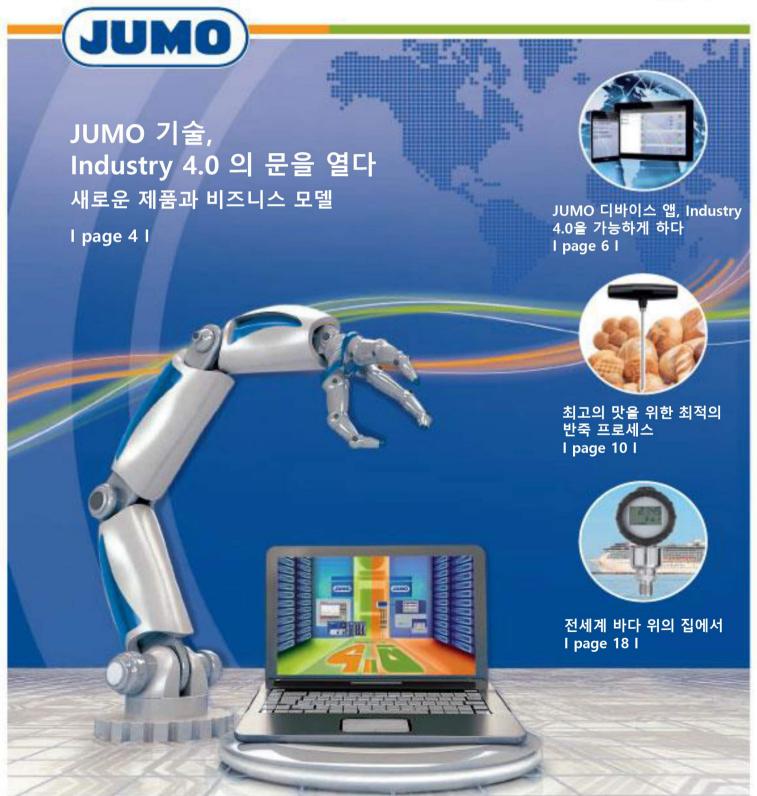
01/2016

sensors 🔁 automation

JUMO 고객잡지





Measurement and control technology by JUMO opens up the door to the fourth industrial revolution:

Digital sensors like those available for the JUMO digiLine system enable hassle-free integration of measurement technology into the process control level.

Sensors with wireless data transmission like the JUMO Wtrans T (temperature) or JUMO Wtrans p (pressure) ensure straightforward networking of the digital factory of tomorrow.

The JUMO Device App allows paperless recorders, the JUMO AQUIS touch analytical measuring device, the JUMO mTRON T automation system, and the JUMO DICON touch process and program controller to be monitored on mobile devices.

JUMO Engineering implements customer projects all over the world.

Welcome to JUMO.

Dear Reader,



Everyone is talking about "Industry 4.0". But is what we are currently experiencing really the next industrial revolution or is it just another hype? The fact is that industry has gained new impetus through increased collaboration with the IT sector. These motivations can especially benefit measurement and control technology. After all, whenever processes are increasingly networked, they also need to be monitored and controlled.

Despite all the euphoria that exists at the moment, two important points must not be forgotten. For one thing, there is the problem of standardization. As long as each corporation defines its own understanding of the term Industry 4.0, the dream of the digital factory can never become reality. Fortunately, serious efforts are now being made to develop uniform standards.

The second critical point relates to security. Being able to manage the control system of an entire production facility with an app is an enormous responsibility. This creates a significant challenge for businesses. The question for the developers must no longer simply be "What can be integrated into a new product?" but rather "What do we want to integrate in order to offer a solution that is as secure

JUMO is aware of this challenge and can make a meaningful and secure contribution towards Industry 4.0. The corresponding products and services are introduced as the focus of our latest Customer Magazine. As always, you will also find interesting reports on applications, product presentations, and news from the JUMO corporate group.

We hope you enjoy reading our Magazine.

Your Managing Partners,

Bernhard Juchheim

Michael Juchheim







4

8

14

18

23

Highlighted Topic

JUMO technology opens the door to Industry 4.0 New products and business models make an important contribution

Products and Services

JUMO Device App makes Industry 4.0 possible 6 Monitoring JUMO devices using smartphones and tablets 7 Innovations

Practical Applications

Optimum measuring technology for evaporation Cooling towers

New directive forces manufacturers and operators to take action

10 Optimal dough process for the perfect taste Wireless temperature measurement ensures consistent baking results

Quality in the barrel and in the bottle 12 Precise temperature control in wine production

Cleanroom monitoring with JUMO technology Reliability for the toughest requirements Automated parking space monitoring ... 16

... with electronic modules by JUMO **Corporate Group** 17

JUMO corporate news **Worth Knowing**

At home on the world's seas Measurement and control technology for shipbuilding

20 Measurement uncertainty is important!

The role of measurement uncertainty in temperature measurement

Working with JUMO digiLine sensor technology 21 Digital Sensor Management (DSM)

JUM0 News 22 JUMO newsletters

Upcoming Events

Trade fair dates 2016

Legal notice

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JUMO의 기술, Industry 4.0의 문을 열다

새로운 제품과 비즈니스 모델에 중요한 기여를하다

Based on a definition by Germany's Federal Ministry for Economic Affairs and Energy, the term describes the fourth industrial revolution, a new level of organization and control over the entire value-added chain throughout the product lifecycle. Industry 4.0 elements include horizontal and vertical process organization, big data, new business models, apps, assistance systems, and robotics.

Smart sensors

Besides ensuring vertical integration, digital sensors such as the recently introduced JUMO digiLine system also make an important contribution to "big data" as they offer totally new opportunities for data acquisition in the entire product lifecycle of the sensors.

JUMO digiLine is a bus-compatible connection system for digital sensors that gives users the ability to build intelligent networks. All important measurement parameters in liquid analysis can be measured with this system. Only a single digital signal line runs to the evaluation

unit or controller in this case. This enables more efficient and faster plant cable installation.

The DSM (Digital Sensor Management) software, which is integral to the system. is also completely new. Calibration data and the evaluation of the sensor status are stored directly in the sensor and enable seamless documentation over the entire lifecycle.

Automation

JUMO mTRON T combines a universal measured value recording system with a precise control system offering intuitive operation. It can also be expanded into a complete automation solution. The scalability of the JUMO mTRON T allows it to be individually adapted to a particular task and it is characterized by features such as tamper-proof data recording.

JUMO mTRON T with its modular design



technology, and comprehensive communication, evaluation, and automation software can be used in a vast range of industries. Important for mobile communication: a complete paperless recorder is implemented, including a web server.

Wireless measurement technology

The future of measurement technology is wireless. In fully digitalized production environments (which is the goal of Industry 4.0) more so than anywhere else, there is no alternative to wireless measurement technology. The benefits

are obvious: a wireless solution should always be your first choice wherever **nication is becom-** data can be used. This cable routing involves too many technical challenges or is too expensive, where high mobility and flexibil-

ity are required, or where the installation work during retrofitting needs to be kept to a minimum. However, a wireless on this technology for years and can now offer solutions for the measurands temperature, pressure, CO₂, and humidity.

Apps

Mobile commu-

ing increasingly

important!

Mobile communication is becoming increasingly important within the context of Industry 4.0. With the JUMO Device App. Android and Apple smartphones as well as tablets can communicate with various JUMO devices. During development, heavy emphasis was placed on making the system as user-friendly as possible. If a JUMO device on the company network is

JUMO Engineering and our systematic

selected via the app, the device tells the app which data could, for example, include lists of text images, events, or alarms.

strial measurement/control/automation technology, supports customers throughout the entire handling of projects, and develops customized applications for a variety of industries. The team's extensive capabilities range from running basic feasibility studies and workshops to drawing up requirement and system specifications as well as the configuration, programming, and validation of automation solutions. In addition to startup and project documentation, tailor-made training courses are also offered.

To sum up, it can be said that:

JUMO's decades of expertise in measurement, control, and automation offer huge opportunities that significantly open up the door to the world of "Industry 4.0".

New business models

transformation from a component seller JUMO Device App transmitter can also be extremely useful to a system provider represent a new for temporary measurements necessary business model in line with Industry 4.0. for process optimization, pilot systems, The Engineering team bundles the deor maintenance tasks. JUMO has focused cades of company experience in indu-JUMO makes an important contribution towards Industry 4.0. In the area of vertical integration in particular, intelligent measurement and control technology opens JUMO mTRON T Scalable measurement, control, up a wide range of networking opportunities at all levels. 🛂 and automation system Type 705000 Dipl.-Kfm. Michael Juchheim Managing Partner 4

+

JUMO 디바이스 앱, Industry 4.0을 가능하게 하다

스마트폰과 태블릿 PC를 통해 JUMO 디바이스를 모니터링 할 수 있습니다

Mobile communication is becoming more and more important within the context of Industry 4.0. After all, the dream of the digital factory can only become a reality if measured values are recorded and monitored in as many places as possible. Yet it is just as important to have access to this data everywhere.

This is made possible by apps, which can certainly not be avoided in future company environments. But the risks that arise here are fundamentally different than those in the consumer sector. For example, improper operation or unauthorized access can quickly have catastrophic consequences in the case of an app that controls an automation system at a waterworks site. That is why development of the first JUMO app focused on security. On the one hand, the intent was for the JUMO Device App to open a door to Industry 4.0. On the other hand, customers specifically told us that they do not want control functions in apps at this time due to security concerns. That being the case, JUMO focused on providing functions strictly for monitoring. Right now, Android and Apple smartphones as well as tablets can use the JUMO Device App to communicate with JUMO devices. This way, the app can visualize and monitor the new JUMO LOGOSCREEN 600 paperless recorder. After updating the software, access to multichannel measuring devices for liquid analysis in the JUMO AQUIS touch series, the JUMO DICON touch process and program controller, and the JUMO mTRON T automation system is now possible. During development, particular emphasis was placed on making the system as user-friendly as possible. And so the user interface integrates much of the intuitive design of the JUMO LOGOSCREEN 600 paperless recorder.

The app can scan for devices on a company network and display any JUMO products discovered in a clear-cut list. Users can select the device either from this list or by entering the IP address / DNS name. It is also possible to make a selection according to device type using filter functions.

After selecting a JUMO device in the app.

the device tells the app which data can be visualized. For the JUMO LOGOSCREEN 600, for example, this involves lists of text images, events, or alarms. As a result, all the configured groups are shown with the relevant channels when using a paperless recorder. It is possible to access the channel names, process values, and units of all currently active groups and channels. Events or alarms are displayed with an icon, a description, and the date/ time at which they occurred.

The app is available free of charge from the Google Play Store and the Apple iTunes Store.

Further information +82 070 4694 1234 mkt@jumokorea.com



INNOVATIONS

More than sensors + automation





JUM0 SMD 0805Type 906125터프한 환경에서도 사용가능한 SMD폼팩터의 플래티넘 온도 센서

The new JUMO platinum-chip SMD temperature sensor, the SMD 0805, is characterized by the sensor's ultra-pure nickel/gold all around contact and extremely smooth surface structure. As a result, it delivers superior processing results and excellent resilience in the soldered connection, which is especially important during frequent temperature changes. Beyond this, innovative and patented design features allow for an extended operating temperature of 250°C (150°C is typical on the market).



JUMO tecLine HY Type 201022 위생용에 적합한 입증된 pH 측정 센서

The new JUMO tecLine HY pH electrode is specifically designed for use in hygienic applications. The sensor, which is certified according to EN ISO 10 993-5, is designed with a ceramic membrane for extreme process conditions. These include temperatures up to +135°C and pressures up to 6 bar. Even after CIP cleaning and sterilization processes, it delivers reliable and stable measured values.



JUMO MIDAS H20 HP Type 401020 이동식 유압을 위한 신뢰할 수 있는 압력 측정 센서

With the MIDAS H20 HP, JUMO offers a pressure transmitter that was developed specifically for use in agricultural and forestry machines, construction machines, or injection molding plants. It has the ECE type approval required for road use and offers extreme vibration and impact resilience combined with a high isolation voltage of 500 VAC.



JUMO DICON touch Type 703571 PRODINET 세상을 위한

프로세스 및 프로그램 컨트롤러

In addition to the existing RS422/RS485 Modbus RTU, Ethernet, and PROFIBUS-DP interfaces, the two channel JUMO DICON touch process and program controller now also supports PROFINET integration. The device has a PROFINET interface for this with an integrated two-port switch, which allows simple line structures to be set up.



JUMO exTHERM-DR Type 701055 ATEX 인증을 받은 새로운 2상 컨트롤러 - Ex(ia) 입력 가능

The JUMO exTHERM-DR two-state controller rounds off the JUMO portfolio in the field of safety technology. Thanks to intrinsically safe Ex (ia) measurement input for RTD temperature probes, thermocouples, or current standard signals, corresponding type-tested sensors can be connected directly. Applications for the two-state controller include the process industry, chemical industry, or painting and drying systems.



JUMO mTRON T Type 705000 시스템 4.0 가능

The current system version 4.0 of the JUMO mTRON T automation system supports the connection of the proven JUMO thyristor power controller via a system bus. The integration of the new JUMO digiLine system for liquid analysis with up to 62 sensors is also possible. Other benefits include an improved process image editor, support for CODESYS V3 remote maintenance, and many more.

Further information +82 070 4694 1234 mkt@jumokorea.com

증발식 냉각타워를 위한 최적의 측정 기술

생산자와 사용자에게 적용되는 새로운 기술적 안전 가이드



생산자와 사용자는 증발식 냉각타워 오염과 관련하여 완성된 기술적 안전가이드 VDI 2047, Sheet 2를 따라야 합니다. 이 가이드는 기존 및 신규 공장에 모두 적용되며, 향후 냉각타워의 보다 위생적인 운영이 가능해질 것입니다.

에어로졸은 수용성 박테리아를 널리 퍼뜨리는 것 으로 알려져 있습니다. 증발식 냉각타워는 보통 건 물 지붕 위에 설치가 되며, 냉각타워에서 발생되는 물방울들이 수증기가 되어 배출되면서 에어로졸의 역할을 하게 됩니다. 이를 사람이 흡입하게 되면 폐 로 들어가서 심각한 병을 유발합니다. 사람들은 1970년 대 미국의 참전용사 모임에 참석했던 옛 군인들이 집단 폐렴에 걸려 사망하면서 이 문제에 대한 심각성을 알게 되었습니다. 이 병은 이후 '재 향군인병'으로 불려지게 되었습니다. 2010년과 2013년에는 독일에서 200건의 감염사례가 보고 되었고, 그 중 8명이 사망하였습니다. 박테리아의 DNA의 프로파일을 분석해본 결과, 산업용 증발식 냉각타워가 대기성 박테리아를 전파하는 매개물이 라는 것이 밝혀졌습니다. 전문가들은 2010년 감 염사례 발생 이후에 본격적으로 대비책을 강구하 기 시작했습니다. 그들의 목표는 독일 각지에 있는 수많은 냉각타워들에 획일적이고 표준화된 모니터 링을 실시하는 것이었습니다. 이후 또 한 번 감염사 례가 발생한 2013년에는 VDI 2047, Sheet 2라 는 기술적 안전가이드를 발표하였습니다. 이에 대 한 입법 초안이 또한 추진되어서 2016년이면 구 속력을 가질 것으로 예상됩니다. 이에 따라 사용자 는 반드시 유지, 보수 및 작업에 대한 요구조건들을 따라야 합니다. 이러한 규제들은 기존에 지어졌던 공장들에도 소급 적용되게 됩니다.

이전까지만 해도 냉각타워에 기술장비들을 설치할 때에 주요 초점은 대개 유지, 보수를 간단하게 하고 및 자동화 수준을 최고로 끌어 올릴 수 있는 것에 맞춰져 있었습니다. 하지 만 미래에는 제조자와 운영자들이 기존에 지 어졌던 공장들의 수질 위생에 더 많은 관심을 기울일 것입니다. 기존에 지어진 공장들은 반 드시 등록을 하고 위험 평가에 기반해 독립적 으로 평가를 받아야 합니다. 기술 장비 및 측 정 기술들은 최신 기술들로 대체될 것입니다. 지침에 따라, 미생물에 대한 일반적인 연구 테스트는 지속적인 온라인 측정을 통해 이루 어질 것입니다. 측정값과 독성물질은 반드시 주기적으로 기록되어야 합니다. 웹 서버를 통 한 무선 모니터링은 오늘날 매우 쉽게 가능합 니다. JUMO는 새로운 냉각 타워를 위한 적합 한 측정 및 제어 디바이스를 제공합니다.

전도도 측정을 통해 이루어지는 냉각 타워의 담수화 작업을 진행할 때에도 디바이스는 냉각타워 위생 보호를 위해 화학물질의 투입량을 제어할 수 있습니다. 화학물질 투입 전 혹은 투입 중의 탈염공정 중 화학물질 접촉 시간 관찰, 모든주요 파라미터에 대한 한계값 모니터링은 옵션으로 제공됩니다. 또한 디바이스는 날짜와 시간 스탬프가 포함된 온도기록 데이터 형식으로 기록할 수 있는 기능을 갖추었습니다.



이는 사용자가 1주 혹은 한달 전의 냉각 타워의 작동 상태를 확인할 수 있도록 도와줍니다. 만약 디바이스가 회사의 인트라넷 혹은 모뎀을 이용한 전화선과 연결되어 있을 경우, 데이터를 어느 PC로든 불러와서 확인할 수 있습니다. 경고 및 알람 레포트들 또한 연결을 통해 텍스트 메시지 혹은 이메일로보낼 수 있습니다. 이를 통해 냉각타워를 1년 내내 모니터링하는 것이 가능해졌습니다. 또한 pH 값의 제어와 측정, redox 측정을 통한 냉각타워의 위생 상태 모니터링, 혹은 염소, 이산화염소, 오존과 같은 살균제의 직접 측정이가능합니다

더불어 사용자에게 최고의 편의성을 제공하는 JUMO AQUIS touch 시리 즈의 자유로운 프로그래밍과 모듈화된 디자인을 통해서 기존 설비를 보다 손쉽게 조정할 수 있습니다.

판넬마운팅 위한 빌트인 디바이스 (전면 IP66)



JUMO AQUIS touch P/S

컨트롤러와 페이퍼리스 기록계가 포함된 수질분석용 모듈러 다채널 수질측정기 Type 202580/202581





완벽한 맛을 위한 최적의 반죽 프로세스

무선 온도 측정을 통해 일관된 제빵 결과를 얻을 수 있습니다



To produce baked goods with optimal results, the dough piece manufacturing process and process management in the baking oven need to be standardized. JUMO measurement technology contributes significantly to ensuring that baked goods can be manufactured consistently and reliably.

Manufacturing reproducible baked goods relies on standardized dough pieces. A dough piece is a piece of raw dough which has been fully processed and shaped. It can be fresh, cooled, or frozen. The cooled state of dough pieces is known as "delayed fermentation" and the frozen state as "interrupted fermentation." Delayed fermentation or interrupted fermentation enables baked goods to be manufactured flexibly. This means that baked goods stands such as those in supermarkets can also offer freshly baked goods and bread without the need for a bakery.

is cooled too slowly, large ice crystals form which damage the yeast cells. Rapid cooling, known as shock freezing, prevents the formation of larger ice crystals. This allows the dough piece to maintain its properties, resulting in ideal baking.

The solution for optimal manufacturing

Wireless data transmission of the temperature (JUMO Wtrans T) was developed to provide an easily workable and useful alternative solution, thereby ensuring uniform high quality of the dough pieces. One particular advantage is that the wireless temperature probe can be removed from the blast chiller with the tray rack without a cable inconveniently disrupting the production flow.



JUMO Wtrans T

To allow this to happen, the JUMO Wtrans T insertion temperature probe is inserted into any one of the dough pieces and put into the blast chiller. During the cooling process to approx. +5°C, the measurement data is transmitted from the JUMO Wtrans T receiver to the connected control via the analog output. A fixed temperature value in the preliminary stages indicates when the dough pieces can be removed. This ensures a consistent level of product quality.

Wireless data transmission also removes the need to disconnect the complex plug connection. This saves the user a lot of time.

Wireless and precise temperature measurement

The JUMO Wtrans series is a system for wireless recording of measured values using wireless technology. The recorded values are first transmitted wirelessly to the Wtrans system's receiver and from there to measurement and control equipment such as controllers, automation systems, displays, or recorders for further processing.

In Europe, the system uses a radio frequency of 868.4 MHz, while in the USA, immune to external interference and, in addition, ideal for use in rough industrial environments. The JUMO Wtrans T01 receiver is used in conjunction with appropriate wireless measuring probes for mobile or stationary temperature measurement. One receiver can process up to 16 wireless signals.

If unique IDs are assigned, the signals can also be processed together by one receiver. The $\lambda/4$ antenna supplied has an impedance of 50 ohm and can be bolted on directly or mounted externally. If the antenna wall holder is used with a three-meter antenna cable, the maximum open air range is up to 300 meter. The JUMO Wtrans T, the insertion variant in the Wtrans series, is particularly suited to determining the core temperature of food.

RTD temperature probe with wireless data transmission Type 902930 JUM0 Wtrans T01

Receiver for JUMO wireless measuring probe

Type 902931



와인 배럴과 병에 담긴 와인의 품질

와인생산에서 가장 필요한 정확한 온도 컨트롤



Wine is a cultural heritage. The first winegrowers are documented as early as 300 BC in Egypt and Phoenicia. From there, wine triumphantly spread through Greece and the Roman Empire to Europe. Wine making is a complex process in which the main requirement is the right temperature. A vineyard in the famous Bordeaux growing region relies on JUMO controllers to bottle excellent products.

France is the secret homeland of wine. More than 80,000 growers produce some 45 million hectoliters of wine every year. This is five times the volume produced in Germany. The average French person consumes 53 liters of wine a year, which is more than twice the consumption in Germany.

Good wine is created in a process of 11 steps from harvesting to storing. The fermentation process is particularly important for the wine quality. A distinction is made between alcoholic and malolactic fermentation. During these processes, the sugar that exists in the grapes is converted into alcohol and the dyes are released from the grape skins.

The temperature needs to be constantly monitored and controlled especially in these phases. Control relies on liquidfilled pipes to the fermentation tanks.

To start the fermentation, the fermentation vats first need to be slightly heated. Because fermentation is an exothermic process, heat is constantly generated. However, as the temperature rises, the yeast activity drops, and fermentation stops completely at temperatures above +35°C. In other words, the fermentation vats need additional cooling to compensate for the generated heat. For each fermentation vat, a controller is required to respond individually to the temperatures.

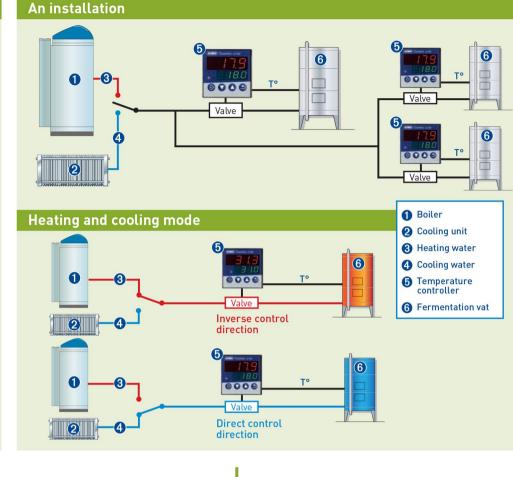
The requirement for the application at the French vineyard was for the controller to Controllers from the JUMO Quantrol series, which were especially customized for this application, meet all of these requirements. These devices are operated using four buttons on the front with a defined pressure point. The universal analog input for RTD temperature probes, thermocouples, or current/voltage signals is user programmable. The setpoint value, the actual value, and all parameters are displayed on two seven-segment LED displays (red/green) with one or two decimal place(s).

Values can be displayed in Celsius or Fahrenheit. Up to five relay outputs with a switching capacity of 3A/230V can be available. The number of relay outputs depends on the format. The switch position of the relays is displayed using yellow LEDs. These relays can be assigned different alarm functions. An analog output of 0 to 10V or 0(4) to 20 mA can be used to control valves or thyristor power controllers. Using the binary input, the JUMO Quantrol device settings and operation can be gradually locked, a ramp or timer can be activated, or autotuning can be initiated.

The JUMO Quantrol series is available in three DIN formats. The device can be connected to superordinate systems using the RS485 serial interface. Instead of operating the device from the front, the user can also program the controller using a setup program and USB interface. At the French vineyard that now uses these controllers, each JUMO Quantrol manages a valve, which in turn controls the liquid supply in the heating and







cooling circuits. A single key combination makes it easy to switch from heating to cooling; the setpoint values are switched over at the same time. There are separate icons for heating and cooling modes. A second key combination switches the controller on or off. In case of an alarm, the second display toggles between the "ALA" text and the setpoint value.

In France, JUMO RTD temperature probes are deployed in addition to the JUMO Quantrol controllers. The probes have a form B connecting head and an immersion sleeve. In addition to simple startup and operation of the system, the customer was particularly impressed with the potential energy savings that the new plant was able to achieve.





JUMO 기술을 통한 클린룸 모니터링







까다로운 요구조건을 충족시키는 신뢰성 높은 JUMO 기술

Clean and ultra cleanrooms are required for special production methods – especially in medicine and pharmaceutical technology – since particles in ordinary ambient air would have an adverse effect. In a cleanroom, selecting the right measuring devices for achieving optimum measurement results is paramount. As a rule, particle content, temperature, humidity, and pressure are monitored and recorded. The control and recording of these measurands have to comply with the stringent rules of GMP (Good Manufacturing Practice).

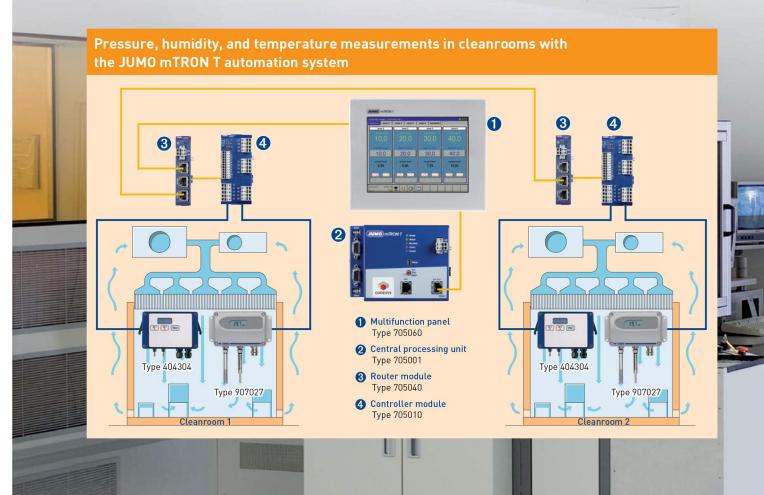
One controller for everything

The JUMO mTRON T automation system is the ideal solution for controlling, regulating, and documenting the measured values temperature, pressure, humidity, and particle content in one or several cleanrooms. The various system input and output modules permit a flexible and decentralized system configuration. The integrated CODESYS V3 PLC, in conjunction with the modules for regulation,

measured value recording, and data recording, form an optimum combination for highly diverse cleanroom applications. EtherCAT – a fast, Ethernet-based system bus that is widespread in measurement and automation technology – is used for networking and data communication for the individual components. The JUMO mTRON T system can be used to operate, control, and regulate several individual cleanrooms while logging the measured

process values for quality assurance. In the past, this required individual control systems.

Documentation of the measured process values is tamper-proof, which is of great importance in cleanrooms. Special integrated functions such as email notification in case of emergency or a web server represent a cost-effective and reliable alternative to complex visualization systems.



Visualization and logging for optimized security

The TFT touchscreen and integrated recording function allow the historical trend to be viewed directly on the plant in addition to the current values, status messages, and alarm messages. This gives the user a high degree of transparency and the option to directly optimize and/or adjust running processes. In this manner, irregularities can be detected at the outset and the corresponding measures can be taken.

The recorded data can be extracted, archived, and evaluated via the interface or a USB flash drive using the JUMO PCC and PCA3000 software programs. Even more comprehensive documentation is possible with the JUMO SVS3000 visualization software. It supports batchrelated reporting following the input of corresponding data at the relevant plant as soon as the program is started. The software can also operate all connected units.

Save time and costs thanks to perfect humidity and temperature measurement

To be able to ignore external influences when producing sensitive products, reproducible climatic conditions are reguired in the cleanroom. Thanks to the capacitive hygrothermal transducers in JUMO's 907027 series, variables such as humidity and temperature can be determined with a single device. The devices have intelligent interchangeable probes with internally stored calibration data and a comparison log. If required, these probes give the user the ability to replace a sensor in seconds without compromising accuracy. Precision calibration procedures and the latest microprocessor technology guarantee high measuring accuracy across the entire temperature operating range. The exceptional long-term stability is based on the use of humidity sensors that have proven themselves over many years. For high-temperature applications (up to +80°C) or applications for which space

is restricted, the probes can be relocated by means of plug-in connecting cables without having to readjust the device. The following output signals are available: voltage outputs 0 to 10V or 4 to 20mA current outputs. Temperature scaling can be easily adapted at the factory to suit the application. An optional display allows the current rF and T values to be displayed.

Capacitive hygrothermal transducer With intelligent exchange probes Type 907027



Pressure and differential pressure transmitter For recording positive, negative, and differential pressure of non-aggressive gases Type 404304



Further information

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주차장의 빈 주차공간 모니터링 자동화...

...JUMO의 전자모듈과 함께!



People often wonder how the car park display knows that parking spaces are still available. The answer here is smart technology. As the numbers of automobiles increase, the topic of parking space monitoring is becoming increasingly relevant. Here, modern systems work with sophisticated sensor technology.

Three years ago, the Croatian company MobiliSis based in Varaždin began developing sensors for recording moving and stationary traffic. The result was the MagSense system, which successfully detects parked vehicles in parking spaces, parking garages, and underground parking lots. Thanks to magnetic field sensing, the MagSense sensors precisely record the occupancy of individual car parking spaces with a detection rate greater than 99 percent. The real-time data for each parking process is then transmitted to a parking guidance system or an external server. JUMO delivers the electronic modules for this system. The electronic modules are manufactured in Fulda according to customer specifications.

They are then programmed and checked by MobiliSis before being soldered and potted. Thanks to this work breakdown, the modules can be produced with a competitive cost-benefit ratio.

The core of JUMO's electronic module manufacturing is three state-of-the-art SMD assembly lines, which can equip up to 100,000 components per hour. The annual SMD equipping capacity is currently 140 million components. In addition, ten semi-automatic equipping systems are available for THT equipping. The annual capacity here is up to 14 million components.

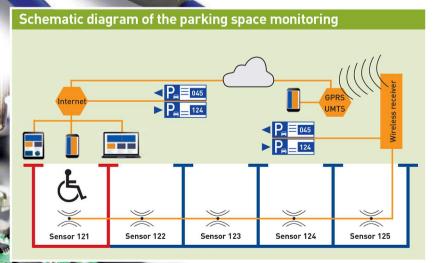
At the request of our customers, an inspection and test concept is already designed during the development phase.

To ensure a high level of quality level, the assembled SMD modules are checked by automated optical inspection systems (AOI). The JUMO customers in this area come from a wide range of industries such as industrial electronics, medical technology, and sensor technology.

Further information

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The patented MagSense sensor





One of the car parks monitored by the MobiliSis system

JUMO 기업 뉴스

다양한 수상 경력을 보유한 파트너

JUMO not only wins over customers all over the world, but also professional juries of major business awards. For example, JUMO received the "Hessen Champion 2015" award in the "Global market leader" category for its temperature probes for heat meters. "Hessen Champion" is the state award for innovation and growth. Its purpose is to recognize companies in Hesse, Germany that stand out due to their excellent achievements.

The "Großer Preis des Mittelstandes" (SME major award) is regarded as Germany's most important business award. In addition to the overall development of the company, the criteria for the award include creating and safeguarding jobs and trainee positions as well as innovative strength. In 2015, JUMO was selected as a finalist in the competition region of Hesse.

For the second time in succession, JUMO was voted "one of the most successful SMEs in Germany" last year by the Munich Strategy Group (MSG). JUMO has ranked

21st out of 4,600 companies that were recently evaluated.

JUMO has been on **FOCUS** magazine's list of the best employers in Germany for three years, taking seventh place in the "Electronics, electrical engineering, and medical equipment" industry among companies with up to 2,000 employees.

JUMO's products also receive awards. For example, the trade journal "messtec drives Automation" annually presents the "MessTec & Sensor Masters Award" for particularly innovative developments

in measurement and sensor technology. Here, the new JUMO digiLine system received an award this year.





With an export quota of some 54 percent, as well as 24 subsidiaries, JUMO is active in all major global markets today. In 2016, no less than five subsidiaries are celebrating anniversaries.

Subsidiary anniversaries

When it comes to internationalization, JUMO has for years relied on organic, internally-driven growth without buying up companies.

45 years ago, the subsidiaries in Belgium, Austria, and Switzerland were founded. This was also the starting point for tapping into markets from within the respective target markets. The Dutch subsidiary

first saw the light of day 40 years ago. Thirty years ago, JUMO started up in Sweden.



JUMO opens new site in China

The new company headquarters of JUMO's Chinese subsidiary "JUMO Automation Dalian Co. Ltd" opened last fall with a ceremonial inauguration.

JUMO has been operating in China since the beginning of 1992 and established its own subsidiary in 1997. The office and production space that the company rented at the time in an industrial estate in Dalian, Northern China, proved to be far too small. The new building complex offers 15,000 m² of floor space for approx-

imately 400 employees in production and administration. This is double the size of the previous floor space and will be large enough for the future development of the company.



전세계 바다를 누비는 집에서

선박을 위한 측정과 제어 기술

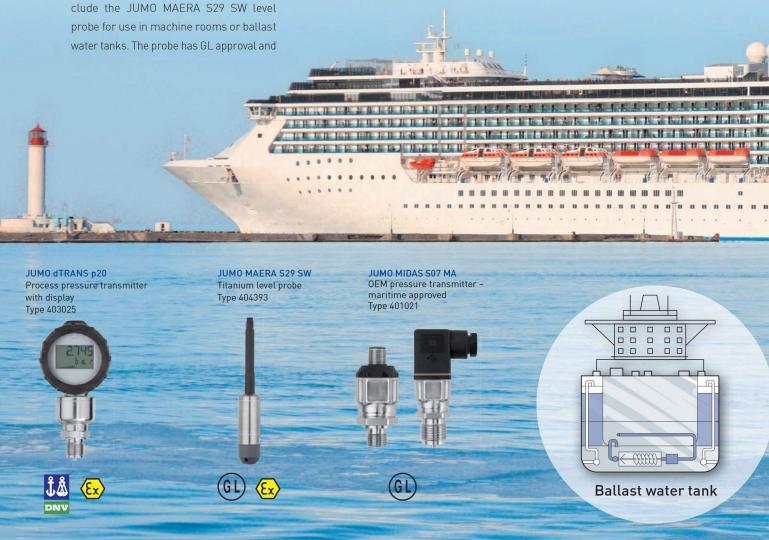
Maritime shipping is an important driver of globalization. Over 90 percent of goods transported worldwide use the seas. German ship owners, shipyards, and dependent shipbuilding suppliers have also benefited for years from a prospering maritime transport industry with above-average growth rates compared to the global economy.

The overall turnover of German shipyards was 6.4 billion euro in 2014; 24 seagoing vessels with a total value of 2.4 billion euro were delivered. Turnover by shipping suppliers was as high as 12.8 billion euro. The measurement and control technology deployed in this industry is subject to strict requirements. JUMO has many years of experience in this area so that it can offer many robust and reliable products for shipbuilding.

JUMO recently expanded its range to in-

is designed primarily for use in salt water in the context of shipping applications and in potentially explosive areas. The level probe is available for relative and absolute pressures from 100 mbar to 10 bar. The titanium design, which is highly resistant to chemicals, and intrinsically safe ATEX approval mean that the probe can also be used in difficult environmental conditions. The JUMO MAERA S29 SW is suitable for continuous level measurement in ballast water tanks to ensure the ideal vessel draught. The device is also used in antiheeling systems in ships. Furthermore, the JUMO MAERA S29 SW can be used to measure very tough and highly viscous media such as heavy oil.

JUMO dTRANS p20 is another product with DNV approval that is suitable for level measurement on ships. The highly accurate pressure transmitter has a display that shows pressure and temperature values among others. Depending on the version, it can be used in a temperature



range from -50 to +200 °C. Thanks to intrinsically safe ATEX approval, this pressure transmitter is predestined for level measurement in LNG tanks.

The JUMO MIDAS S07 MA pressure transmitter is especially developed for the shipbuilding industry. It is characterized by its compact design type, robust stainless steel construction, and easy installation. The JUMO MIDAS S07 MA is available for measuring ranges from 1 to 100 bar relative pressure and 1 to 25 bar absolute pressure. The medium temperature can be between -40 and +125 °C. The fully welded and therefore seal-free measuring system made of high-grade stainless steel allows the pressure transmitter to be used in virtually any medium.

In one of the applications on board ships,

the JUMO MIDAS S07 MA is deployed in separators in which untreated oil that is heated to the correct temperature is fed continuously to the separator to allow impurities to be eliminated. JUMO also offers different products with GL approval from the area of control and automation technology. An example here is the JUMO DICON touch, a two-channel universal process and program controller. The device has four analog universal inputs and up to eight external inputs that can record a variety of physical measured values with high precision. Thanks to different output variants, the actuators can be controlled directly in the device with either an analog or digital setup. Interfaces such as Modbus (master/slave), PROFIBUS, PROFINET, or Ethernet with web server can be used for the communication with superordinate systems.

The scalable JUMO mTRON T measurement, control, and automation system has GL approval. It can be used on board ships for demanding automation solutions with many measurands and signal source locations such as engine rooms. The system uses an Ethernet-based system bus and an integrated PLC. Up to 30 input/output modules can be connected via the central processing unit.

Further information

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측정 불확도는 중요합니다!

온도 측정 시 측정 불확도의 역할



The word "uncertainty" does not normally convey a feeling of trust. But in contrast to normal, idiomatic use, this term has a positive meaning in technical and scientific fields. Measurement uncertainty is a measure of the trust in a measured value. Every measurement is subject to influencing factors; no measurement delivers an exact and precisely reproducible measured value. Even if you repeat a measurement under the same conditions, it will deliver different results.

Difference between precision and accuracy

Precision tells us something about the scattering of matches. It is therefore a measure of reproducibility.

In contrast, accuracy describes the deviation of the matches from the bullseye $\mathbf{0}$.

Knowing the measurement uncertainty value is important

The measurement uncertainty statement gives the user the ability to determine the reliability of the measuring result and to compare it with other measuring results.

Stating the measurement uncertainty for a measured value is therefore a measure of the measuring result quality. If no details of the measurement uncertainty are provided, the measured values are worthless.

Checking for compliance with limit deviations

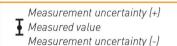
When a manufacturer (final testing) or a user (incoming goods testing) tests a sensor, the measurement uncertainty needs to be taken into consideration. Consequently, a distinction is made between selection criteria and rejection criteria.

Selection criterion (manufacturer):

The measuring result with the extended measurement uncertainty added to it is still fully within the required limit deviation.



Deviation plus measurement uncertainty fully within the limit values!



Influencing factors of a measuring chain

Measuring point

- Vertical temperature distribution
- Horizontal temperature distribution
- Temporal temperature stability

Thermocouple

- Tolerance class
- Characteristic curve errors
- Insulation resistance
- Inhomogeneity
- Heat dissipation errors
- Influence of connecting cable

RTD temperature probes

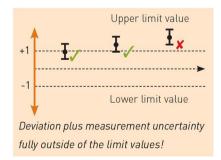
- Characteristic curve errors
- Insulation resistance
- Hysteresis
- Parasitic thermoelectric voltage
- Tolerance class
- Influence of connecting cable
- Self-heating
- Drift behavior
- Heat dissipation errors

Measuring device

- Accuracy (specification)
- Measuring point switch
- Connection type
- Cold junction
- Display resolution
- Influence of ambient temperature
- Reading off the display

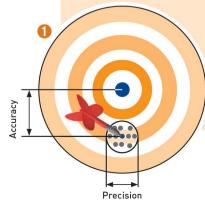
Rejection criterion (user):

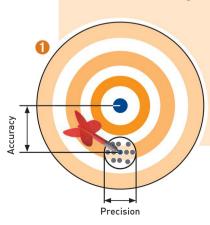
The permissible limit deviation is not met if the measuring result with the extended measurement uncertainty added to it lies fully outside of the limit deviation.



Further information

www.calibration.jumo.info +82 070 4694 1234 mkt@jumokorea.com





JUMO digiLine 센서 기술과 함께 하세요!

디지털 센서 관리 (Digital Sensor Management)



JUMO digiLine 시스템의 한 부분은 분석 측정기술을 위해 내부 메모리를 갖고 있는 디지털 센서로 구성되어 있습니다. JUMO AQUIS touch 다채널 측정 디바이스와 연결하게 되면 프로세스는 더욱 쉬워집니다.

iLine 전극은 복합 전극 또는 compensation thermometer 형식의 센서 유닛과 조합되어 사용됩니다. 10 버전에 따라, N 시스템 또는 VP(Variopin) 시스템을 갖춘 전극을 연결할 수 있습니다. 트랜스미터를 위한 전원공급 과 RS485 인터페이스는 5핀 M12 커넥터 (IP66)를 통해 연결됩니다. 아날로그 시스템 을 위한 8핀 버전은 아날로그 출력 신호 및 바이너리 입력을 제공합니다.

- ❷JUMO digiLine 센서는 USB-RS485 인터 JUMO AQUIS touch 에 할당받게 됩니다. 페이스를 통해 PC와 연결될 수 있습니다. 디지털센서관리 덕분에 복한 센서 타입은 electronics에 할당되며, TAG 넘버 또한 필 요할 경우 할당받을 수 있습니다.
- ਰ JUMO digiLine 센서와 JUMO AQUIS 🛭 는 유지됩니다. 시스템은 실험실에서의 센 touch는 다양한 연결 케이블과 Y형 케이블 ❸ 로 연결 가능합니다. ❹JUMO digiLine 해 매우 유용하게 사용됩니다. 공장에서 센 허브는 케이블의 길이를 연장하고 전원 공 급을 분산시키 기 위해 사용됩니다.

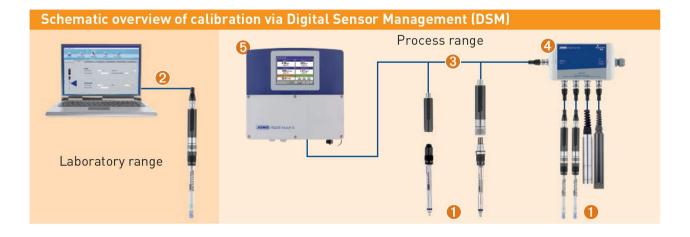
시리얼 인터페이스를 통해 총 6개의 digiLine 센서를 JUMO AQUIS touch에 연결할 수 있습니다.

JUMO mTRON T 자동화 시스템이 현명한 는 데이터베이스에 저장됩니다. 교정 일지 선택이 될 수 있습니다. (예, 복잡한 CIP 나 설정 이력, 센서의 작업 시간과 같은

센서의 채널은 JUMO AQUIS touch (pH, redox potential, 온도)에 의해 정해집니다. 만약 이 타입의 단 한 센서만이 bus에 연결되어 있다면, 자동적으로 채널을 할당 받게 됩니다. 필요하다면, 측정 포인트를 위한 TAG 번호 또한 linking에 우선하여 Linking은 오직 TAG 넘버가 센서와 매치될 때만 일어납니다. 센서의 추가 구성은 JU -MO AQUIS touch를 통해 이루어집니다. 교정 데이터는 센서에 저장되며, 교정 일지 서 유지 관리와 DSM 기반 교정의 유지를 위 서만 교체하면 됩니다. 만약 같은 타입의 센 서로 교체되면, 새로운 센서는 자동적 으로 기존에 사용했던 센서의 기능성을 그대로 이어받게 됩니다.

pH 값, Redox, 온도를 측정하기 위해 dig- 만약 더 많은 센서를 연결하고 싶다면. 센서가 DSM과 연결되게 되면. 센서 데이터 정보들은 DSM에서 모두 확인 가능합니다. JUMO digiLine system은 pH, redox, 온도 센서와 함께 용존산소, 탁도 측정을 위한 디지털 센서를 장착할 수 있습니다. 염소, 오존과 같은 멸균용 측정물질을 위한 센서 들도 가까운 시일 내에 연결 가능해집니다. 더불어 전도도(conductive, inductive) 측정 이 가능한 JUMO digiLine 센서 기술을 제공 하기 위해 개발에 착수했습니다.

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JUMO News

JUMO newsletters



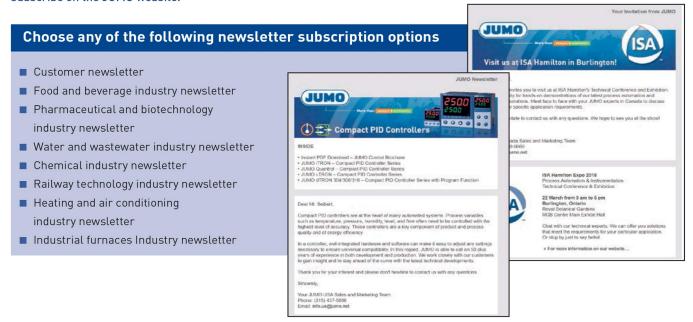








JUMO newsletters provide up-to-date information on products, services, industries, seminars, and trade fair dates. It is easy to subscribe on the JUMO website.



JUMO reference books - by experts for professionals

Industrial measurement and control technology is a complex discipline. Besides delivering the right choice of products, JUMO also sets great store in conveying the expertise to match.

As a result, in addition to our comprehensive seminar program, we also have a selection of useful reference books. This is where you will find information for both newcomers and experts on topics such as analytical measurement technology, functional safety, or control technology. All authors are specialists in their own disciplines. In all of our publications, we focus on illustrations with practical relevance and many examples.

The books are either available free of charge as PDF downloads or they can be ordered in printed form for a small contribution towards costs.

Further information

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The following publications are currently available in English

- Control Engineering Basic principles and tips for practitioners
- Electrical Temperature Measurement
- Error Analysis of a Temperature Measurement System
- Explosion Protection in Europe
- SCR Power Controllers
- Information on high-purity water
- Information on conductivity measurement
- Information on redox voltage measurement
- Information on pH measurement
- Information on measuring ammonia in water
- Information on the amperometric measurement of free chlorine, chlorine dioxide and ozone in water
- Information on the measurement of hydrogen peroxide and peracetic acid
- Functional Safety Safety Integrity Level

2016 전시회 일정

We look forward to your visit!

Visit us at numerous trade shows and keep in touch with our newest product developments and innovations.

AZERBAIJAN



Caspian Oil & Gas

Trade fair for oil and gas production

June 1-4 Baku

BELGIUM



AQUARAMA

Trade fair for water technology

October 12 Brabanthal Leuven

CHINA



IEexpo

Leading trade fair for environmental technology solutions:

water, waste water, air and soil

May 5-7 Shanghai

ISH China & CIHE

International trade fair for heating, ventilation, air-conditioning, sanitation, and home comfort systems

May 30-June 1 Beijing

DENMARK Automatik



Trade fair for automation technology September 13-15 Brøndby

FRANCE



SEPEM Industries Est

Trade fair for services, equipment, control technology, and maintenance in industrial production

May 31-June 2 Colmar

WNE

Leading event for the global nuclear energy sector

June 28-30 Paris

Find out more trade fair dates

fairs-international.jumo.info

GERMANY

HANNOVER MESSE

World's premiere industrial technology showcase

April 25-29 Hanover

IFFA

International trade fair for the meat industry

May 7-12 Frankfurt am Main

SENSOR + TEST

The measurement fair

May 10-12 Nuremberg

IFAT

World's leading trade fair for water, sewage, waste and raw materials management

May 30-Jun 3 Munich

SMM

Leading international maritime trade fair

September 6-9 Hamburg

InnoTrans

International trade fair for transport technology

September 20-23 Berlin

INDIA



AUTOMATION

Leading trade fair for process automation

August 22-25 Mumbai

NETHERLANDS



WOTS - World of

Technology & Science

Meeting point for technology

October 4-7 Utrecht

NORWAY



Euro Expo Haugesund

Industrial fair

September 7-8 Haugesund

POLAND



WOD-KAN

Trade fair for water and wastewater technology

May 10-12 Bydgoszcz

ENERGETAB

International power industry fair September 13-15 Bielsko-Biala

RUSSIA



Metallurgy Litmash, Tube Russia

Trade fair for foundry, metallurgy, non-ferrous metal, metalworking, and welding engineering

June 6-9 Moscow

SWEDEN



Euro Expo

Industrial fair

May 25-26 Umeå

VA-MÄSSAN

Fair for water and wastewater September 27-29 Joenkoeping

UNITED ARAB EMIRATES



WETEX

Exhibition for water, energy technology, and environment

October 4-6 Dubai

USA



Sensors Expo

Leading industry event focused on sensors and sensor-integrated systems

June 22-23 San Jose, California

UZBEKISTAN



Trade fair for oil and gas

May 18-20 Tashkent

www.jumo.net

