

# ODAC® 100

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® 100 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® 100 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.

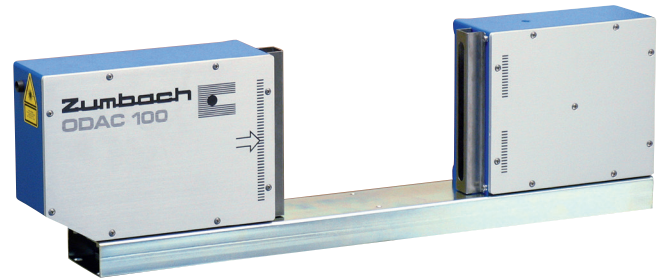
### Adaptive signal processing in the measuring units increase accuracy

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



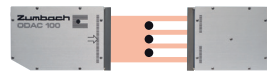
#### 3 Penetration depth



#### 4 Height



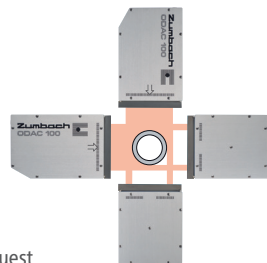
#### 5 Multiple products



#### 6 Dual scanning with large measuring field (synchronized)



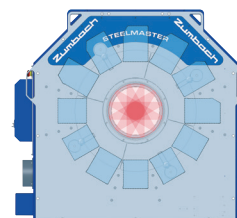
#### 7 Dual scanning XY (synchronized)



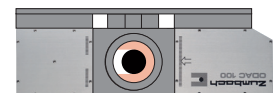
Other types of measurement on request

### Special applications

Measurement of hot steel



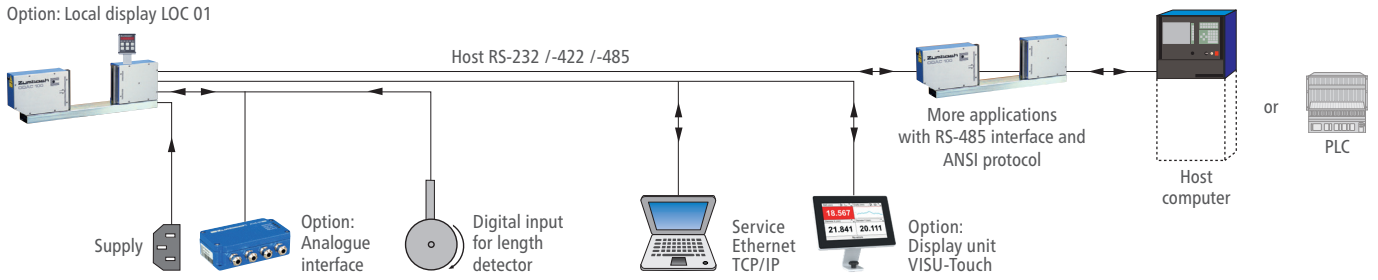
CV measurement



► Ask for special data sheets on CV or STEELMASTER hot steel systems

# System Overviews

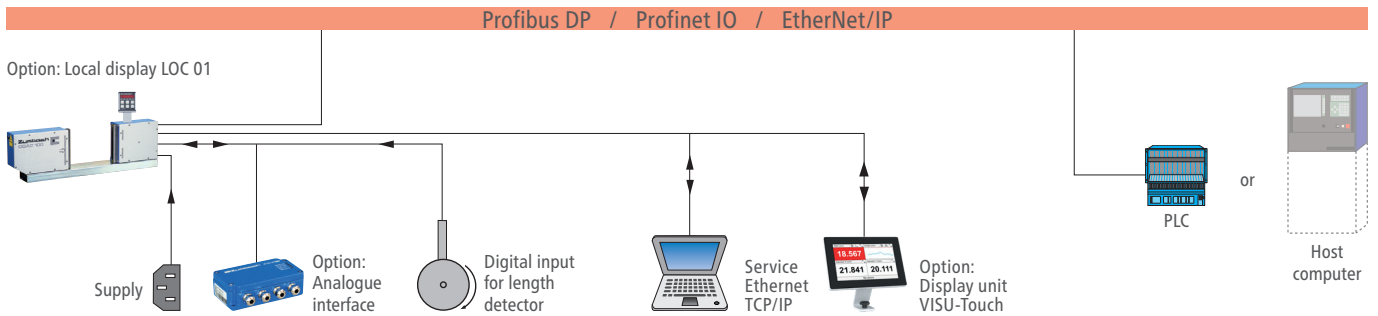
## ODAC® 100EN-RS (serial interface)



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.

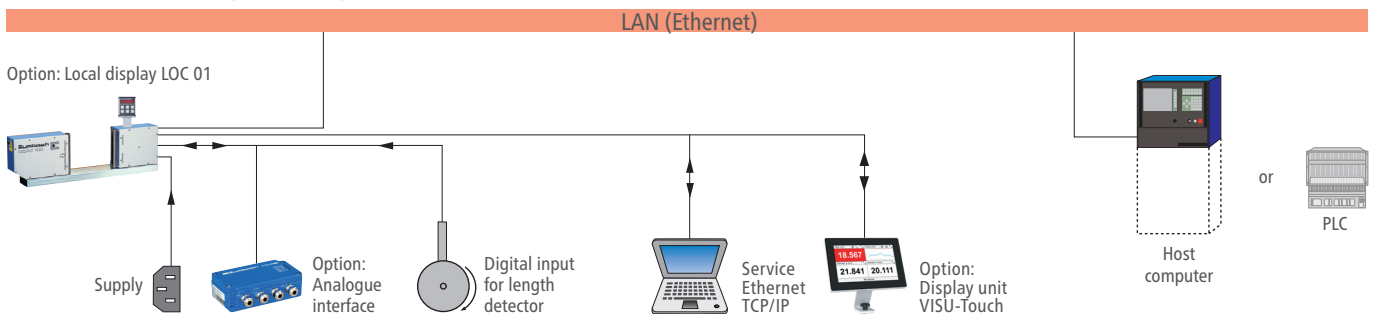
## ODAC® 100EN-DP (Profibus DP), -EN-PN (Profinet IO) or -EN-EI (EtherNet/IP)



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® 100EN-EN (Ethernet)



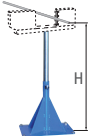
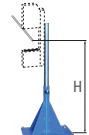


The built-in processor allows the acquisition and filtering of the measured values, as well as statistic functions, parameter selection and many other functions. The EN version communicates via the integrated EN interface with a higher level system. The selectable






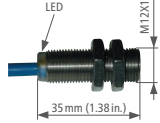
ZUMBACH protocols (ODAC or ASCII) are integrated and transmitted in the well known TCP/IP protocol. TCP/IP allows the data transfer through existing networks such as LANs and others.

## ODAC® 100Jxx with the corresponding external ZUMBACH processors

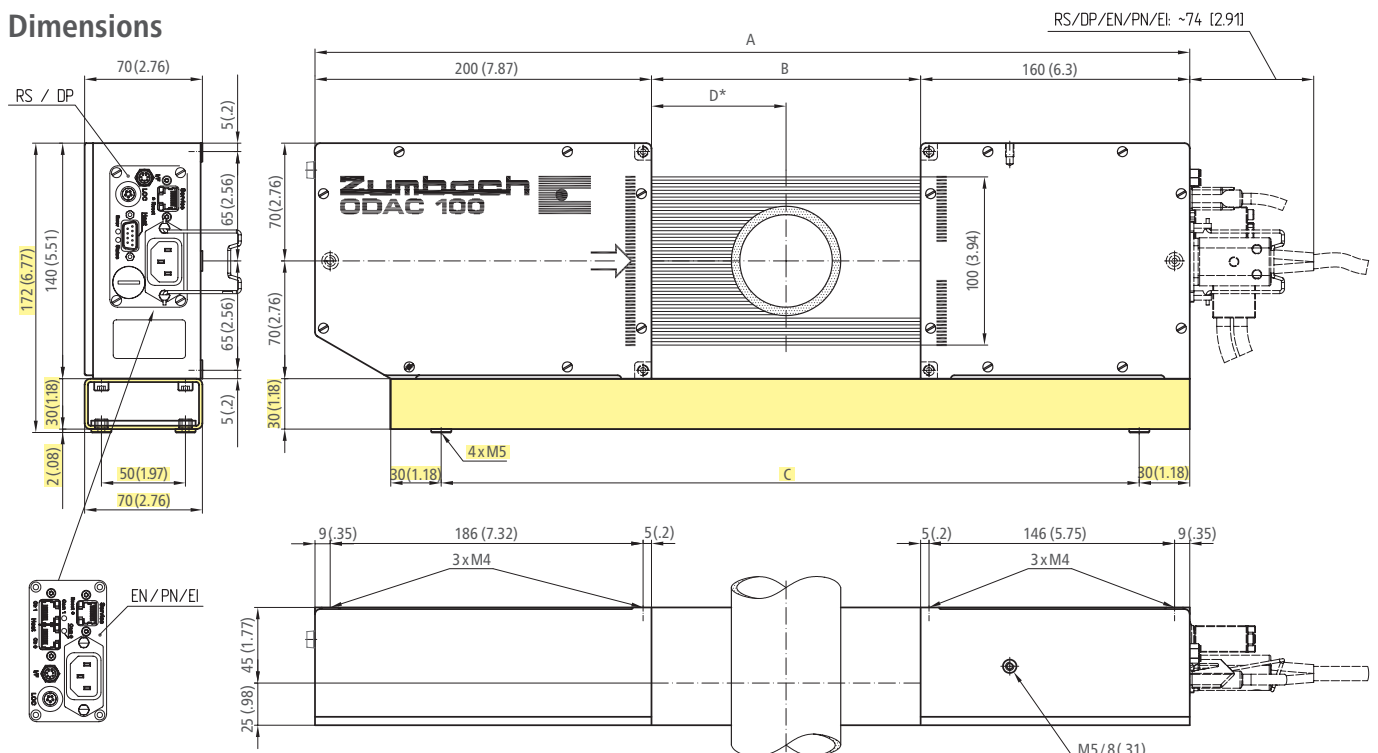


## Accessories

Description	Order Number
<b>Floor stand ST2-ODAC 100.DT100</b> <b>Floor stand ST2-ODAC 100.DT200</b>	<b>ST02.143.28575</b> <b>ST02.143.28590</b>
Vertically adjustable.  Line height (H): 900...1200 mm (35.4...47.25 in.)	
<b>Floor stand ST2-ODAC 100.DT100 90°</b>	<b>ST02.143.28585</b>
Vertically adjustable.  Line height (H): 900...1200 mm (35.4...47.25 in.)	
<b>Mountable support for ST2</b>	<b>ST02.060.190</b>
Lateral support, including rotary holder (USY.0002.910) for table top version of the USYS 20 processor.	
<b>Rotary holder USYS 20</b>	<b>USY.0002.910</b>
<b>Fixation set for wall mounting (with pivot arm)</b>	<b>USY.0002.920</b>
<b>Fixation set for table top</b>	<b>USY.0002.930</b>
<b>Limiting socket VF100-ODAC100</b>	<b>ODAC.1001.400</b>
<b>Air curtain LV.G-ODAC 100</b>	<b>ODAC.1001.920</b>
<b>Blower unit GE 7, 0.55kW</b>	<b>GE.701.07000</b>
<b>Water cooler WK1-ODAC 100</b>	<b>ODAC.1001.930</b>
<b>Deviation unit ODAC 100-90°</b>	<b>ODAC.1001.940</b>
<b>Set of calibration standards</b>	<b>ODAC.9501.07000</b>
Delivered in a protection box, comprising: – Calibration standard holder – Calibration standard $\varnothing$ 2 and 75 mm – Certificate Other calibration standards on request.	

Description	Order Number
<b>Local display LOC 01</b> 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.	<b>LOC.011.01000</b> 
<b>VISU-Touch</b> 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.	<b>VISU.001.01XXX</b> 
<b>Ethernet cable</b> 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.	<b>A15 608 8XXX</b>
<b>PoE Injector 48 V, 24 W</b> Power over Ethernet supply for devices that do not support PoE or a long Ethernet cable. Not for ODAC J versions.	<b>N2.7860.1000</b> 
<b>Analogue interface AI4-R</b> Interface with 4 analogue, 5 digital and 2 relay outputs. Direct connection of the digital input (proximity switch). Not for ODAC J versions.	<b>ODAC.001.100</b> 
<b>Signal cable L2 Bus 1DR22 x 02R</b> For the connection between the Profibus DP interface and the customer's data acquisition system. Only for DP version.	<b>A13 252 0150</b>
<b>Connector</b> 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.	<b>A10 125 0070</b> 
<b>Proximity switch</b> 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.)	<b>A16 100 0110</b> 

## Dimensions



Model	A	B	C	D*
ODAC 100xx.DT100	560 (22.05)	200 (7.87)	455 (17.91)	100 (3.94)
ODAC 100xx.DT200	760 (29.92)	400 (15.75)	655 (25.79)	200 (7.87)
ODAC 100xx.DT300	960 (37.80)	600 (23.62)	855 (33.66)	300 (11.81)
ODAC 100xx.DT400	1160 (45.67)	800 (31.50)	1055 (41.54)	400 (15.75)

C = Version with rail  
\* Measuring Distance

Dimensions in mm (inch)

# Technical Data

Model ODAC 100	J EN-xx	JP EN-xxP	JN EN-xxN	JC EN-xxC	JSx	
<b>Measurement</b>						
Version	Standard	Profile measurement	"Narrow Beam" <sup>7)</sup>	Measurement with CV tube	Same with synchroni. input	
Measuring field M <sup>1)</sup>	100 mm (3.94 in.)	100 mm (3.94 in.)	100 mm (3.94 in.)	94 mm (3.7 in.)	see J/JP/JN	
Min. object ø	0.25 mm (.01 in.)	1 mm (.04 in.)	0.25 mm (.01 in.)	0.25 mm (.01 in.)	see J/JP/JN	
Scanning frequency scans/s	standard 1000 F version 2000	1000 2000	1000 2000	500 -	500 -	
Scanning speed	219 m/s (718 ft./s); F version: 438 m/s (1437 ft./s)					
Width of laser beam <sup>6)</sup>	5 mm (0.2 in.)	5 mm (0.2 in.)	0.6 mm (.02 in.)	5 mm (0.2 in.)	see J/JP/JN	
Repeatability (3 σ) at measuring distance D and averaging time (s)	100 mm (3.94 in.)	0.70 μm (0.1 s) (.000028 in.)	0.35 μm (1 s) (.000014 in.)	1.00 μm (0.1 s) (.000040 in.)	0.50 μm (1 s) (.000020 in.)	
	200 mm (7.88 in.)	0.80 μm (0.1 s) (.000032 in.)	0.40 μm (1 s) (.000016 in.)	1.15 μm (0.1 s) (.000045 in.)	0.60 μm (1 s) (.000024 in.)	
	300 mm (11.81 in.)	0.90 μm (0.1 s) (.000036 in.)	0.45 μm (1 s) (.000018 in.)	1.30 μm (0.1 s) (.000050 in.)	0.70 μm (1 s) (.000028 in.)	
	400 mm (15.75 in.)	1.00 μm (0.1 s) (.000040 in.)	0.55 μm (1 s) (.000022 in.)	1.40 μm (0.1 s) (.000055 in.)	0.80 μm (1 s) (.000032 in.)	
Measurement error centric at measuring distance D <sup>2)</sup>	100 mm (3.94 in.) ± 2 μm (.00008 in.)					
	200 mm (7.88 in.) ± 3 μm (.00012 in.)					
	300 mm (11.81 in.) ± 4 μm (.00016 in.)					
	400 mm (15.75 in.) ± 5 μm (.00020 in.)					
Measurement error within the measuring zone <sup>3)</sup>	2 x value of the measurement error centric (ODAC 100xxP: 4 x value of the measurement error centric)					
Measuring zone (width x height)	50 x 95 mm (1.97 x 3.74 in.)	100 x 95 mm (3.94 x 3.74 in.)	30 x 95 mm (1.18 x 3.74 in.)	30 x 90 mm (1.18 x 3.74 in.)	see J/JP/JN	
Resolution <sup>4)</sup>	0.1 μm (.000005 in.)					
Light source <sup>5)</sup>	VLD (Visible Laser diode) 630-680 nm, laser class 2 (device)					
Types of measurement (see page 1)	1, 2, 3, 4, 5			1, 2	1, 6, 7	
<b>Interfaces / Connections</b>						
Model ODAC 100	EN-RSx	EN-DPx	EN-Ex	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 9p./m, galvan. isolated	Profibus DP (RS-485), D-sub. connector 9p./f, galvanically isolated	Ethernet TCP/IP, 2x RJ45 10/100BaseT, galvanically isolated	Profinet IO, 2x RJ45 10/100BaseT, galvanically isolated	EtherNet/IP, 2x 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	333/s	63/s	333/s	63/s	125/s	RS/-DP/-EN/-PN/-EI.
Data rate max. F version	333/s	125/s	333/s	125/s	200/s	JSx interfaces via
Data rate max. C version	167/s	63/s	167/s	63/s	63/s	Synchrobox CI 2/3JS/1J to the processors. Data rate max. 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, 0.5A 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	-
<b>Energy supply</b>						
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	20VA					
<b>Operation conditions / Miscellaneous</b>						
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 <sup>8)</sup>	Case IP 65, connection plate and connector area IP 40					
Weight	Emitter: 2.75 kg (6.07 lbs.), Receiver: 1.85 kg (4.08 lbs.), Rail (DT100): 1.5 kg (3.3 lbs.)					

<sup>1)</sup> M stands for measuring field height. In practice, the largest object diameter corresponds to Measuring Field Height minus instability of position.

<sup>2)</sup> 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".

<sup>3)</sup> 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".

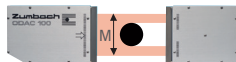
<sup>4)</sup> System resolution is the smallest practical value on the last digit of the display (adjustable).

<sup>5)</sup> Maximum power of the laser can be read on the warning label.

<sup>6)</sup> Measured in the measuring plane, including lateral jitter of the scans.

<sup>7)</sup> 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.

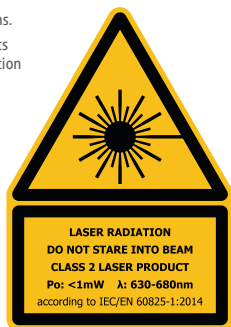
<sup>8)</sup> Conformity not verified by UL.



## Ordering Information

When ordering, please specify the following:

- Models: **ODAC 100Jx**, **-JSx** or **ODAC 100EN-RSx**, **-DPx**, **-ENx**, **-PNx**, **-EIx**  
Versions: Standard, P (Profile measurement), N (Narrow Beam), C (CV tube measuring), K (Components, without rail) specify the measuring distance D (see page 3), F (Fast, with higher scan frequency)
- Connection cable
  - The connection between **ODAC 100EN-RS** and the higher level system is to be provided by the customer (via serial interface).
  - For **ODAC 100EN-DP**, the connection to a higher level system is made with the signal cable # A13 252 0150.
  - For the **ODAC 100EN-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 100Jx** 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: 0.56, 0.76, 0.96, 1.16, 1.5, 2, 3, 4, 5, 6, 8 m (1.8, 2.5, 3.15, 3.8, 5, 6.5, 10, 13, 16.4, 19.7, 26.2 ft.). Minimum length = 2 x measuring distance D + 0.35 m (1.2 ft.). Order no. B.ODAC.821.32xx.
- Processor model (Data acquisition system), only for **ODAC 100Jx**:  
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

Switzerland (H.Q.): ZUMBACH Electronic AG, P.O. Box, CH-2552 Orpund, Phone +41(0)32 356 04 00, Fax +41(0)32 356 04 30, E-Mail: sales@zumbach.ch  
Benelux • China • Czech Republic • France • Germany • India • Italy • Spain • Taiwan • United Kingdom • USA

[www.zumbach.com](http://www.zumbach.com)