Modern single axis measuring head from the ODAC® laser measuring unit series. Highest accuracy, robustness, reliability and functionality distinguish all the laser heads from ZUMBACH. The ODAC® 160 is manufactured with a modular design. It is available with a support rail or as individual emitter and receiver parts when a maximum of flexibility is required to install the head in any position. The measuring head can also be installed in constricted confines or several emitter/receiver pairs can be mounted in the same plane. ODAC® 160 models 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 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 the interface.

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.

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

**ODAC® 160EN-RS (serial interface)**

The built-in processor allows the acquisition and filtering 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, ASCII or the network capable ANSI software protocols are selectable according to choice.

**ODAC® 160EN-DP (Profibus DP) or -EN-PN (Profinet IO)**

The built-in processor allows the acquisition and filtering of the measured values, as well as statistic functions, parameter selection and many other functions. These versions communicate via the integrated Profibus DP or Profinet IO 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® 160EN-EN (Ethernet)**

The built-in processor allows the acquisition and filtering 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 selectable ZUMBACH protocols (ODAC or ASCII) are integrated and transmitted in the well known TCP/IP protocol. TCP/IP allows the data transfer through existing networks such as LANs and others.

**ODAC® 160-Jxx with the corresponding external ZUMBACH processors**

- WIREMASTER
- USYS 20
- USYS 200
- USYS IPC 1e
- USYS IPC 2e
**Accessories**

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor stand ST2-ODAC 160.DT125</td>
<td>ST02.200.30000</td>
</tr>
<tr>
<td>Vertically adjustable.</td>
<td></td>
</tr>
<tr>
<td>Line height (H): 900...1200 mm (35.4...47.25 in.)</td>
<td></td>
</tr>
<tr>
<td>Floor stand ST2-ODAC 160.DT125 90°</td>
<td>ST02.200.30010</td>
</tr>
<tr>
<td>Vertically adjustable.</td>
<td></td>
</tr>
<tr>
<td>Line height (H): 900...1200 mm (35.4...47.25 in.)</td>
<td></td>
</tr>
<tr>
<td>Floor stand ST1-ODAC 160XY</td>
<td>ST01.194.48600</td>
</tr>
<tr>
<td>Vertically adjustable.</td>
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</tr>
<tr>
<td>Line height (H): 900...1100 mm (35.4...43.3 in.)</td>
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</tr>
<tr>
<td>Mountable support for ST2</td>
<td>ST02.060.190</td>
</tr>
<tr>
<td>Lateral support, including rotary holder (USY.0002.910) for table top version of the USYS 20 processor.</td>
<td></td>
</tr>
<tr>
<td>Rotary holder USYS 20</td>
<td>USY.0002.910</td>
</tr>
<tr>
<td>Fixation set for wall mounting (with pivot arm)</td>
<td>USY.0002.920</td>
</tr>
<tr>
<td>Fixation set for table top</td>
<td>USY.0002.930</td>
</tr>
<tr>
<td>Set of calibration standards</td>
<td>ODAC.9501.49000</td>
</tr>
<tr>
<td>Delivered in a protection box, comprising:</td>
<td></td>
</tr>
<tr>
<td>– Calibration standard holder</td>
<td></td>
</tr>
<tr>
<td>– Calibration standard ø 2 and 100 mm (.8 and 3.94 in.)</td>
<td></td>
</tr>
<tr>
<td>– Certificate</td>
<td></td>
</tr>
<tr>
<td>Other calibration standards on request.</td>
<td></td>
</tr>
</tbody>
</table>

**Limiting socket VF160-ODAC160** | ODAC.1601.400 |

**Air curtain LV.G-ODAC 160** (only for single axis heads) | ODAC.1601.920 |

**Blower unit GE 7, 0.55kW** | GE.701.07000 |

**Deviaton unit ODAC 160-90°** | ODAC.1601.940 |

**Local display LOC 01** | LOC.011.01000 |
| Is mounted directly on the measuring head. Requires connection cable # ODAC.9167.00005 between LOC 01 and the measuring head. 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 ODAC DP version. | |

**Analogue interface AI 4-ODAC** | ODAC.000.100 |
| Interface with 4 analogue and 5 digital 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 AI 4-ODAC is already used. Not for ODAC J versions. | |

**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.) | |

**Limiting socket VF160-ODAC160** | ODAC.1601.400 |

**Air curtain LV.G-ODAC 160** (only for single axis heads) | ODAC.1601.920 |

**Blower unit GE 7, 0.55kW** | GE.701.07000 |

**Deviaton unit ODAC 160-90°** | ODAC.1601.940 |

**Local display LOC 01** | LOC.011.01000 |
| Is mounted directly on the measuring head. Requires connection cable # ODAC.9167.00005 between LOC 01 and the measuring head. 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 ODAC DP version. | |

**Analogue interface AI 4-ODAC** | ODAC.000.100 |
| Interface with 4 analogue and 5 digital 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 AI 4-ODAC is already used. Not for ODAC J versions. | |

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| – Protection: IP 67 | |
| – Connection: PVC cable 2 m (6.5 ft.) | |

**Dimensions**

**Model** | **A** | **B** | **C** | **D** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ODAC 160xx.DT125</td>
<td>730</td>
<td>250</td>
<td>625</td>
<td>125</td>
</tr>
<tr>
<td>ODAC 160xx.DT250</td>
<td>980</td>
<td>500</td>
<td>875</td>
<td>250</td>
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<tr>
<td>ODAC 160xx.DT375</td>
<td>1230</td>
<td>750</td>
<td>1125</td>
<td>375</td>
</tr>
<tr>
<td>ODAC 160xx.DT500</td>
<td>1480</td>
<td>1000</td>
<td>1375</td>
<td>500</td>
</tr>
</tbody>
</table>

xx = Version J or JS or RS/DP, -EN, -PN, -EI

* Measuring distance

**View A**

Dimensions in mm (inch)
### Technical Data

#### Measurement

<table>
<thead>
<tr>
<th>Model(s)</th>
<th>ODAC 160I</th>
<th>ODAC 160EN-xx</th>
<th>ODAC 160IP</th>
<th>ODAC 160EN-xxP</th>
<th>ODAC 160IN</th>
<th>ODAC 160EN-xN</th>
<th>ODAC 160IC</th>
<th>ODAC 160EN-xNC</th>
<th>ODAC 160ISx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version</td>
<td>Standard</td>
<td>Profile measurement</td>
<td>&quot;Narrow Beam&quot;</td>
<td>Measurement with CV tube</td>
<td>Same with synchronization input</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Measuring field M

- 160 mm (6.3 in)
- 160 mm (6.3 in)
- 150 mm (5.9 in)

#### Min. object ø

- 0.5 mm (.02 in)
- 1.5 mm (.06 in)
- 0.5 mm (.02 in)
- 0.5 mm (.02 in)

#### Scanning frequency (scans/option)

- Standard: 1000
- Option: 1000
- F version: 500
- F version: 2000
- F version: 2000

#### Scanning speed

- 328 m/s (10,837 ft/s); F version: 656 m/s (2,152 ft/s)

#### Width of laser beam

- 5 mm (0.2 in)
- 5 mm (0.2 in)
- 5 mm (0.2 in)

#### Repeatability (3 δ) at measuring distance D and averaging time (s)

<table>
<thead>
<tr>
<th>Model(s)</th>
<th>125 mm (4.92 in)</th>
<th>250 mm (9.84 in)</th>
<th>375 mm (14.76 in)</th>
<th>500 mm (19.69 in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeatability</td>
<td>0.8 µm (0.1 s)</td>
<td>1.0 µm (0.1 s)</td>
<td>1.2 µm (0.1 s)</td>
<td>1.4 µm (0.1 s)</td>
</tr>
<tr>
<td></td>
<td>(0.000032 in)</td>
<td>(0.000039 in)</td>
<td>(0.000048 in)</td>
<td>(0.000056 in)</td>
</tr>
</tbody>
</table>

#### Centric measurement error at measuring distance D

- 125 mm (4.92 in): ± 3 µm (0.00012 in)
- 250 mm (9.84 in): ± 4 µm (0.00016 in)
- 375 mm (14.76 in): ± 5 µm (0.00020 in)
- 500 mm (19.69 in): ± 6 µm (0.00024 in)

#### Measurement error within the measuring zone

2 x value of the centric measurement error (ODAC 160xx: 4 x value of the centric measurement error)

#### Measuring zone (width x height)

- 80 x 152 mm (3.15 x 6 in)
- 160 x 152 mm (6.3 x 6 in)
- 80 x 152 mm (3.15 x 6 in)
- 40 x 145 mm (1.57 x 5.7 in)

#### Resolution

- 0.1 µm (0.00005 in)

#### Connection cable

- Only for Zumbach local display LOC 01

#### LED Host interface

- Indicates link and traffic

#### Indicator of contaminated windows

- Flashing LED on the measuring head (relay output 48 V / 0.5 A as option)

#### Power supply

- 90...265 VAC, 48...62 Hz, 20 VA supplied by the processor unit (24 V)

#### Operation conditions / Miscellaneous

- Ambient temperature: 0...45°C (32...113°F)
- Max. atmospheric humidity: 95% (non condensing)
- Altitude: 0...2500 m (0...8200 ft.) over sea level
- Type of protection: Case IP 65, connection plate IP 40
- Weight: 5.9 kg (13 lbs.), Rail (DT125): 3.7 lbs., Rail (DT300): 7 lbs.

---

1. M stands for measuring field height. In practice, the largest object diameter corresponds to Measuring Field Height minus instability of position.
2. Valid for object diameter bigger than “Min. object ø” and smaller than 95% from “measuring field M”. The centre of the object is at the “measuring distance D” as well as in the middle of the “measuring field M”.
3. The measured borders of the object must be within this measuring zone. The centre of this measuring zone is at the “measuring distance D” as well as in the middle of the “measuring field M”.
4. System resolution is the smallest practical value on the last digit of the display (adjustable).
5. Maximum power of the laser can be read on the warning label.
6. Measured in the measuring plane, including lateral jitter of the scans.
7. The xx versions (Narrow beam) is recommended in case of products with very uneven surfaces, or products where the connection between ODAC.007.0160.EN and the processor.
8. Specifications are subject to change without notice.

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Ordering Information

When ordering, please specify the following:

1. Model(s): ODAC 160Jx, Jxx, JxxK, Jxx(EN-RS/-DP/-EN/-PN), Exxx, ExxxP (Without rail) specify the measuring distance D (see page 3), (Fast, with higher scan frequency)
2. 2a The connection between ODAC 160EN-xx and the higher level system is to be provided by the customer (via serial interface).
2b For ODAC 160EN-PFx, the connection to a higher level system is made with the signal cable # A13 252 0150.
2c For the ODAC 160EN-EN/-PN version, the connection from the measuring head to the customer’s Ethernet port can be made with a standard RJ45 Patch cable.
2d Length of the connection cable between ODAC 160Jx and the processor.

---

1. M stands for measuring field height. In practice, the largest object diameter corresponds to Measuring Field Height minus instability of position.
2. Valid for object diameter bigger than “Min. object ø” and smaller than 95% from “measuring field M”. The centre of the object is at the “measuring distance D” as well as in the middle of the “measuring field M”.
3. The measured borders of the object must be within this measuring zone. The centre of this measuring zone is at the “measuring distance D” as well as in the middle of the “measuring field M”.
4. System resolution is the smallest practical value on the last digit of the display (adjustable).
5. Maximum power of the laser can be read on the warning label.
6. Measured in the measuring plane, including lateral jitter of the scans.
7. The xx versions (Narrow beam) is recommended in case of products with very uneven surfaces, for the contour measurement and detection of surface defects, such as lumps and neckdowns.
8. Comprises inter alia: 2 ODAC 160ENxK, 1 syncro box CI 23/1; Scanning frequency: 2 x 100/s

All units, which are equipped with lasers, were designed to meet the regulations CDRH (USA), BS 4803, EN 60825-1, DIN VDE 0837. They hold the warning and explanatory labels prescribed by EN 60825-1.