Zumbach

SWISS PRIME MEASURING SINCE 1957

High Precision, Dual-Axis Measuring Head with 3 or 16 mm (.12 or .64 in.) Measuring Field.

# ODAC® 14XY

Modern two axis measuring head from the ODAC® laser measuring unit series. Highest accuracy, robustness, reliability and functionality distinguish all the laser measuring heads from ZUMBACH. Thanks to the compact design, the ODAC® 14XY 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 125* data packages per second.
The measuring heads can be used with all line speeds. Vibrations during production have no noticeable influence on measurements.

**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.

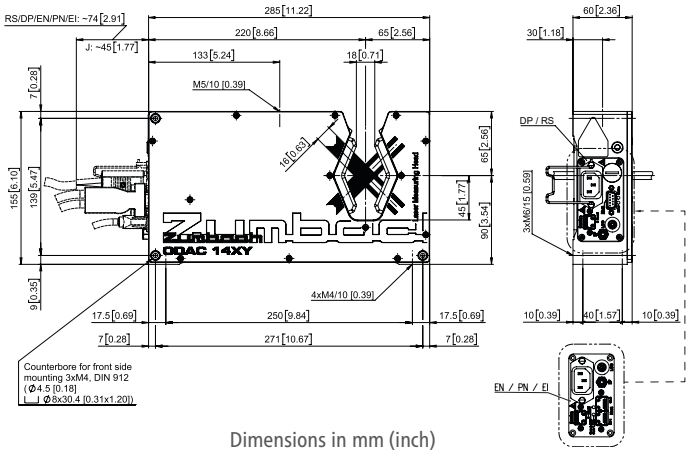
Display unit (option): VISU-Touch or LOC 01

**Specially suited for:**
Fine and extra fine wires, enamelled wires, cables, steel cords, fibres, medical tubing, extruded plastic or rubber products.

Available for 2 measuring ranges:
- Standard version from ø 0.06 mm (.0024 in.)
- Micro version from ø 0.015 mm (.0006 in.)
  Thanks to the use of a blue laser at the micro versions, smallest diameters within the micrometer range can be measured.

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

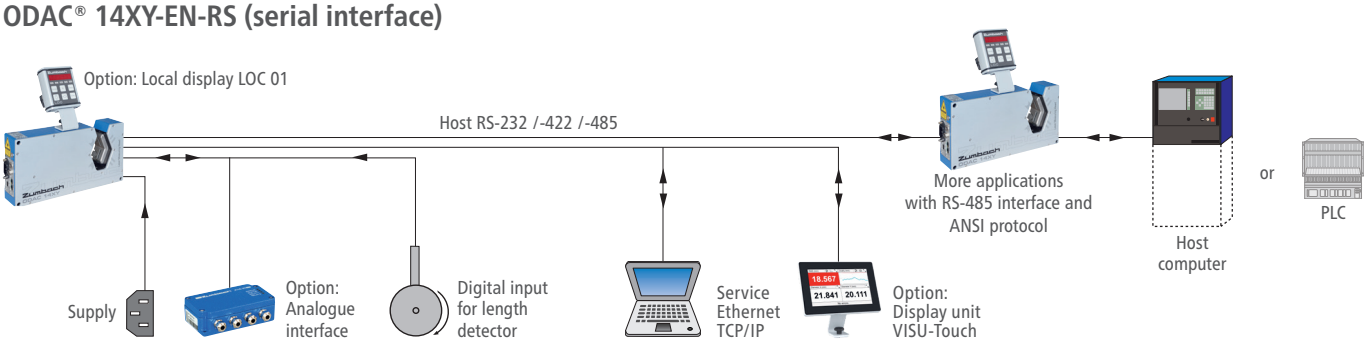
## Dimensions




Dimensions in mm (inch)

# System Overviews

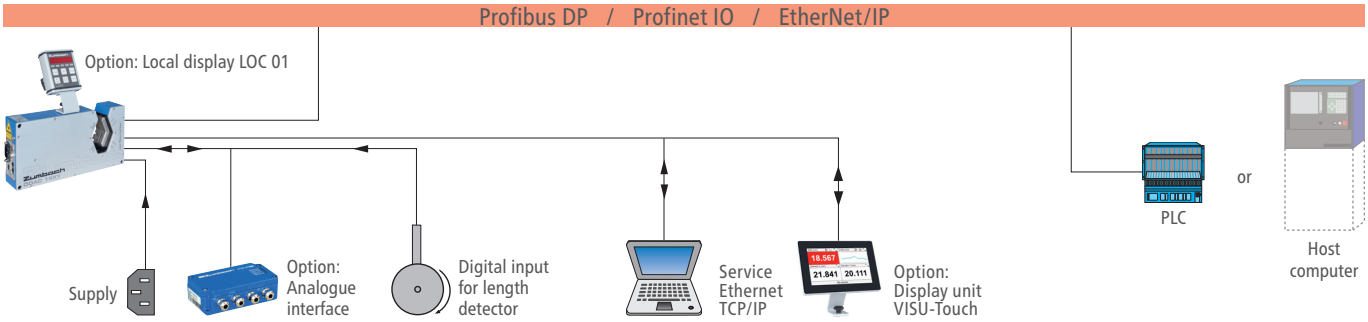
## ODAC® 14XY-EN-RS (serial interface)




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® 14XY-EN-DP (Profibus DP), -EN-PN (Profinet IO) or -EN-EI (EtherNet/IP)

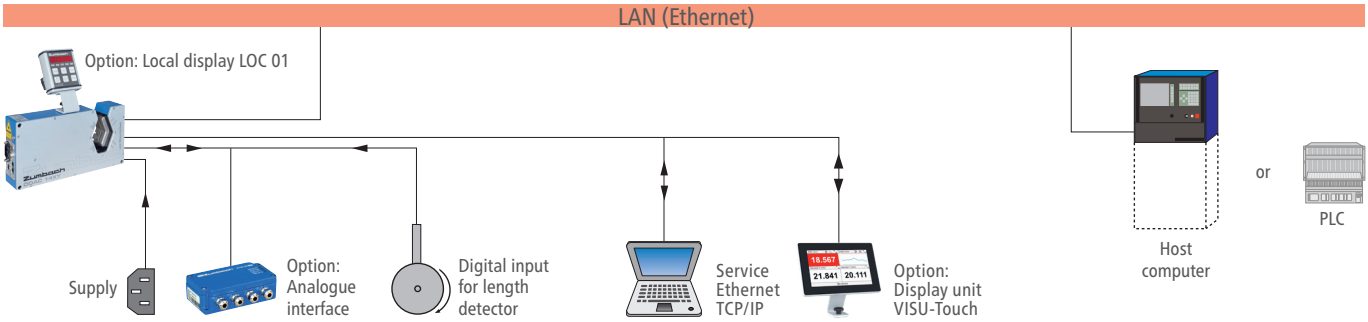
Profibus DP / Profinet IO / EtherNet/IP




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® 14XY-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.

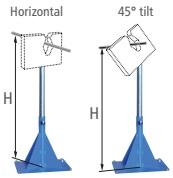
## ODAC® 14XY-J with the corresponding external ZUMBACH processors

# Accessories

**Description** — **Order Number**

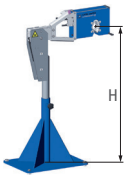
**Floor stand ST2-ODAC 14XY** — **ST02.061.14000**
**Floor stand ST2-ODAC 14XY 45°** — **ST02.061.14010**
Vertically adjustable.
Line height (H): 900...1200 mm, (35.4...47.25 in.)

► Special lateral supports with rotary holder are available for USYS 20 processors (corresponding data sheets are available on request).




**Swivel floor stand ST6-ODAC 14XY** — **ST06.139.14000**
Vertically adjustable.

Line height (H): 860...1150 mm (33.86...45.28 in.)
Opening angle: 90°




**Limiting socket VF15-ODAC15** — **ODAC.151.420**
Used as a device to delimit the measuring field.
It has no guiding function!

**Guide VF6-ODAC15** — **ODAC.151.430**
With ceramic rollers (V shape) for measured object diameter up to 6 mm (.24 in.).

**Guide VR1M-ODAC15** — **ODAC.151.450**
With ceramic rollers (V shape). For measured object diameter smaller than 1 mm (.04 in.). The measured object must be guided precisely through the middle of the measuring field.

**Guide VR10-ODAC15** — **ODAC.151.470**
With steel rollers (V shape) for measured object diameter up to 10 mm (.4 in.).

**Guide DF4-ODAC15** — **ODAC.151.500**
With ceramic guides. Used for the positioning of products such as monofilaments and similar.
For measured object diameter of up to 4 mm (.16 in.).

**Guide FR13B-ODAC18** — **ODAC.181.430**
With flat ceramic rollers. Used for the precise guiding of flat profiles, having a border length of up to max. 13 mm (.51 in.).

**Guide VF16-ODAC18** — **ODAC.181.440**
Continuously adjustable. It is suitable for the centric guidance of products with diameter of up to 16 mm (.63 in.).

**Guide FRG6B-ODAC18** — **ODAC.181.460**
With flat ceramic rollers and counter rollers. Used for the precise guiding of flat profiles, having a border length of up to max. 6 mm (.24 in.).

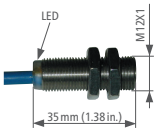
**Guide VR16-ODAC18** — **ODAC.181.470**
Continuously adjustable. It is suitable for the centric guidance of products with diameter of up to 16 mm (.63 in.).

**Guide FR6B-ODAC18** — **ODAC.181.480-06**
With flat ceramic rollers. Best for the guiding of flat profiles, having a border length of up to max. 6 mm (.24 in.).

**Set of calibration standards** — **ODAC.9500.38000**
Delivered in a protection box, comprising:
– Calibration standard holder
– Calibration standard ø 0.5 (.02 in.)
– Calibration standard ø 10 mm (.5 in.)
– Certificate
Other calibration standards on request.

**Set of calibration standard for VR1M guide** — **ODAC.9500.10110**
Delivered in a protection box, comprising:
– Calibration standard ø 0.05 mm (.002 in.)
– Calibration standard ø 1.0 mm (.05 in.)
– Certificate
Other calibration standards on request.

**Proximity switch** — **A16 100 0110**
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.)




**Description** — **Order Number**

**Air curtain LV.D-ODAC 15-18** — **ODAC.151.140**
Pressurized dust guard. Recommended for wire drawing applications.

**Metal bushing with ceramic inserts.**
For the air curtain it's essential to select the corresponding bushing pair:

| Part no. | Bushing Ø | Max. Product Ø: |
|---|---|---|
| B.ODAC.151.1440 | 1.5 mm (.06 in.) | 1.000 mm (.04 in.) |
| B.ODAC.151.1450 | 2.5 mm (.10 in.) | 2.000 mm (.08 in.) |
| B.ODAC.151.1460 | 3.5 mm (.14 in.) | 3.000 mm (.12 in.) |
| B.ODAC.151.1470 | 4.5 mm (.18 in.) | 4.000 mm (.16 in.) |
| B.ODAC.151.1480 | 5.5 mm (.22 in.) | 5.000 mm (.20 in.) |
| B.ODAC.151.1500 | 6.5 mm (.26 in.) | 5.500 mm (.22 in.) |
| B.ODAC.151.1510 | 8.0 mm (.32 in.) | 7.000 mm (.28 in.) |
| B.ODAC.151.1490 | 9.0 mm (.35 in.) | 8.000 mm (.32 in.) |
| B.ODAC.151.1520 | 10.0 mm (.40 in.) | 9.000 mm (.35 in.) |
| B.ODAC.151.1530 | 11.0 mm (.43 in.) | 10.000 mm (.40 in.) |
| B.ODAC.151.1540 | 12.0 mm (.47 in.) | 11.000 mm (.43 in.) |

► Suitable maintenance kit see below.

**Hose assembly for air curtain** — **ODAC.151.120**
Compressed air hose assembly with connection nipples for the air supply of the standard mounted air curtains/splash guards.

**Maintenance kit** — **A34 200 0080**
Cleans and keeps the compressed air free of dirt.
Features: Filter regulators, submicrofilter, manometer, pressure difference display, automatic condensate emptying and wall fixture.

**Air curtain LV.G-ODAC 15 ODAC 15/18XY** — **ODAC.151.940**
Protective device for wire drawing application. It is supplied with filtered air by the GE 6 blower unit. The air curtain is supplied with 2.0 m (6.5 ft.) hose and two hose clamps.

**Blower unit GE 6** — **GE.601.060XX**
Order number: GE.601.06000 (230V/50Hz/0.2kW)
Order number: GE.601.06010 (115V/60Hz/0.2kW)
Spare filter cartridge CF4 to FL2/FL3/FL4: Order number: A15 105 3230

**Local display LOC 01** — **LOC.011.01000**
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.

**VISU-Touch** — **VISU.001.01XXX**
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 ODAC measuring head. It is supplied with a holder for fixing on the ODAC measuring head.
Not for ODAC J versions.

**Ethernet cable** — **A15 608 8XXX**
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.

**Analogue interface AI4-R** — **ODAC.001.100**
Interface with 4 analogue, 5 digital and 2 relay outputs.
Direct connection of the digital input (proximity switch).
Not for ODAC J versions.

**Connector** — **A10 125 0070**
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.

**Signal cable L2 Bus 1DR22 x 02R** — **A13 252 0150**
For the connection between the Profibus DP interface and the customer's data acquisition system. Only for DP version.

# Technical Data

| Model ODAC 14XY- | | | | | | |
|---|---|---|---|---|---|---|
| **Version** | **Standard** | | | **Micro** | | |
| Measuring field M [1] | 16 x 16 mm (.64 x .64 in.) | | | 3 x 3 mm (.12 x .12 in.) | | |
| Min. object ø | 0.06 mm (.0024 in.) | | | 0.015 mm (.0006 in.) | | |
| Scanning frequency | 2 x 500 scans/s | | | 2 x 500 scans/s | | |
| Scanning speed | 65.8 m/s (215.9 ft./s) | | | 65.8 m/s (215.9 ft./s) | | |
| Width of laser beam [3] | 0.5 mm (.02 in.) | | | 0.5 mm (.02 in.) | | |
| Repeatability (3 σ) | 0.16 µm (.0000062 in.) (Averaging time 0.1 s)<br>0.07 µm (.0000027 in.) (Averaging time 1s) | | | | | |
| Measurement error | ± 0.8 µm (.000032 in.) ± 0.15‰ | | | ± 0.3 µm (.000012 in.) range up to 0.5 mm (.02 in.)<br>± 0.8 µm (.000032 in.) range up to 3 mm (.12 in.) | | |
| Resolution [2] | 0.1 µm (.000005 in.) | | | | | |
| Light source [4] | VLD (Visible Laser Diode) 650 nm, laser class 2 (device) | | | VLD (Visible Laser Diode) 405 nm, laser class 2 (device) | | |

| Interfaces / Connections | | | | | | |
|---|---|---|---|---|---|---|
| **Models** | **ODAC 14XY-EN-RSx** | **ODAC 14XY-EN-DPx** | **ODAC 14XY-EN-ENx** | **ODAC 14XY-EN-PNx** | **ODAC 14XY-EN-EIx** | **ODAC 14XY-J/J-M** |
| Interface Service | Ethernet TCP/IP, RJ45 10/100BaseT, PoE (PSE), 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, galvan. 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, galvanically isolated | |
| Data rate max. standard | 125/s | 63/s | 125/s | 63/s | 63/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 contaminated 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 / 5 W) |
| Operating range | 85-265 VAC typically | |
| Mains frequency | 50/60 Hz | |
| Operating range | 47-63 Hz typically | |
| Power | 35 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 | 3.1 kg (6.83 lbs) |

• Technical specifications are subject to change without notice

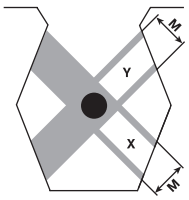
[1] M stands for measuring field height. In practice, the largest object diameter corresponds to Measuring Field Height minus instability of position.

[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.




Standard version

Micro version

# Ordering Information

**When ordering, please specify the following:**

**1 Measuring head models: ODAC 14XY-EN-RS/-DP/-EN/-PN/-EI (-M), ODAC 14XY-J/J-M**

**2 Connection cable**

**2a** The connection between **ODAC 14XY-EN-RS** and the higher level system is to be provided by the customer (via serial interface).

**2b** For the **ODAC 14XY-EN-DP** versions, the connection to a higher level system is made with the signal cable # A13 252 0150.

**2c** For the **ODAC 14XY-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 14XY-J/J-M** 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 14XY-J/J-M**: 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.

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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
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


Close to you wherever you are

www.zumbach.com