In-line & Off-line Dimensional & Quality Control

ODAC® – Laser Diameter & Dimension Measuring Gauges
USYS – Universal Data Acquisition, Processing & Display Systems
Highest accuracy, robustness, reliability and functionality distinguish all the laser measuring heads from ZUMBACH. Known for precision, quality and ease of use the laser measuring heads are among the best of their class. The technological basis considered for these measuring heads is always of the latest cutting edge technology combined with intelligent and powerful measured-value processors which facilitate a simple and flexible integration. Our long-standing experience as a pioneer of in-line measuring technology, combined with high production figures result in a product with an excellent price-performance ratio.

Amongst the outstanding features are features such as single scan calibration (CSS), single scan monitoring and high data rate output of up to 333* data packages per second.

The measuring heads can be used with all line speeds. Vibrations during production have no noticeable influence on measurements.

* Depending on the measuring head model, the number of transmitted measured values as well as the baud rate of transmitted measured values as well as the baud rate.

Flexible communication integration
- RS (-232/-422/-485)
- DP (Profibus DP)
- EN (Ethernet TCP/IP)
- PN (Profinet IO V2.3)
- EI (EtherNet IP)
- J (digital, for connection to USYS processors)
- Local display
- Analog interface

* For 3 Sigma and 1s averaging time
- Available only in ODAC J versions

All dimensions in mm and (inches) resp. (µm) 1µm = 0.001mm
Typical measuring modes

- Diameter
- Position
- Multiple objects
- Penetration
- Large diameters
- Gap
- Length/Width
- Thickness (with pivoting support)

Adaptive signal processing in the measuring units increase accuracy

All the measuring heads of the ODAC® series have adaptive signal processing (patent DE3111356), which makes subsequent regular re-calibrations superfluous. Only in instances of component exchange or compliance to calibration regulations ISO 9000/9001 etc would re-calibration be required.

All the relevant parameters for accuracy are continuously monitored by the measuring system and automatically compensated. This is valid in particular also for possible long-term changes of the behaviour of the scanner motor or the measuring electronics.

MEASURING PRINCIPLE AND TECHNOLOGY

A focused laser beam at a high rate is scanning the object. The time of obscuration is captured with a resolution of 0.00001 mm (.0000004 in.) as a dimension (shadow) and then further processed. Material, colour, temperature etc. of the object has no influence on the measurement.

USYS Processors

- For each application and each budget the optimal model
- Extremely fast and powerful thanks to ZUMBACH hardware and real-time software
- Industrial, easy to operate
- Rugged and stable evaluation and processing system
- Programmes on flash disc (no hard disc)
- Process specific configuration and software packages
- Flexible for extension

A Complete Line of USYS Processors

A complete line of devices for the data processing, display, statistics, process control and networking is available for any specification and budget. All USYS processors are industrial, stable, easy to operate and extendable. They can process multiple ODAC® heads plus other sensors, speed and event inputs.

Fast Real Time

The unique CP XX pre-processors in ODAC® sensors or USYS processors enable, at the same time, fast, accurate and consistent readings thanks to sophisticated filter and computation algorithms. Up to 3000 measurements/s can be processed, depending on the measuring head.

The SIGMA EXPERT Controller

Most USYS processors are available with this self-adapting controller type, which guarantees tighter product tolerances and considerable material savings.
## DATA ACQUISITION, PROCESSING AND DISPLAY SYSTEMS

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### Nomenclature:
- **= Standard**
- **= Option**
- **= Only 1 feature at once**
The list of all possible applications and specific benefits of the various ZUMBACH systems is practically endless. The following represents some of the most typical applications:

Cable industry
- Diameter & ovality measurement / control
- Average wall thickness
- Width / Height
  - Bare wire
  - Cores
  - Bundles
  - Fillers
  - Jackets
  - Sectors
  - Flat cables
  - MV and HV cables
  - Automotive cables
  - Data cables
  - Optical fibres
  - Coatings

Wire Drawing
- Diameter & ovality measurement / control
- Turbo Air Guard for dry lubrication
  - Wet lubrication
  - Dry lubrication
  - Copper wire
  - Steel wire
  - Steel cord
  - Special wires
  - Profile wires

Medical, Food, Cosmetic, Packaging
- Diameter & Ovality
  - Hoses
  - Rods
  - Tubes
  - Blown film diameter
  - Sausage casings

Plastic & rubber extrusion
- Diameter & ovality measurement / control
- Width / Height
- Multi strand
  - Tubing
  - Tubes
  - Hoses
  - Large tubes / pipes
  - Profiles
  - Ribbons
  - Multi strands
  - Blown Film Diameter

Measurement of Insulations or Jackets on Cables
For the extrusion of cores or jackets the USYS IPC WALLMASTER system offers many possibilities thanks to its flexibility and easy handling. All parameters, thickness, eccentricity, diameter and ovality, can be controlled.

- For core insulation
- For jackets, also when loose or non-round
- For co-extrusion
- Automatic calibration with DIACAL system
- Hot / cold compensation

Steel & Metal Industry
- STEELMASTER SMR, SMO or SMS systems
- 1 to 6 measuring axes (ODAC® measuring heads)
  - Hot rolled long products
  - Wire rod, Bar
  - Profiles
  - Tubes / seamless pipe
  - Cold rolled and drawn products
- EPM – "Enhanced Profile Measurement" (patent pending)
  The Measuring Method for Special Product Geometries

Scanning a multitude of shadow edges around the entire periphery captures the product shape. This is achieved with several ODAC® measuring heads, scanning synchronously with high accuracy. Also polygonal faults or other irregular geometries are accurately detected.
**ODAC® / STEELMASTER – SYSTEMS FOR THE STEEL AND METAL INDUSTRY**

**Hot Processes**
For heavy operating conditions in the area of steel and metal industry, in particular for hot rolling, ZUMBACH offers the special STEELMASTER program. 1 up to 6 ODAC® scanners form the heart of the measuring units SMS (static), SMO (oscillating) or SMR (rotating). The STEELMASTER electronics and software process the measuring data for display, process monitoring, statistics and for the data exchange with the customer's network.

**Cold Processes**
For cold processes, including cold rolling, drawing, peeling, grinding and for quality control (NDT) and sorting, ODAC® scanners with respective protection and USYS or STEELMASTER processors are used, depending on the case.

**COMMUNICATION AND NETWORKING**

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

**ODAC® Manager**
User-friendly software kit for easy configuration, calibration and verification using a PC. Versions for serial or ETHERNET communication.
- Minimises set-up time
- Easy access
- Graphic / numeric visualisation at a glance
- Easy, safe to retrieve configuration to/from the PC

**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 talks to the ZUMBACH processors via a serial RS-232 port or an ETHERNET TCP/IP connection.

1™ WINDOWS and Excel are trademarks of Microsoft Corporation

**USYS Web Server**
With this option an USYS processor with an IP address can be addressed over a local area network (LAN, Intranet) via an ETHERNET PCB, using a browser like Internet Explorer or other.

**USYS Report Manager**
The USYS system can store in a local or remote disc the detailed statistics 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.

► Ask for special literature for above applications.

**OPC UA**
Communication protocol for Windows. The OPC UA technology is a standard in the area of process control such as SCADA or HMI. It defines a common interface for accessing data of peripherals. The application “Zumbach OPC Server” provides the measured values and enables editing product recipes. The software operates with Windows 2000, XP, Vista or 7.

* For USYS 200, USYS IPC 1e/2e. (OPC version for USYS 20).

• All technical data are subject to change without notice.

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