Zumbach

SWISS PRIME MEASURING SINCE 1957

Modular Single Axis Laser Measuring Head
for Diameter, Width, Height.
Measuring Field = 230 mm (9.05 in.).

ODAC® 230

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® 230 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® 230 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

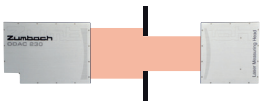
Flexible mounting

With or without rail, different measuring distances

Types of measurement

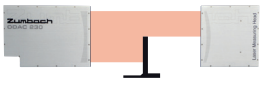
1 Diameter

2 Slit width



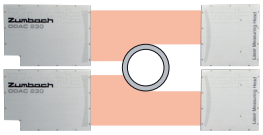
3 Penetration depth

4 Height

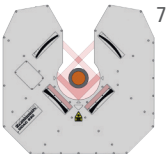


5 Multiple products

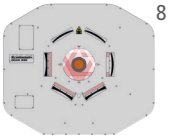
6 Dual scanning with large measuring field (synchronized)



7 Dual scanning XY (synchronized)



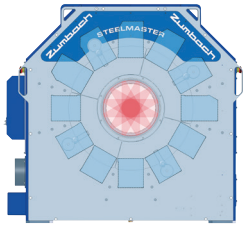
8 Triple scanning TRIO (synchronized)



Other types of measurement on request

Special applications

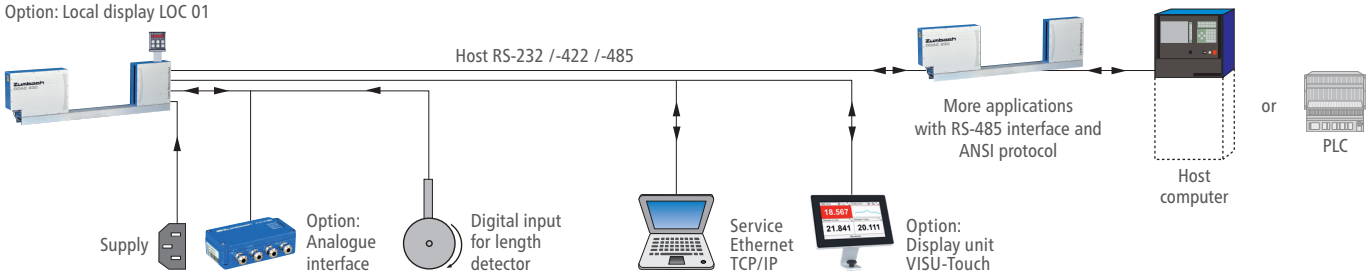
Measurement of hot steel



▶ Ask for special data sheets on STEELMASTER hot steel systems

System Overviews

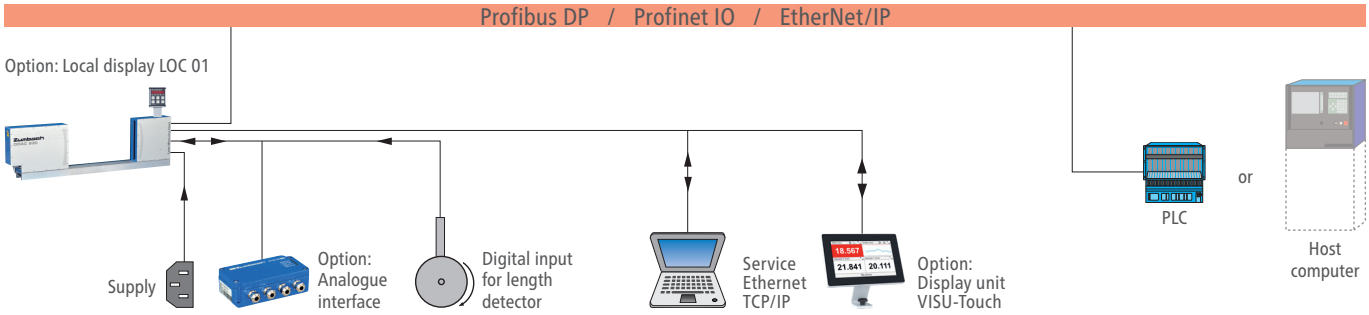
ODAC® 230EN-RS (serial interface)



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® 230EN-DP (Profibus DP), -EN-PN (Profinet IO) or -EN-EI (EtherNet/IP)

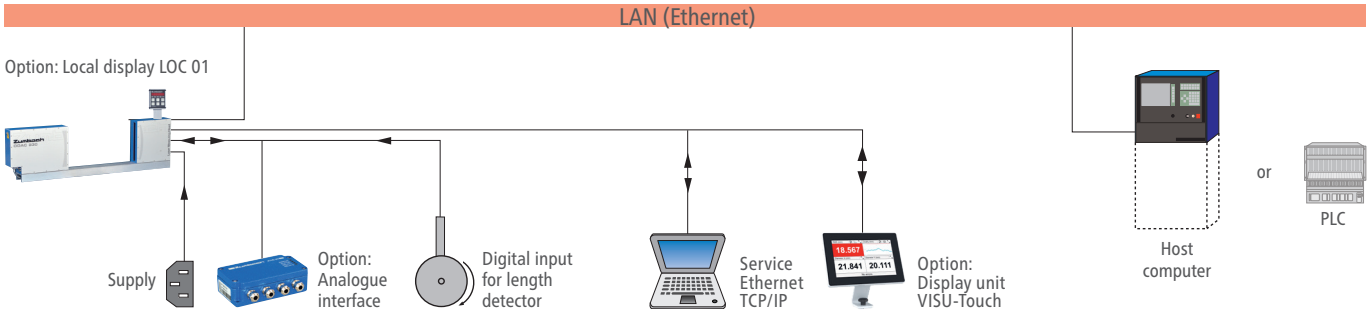
Profibus DP / Profinet IO / EtherNet/IP



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® 230EN-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® 230-Jxx with the corresponding external ZUMBACH processors

Accessories

Description	Order Number
USYS 20 Rotary holder	**USY.0002.910**
USYS 20 Fixation set for wall mounting (with pivot arm)	**USY.0002.920**
USYS 20 Fixation set for table top	**USY.0002.930**

Set of calibration standards ODAC 230 **ODAC.9501.58300**
Set of calib. standards ODAC 230XY / TRIO **ODAC.9501.58400**

Delivered in a protection box, comprising:
- Calibration standard holder
- Calibration standard ø 2 and 140 mm
- Certificate

Local display LOC 01 **LOC.011.01000**

Is mounted directly on the measuring head.
Requires connection cable no. 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.

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**

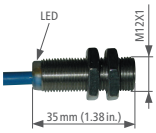
For the connection between the Profibus DP interface and the customer's data acquisition system. Only for DP version.

Connector **A10 125 0070**

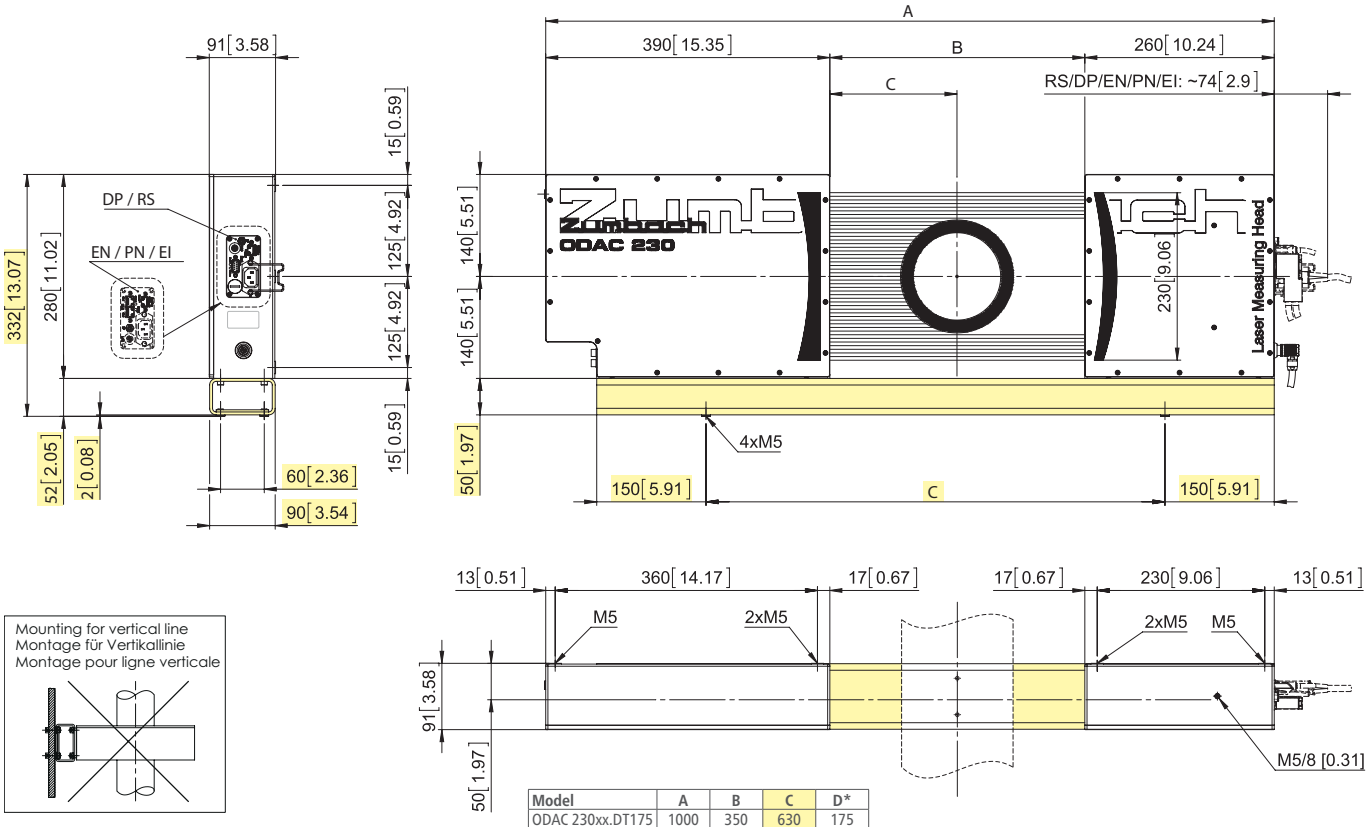
Counter connector for digital input "I/F". Connection of a proximity switch. It is not required, if the analogue interface is already used. Not for ODAC J versions.

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



Model	A	B	C	D*
ODAC 230xx.DT175	1000 (39.37)	350 (13.78)	630 (24.80)	175 (6.89)
ODAC 230xx.DT250	1150 (45.28)	500 (19.69)	780 (30.71)	250 (9.84)
ODAC 230xx.DT375	1400 (55.12)	750 (29.53)	1030 (40.55)	375 (14.76)
ODAC 230xx.DT500	1650 (64.96)	1000 (39.37)	1280 (50.39)	500 (19.69)
xx = Version **J** or **JS** or **EN-RS, -DP, -EN, -PN, -EI**				

* Measuring distance C = Version with rail Dimensions in mm (inch)

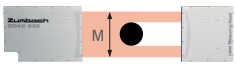
Technical Data

Model ODAC 230		J EN-xx	JP EN-xxP	JN EN-xxN	JSx XY-xx [8] / TRIO-xx [9]
Measurement					
Version		Standard	Profile measurement	"Narrow Beam" [7]	Same with synchronization input
Measuring field M [1]		230 mm (9.05 in.)	230 mm (9.05 in.)	230 mm (9.05 in.)	see J/JP
Min. object ø		0.75 mm (.03 in.)	1.5 mm (.06 in.)	0.75 mm (.03 in.)	see J/JP
Scanning frequency scans/s	standard	1000	1000	1000	500
	F version	2000	–	2000	–
Scanning speed		473 m/s (1552 ft./s); F version: 946 m/s (3104 ft./s)			
Width of laser beam [6]		5 mm (0.2 in.)	5 mm (0.2 in.)	1 mm (0.004 in.)	see J/JP
Repeatability (3 σ) at measuring distance D and averaging time (s)	175 mm (6.89 in.)	1.2 µm (0.1 s) (.000047 in.) 0.6 µm (1 s) (.000024 in.)			1.7 µm (0.1 s) (.000067 in.) 0.8 µm (1 s) (.000033 in.)
	250 mm (9.84 in.)	1.5 µm (0.1 s) (.000059 in.) 0.8 µm (1 s) (.000030 in.)			2.1 µm (0.1 s) (.000084 in.) 1.1 µm (1 s) (.000042 in.)
	375 mm (14.76 in.)	1.8 µm (0.1 s) (.000071 in.) 0.9 µm (1 s) (.000035 in.)			2.5 µm (0.1 s) (.00010 in.) 1.3 µm (1 s) (.000050 in.)
	500 mm (19.68 in.)	2.1 µm (0.1 s) (.000083 in.) 1.1 µm (1 s) (.000041 in.)			3.0 µm (0.1 s) (.000117 in.) 1.5 µm (1 s) (.000058 in.)
Measurement error centric at measuring distance D [2]		175 mm (6.89 in.) ± 5 µm (.00020 in.)			
		250 mm (9.84 in.) ± 6 µm (.00024 in.)			
		375 mm (14.76 in.) ± 7.5 µm (.00030 in.)			
		500 mm (19.68 in.) ± 9 µm (.00036 in.)			
Measurement error within the measuring zone [3]		2 x value of the centric measurement error (ODAC 230xxP: 4 x value of the centric measurement error)			
Measuring zone (width x height)		110 x 218 mm (4.33 x 8.58 in.)	220 x 218 mm (8.66 x 8.58 in.)	110 x 218 mm (4.33 x 8.58 in.)	see J/JP
Resolution [4]		0.1 µm (.000005 in.)			
Light source [5]		VLD (Visible Laser diode) 630-680 nm, laser class 2 (device)			
Types of meas. (see page 1)		1, 2, 3, 4, 5			1, 6, 7

Interfaces / Connections							
Model ODAC 230		**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: USYS 20, USYS 200, USYS IPC 1e, USYS IPC 2e, CI 1J/EN-RS/-DP/-EN/-PN/-EI. JSx interfaces via Synchrobox CI 2/3JS/1J to the ZUMBACH processors. Data rate max. 63/s.
Interface Host		RS-232/-422/-485, D-sub. connectors 9p./m, galvani. 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		333/s	63/s	333/s	63/s	125/s	
Data rate max. F version		333/s	125/s	333/s	125/s	200/s	
Data rate max. C version		167/s	63/s	167/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 contamin. windows		Flashing LED on the measuring head (relay output 30 VAC/VDC, 0.5 A 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							
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		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 [10]	Case IP 65, connection plate IP 40
Weight	Emitter: 12 kg (26.5 lbs.), Receiver: 7 kg (15.4 lbs.), Rail (DT175): 7.3 kg (16.1 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 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**N** 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 230JSxK, 1 synchro box CI 2JS/1J; Scanning frequency: 2 x 500/s. All XY models are also available in the versions: standard, profile measurement and "narrow beam" with the interfaces Jx and EN-xxx.

[9] Comprises inter alia: 3 ODAC 230JSxK, 1 synchro box CI 2JS/1J; Scanning frequency: 3 x 500/s. All TRIO models are also available in the versions: standard, profile measurement and "narrow beam" with the interfaces Jx and EN-xxx.

[10] Conformity not verified by UL.

• Technical specifications are subject to change without notice

Ordering Information

When ordering, please specify the following:

1 Models: **ODAC 230Jx, -JSx or ODAC 230EN-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)

2 **Connection cable**

2a The connection between **ODAC 230EN-RS** and the higher level system is to be provided by the customer (via serial interface).

2b For **ODAC 230EN-DP**, the connection to a higher level system is made with the signal cable # A13 252 0150.

2c For the **ODAC 230EN-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.

2d **Length** of the connection cable between **ODAC 230Jx** 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.

2e For **"K" versions** (without rail): Length of the connection cable between emitter and receiver. Available lengths: 1.16, 1.5, 2, 3, 4, 5, 6, 8 m (3.8, 5, 6.5, 10, 13, 16.4, 19.7, 26.2 ft.). Minimum length = 2 x measuring distance D + 0.65 m (2.13 ft.). Order no. B.ODAC.821.32xxx.

3 **Processor model** (Data acquisition system), only for **ODAC 230Jx**:
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.

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