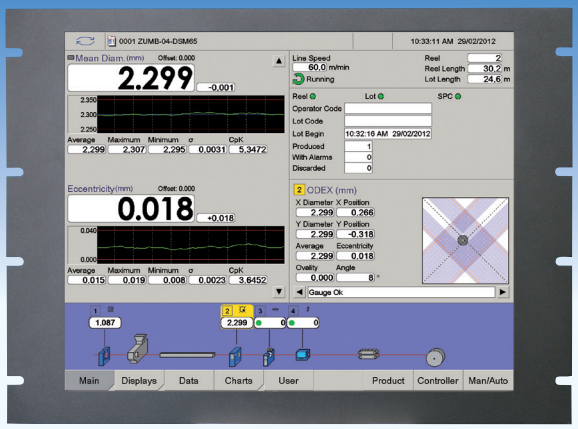
Zumbach

SWISS PRIME MEASURING SINCE 1957

# USYS® IPC 1e / 2e



## Powerful yet Cost-Effective Multi-Sensor Process Control and Data Acquisition Systems

# MODULAR PROCESSOR SOLUTION WITH EMBEDDED SYSTEMS ARCHITECTURE

The USYS® IPCe models are powerful, modular and very flexible processor systems, which are suitable for any manufacturing process in the wire and cable, plastic or rubber industries and for all processes in the cold steel and metals industries. The USYS® IPCe systems are an alternative to the other processor and display units of the USYS® series.

## Hardware Configurations/Components

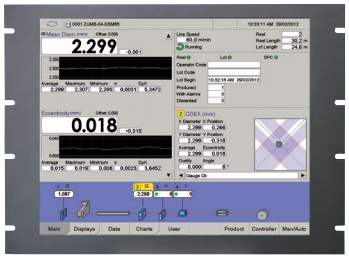
The economic and space saving USYS® IPCe hardware compliments the USYS® family of processors. They offer the flexibility to mount the processor in a convenient location while mounting the LCD touch screen at a more appropriate location for the operator.

## USYS® IPCe Processor Unit

Industrial processor with active back plane and flexible I/O options. Front panel provides power on/off switch and USB connectors. USB, RS-232/-422, Ethernet and LCD monitor connections are provided on the rear.

## 19" LCD Touch Screen Display

Rack mountable for installation into existing 19" rack cabinet or extruder panel.



## 17" LCD Touch Screen Display

Self contained for table top or for mounting to a free standing post, surface mount or LCD mounting arm.

Options:
- Mounting post
- Wall mounting bracket, 228 mm (9 in.) extension
- Wall mounting arm, 600 mm (24 in.)

## Perfect Matching – For Each Application the Optimal Solution

With Zumbach's concept of modular extension modules, the customer invests only in what he really needs to match the required measurement and control challenges, and thus reaching quality requirements.

For each application the optimal equipment!

| JACKETMASTER | CELLMASTER | WALLMASTER | BARMASTER | ODEXMASTER | RAYEXMASTER |
|---|---|---|---|---|---|
| Sheathing and core line extrusion | Data communication and coax cables | Wall thickness, concentricity + OD of tubes, pipes, cables | Centreless grinding, bar peeling and cold steel applications | OD + concentricity at datacom, building wires, automotive cables | Triple layer power cables, composite tubes and pipes |

# USYS® FAMILY OF INDUSTRIAL PROCESSORS

ZUMBACH has been supplying process monitoring, control and data acquisition systems all over the world for over 55 years. To ensure our success in a worldwide market, we focus our engineering efforts on designing reliable maintenance-free systems. We also place emphasis on backwards compatibility, which enhances the long-term value of initial investments. To facilitate the ease of interfacing our systems, flexibility and configurability, we design our own I/O technology.

We promote the modular approach in our USYS® family of data acquisition, processing and display units to provide custom configurations, ease of support and upgrade capability. Depending on the users needs, the number of measuring gauges to be connected and process control functions, the following USYS® models are available:

USYS® 20

USYS® 20-19"

USYS® 200

USYS® IPC 1e

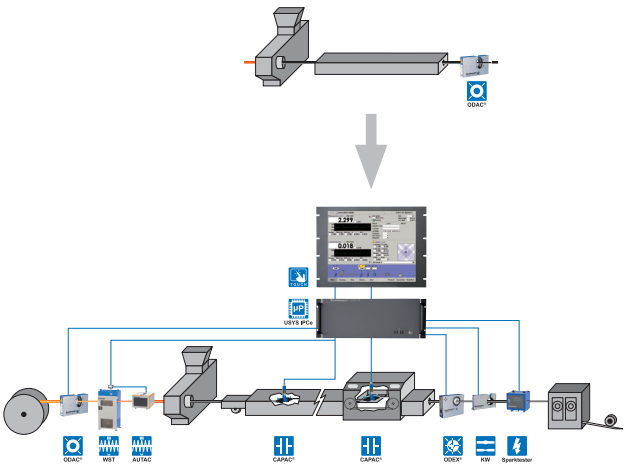
USYS® IPC 2e

## SOLUTIONS WITH MANY DIFFERENT INSTRUMENTS AND MEASUREMENT TECHNOLOGIES

The variety of models offers for each production line and each application the optimum solution in terms of price and performance. Its flexible configuration, with CPU, I/O PCB's and process-specific intelligence from the extensive ZUMBACH software library, provides optimal adaptability to suit the process and production line.

- Depending on the USYS® IPCe model, up to 6 ODAC®/MSD sensors may simultaneously be connected for dimensional measurement.
- Diameter measurement with ODAC®/MSD sensors and/or eccentricity and wall thickness measurement with UMAC® ultrasonic scanners.
- In the JACKETMASTER configurations for core or jacket extrusion, USYS® IPCe processes the diameter values from 1 to 6 ODAC®/MSD sensors. Furthermore, a combined inductive/laser ODEX® instrument can be connected to measure the concentricity/eccentricity and diameter.
- It is also possible to connect KW fault detectors, spark testers and a length detector. All faults can be logged and identified.
- CELLMASTER® applications for foam extrusion allow the connection of up to 4 ODAC®/MSD diameter measuring heads, up to 2 CAPAC® capacitance sensors which can be used together with the diameter measuring heads, the ODEX® system as well as many other sensors.

Solutions for every application!
From the elemental diameter measurement
up to the complex CD control.



### Multifunctional

USYS® IPCe processors manage and monitor quality and production costs by simultaneously carrying out all the following functions (multitasking):

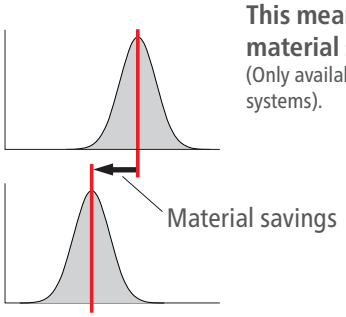
- Continuous measurement and display
- Monitoring of the limit values
- Diameter, wall thickness, concentricity/eccentricity, capacitance control
- Material savings
- Recipe management
- Statistics and data logging, SPC control charts
- Communication with a host computer

## FOR THE HIGHEST LEVEL OF PRODUCTIVITY AND PRECISION

With many standard features and numerous extension modules, ZUMBACH provides solutions to achieve for each application the highest level of productivity and precision.

### Automatic diameter and wall thickness control

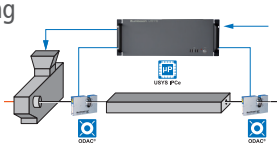
Every USYS® IPCe includes up to one or more SIGMA EXPERT controllers each with Static Regulating Device (SRD) or relay output. The SIGMA EXPERT controllers are self-optimizing. They do not need further parameter optimization and even provide dynamic regulation of the process during start-up. By means of the Cpk Pilot, the nominal value is automatically adjusted to the lower limit given by statistical computations.




**This means important material savings!**
(Only available for JACKETMASTER systems).

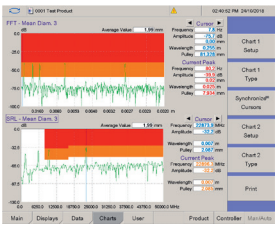
### HOT/COLD Control (Dual Loop)

(Patents: GB 2 145 852 B and others)
As a result of using 2 measuring gauges and a SIGMA EXPERT controller, dynamically optimal control is obtained with respect to the cold value.



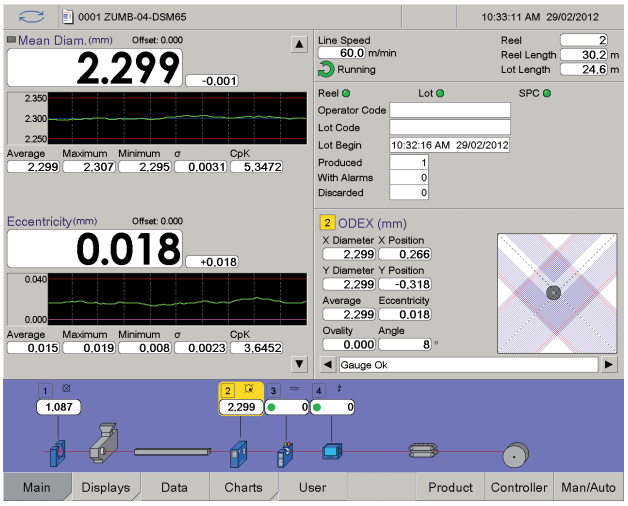
### FFT Analysis / SRL Prediction (option)

USYS® systems visualize the data of the FFT analysis and the structural return loss SRL. With **FFT analysis**, early detection of periodic irregularities resulting from the manufacturing process is possible during the production stage.

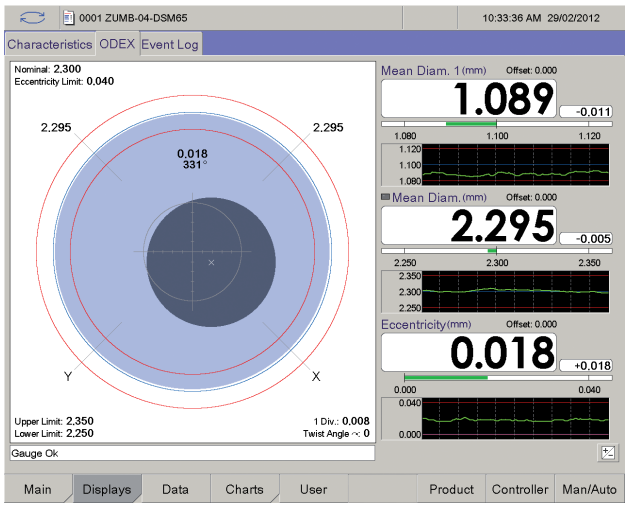


# OPERATION AND DISPLAY

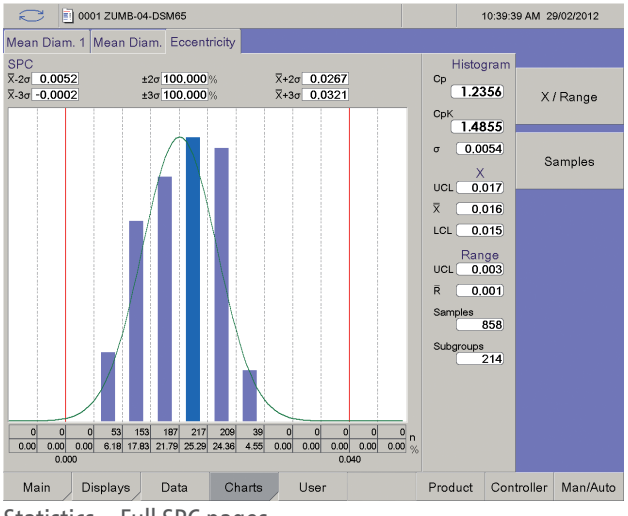
Operation is menu-driven via a separate touch screen with a clearly arranged and easy-to-use user interface for the entry/ selection of the parameters. The measured values are displayed both numerically and graphically. Line layouts with pictograms of the connected devices are user configurable. Time or length-based trending of all values, extensive statistics with min., max., mean value, standard deviation, Cp and Cpk values are, amongst others, standard displays.



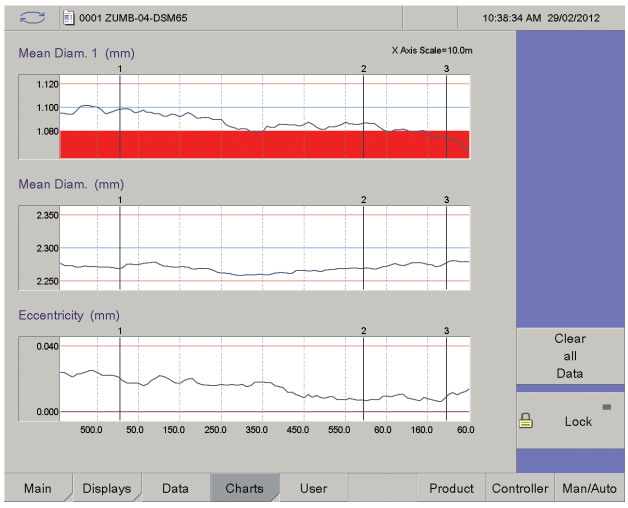

Main display




Concentricity display (with ODEX® system)



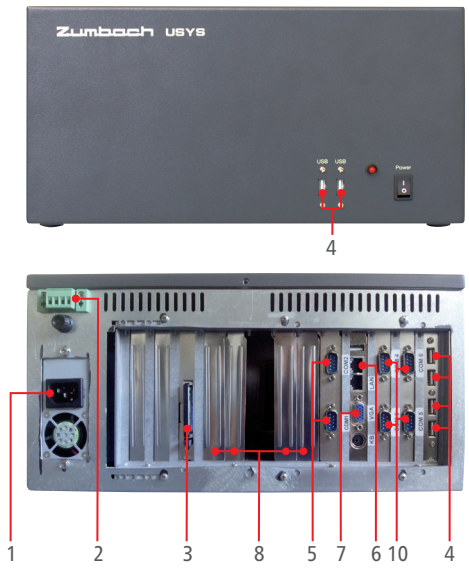

Statistics – Full SPC pages



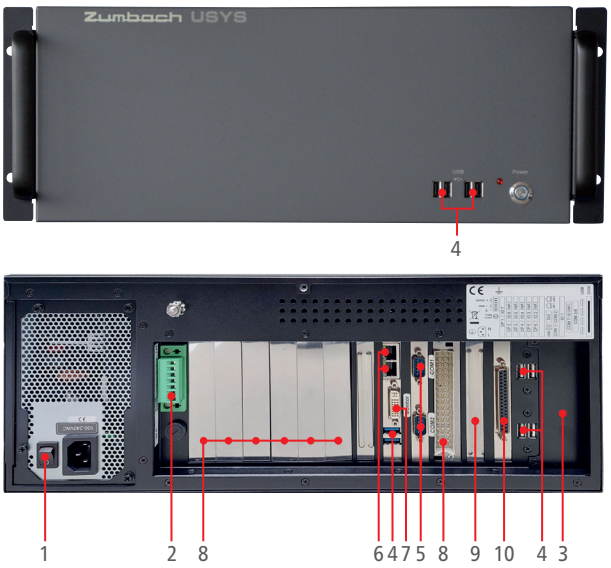

Trend display in numeric and graphical form

## REAR PANEL FEATURES

### USYS® IPC 1e




### USYS® IPC 2e




1 Mains connector with integrated mains filter

2 Output 24 VDC, 0.2 AT

3 Flash disk

4 4 USB ports IPC 1e and 6 USB ports IPC 2e (for touch screen, printer, mouse, keyboard, USB stick)

5 Host computer / PLC. Up- / Download RS-232, label / tag printer.
Reel end summary printed onto self-adhesive labels (contents configurable by user).

6 1 Ethernet port USYS® IPC 1e and 2 Ethernet port USYS® IPC 2e

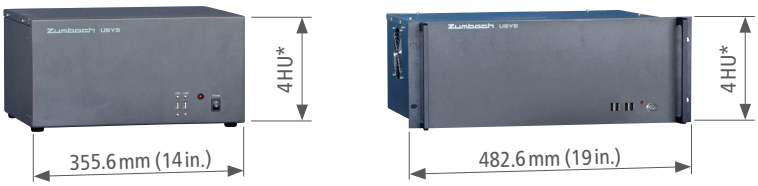
7 Connector for screen USYS® IPC 1e: VGA, USYS® IPC 2e: DVI-I

8 PCIe slots: – 4 at USYS® IPC 1e
– 7 at USYS® IPC 2e
Supporting an array of input/output PCB's needed to interface the system to the "outside world".
Alarm/analog outputs expansion features tolerance pre-alarm, SPC trend alarm or to connect ODAC® or CAPAC®.

9 The multi-port RS-422 expansion board is available for the connection up to 8 RS devices on the USYS® IPC 2e
(4 on the USYS® IPC 1e) (Spark Testers, KW fault detectors, ODEX®, CAPAC®, remote displays). 2 PCIe slots at USYS® IPC 2e.

10 "Multi-Port"-RS-422 is available at the USYS® IPC 1e for the connection of up to 4 RS instruments
(Spark Testers, KW, ODEX®, CAPAC®, remote displays)

## DIMENSIONS / MAIN DATA




| | | USYS® IPC 1e mm | USYS® IPC 1e inch | USYS® IPC 2e mm | USYS® IPC 2e inch |
|---|---|---|---|---|---|
| Width | without 19" housing | 355.6 | 14 | 430 | 16.9 |
| | with 19" housing | – | – | 510 | 20.1 |
| Depth | without 19" housing | 279.4 | 11 | 452.7 | 17.8 |
| | with 19" housing | – | – | 500 | 19.7 |
| Height | without 19" housing | 177 | 7 | 177 | 7 |
| | with 19" housing | – | – | 217 | 8.5 |

* 1 HU = Height Unit = 44.25 mm (1.75 in.)

**Power**
100...240 VAC (auto-select), 47...63 Hz

**Operating temperature**
0...50° C (32...120° F)

**Weight**
– USYS® IPC 1e: approx. 17.2 kg (38 lbs)
– USYS® IPC 2e: approx. 15 kg (33.1 lbs); without 19" housing

CE USYS® IPCe units meet the current CE standards regarding overall performance and EMC (Electro Magnetic Compatibility).

• Technical specifications are subject to change without notice

## COMMUNICATION AND NETWORKING

Today, the ability of sensors or processors to communicate with other computers or networks is essential. ZUMBACH offers a variety of gauges, interface units and USYS® software to satisfy almost any need and concept.

### USYS® Data Log

The USYS® Data Log is a WINDOWS™ based software for easy data collection from one or several ZUMBACH processors and for saving the data in text or Excel™ files. USYS® Data Log communicates to the ZUMBACH processors via a serial RS-232 port or an Ethernet TCP/IP connection.

### USYS® Report Manager

The USYS® processor can store in a local or external memory the detailed statistical data calculated for the Piece, Lot and SPC periods. In this way it is possible to recover and visualize the data of previous productions and reproduce the quality control printed reports.

### USYS® OPC UA Server

Values from a USYS® processor of type USYS® 200, USYS® Touch or USYS® IPCe are available to higher-level customer systems via OPC UA thanks to the OPC UA server integrated in the USYS® software. This also includes the management of data from devices that are connected to the USYS® processor, which thus acts as a gateway between the devices and higher-level customer systems.

### USYS® Web Server

With this software integrated by default, a USYS® processor can be addressed via an Ethernet TCP/IP network (LAN, Intranet, Internet), using a standard browser.

## EMBEDDED SYSTEMS

To complement the hardware design philosophy, we chose the embedded systems design to develop and implement our application software. The embedded systems approach is typically found in industrial real- time control applications, where the reliability of mission critical tasks, such as controlling an extrusion line, is of importance. An embedded system is a special-purpose system in which the computer is completely encapsulated by the device it controls. Unlike a general-purpose computer, such as a personal computer, an embedded system performs predefined tasks, usually with very specific requirements.

| General Purpose System | Versus | Embedded System |
|---|---|---|
| The Windows operating system is preliminarily designed for use in a desktop computer environment. | | The USYS® operating system is designed for use in industrial applications. |
| **Operating system availability is at the mercy of a third party**<br>Application software may or may not run on every version of Windows operating system. This forces customers to upgrade over time or accept incompatible systems. Source code is proprietary and not available. | | **Full control over releases**<br>Zumbach has full control over the software releases, including the operating system. We can supply the exact same software over many years, ensuring that the customer will not have to revisit systems validation with a new purchase. Source code is available. |
| **License issues**<br>Upgrading or replacing hardware will be subject to dealing with operating system license issues.<br>Variation in operating systems depend on country of origin. One can not easily switch systems to a different language. | | **No license issues**<br>No need to deal with license issues when upgrading or replacing systems. International language selections ensure compatibility and support, independent of country of origin. User interface language can be set different from language used on reports. |
| **Substantial danger of catching a virus**<br>A virus can easily be introduced by networking the systems or connecting external storage devices. If networked or data is exchanged, systems need to continuously be updated with the latest virus detection updates. | | **Absolutely no danger of catching a virus**<br>Systems can be networked, data can be transferred with total peace of mind. |
| **Operating system requires substantial hardware resources**<br>A considerable amount of the hardware resources is used up by the operating system. Each new release of the operating system requires hardware upgrades. Requires a hard drive which is subject to failures. | | **Lean and optimized utilization of hardware resources**<br>Software upgrades or operating system upgrades can be installed without the need to upgrade the hardware. Entire operating system, application, systems configuration and product recipe fit on a compact flash card (solid state storage device). |
| **Compatible with Windows™ environment** | | **Compatible with Windows and UNIX environments**<br>All data formats and networking are fully compatible with Windows™ or UNIX based systems. |

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## WORLDWIDE CUSTOMER SERVICE AND SALES OFFICES


*Headquarter:*
Zumbach Electronic AG
P.O. Box
CH-2552 Orpund
SWITZERLAND
Tel.: +41 (0)32 356 04 00
sales@zumbach.ch

BENELUX, sales@zumbach.be
CHINA P.R., sales@zumbach.com.cn
CZECH REPUBLIC, jvorlicek@zumbach.cz
FRANCE, ventes@zumbach.com.fr
GERMANY, verkauf@zumbach.de

INDIA, sales@zumbachindia.com
ITALY, zumit@zumbach.it
SPAIN, gestion@zumbach.es
TAIWAN, info@zumbach.tw
UNITED KINGDOM, sales@zumbach.co.uk

*North American Headquarter:*
Zumbach Electronics Corp.
140 Kisco Avenue
Mount Kisco, NY 10549-1407
Phone +1 914 241 7080
USA
sales@zumbach.com


Close to you, wherever you are

www.zumbach.com



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