Zumbach

SWISS PRIME MEASURING SINCE 1957

3-Axis Laser Measurement.
The Solution for Accurate Diameter and Ovality Measurement.

ODAC® 13TRIO

Diameter Scanner and Flaw Detector in One Unit

ZUMBACH, pioneer of on-line measurement and its triple-axis ODAC TRIO laser diameter gauges belong to the market leaders of super fast diameter measuring devices. 3 synchronized measurement axis in 1 single plane provide comprehensive measurement coverage, peak-precision diameter and ovality measurement as well as precise and super-fast flaw detection capabilities. Such combinations will help to reduce system costs due to the combination of diameter measurement and flaw detection into one single measuring device. Thanks to the compact design, the ODAC® 13TRIO measuring heads can be used in virtually every manufacturing process in the wire and cable industry, the plastics and rubber industry as well as the steel and metal industry. Known for precision, quality and ease of use the laser measuring heads from ZUMBACH are among the best of their class. The technological basis considered for these measuring heads is always of the latest cutting edge technology, with laser diodes as light sources 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 200* data packages per second.

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

Display unit (option):
VISU-Touch or LOC 01

Adaptive signal processing in the measuring units increase accuracy

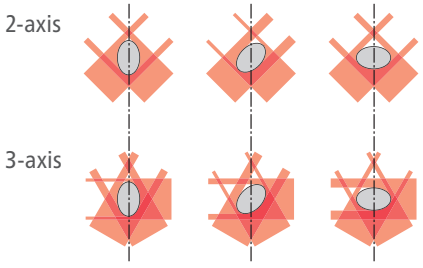
All the measuring heads of the ODAC® series have adaptive signal processing (patent DE3111356), which makes subsequent regular re-calibrations superfluous. Only in instances of component exchange or compliance to calibration regulations ISO 9001 etc. would re-calibration be required. All the relevant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

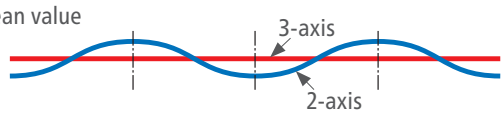
* Depending on the measuring head model, the number of transmitted measured values as well as the baud rate of the interface.

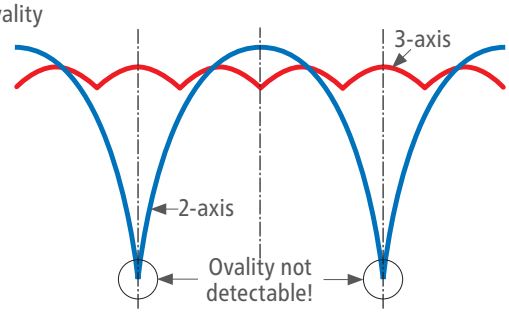
Main Advantages

- 9000 measurements per second (FF version)
- 3 synchronized measurement axes on 1 single plane
- Single scan monitoring – up to 9000 scans/second
- Reliable detection of the ovality
- Detects any deviation from roundness of oval and out-of-round with polygonal shape (multi-lobe)
- Yields highly accurate mean value, regardless of the orientation of the product ovality
- Computes accurate values of circumference and cross section (important for fittings of tubes and hoses)
- Increased measurement accuracy and reliability
- High dirt and dust tolerance

Comparison of 3- and 2-axis measurement:
Orientation of the object

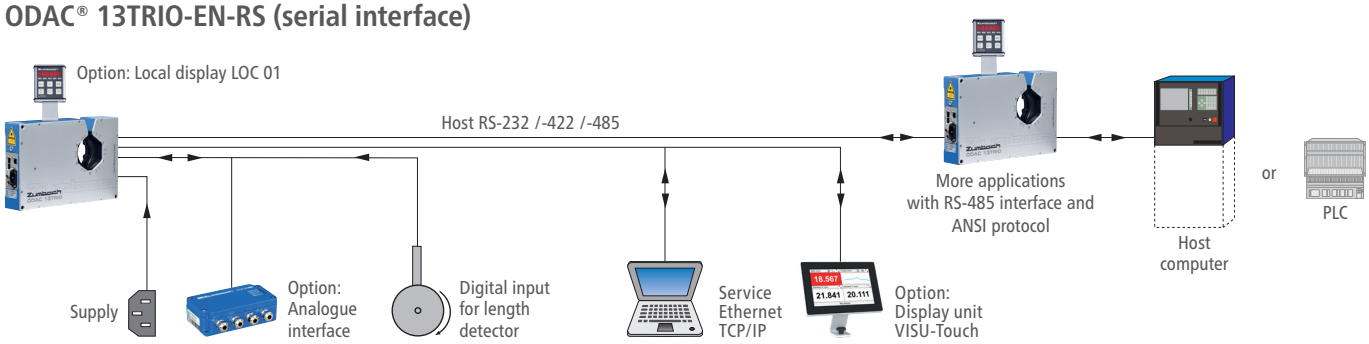






System Overviews

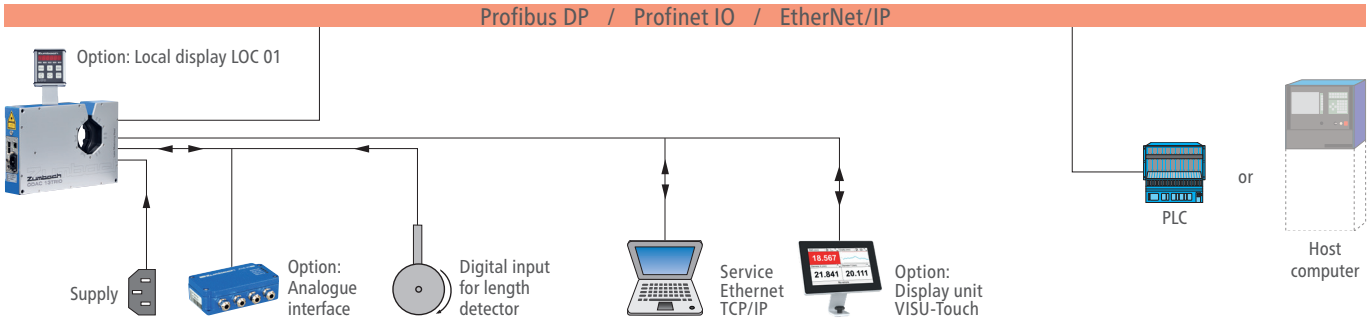
ODAC® 13TRIO-EN-RS (serial interface)



The built-in processor allows the acquisition and monitoring of the measured values, as well as statistic functions, parameter selection and many other functions. The RS version communicates via the integrated RS interface with a higher level system, like USYS from Zumbach, Host computer (or PLC). The Zumbach protocols ODAC or Host are selectable according to choice. The service interface (Ethernet TCP/IP) is used for configuring the measuring system.

ODAC® 13TRIO-EN-DP (Profibus DP), -EN-PN (Profinet IO) or -EN-EI (EtherNet/IP)

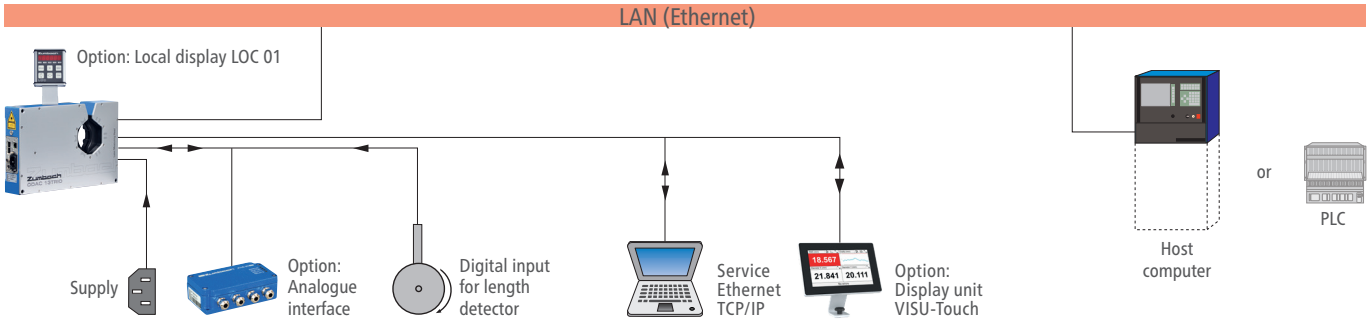
Profibus DP / Profinet IO / EtherNet/IP



The built-in processor allows the acquisition and monitoring of the measured values, as well as statistic functions, parameter selection and many other functions. These versions communicate via the integrated Profibus DP, Profinet IO or EtherNet/IP interface with a higher level system. These interfaces are designed for high speed data transfer at the sensor actuator level. At this level, controllers such as programmable logic controllers (or PLC's) exchange data via a fast serial (Profibus DP) or Ethernet (Profinet IO) connection with their distributed peripherals such as drivers, valves or intelligent slaves like ODAC measuring heads from Zumbach.

ODAC® 13TRIO-EN-EN (Ethernet)

LAN (Ethernet)



The built-in processor allows the acquisition and monitoring of the measured values, as well as statistic functions, parameter selection and many other functions. The EN version communicates via the integrated EN interface with a higher level system. The measured values and parameters are integrated and transferred using a selectable Zumbach protocol (ODAC or Host protocol) in standardized packages of the TCP/IP. TCP/IP allows the data transfer through existing networks such as LANs and others.

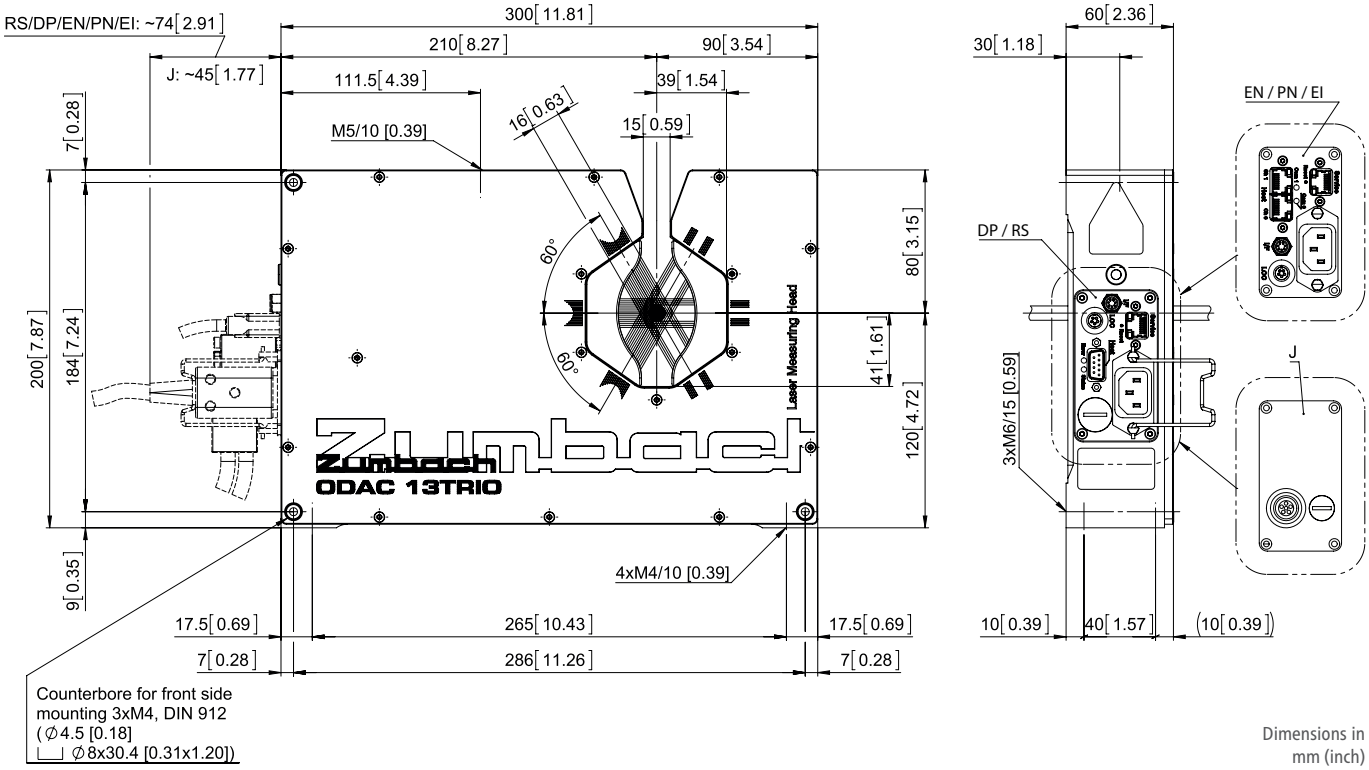
ODAC® 13TRIO-J with the corresponding external ZUMBACH processors

Accessories

Description	Order Number
Floor stand ST2-ODAC 14XY/13TRIO **Floor stand ST2-ODAC 14XY/13TRIO 45°** Vertically adjustable. Line height (H): 900…1200 mm (35.43...47.24 in.)	**ST02.061.14000** **ST02.061.14010**
Mountable support for ST2 Lateral support, including rotary holder (USY.0002.910) for table top version of the USYS 20 processor.	**ST02.060.190**
Swivel floor stand ST6-ODAC 13TRIO 90° Vertically adjustable. Line height (H): 860 … 1150 mm (33.86 … 45.28 in.) Opening angle: 90°	**ST06.138.13000**
Guide VF6-ODAC13 With ceramic guides (V shape) for measured object diameter up to 6 mm (.24 in.).	**ODAC.131.400**
Guide VR6-ODAC13 With steel rollers (V shape) for measured object diameter up to 6 mm (.24 in.).	**ODAC.131.410**
Guide VR1M-ODAC13 With ceramic rollers (V shape) for measuring object diameter < 1 mm (.04 in.). Small objects must be guided through the center of the measuring field.	**ODAC.131.450**
Guide VR15-ODAC13TRIO With steel rollers (V shape) for measured object diameter up to 15 mm (.59 in.).	**ODAC.131.420**
Guide VF15-ODAC13TRIO With ceramic guides (V shape) for measured object diameter up to 15 mm (.59 in.).	**ODAC.131.430**
Air curtain For wire drawing applications and similar. For measuring object diameter from 1 (.04 in.) to 11 mm (.43 in.).	**ODAC.131.940**
Blower unit GE 6 Spare filter cartridge CF4 to FL2 / FL3 / FL4	**GE.601.06000 (230V / 50 Hz / 0.2kW)** **GE.601.06010 (115V / 60 Hz / 0.2kW)** **A15 105 3230**
Maintenance kit for air curtain **Compressed air connection**	**A34 200 0050** **KW.331.140**

Heat protection shield (Back)	**ODAC.131.930**
Set of calibration standards Delivered in a protection box, comprising: – Calibration standard holder – Calibration standard ø 0.5 and 10 mm – Certificate, other calibration standards on request.	**ODAC.9500.32000**
Local display LOC 01 Is mounted directly on the measuring head. Requires connection cable # ODAC.9167.00004 between LOC 01 and the measuring head. Not for ODAC J versions.	**LOC.011.01000**
VISU-Touch The VISU-Touch is a rugged and compact 7" touch screen. This universal PoE (Power over Ethernet) powered touch screen enables display of the integrated web interface of the connected measuring head. It is supplied with a holder for fixing on the measuring head. Not for ODAC J versions.	**VISU.001.01XXX**
Ethernet cable Ethernet network cable cat. 6 S/FTP with RJ45 connectors. (XXX in the order number stands for: x 0.1 m, e.g. A15 608 8025 stands for 25 x 0.1 m and thus a cable that is 2.5 m long). Not for ODAC J versions.	**A15 608 8XXX**
PoE Injector 48 V, 24 W Power over Ethernet supply for devices that do not support PoE or a long Ethernet cable. Not for ODAC J versions.	**N2.7860.1000**
Analogue interface AI4-R Interface with 4 analogue, 5 digital and 2 relay outputs. Direct connection of the digital input (proximity switch). Not for ODAC J versions.	**ODAC.001.100**
Signal cable L2 Bus 1DR22 x 02R For the connection between the Profibus DP interface and the customer's data acquisition system. Only for DP version.	**A13 252 0150**
Connector Counter connector for digital input "I/F". Connection of a proximity switch. It is not required, if the analogue interface is already used. Not for ODAC J versions.	**A10 125 0070**
Proximity switch The proximity switch is used for the length detection. Main data: – Standard: EN 60947-5-6 (NAMUR, NC) – Switching distance max. 2 mm (.08 in.), flush mounting – Ambient temperature: -25...100° C (-13...212° F) – Protection: IP 67, Connection: PVC cable 2 m (6.5 ft.)	**A16 100 0110**

Dimensions



Dimensions in mm (inch)

Technical Data

Model ODAC 13TRIO-	EN-RS	EN-DP	EN-EN	EN-PN	EN-EI	J
Measurement						
Measuring field M [1]	16 x 16 x 16 mm (.63 x .63 x .63 in.)					
Min. object ø	0.06 mm (.0024 in.) (standard and F version); FF version: 0.08 mm (.0032 in.)					
Scanning frequency	3 x 600 scans/s (standard); F version: 3 x 1500 scans/s; FF version: 3 x 3000 scans/s					
Scanning speed	52.6 m/s (172.6 ft./s) (standard); F version: 131.5 m/s (431.4 ft./s); FF version: 263 m/s (862.9 ft./s)					
Width of laser beam [3]	0.4 mm (.016 in.)					
Repeatability (3 σ)	0.12 µm (.0000048 in.) (standard and F version); FF version: 0.30 µm (.000012 in.) *(averaging time 0.1 s)* 0.04 µm (.0000016 in.) (standard and F version); FF version: 0.12 µm (.0000048 in.) *(averaging time 1 s)*					
Measurement error	± 0.5 µm (.00002 in.) ± 0.1 ‰					
Resolution [2]	0.1 µm (.000005 in.)					
Light source [4]	VLD (Visible Laser Diode) 630-680 nm, laser class 2 (device)					
Interfaces / Connections						
Interface Service	Ethernet TCP/IP, RJ45 10/100BaseT, galvanically isolated					Only J interfaces to Zumbach processors: USYS 20, USYS 200, USYS IPC 1e, USYS IPC 2e, CI 1J/EN-RS/-DP/-EN/-PN/-EI
Interface Host	RS-232/-422/-485, D-sub. connectors 9p./m, galvanically isolated	Profibus DP (RS-485), D-sub. connector 9p./f, galvanically isolated	Ethernet TCP/IP, 2 x RJ45 10/100BaseT, galvanically isolated	Profinet IO, 2 x RJ45 10/100BaseT, galvanically isolated	EtherNet/IP, 2 x RJ45 10/100BaseT, galvanic. isolated	
Data rate max. standard	200/s	50/s	200/s	50/s	200/s	
Data rate max. F version	188/s	125/s	188/s	125/s	150/s	
Data rate max. FF version	125/s	125/s	125/s	125/s	100/s	
Interface LOC	Only for Zumbach local display LOC 01					
Interface I/F	Can be used for the connection of a remote interface (e. g. AI4-R) or as digital input for length detector (e.g. proximity switch according to EN 60947-5-6, NAMUR)					
Indicator of contamin. windows	Flashing LED on the measuring head					
LED Service interface	Indicates link and traffic					–
LED Host interface	Indicates traffic	Indicates traffic and error	Indicates link and traffic	Indicates link, traffic, system error and bus error	Indicates link, traffic, module status and network status	–
Energy supply						
Mains voltage	100-240 VAC					Supplied by the processor unit (24 VDC / 8 W)
Operating range	85-265 VAC typically					
Mains frequency	50/60 Hz					
Operating range	47-63 Hz typically					
Power	30 VA					
Operation conditions / Miscellaneous						
Ambient temperature	Operating: 0...45° C (32...113° F), Transport / Storage: -20...50° C (-4...122° F)					
Max. atmospheric humidity	95% (non condensing)					
Altitude	0...3000 m (0...9843 ft.) over sea level					
Type of protection [5]	Case IP 65, connection plate IP 40					
Weight	3.9kg (8.6 lbs)					

• Technical specifications are subject to change without notice

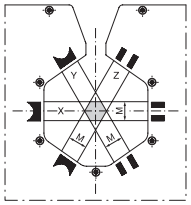
[1] M stands for measuring field height. In practice, the largest object diameter corresponds to Measuring Field Height minus instability of position.

[2] System resolution is the smallest practical value on the last digit of the display.

[3] Measured in the measuring plane, incl. lateral Jitter of the scans.

[4] Maximum power of the laser can be read on the warning label.

[5] Conformity not verified by UL.



Ordering Information

When ordering, please specify the following:

1 Measuring head models: ODAC 13TRIO-EN-RS/-DP/-EN/-PN/-EI, ODAC 13TRIO-J

2 Connection cable

2a The connection between **ODAC 13TRIO-EN-RS** and the higher level system is to be provided by the customer (via serial interface).

2b For the **ODAC 13TRIO-EN-DP** versions, the connection to a higher level system is made with the signal cable # A13 252 0150.

2c For the **ODAC 13TRIO-EN-EN/-PN/-EI** versions, the connection from the measuring head to the customer's Ethernet port, must be provided by the customer.

2d Length of the connection cable between ODAC 13TRIO-J and the processor.
Available lengths: 1, 2, 5, 10, 15, 20, 25 and 30 m (3.3, 6.6, 16.4, 32.8, 49.2, 65.6, 82 and 98.5 ft.); Longer cables on request.

3 Processor model (Data acquisition system), only for ODAC 13TRIO-J: USYS 20, USYS 200, USYS IPC 1e, USYS IPC 2e, CI 1J/EN-RS, CI 1J/EN-DP, CI 1J/EN-EN, CI 1J/EN-PN, CI 1J/EN-EI. Please ask for corresponding data sheets.

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
UK, 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

www.zumbach.com