

ODAC® 310

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® 310 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® 310 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 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)
- DP (Profibus DP)
- EN (Ethernet TCP/IP)
- PN (Profinet IO V2.3)
- EI (EtherNet/IP)
- J (digital, for connection to USYS processors)



Main Advantages

- Very high scan rate (measuring frequency)
Standard: 1000/s, Version F: 2000/s
- High precision measurement
- High insensitivity to dirt and dust

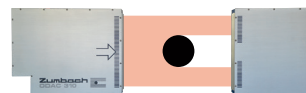
Flexible mounting

With or without rail, different measuring distances



Types of measurement

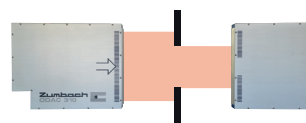
1 Diameter



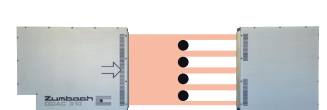
4 Height



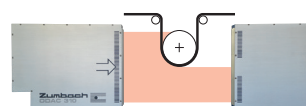
2 Slit width



5 Multiple products



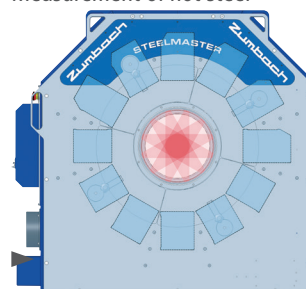
3 Penetration depth



Other types of measurement on request

Special Applications

Measurement of hot steel

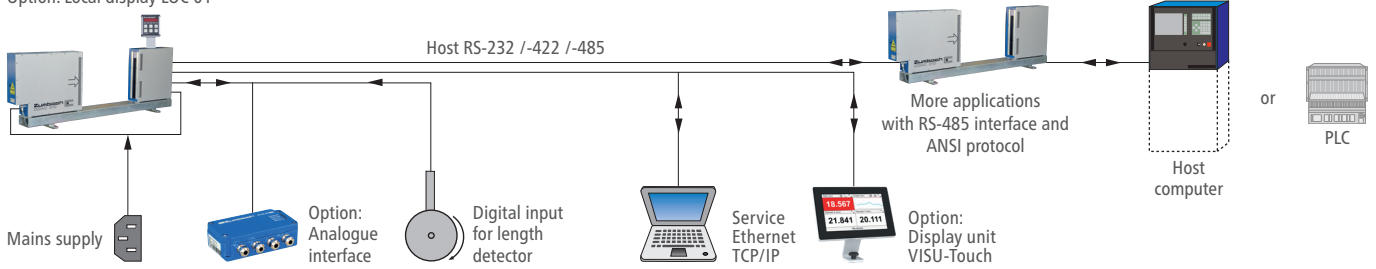


► Ask for special data sheets on STEELMASTER hot steel systems

System Overviews

ODAC® 310EN-RS (serial interface)

Option: Local display LOC 01

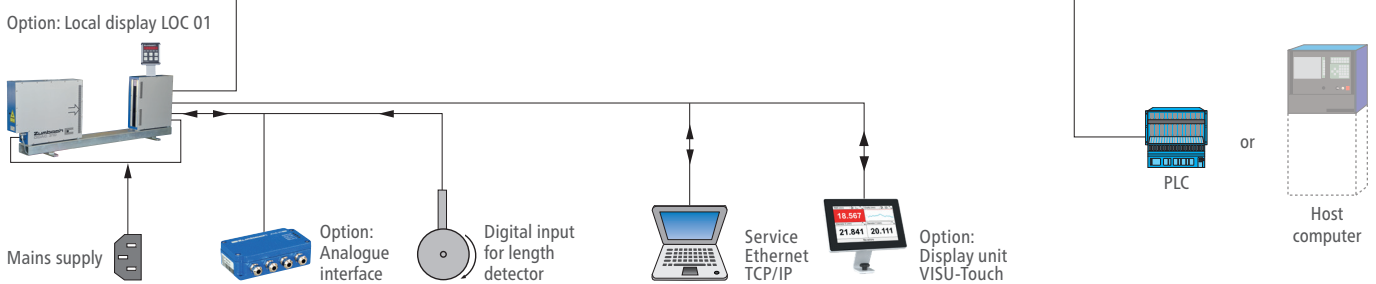


The built-in processor allows the acquisition and filtering of the measured values, as well as statistic functions, parameter selection and many other functions. The RS version communicates via the integrated

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® 310EN-DP (Profibus DP), -EN-PN (Profinet IO) or -EN-EI (EtherNet/IP)

Profibus DP / Profinet IO / EtherNet/IP

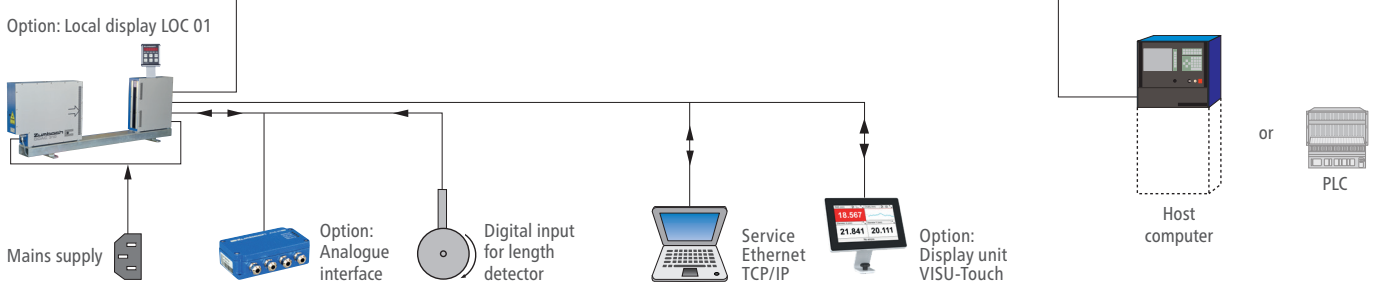


The built-in processor allows the acquisition and filtering of the measured values, as well as statistic functions, parameter selection and many other functions. These versions communicate via the integrated Profibus DP or Profinet IO interface with a higher level system. These interfaces are designed 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® 310EN-EN (Ethernet)

LAN (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® 310Jxx with the corresponding external ZUMBACH processors



Accessories

Description

Order Number

Set of calibration standards

ODAC.9501.72000

Delivered in a protection box, comprising:

- Calibration standard holder
- Calibration standard \varnothing 6 and 200 mm
- Certificate

Other calibration standards on request.



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.



VISU-Touch

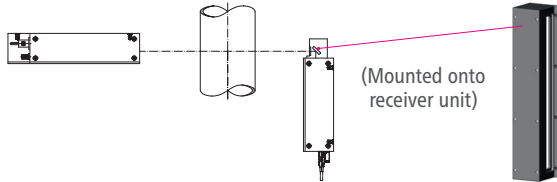
VISU.001.01XXX

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
measuring head. It is supplied with a holder for fixing on
the measuring head. Not for ODAC J versions.



Deviation unit ODAC-310-90° Emitter Deviation unit ODAC-310-90° Receiver

ODAC.3101.940 S
ODAC.3101.940 E



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.

PoE Injector 48 V, 24 W

N2.7860.1000

Power over Ethernet supply for devices that
do not support PoE or a long Ethernet cable.
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.



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.

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.



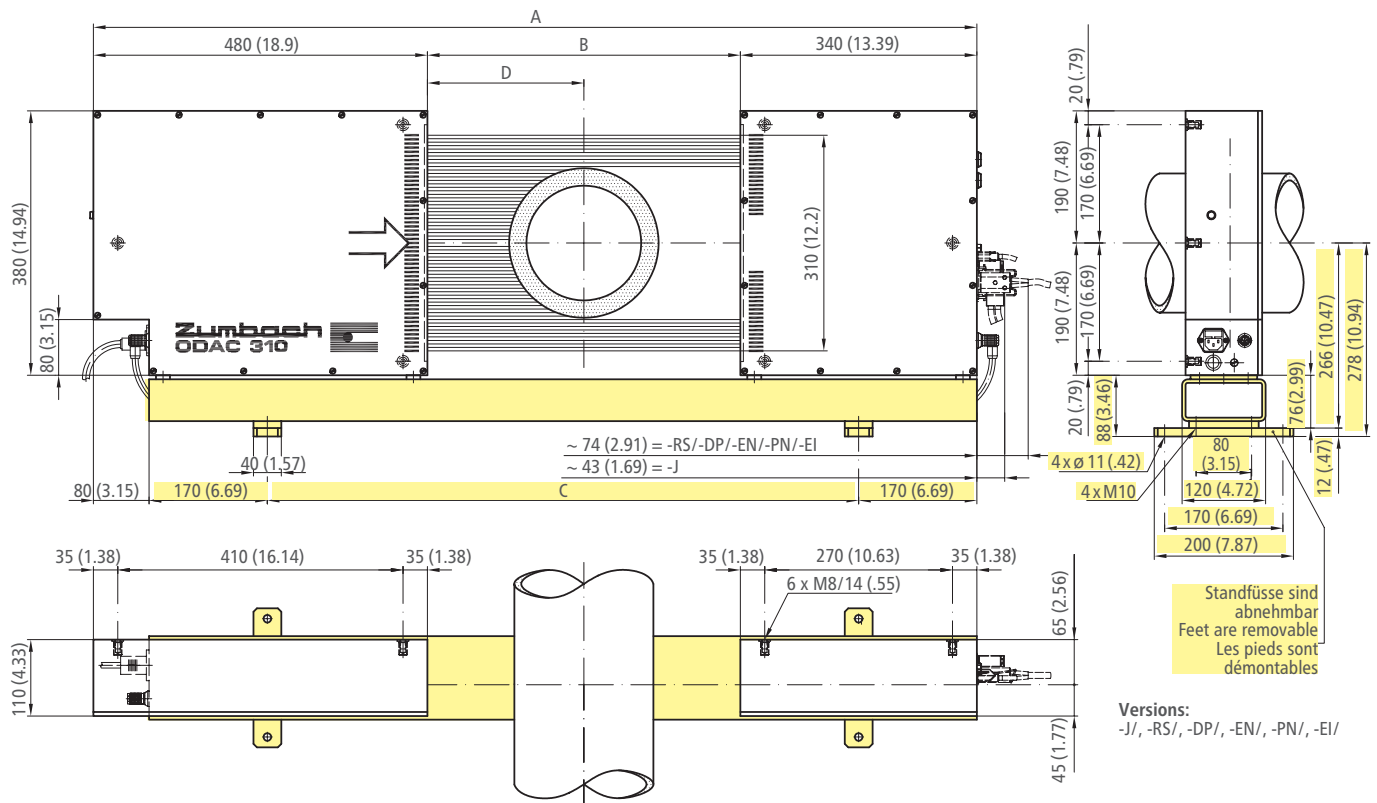
Proximity switch

A16 100 0110

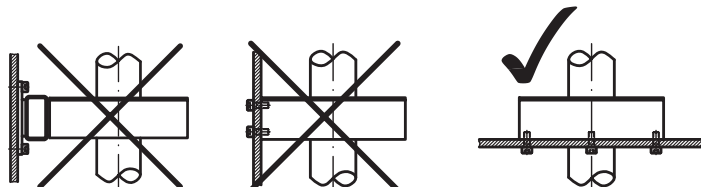
The proximity switch is used for the length detection.
Main data:
- Standard: EN 60947-5-6 (NAMUR, NC)
- Switching distance max. 2 mm (.08 in.), flush mounting
- Ambient temperature: -25...100° C (-13...212° F)
- Protection: IP 67, Connection: PVC cable 2 m (6.5 ft.)



Dimensions



Installation in Vertical Lines



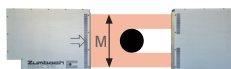
Model	A	B	Models with rail C	D
ODAC.310.DT.250	1320 (51.97)	500 (19.69)	900 (35.43)	250 (9.84)
ODAC.310.DT.500	1820 (71.65)	1000 (39.37)	1400 (55.12)	500 (19.69)
ODAC.310.DT.750	2320 (91.34)	1500 (59.06)	1900 (74.8)	750 (29.53)
ODAC.310.DT.1000	2820 (111.02)	2000 (78.74)	2400 (94.49)	1000 (39.37)

Dimensions in mm (inch)

Technical Data

Model ODAC 310	J EN-xx	JP EN-xxP	JN EN-xxN	JSx		
Measurement						
Version	Standard	Profile measurement	"Narrow Beam" ⁷⁾	Same with synchronization input		
Measuring field M ¹⁾	310 mm (12.2 in.)					
Min. object ø	1 mm (.04 in.)					
Scanning frequency scans/s	standard	1000	500			
	F version	2000	-			
Scanning speed	606 m/s (1988 ft./s); F version: 1212 m/s (3976 ft./s)			606 m/s (1988 ft./s)		
Width of laser beam ⁶⁾	8 mm (0.3 in.)		1.4 mm (.055 in.)	see J/JP/JN		
Repeatability (3 σ) at measuring distance D and averaging time (s)	250 mm (9.84 in.)	2.0 μm (0.1 s) (.00008 in.)	1.0 μm (1 s) (.00004 in.)	3.0 μm (0.1 s) (.00012 in.)	1.5 μm (1 s) (.00006 in.)	
	500 mm (19.69 in.)	2.5 μm (0.1 s) (.0001 in.)	1.2 μm (1 s) (.000048 in.)	3.7 μm (0.1 s) (.000145 in.)	1.8 μm (1 s) (.000071 in.)	
	750 mm (29.53 in.)	3.0 μm (0.1 s) (.00012 in.)	1.5 μm (1 s) (.00006 in.)	4.5 μm (0.1 s) (.00018 in.)	2.2 μm (1 s) (.00087 in.)	
	1000 mm (39.37 in.)	3.5 μm (0.1 s) (.00014 in.)	1.7 μm (1 s) (.000067 in.)	5.0 μm (0.1 s) (.0002 in.)	2.5 μm (1 s) (.0001 in.)	
Measurement error centric at measuring distance D ²⁾	250 mm (9.84 in.)	± 25 μm (.00098 in.)				
	500 mm (19.69 in.)	± 32 μm (.00126 in.)				
	750 mm (29.53 in.)	± 40 μm (.00157 in.)				
	1000 mm (39.37 in.)	± 45 μm (.00177 in.)				
Measurement error within the measuring zone ³⁾	1.25 x value of the measurement error centric (ODAC 310xxP: 1.5 x value of the measurement error centric)					
Measuring zone (width x height)	200 x 300 mm (7.87 x 11.81 in.)	400 x 300 mm (15.75 x 11.81 in.)	200 x 300 mm (7.87 x 11.81 in.)	see J/JP/JN		
Resolution ⁴⁾	1 μm (.00005 in.)					
Light source ⁵⁾	HeNe Laser, laser class 2 (device)					
Types of measurement (see page 1)	1, 2, 3, 4, 5			1, 6, 7		
Interfaces / Connections						
Model ODAC 310	EN-RSx	EN-DPx	EN-ENx	EN-PNx	EN-EIx	Jx
Interface Service	Ethernet TCP/IP, RJ45 10/100BaseT, galvanically isolated					Only J interfaces to Zumbach processors:
Interface Host	RS-232/-422/-485, D-sub. connectors	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	USYS 20, USYS 200, USYS IPC 1e, USYS IPC 2e, CI 1J/EN-RS/-DP/-EN/-PN/-EI.
Data rate max. standard	9p./m. galvani. isolated	63/s	333/s	63/s	125/s	200/s
Data rate max. F version	333/s	125/s	333/s	125/s	200/s	63/s
Data rate max. N version	167/s	63/s	167/s	63/s	63/s	63/s
Interface LOC	Only for Zumbach local display LOC 01					JSx interfaces via Synchrobox CI 2/3JS/1J to the processors.
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)					Data rate max. 63/s.
Indicator of contamin. windows	Flashing LED on the measuring head (relay output 30 VAC/VDC, 0.5A as option)					
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 emitter						
Power supply	115/230 VAC switchable					
Tolerance	± 10 %					
Mains frequency	50/60 Hz					
Operating range	47-63 Hz					
Power	40 VA					
Energy supply receiver						
Power supply	100-240 VAC					
Operating range	85-265 VAC typically					
Mains frequency	50/60 Hz					Supplied by the processor unit (24VDC / 5 W)
Operating range	47-63 Hz typically					
Power	20 VA					
Operation conditions / Miscellaneous						
Ambient temperature	Operating: 0...45°C (32...113°F), Transport / Storage: -20...50°C (-4...122°F)					
Max. atmospher. humidity	95% (non condensing)					
Altitude	0...3000 m (0...9843 ft.) over sea level					
Type of protection ⁸⁾	Case IP 65, connection plate IP 40					
Weight	Emitter: 21.5 kg (47.4 lbs.), Receiver: 13.5 kg (29.8 lbs.), Rail short (DT250): 18 kg (39.7 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 xxN 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⁾ Conformity not verified by UL.

Ordering Information

When ordering, please specify the following:

- Models: **ODAC 310Jx, -JSx or ODAC 310EN-RSx, -DPx, -ENx, -PNx, -EIx**
 Versions: Standard, P (Profile measurement), N (Narrow Beam), K (Components, without rail) specify the measuring distance D (see page 3), F (Fast, with higher scan frequency)
- Connection cable
 - The connection between **ODAC 310EN-RS** and the higher level system is to be provided by the customer (via serial interface).
 - For **ODAC 310EN-DP**, the connection to a higher level system is made with the signal cable # A13 252 0150.
 - For the **ODAC 310EN-EN/-PN/-EI** version, the connection from the measuring head to the customer's Ethernet port can be made with a standard RJ45 Patch cable.
 - Length** of the connection cable between **ODAC 310Jx** and the processor. Available lengths: 1, 2, 3, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 m, each 10 m up to 200 m, 220 m, 240 m (3.3, 6.6, 10, 16, 33, 50, 65, 82, 98, 115, 131, 147, 164 ft., each 33 ft. up to 656 ft., 722 ft., 787 ft.). Longer cables on request.
 - For "K" versions (without rail): Length of the connection cable between emitter and receiver. Available lengths: 1.5, 2, 3, 4, 5, 6, 8 m (5, 6.5, 10, 13, 16.4, 19.7, 26.2 ft.). Minimum length = 2 x measuring distance D + 0.9 m (3 ft.). Order no. B.ODAC.821.32xxx.
- Processor model (Data acquisition system), only for **ODAC 310Jx**:
 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.
 ▶ Ask for corresponding data sheets.



• Technical specifications are subject to change without notice

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