement is achieved by in-situ or extractive. In-situ measurement of the process gas is directly across the actual process pipe, duct, tank or fire box. Consequently gases can be measured under extreme conditions. Extractive measurement is achieved by diverting the gas to be measured to a spool piece. 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 or extractive gas analysis using tunable diode laser spectrometers (TDLS) and fiber optics communication
- 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

# Innovative and powerful gas chromatographs

The application of Siemens' MAXUM gas chromatographs provides the user with a number of benefits resulting from our innovative technologies combined with years of experience in the field of process gas chromatography. The flexibility of our products enables us to custom engineer the perfect solution for any application. The powerful and efficient chromatographs, integrated turnkey solutions and with technical support throughout the life cycle, solve a wide variety of measuring tasks in a number of sectors such as the chemical, petrochemical, oil and gas, and energy industries.



MAXUM edition II is the result of decades of experience and technological developments. It sets the standard in the industry when it comes to flexibility, versatility and reliability.

- Simplicity and maintainability through modularity
- Communication versatility, even redundant
- Exceeds expectations for reliable on-line measurement in harsh process environments.



### MAXUM edition II

- Areas of application: gas processing, refinery, petro chemical and chemical industry, energy and automotive industries as well as environmental emission such as flare, cooling tower emission and ambient air monitoring
- Rugged with specially designed hardware and software, simultaneous applications
- The modular analyzer design permits continuous innovation and providing the latest features and benefits
- Large airbath, independent dual airless oven as well as dual airless modular oven
- Parallel chromatography simplifies complex analytical systems and significantly reduces analysis times
- High sensitive thermal conductivity detector reduces needs for flame ionization and flame photometric detectors
- MAXUM with modular analytical design provides unsurpassed analytical maintainability
- The modular design enables fast maintenance and higher analyzer availability during measurement and process optimization
- Up to 4 modular column trains with high sensitive thermal conductivity detector
- Exchangeable with identical module for quick return to on-line measurement with high probability of successful repair
- Open network with TCP/IP and Ethernet for communication with PC workstations, other chromatographs or a process control system
- Economical measurement solution with minimum installation requirements

# 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.



## Continuous Emission Monitoring System (CEMS)

- 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 extractive measuring tasks
- Simple operation and calibration by means of an operator panel integrated in the cabinet door
- Up to three analyzers possible, based on IR, UV, CLD or paramagnetic technologies and electrochemical sensors
- Sampling device with blowback sample cooler and sample system for system validation
- General purpose design and for Div. 2 installation environment



### CEMS

- 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>, and O<sub>2</sub>
- The proven ULTRAMAT analyzers are at the core of the system
- High degree of flexibility through modular design



### Standardized System Solutions

- Pre engineered and standardized solutions
- Sample systems for single or dual streams
- Cabinets for continuous gas analyzers or process gas chromatographs
- General purpose or electrical hazardous area
- Defined with bill of material
- Economical and fast turn around time



### 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 solution is based on the four-component ULTRAMAT 23 gas analyzer
- Safe monitoring and measurement of the biogas from landfills, digesters or fermenters
- Major components CH<sub>4</sub> and CO<sub>2</sub> and critical associated components O<sub>2</sub> and H<sub>2</sub>S
- Economical and flexible analyzer 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 to provide not just measuring solutions, but to also assist you in engineering, designing, supplying, installing and commissioning measurement solutions for complete industrial plants. and commissioning measurement solutions for complete industrial plants. Our “one-stop shop” concept supports selection of all process products 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 (FEE) determining jointly the best life cycle measurement solutions
- Plant engineering and scheduling by an experienced project management team
- Experts 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, and spare parts supplies

#### Enabling your Success

##### Lifecycle Support around the clock

- Proper maintenance and system availability go hand-in-hand. Siemens has strong commitment to quality maintenance support throughout the measurement system life time. Whatever your specific maintenance philosophy, availability requirements and in-house maintenance resources, there is a Siemens service product and solution designed to meet your needs.
- 24/365 technical phone support
- On-demand, scheduled and embedded site support by dedicated analyzer technician
- Field installation, start-up and commissioning
- Reapplication and optimization of measurement systems
- Spare parts
- Factory repair of analyzers and parts
- Continuous training classes from Basic to Expert level



# 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





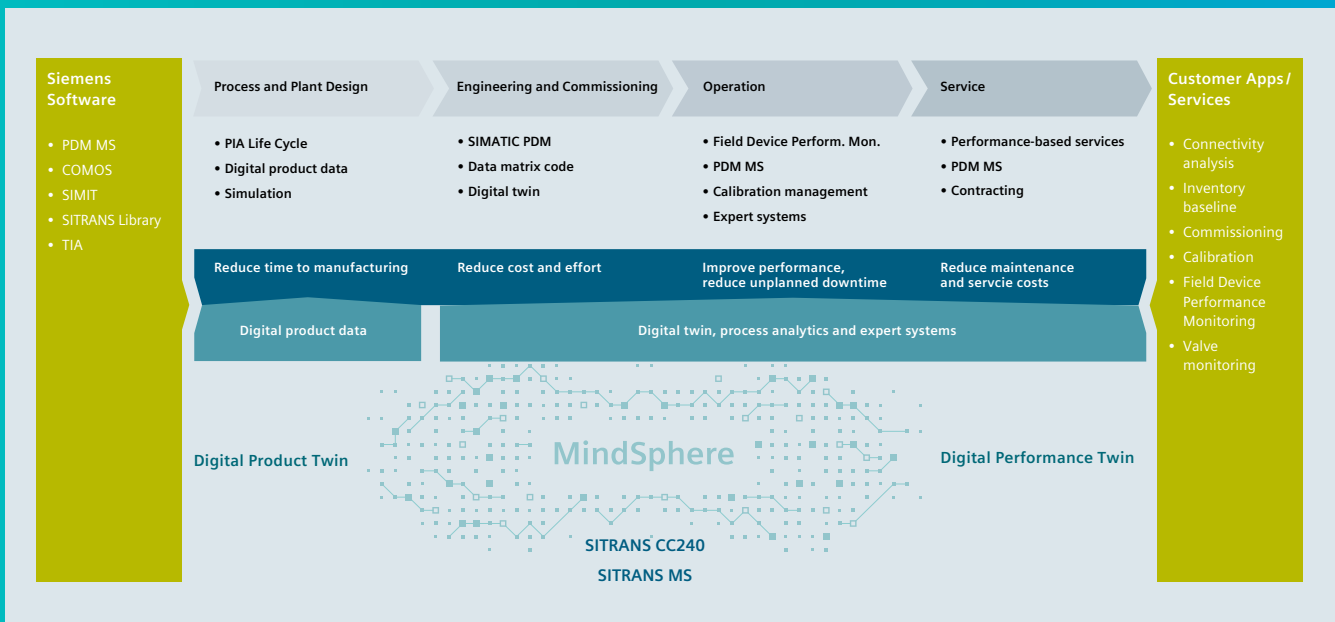
Operator control and monitoring system for optimizing the analyzer landscape in new and existing plants. PC-based system for monitoring, testing and management of gas analyzers in subsystems or complete plants.

#### **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

# Digitalize your process

From design and commissioning to operations and performance monitoring – Siemens provides the software, tools, and services for the digitalization of every phase of a plant's life cycle. End-to-end digitalization from a single source optimizes plant operations to reduce downtime and maximize cost efficiency.



## Siemens supports your digitalization over the entire lifecycle

During each of the main steps of the lifecycle of a plant, Siemens supports you with a set of software tools, apps, and services. In order to improve the uptime and performance of your plant while reducing your maintenance and service costs.

## Process and plant design

In order to support you while designing the plant, Siemens Instrumentation provides you with ample information via its PIA Portal ([www.pia-portal.automation.siemens.com](http://www.pia-portal.automation.siemens.com)). When using engineering tools like COMOS, all digital product data can be imported directly. And if you are using SIMIT to train your staff, the process instrumentation is certainly included with simulation objects.

### Engineering

When using state-of-the-art process automation like PCS 7, engineering is made easy with the industry library and especially the Sitrans Library for Field Instruments. Here, the faceplates provide the full potential of the instrumentation.

### Commissioning and operation

New plants usually have communication down to the field level with HART, Profibus or Profinet, ensuring transparency of secondary data of the field devices. Stand-alone or integrated parameterization tools like SIMATIC PDM Maintenance Station are able to access or forward this data for further processing in apps, with no disruption to plant operations. They allow an up- or download of parameter assignments during commissioning of field devices based on an always-synchronized, central database and known network topology.

### Service

In the future, monitoring of plant assets via Siemens apps, such as Field Device Performance Monitoring will allow the plant operator to pinpoint service needs and to make plant maintenance more efficient, thus reducing costs and increasing uptime. In addition, many support services are available, such as QR codes on each PI device, which allow you to easily download the specific information of an instrument on-site.

Contact our experts directly for assistance with data troubleshooting and other services.



# Online support for customers with SIOS and the industry support app

Access to accurate information is a huge asset in the field. Siemens Industry Online Support (SIOS) provides up-to-date information about specific products quickly and easily. Available in the online portal or in the downloadable smartphone app for maximum convenience.



## SIOS Portal

24 hrs a day, 365 days a year – this portal provides comprehensive information on the entire portfolio of Siemens for process and discrete industries. Find information on automation, communication, and process instrumentation under:

- Product support: handbooks, manuals, FAQ, product notes, certificates
- Services: the service portfolio
- Support request: help – just state your issue and we will contact you within 4 working hours
- My support: activate notifications according to your needs



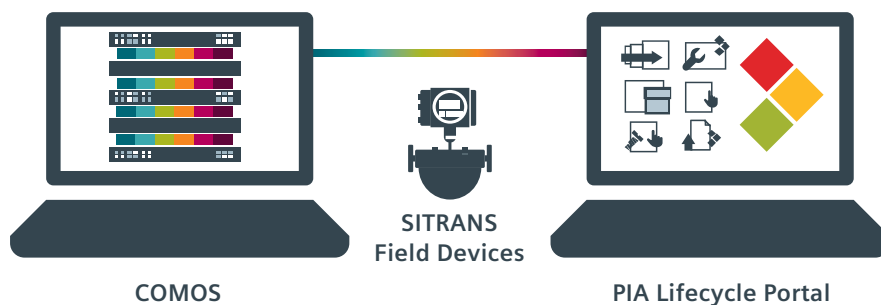
## Industry Support App

- Download and install the app on your smartphone.
- Scan the QR code of any device in the field
- Access comprehensive information including device-specific information like handbooks, Manuals, FAQ, product notes
- Submit a support request and we will contact you within 4 working hours (even quicker with a premium service contact)



# Integrated tools for engineering efficiency

Empower your data! Clever, integrated tools and solutions such as COMOS and SIMIT let you take control – and greatly increase the efficiency of processing and manufacturing plants.



## PIA Lifecycle Portal

This portal helps you select, size and configure your ideal piece of instrumentation.

Interfaces to COMOS and exports to the online ordering portal of Siemens: the Industry mall (mall.industry.siemens.com)

You are able to track the lifecycle of your instrument, see warranty and extended exchange option information as well additional information such as factory certificates (e.g., for calibration or validation).

## COMOS

COMOS is the engineering tool from Siemens for the entire lifecycle of your plant. With the direct integration of our PIA Lifecycle Portal we guarantee the seamless integration of our field devices in the engineering environment. We can offer field devices best suited to your processes, properties, and measuring requirements.

## SIMIT

The simulation platform SIMIT enables comprehensive tests of automation applications and provides a realistic training environment for operators even before the real startup. This creates opportunities for process optimization and know-how retention which results in reduced commissioning time and significantly shortened time-to-market.

## 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) through the entire life cycle, from engineering to running of the plant



# SITRANS IQ

Our digital field device platform for performance, efficiency, and less downtime across the life cycle

## SITRANS field devices

The full portfolio of flow, temperature, pressure and level, as well as weighing and pneumatic valve positioners are well established in many industries. Reliable and accurate, they measure the primary measurement value and often provide secondary data such as wear of a valve.

Multi-sensors will in future also detect additional non-cyclic information like vibration or sounds, for example.

Some instruments such as the MAG 8000 even send their data directly to the cloud – or wherever you wish.

Connectivity down to the field devices is not given in the majority of the brownfield plants. Therefore new bridging technologies are needed to provide connectivity in parallel to the classic, non-transparent I/O modules of the DCS or PLC. SITRANS CC240 will in future allow to access these stranded HART data.

And last but not least, the Remote Terminal Unit RTU 3030c will collect measurement data from highly distributed remote measurements and send it via encrypted e-mails to a SITRANS RMS – that forwards the enclosed data into Scada Systems or APPs.



## Sitrans IQ field device apps

Data connectivity via SIMATIC PDM or SITRANS CC240 by itself has no value. Some form of intelligence needs to look at the data, analyze it, and derive conclusions from it, in order to reduce service expenditures or the risk of unplanned downtimes. As the flow of data is rich, this can be a very monotonous task while the recognition of patterns and prediction of failures require diligence.

With its co-creating partners and customers, Siemens is developing apps that monitor the plant for you. They provide life lists, diagnostic data, change & knowledge management. They visualize patterns, monitor limits (e.g., wear), and much more.

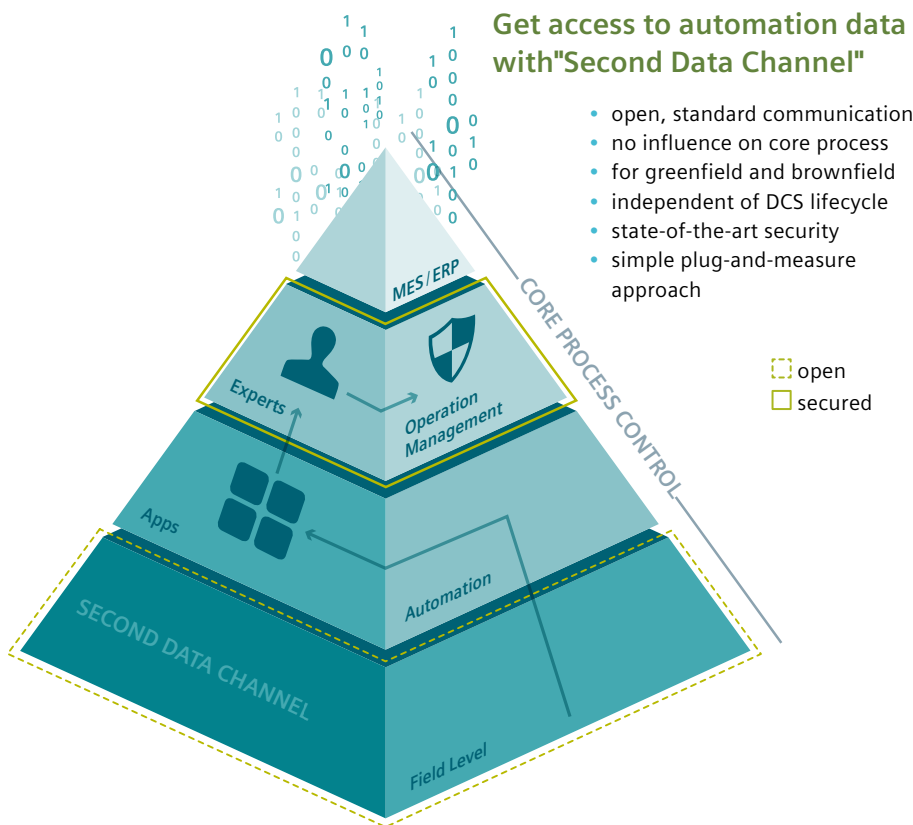
If the app detects an issue, an expert can be notified at the push of a button: the app user can extract relevant data from the apps and share it with our remote experts.

## Digital services

The analytics have been developed by Siemens. These experts are ready to remotely analyze the data together with your plant operators and service staff.

# NAMUR Open Architecture will enable new business cases in MRO applications

The open architecture and second communication channel allow innovative solutions for new and existing plants to be implemented quickly while leaving the process control core unaffected.



operation, multisensors are able to predict potential failures or necessary maintenance of the plant in time. This leads to better planning of the maintenance process and a reduction in unplanned shutdowns.

## Information model and security

It is absolutely essential, while collecting data from the plant, that the automation and process control remain untouched. The security must be incorporated by design. Likewise, any insights and possible optimization measures are reviewed by experts and the plant operator, before being fed back into the automation – it is always the plant operator who is in control.

## Apps

Siemens is developing its apps within the framework of Digitalization Enterprise Labs, ensuring a consistent framework of state-of-the-art functionality for all Siemens apps.

As our automation works seamlessly with all instrumentation available on the market, apps like Valve Monitoring and Field Device Performance Monitoring cover your entire installed base (though we would prefer it if you chose Siemens in the first place).

## Process instrumentation as part of core process control

The instrumentation is the source of all information to run your plant efficiently and safely. Instruments are your eyes and ears in the plant. To bring this information to the automation systems, PI runs on many different communication standards, from very cost-effective 4...20mA only devices, to HART communication, Profibus and in future also Profinet devices.

## Multi-sensors as part of the monitoring and optimization area

While the core process instrumentation measures the critical values to run your application process (flow, temperature, pressure, level), the so-called multisensor measure indirect values such as vibration, temperature, etc. They usually monitor the state of selected assets and are outside the core automation pyramid. By recognizing deviations of the machines, valves, and the plant itself in daily

# Our services support your success

To thrive in today's hyper-competitive markets, industrial companies must extract maximum value from their assets. Our extensive range of services provide customers with the tools and knowledge they need to minimize lifecycle costs while increasing performance. Thanks to our dedicated service people all around the world, we can deliver the services you need tailored to the individual challenges of your industry.

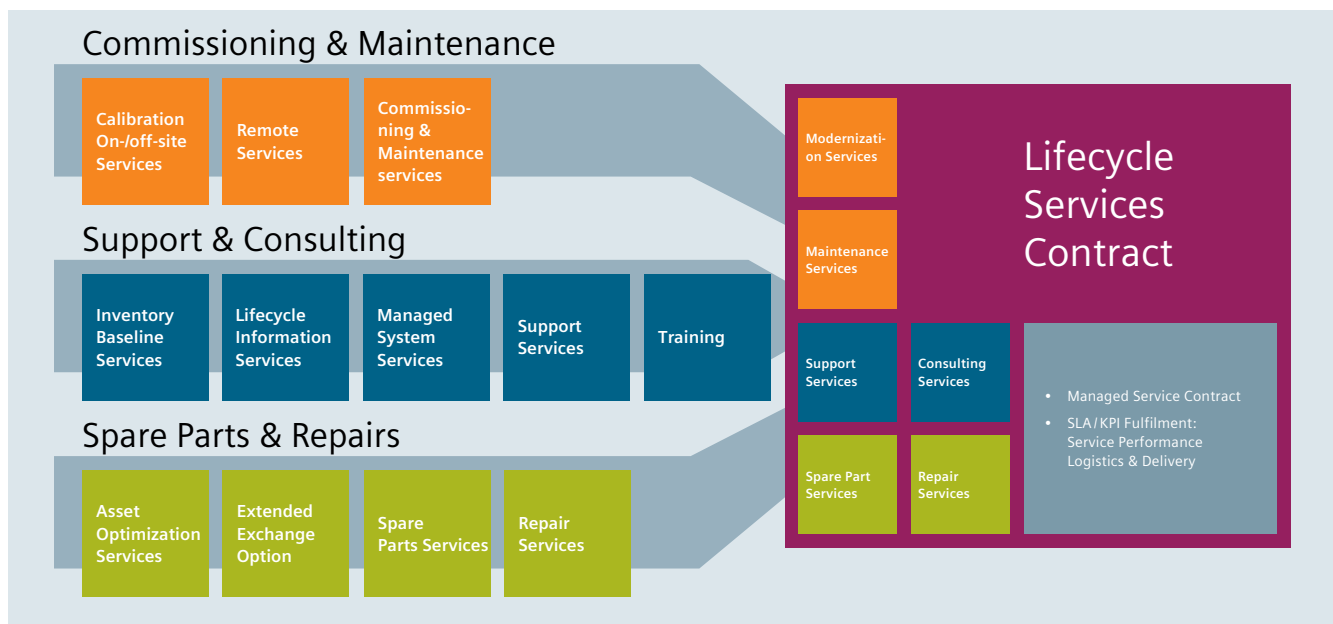


The Industry Services portfolio includes corrective, preventive, predictive services – as well as Digital Industry Services – through the entire lifecycle of products, machines, and plants. Whether making system states transparent or reliably monitoring machines and plants while also protecting them with security concepts, Siemens Industry Services enables your machines and plants to perform at their best.



# Industry services for process instrumentation

In the process industries, communication with field devices is key to managing costs while ensuring safety, security, and quality. Comprehensive and modular range of Industry Services for Process Instrumentation from Siemens provides valuable tools for optimizing operations and protecting the long-term viability of your plant.



## Commissioning and maintenance

Commissioning and maintaining field instruments is time-consuming, labor-intensive, and – depending on whether it’s performed inside or outside explosion-risk zones – involves a substantial outlay. In addition, the ever-growing demands for IT security play an increasingly important role. Our range of on-site services, platform-based remote services, and comprehensive calibration services support you in all your activities, from engineering and commissioning to maintenance.

## Support and consulting

Siemens’ Inventory Baseline Services and Lifecycle Information Services provide convenient and powerful portfolio elements for your installed base. We offer a comprehensive training program for design, operation and maintenance personnel that can take place either at the Siemens Training Center or on your premises. Managed System Services are focused on the efficient, centrally coordinated processing of complex support requests. They not only make all service and support activities transparent, they also significantly reduce service time.

## Spare parts and repairs

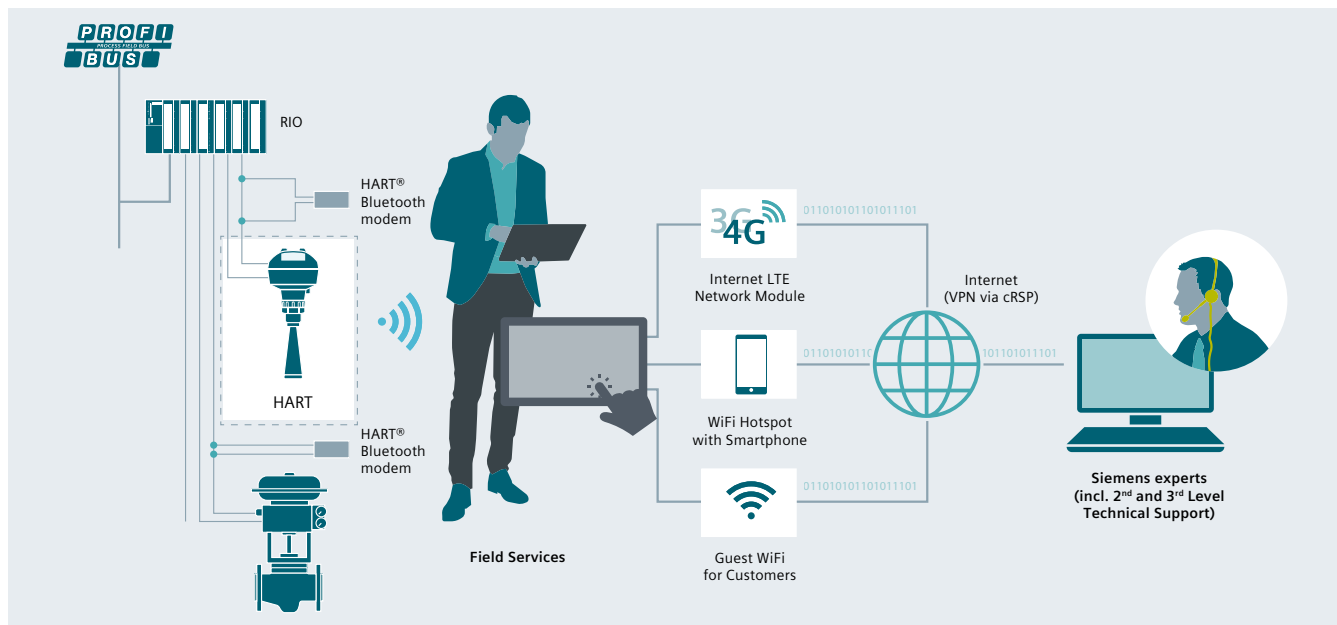
Asset Optimization Services take a structured, systematic approach to the comprehensive optimization of your supply of spare parts. With the Extended Exchange Option, you can protect any Siemens process instrumentation products you order from unforeseeable repair costs.

## Lifecycle services contracts

A modular lifecycle services contract is composed of defined service elements and contract-specific parameters. Long-term investment protection and the assurance of serviceability are the essential benefits of a contract solution.

# Remotely assisted by experts – in real time and wherever you are

Our Remote Services for Process Instrumentation ensure optimal reactive support for all the field devices used. Remote access is via Siemens' own IT infrastructure (cRSP = common Remote Service Platform). Our offering guarantees smooth commissioning, rapid troubleshooting, and comprehensive consulting related to your field devices, control loops, and plant.



## Maintenance

- Maintenance is generally covered by inspection and maintenance services according to DIN 31051:
  - such as inspecting the field instrument's condition for a transparent view of the system status and implementation of preventive measures

## Engineering

- SIMATIC Process Device Manager
- Professional software for parameter assignment, visualization, or error tracing for every kind of instrumentation – either from Siemens or any other supplier
- The same usability – no matter whether you access the device on-site or remotely from the engineering station
- In use worldwide for more than a decade

## Commissioning

- Service Tablet PC SIPIX SD
- Siemens common Remote Service platform (cRSP)
- High-performance industry tablet PCs
- Designed for use in harsh industrial environments
- ATEX approval for Zone 1 and Zone 2
- Configured with all necessary service applications, for Siemens and all common foreign devices
- Access via HART Bluetooth Modem or HART USB cable
- A graduated security and access concept, secure and monitored communication

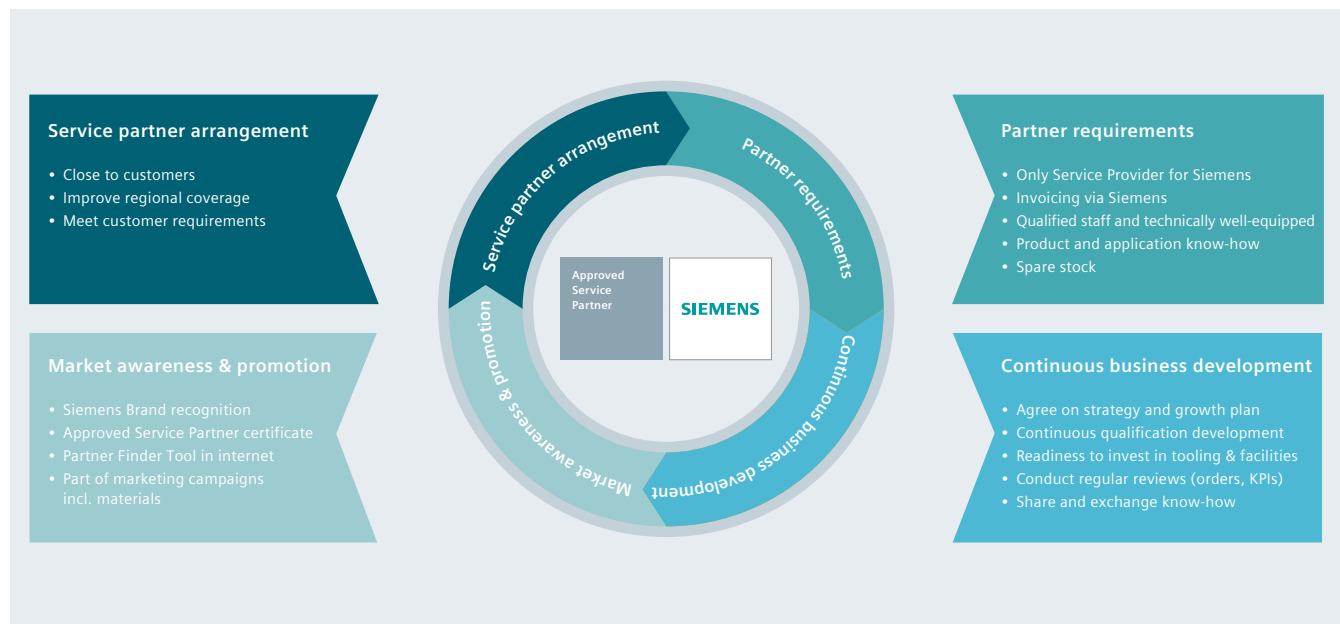
- Absence of feedback effects thanks to the separation of the different networks (DMZ). Compatibility with general industrial security concepts, Certification under ISO27001 / CERT

## Your benefit

- Reliable access to your process instrumentation
- Save access either at the device directly or from the first remote I/O (explosion proof)
- The fast and worldwide availability of expert know-how directly from the product manufacturer
- Technical assistance also during the configuration, commissioning, and maintenance phases

# Approved & certified partners – near you

Siemens partners stand for proven expertise and excellent customer support. The companies we accept as partners have proven their capabilities and been certified in accordance with rigorous standards. At the same time, we support our partners with the same criteria we apply to the training of our own employees.



## Role of partners

- Act as a competent service delivery on behalf of Siemens
- Regional support on site
- Bring expertise and service capability
- Together with Siemens secure ongoing development of new service offerings
- Win new service customers

## Siemens delivers quality

- Based on shared interest (Siemens and partner)
- The partnership is periodically evaluated
- Partners attend Siemens training programs on a regular basis
- Build on existing long-term relationships between Siemens and partners
- Through an extensive certification process ensuring that Siemens requirements for competence profile and tooling are maintained

## Your benefits

- Competent service delivery
- Close to customers (short reaction time)
- Fast access to critical spares (partner stock)
- Increased flexibility
- Partners typically enjoy a high degree of regional acceptance

**Legal Manufacturer**

Siemens Industry, Inc.  
100 Technology Drive  
Alpharetta, GA 30005  
United States of America

Telephone: +1 (800) 365-8766  
[usa.siemens.com/pi](http://usa.siemens.com/pi)

Order No.: PIBR-B10232-0122

This document contains a general description of available technical options only, and its effectiveness will be subject to specific variables including field conditions and project parameters. Siemens does not make representations, warranties, or assurances as to the accuracy or completeness of the content contained herein. Siemens reserves the right to modify the technology and product specifications in its sole discretion without advance notice.