

OBSOLETE

Operating Instructions
Betriebsanleitung

D-10-9 / D-11-9
Version 1.0

Pressure Transmitter with CANopen Interface

GB

Drucktransmitter mit CANopen-Schnittstelle

D



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GB

**Pressure Transmitter with
CANopen Interface**

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D

**Drucktransmitter mit
CANopen-Schnittstelle**

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1. General Information

- GB** **D-10-9:** Pressure transmitter with CANopen-Interface Standard version.
- D-11-9:** Pressure transmitter with CANopen-Interface with flush diaphragm.

WIKA pressure transmitters are carefully designed and manufactured using state-of-the-art technology. Every component undergoes strict quality inspection before assembly and each instrument is fully tested prior to shipment.



Please inspect the equipment for possible damage during transportation. Should there be any obvious damage, please inform the transport company and WIKA without delay.

The following installation and operating instructions have been compiled by us with great care but it is not feasible to take all possible applications into consideration.

These installation and operation instructions should meet the needs of most pressure measurement applications.

If questions remain regarding a specific application, you can obtain further information (data sheets, instructions, etc.) via our Internet address (www.wika.de / www.wika.com / download) or contact WIKA for additional technical support. (see section 8, service).

The technical specifications given in the data sheet are only accurate after a warming up period of approx. 10 minutes.

2. Safety Instructions

GB



Caution

Prior to installing, starting and operating a pressure measuring instrument the user must ensure that the appropriate instrument has been selected with regard to scale range and performance and that the material of the wetted parts (corrosion) of the instrument chosen is suitable for the specific measuring conditions of the respective application. In addition the relevant national safety regulations (e.g.: VDE 0100) have to be observed.

Serious injuries and / or damage can occur should the relevant regulations not be observed.

Only qualified persons authorised by the plant manager are permitted to install, maintain and service the pressure measuring instruments.

Dangerous pressure media such as oxygen, acetylene, flammable gases or liquids and toxic gases or liquids as well as instruments for refrigeration plants or compressors etc. require attention above the standard regulations.

Here the specific safety codes or regulations must be considered. Please observe the ambient and working conditions outlined in section 3 "Technical data".

Any operation other than that described in the following instructions is inconsistent with the provisions and has to be excluded for that reason.

If the instrument should become damaged or unsafe for operation it should be removed from service and marked to prevent it from being used again accidentally.

Repairs may be performed by the manufacturer only. The instrument must not be interfered with or changed.

Do not exceed overpressure safety of the respective pressure range!

All pressure connections may only be opened after the system is without pressure!

Remainder of the pressure medium contained in the pressure element may be hazardous or toxic. This should be considered when handling and storing the removed pressure measuring instrument.

3. Technical data

GB	Specification	Model D-10-9 / D-11-9											
Pressure ranges	bar	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40
Over pressure safety	bar	2	2	4	5	10	10	17	35	35	80	50	80
Burst pressure	bar	2.4	2.4	4.8	6	12	12	20.5	42	42	96	250	400
Pressure ranges	bar	60	100	160	250	400	600	1000 ¹⁾					
Over pressure safety	bar	120	200	320	500	800	1200	1500					
Burst pressure	bar	800	800	1000	1200	1700	2400	3000					
Material													
■ Wetted parts		Stainless steel											
		(Other materials see WIKA diaphragm seal)											
■ O-ring		Only for flush diaphragm models: NBR {EPDM; FPM/FKM}											
■ Case		Stainless steel											
■ Process connection / diaphragm		Stainless steel											
Internal transmission fluid		Synthetic oil (only for pressure ranges up to 0 ... 16 bar or flush diaphragm units)											
		{Halocarbon oil for oxygen applications} ²⁾											
		{Listed by FDA for food industry }											
Power supply U _B	DC V	10 ... 30											
Power input	W	0.7											
Signal output		CANopen protocol acc. to CiA DS-301, Device profile DSP 404											
		(See chapter 5.2 PDO Structure)											
Communication services		LSS (CiA DSP 305, version 1.0) services, configuration											
		of device address and baud rate											
		Sync/Async											
		Node/Lifeguarding											
Diagnosis data		Emergency Message, if											
		■ pressure is 5% below minimum of measuring range											
		■ or pressure is 5% beyond maximum of measuring range											
		■ or temperature at sensor is higher than 80 °C											
Termination		Internal termination can be activated via integrated DIP-switch											
Internal measuring rate	Hz	100											
Warm-up time	min	< 10											
Accuracy *)	% of span	≤ 0.25 {0.10} in the range 0 °C ... +50 °C											
Hysteresis	% of span	≤ 0.10 {0.04}											
Repeatability	% of span	≤ 0.05 {0.03}											
1-year stability	% of span	≤ 0.10 (under reference conditions)											
Permissible temperature of													
■ Medium	°C	-20 ... +80											
■ Ambient	°C	-20 ... +80											
■ Storage	°C	-40 ... +85											
■ Compensated	°C	-20 ... +80											

3. Technical data

Specifications		Model D-10-9 / Typ D-11-9	GB
Temperature coefficients in compensated temperature range			
■ Mean TC of zero	% of span	≤ 0.20 / 10 K {0.10}	
■ Mean TC of range	% of span	≤ 0.20 / 10 K {0.10}	
		(The temperature related deviations in the range 0 ... +50 °C [32 ... 122 °F] are already included in the accuracy)	
CE - conformity		89/336/EWG interference emission and immunity see EN 61 326 97/23/EG Pressure equipment directive, Appendix 1 Declaration of conformity on request	
Shock resistance	g	< 100 according to IEC 770 (mechanical shock)	
Vibration resistance	g	< 5 according to IEC 770 (vibration under resonance)	
Wiring protection		Protected against reverse polarity, overvoltage and short circuiting	
Ingress protection		per IEC 60529 / EN 60529, see page 8	
Weight	kg	Approx. 0.4	

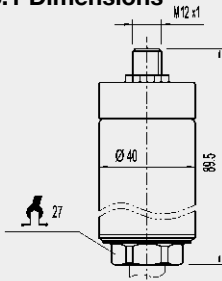
* Included calibration error with zero, and span, hysteresis and linearity, limit point calibrated in vertical mounting position with the pressure connection facing down.

- 1) Not for flush diaphragm models
 - 2) The oxygen version must not be operated under medium temperatures higher than 60 °C (140 °F)
The oxygen version cannot be manufactured for absolute pressure ranges < 1 bar abs.
- { } Items in curved brackets { } are optional extras for additional price.

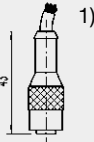
3. Technical data

GB

3.1 Dimensions

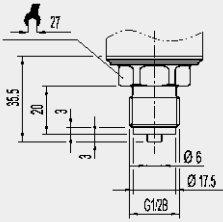


Circular connector *)
M 12x1, IP 65
Ordercode: M5

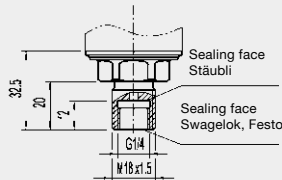


Pressure connection

G 1/2 B, EN 837-G 1/2B
Ordercode: GD

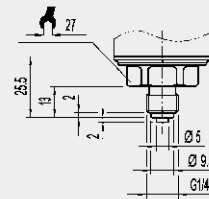


M 18x1,5
Ordercode: M6

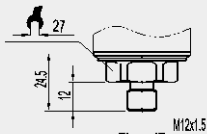


For quick disconnect coupler
Swagelok, Stäubli, Festo

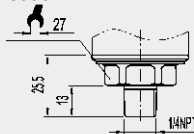
G 1/4 B
Ordercode: GB



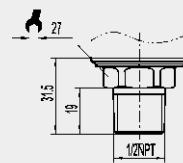
M 12x1,5
Code: MK



1/4 NPT per "Nominal size for
US standard tapered pipe
thread NPT"
Ordercode: NB

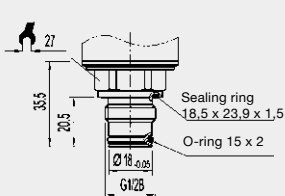


1/2 NPT per "Nominal size for
US standard tapered pipe thread NPT"
Ordercode: ND

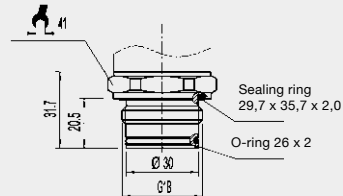


Pressure connection for flush diaphragm

G 1/2 B
Ordercode: 86



G 1 B
Ordercode: 85



For tapped holes and welding sockets please see data sheet IN 00.14 or www.wika.de/download

*) Other electrical connections and IP 67 on request. 1) Connectors are not included in delivery.

4. Installation

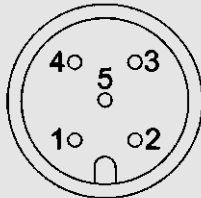
4.1 PIN Assignment

Circular connector M 12x1, 5-pin

GB

Mounting plug, plan view (acc. to CiA DR-303-1)

Pin assignment



1-

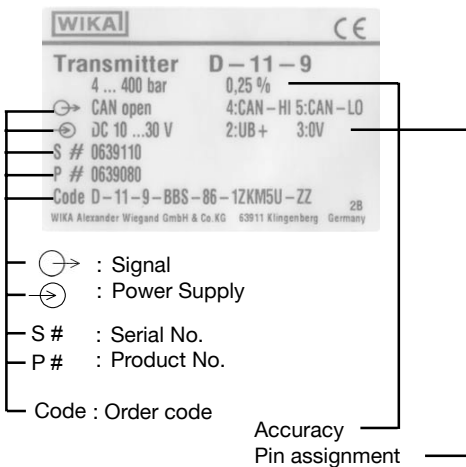
2 - U_B+

3 - U_B-

4 - CAN-High

5 - CAN-Low

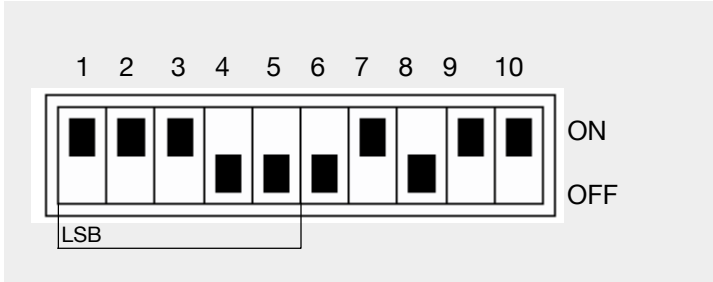
4.2 Description Product label



2439316.01 D/GB/F 02/2003

5. Commissioning

GB 5.1 DIP Switch Assignment



DIP switch 1 to 5: Address settings, address 1...31

DIP switch 6: Baud rate
ON=20kBd
OFF=250kBd

DIP switch 7: Settings
ON: acc.to DIP switch
OFF: from memory inside the instrument

DIP switch 8: Switching of measuring value output
ON: currently configurated PDO is sent
every 10 ms (e.g. for diagnostic purposes)

OFF: Output depending on settings in object directory

DIP switch 9 and 10: Termination
ON: terminating resistor switched on
OFF: terminating resistor switched off

Factory default settings: DIP switch 1-10: OFF

5. Commissioning

5.2 PDO-Structure

GB

Telegram structure PDO					
ID	DLC	Byte 1	Byte 2	Byte 3	Byte 4
Identifier	8				process value
Byte 5	Byte 6	Byte 7	Byte 8		

The structure of the synchronous and asynchronous PDO is identical.

Byte1 to byte4 contain the currently configured process value.

The coding corresponds to DS 301, chapter 9.1.4.5.

Here default settings byte 1 is the least and byte 4 the most significant byte.

Factory-set: Object 91 30 01

The following INTEGER data types are used.

octet number	1.	2.	3.	4.
INTEGER32	b ₇ ..b ₀	b ₁₅ ..b ₈	b ₂₃ ..b ₁₆	b ₃₁ ..b ₂₄

5. Commissioning

5.3 Object Directory-Communication Profile Area (according CiA Draft Standard 301), Part 1

Index	Sub-Index	Object Name	Type	Attr	Default-Value	Remarks
12	1000 h	var device type	unsigned 32	ro	00 02 01 94 h	DSP 404, analogue input block
	1001 h	var error register	unsigned 8	ro	00 h	
	1005 h	var COB-ID SYNC	unsigned 32	ro	80 h	
	1009 h	var manufacturer hardware version	visible string	ro		
	100A h	var manufacturer software version	visible string	ro		
	100C h	var guard time	unsigned 16	rw	00 h	only multiple of 10
	100D h	var life time factor	unsigned 8	rw	00 h	
	1010 h	array store parameters	unsigned 32			*1
		var number of entries	unsigned 8	ro	01 h	
	1	var save all parameters	unsigned 32	rw	01 h	
	1011 h	array restore default parameters	unsigned 32			*2
		var number of entries	unsigned 8	ro	01 h	
	1	var restore all default parameters	unsigned 32	rw	01 h	
	1014 h	var COB-ID Emergency message	unsigned 32	ro	81 h	80h + Node-ID
	1018 h	record Identity Object				
	0	var number of entries	unsigned 8	ro	04 h	
	1	var Vendor ID	unsigned 32	ro	00 00 00 47 h	
	2	var Product code	unsigned 32	ro	P#	
	3	var Revision number	unsigned 32	ro		
	4	var Serial number	unsigned 32	ro	S#	
	1800 h	record 1st transmit PDO parameter				
	0	var number of entries	unsigned 8	ro	02 h	
	1	var COB-ID used by PDO	unsigned 32	ro	01 81 h	
	2	var transmission type	unsigned 8	ro	FE h	

5. Commissioning

5.3 Object Directory-Communication Profile Area (according CiA Draft Standard 301), Part 2

GB

Index	Sub-Index	Object Name	Type	Attr	Default-Value	Remarks
1801 h		record				
	0	2nd transmit PDO parameter number of entries	unsigned 8	ro	02 h	
	1	COB-ID used by PDO	unsigned 32	ro	02 81 h	
	2	transmission type	unsigned 8	ro	01 h	
1A00 h		record				
	0	1st transmit PDO mapping number of mapped application objects in PDO	unsigned 8	ro	01 h	
	1	PDO mapping for the 1. application object to be mapped	unsigned 32	ro	91 30 01 20 h	
1A01 h		record				
	0	2nd transmit PDO mapping number of mapped application objects in PDO	unsigned 8	ro	01 h	
	1	PDO mapping for the 2. application object to be mapped	unsigned 32	ro	91 30 01 20 h	

*1: By writing the signature "save" 65766173h, all settings are saved on the module

*2: By writing the signature "load" 64616F6Ch, the factory default settings are loaded

5. Commissioning

GB 5.4 Object Directory-Manufacturers Specific Profile Area

Index	Sub-Index	Object	Name	Type	Attr	Default-Value	Remarks
2001 h	0	var	measure mode	unsigned 8	ro		
2002 h	0	var	sampling time	unsigned 16	ro		
2003 h		record	next calibration	unsigned 16			
	0	var	number of entries	unsigned 8	ro	2	
	1	var	month	unsigned 16	rw		
	2	var	year	unsigned 16	rw		
2004 h		record	last calibration	unsigned 16			
	0	var	number of entries	unsigned 8	ro	2	
	1	var	month	unsigned 16	rw		
	2	var	year	unsigned 16	rw		
2005 h	0	var	maximum temperature	integer 16	ro		
2006 h	0	var	cycle timer	unsigned 8	rw	00 h	only 0 or 10 allowed
20FD h			reserved				
20FE h			reserved				
20FF h			reserved				

5. Commissioning

5.5 Object Directory-Device Profile Area (according CiA DSP 404)

GB

Index	Sub-Index	Object Name	Type	Attr	Default Value	Remarks
6110 h	0	AI_Sensor_Type number of entries	unsigned 16 unsigned 8	ro	01 h	
6131 h	1	AI_Sensor_Type_1	unsigned 16	ro	5A h	Pressure Transducer
	0	AI_Physical_Unit_PV number of entries	unsigned 16 unsigned 8	ro	01 h	
6132 h	1	AI_Physical_Unit_PV_1	unsigned 16	ro	00 22 h	pressure unit Pascal
	0	AI_Decimal_Digits_PV number of entries	unsigned 8	ro	01 h	
7100 h	1	AI_Decimal_Digits_PV_1	unsigned 8	ro	00 h	
	0	AI_Input_FV number of entries	unsigned 16 unsigned 8	ro	01 h	
9130 h	1	AI_Input_FV_1	unsigned 16	ro		
	0	AI_Input_PV number of entries	integer 32 unsigned 8	ro	01 h	
9148 h	1	AI_Input_PV_1	integer 32	ro		pressure value
	0	AI_Span_Start number of entries	integer 32 unsigned 8	ro	02 h	
9149 h	1	AI_Span_Start_1	integer 32	ro		min. operating pressure (Pa)
	0	AI_Span_End number of entries	integer 32 unsigned 8	ro	02 h	
	1	AI_Span_End_1	integer 32	ro		max. operating pressure (Pa)

5. Commissioning

GB 5.6 Object Directory-Description of Manufacturer Specific Profile

Description of Manufacturer Specific Profile Area

Object 2001 Measure Mode

This read only entry stores the transducer type.

This is coded as follows:

128 gauge, 000 absolute.

Object 2002 Sampling Time

This read only entry corresponds to the maximum time for the transducer updating its pressure value in the units of ms.

Object 2003 Next calibration (Year / Month)

The date of the next calibration in year / month format is stored. Initially this is the date of the factory calibration + 1 year. When a calibration is performed the user should update this date.

Object 2004 Last calibration (Year / Month)

The date of the last calibration in year / month format is stored. Initially this is the date of the factory calibration. When a calibration is performed the user should update this date.

5.7 Object Directory-Description of Communication Profile

Description of Communication Profile Area

1010h Store parameters

- Guard Time (100Ch)
- Life Time Factor (100Dh)

1011h Restore default parameters

- Guard Time (100Ch)
- Life Time Factor (100Dh)

1800h 1st transmit PDO parameter (asynchronous PDO)

Subindex 1: COB-ID used by PDO

180h + Node-ID

Subindex 2: Transmission Type (FEh)

(dependent on object 2006h cycle timer)

1801h 2nd transmit PDO parameter (asynchronous PDO)

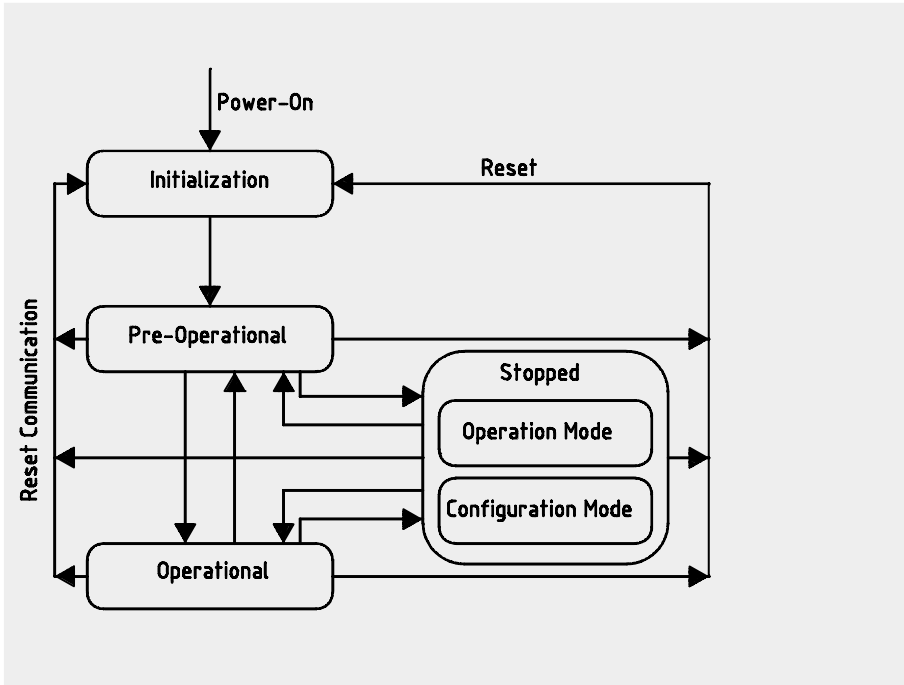
Subindex 1: COB-ID used by PDO

280h + Node-ID

Subindex 2: Transmission Type (01h)

Slave answers on every SYNC

GB 6.1 NMT Slave State Diagramm



6.2 Configure Node-ID

- Set device to stopped mode
- Change from operation mode to configuration mode
Switch mode selective:

Master sends:

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	CS	LSB	
Byte3	Byte4	Byte5	Byte6	Byte7
	MSB	res.	res.	res.

CS: Command Specifier

Byte 0	Byte 1-4	Byte 5-7
40h	Vendor-ID (00000047h)	res.
41h	Productcode (see table: P#)	res.
42h	Revision Number	res.
43h	Serial Number (see table: S#)	res.

(The respective instrument data is included in the object directory, index 1018h)

Device responds:

ID	DLC	Byte0	Byte1	Byte2
7E4h	8	CS	LSB	
Byte3	Byte4	Byte5	Byte6	Byte7
	MSB	res.	res.	res.

Byte 0 44h
 Byte 1 Mode
 Byte 2-7 res.

Mode 0: Operation Mode
 Mode 1: Configuration Mode

6. Communication (LSS-Services acc. to CiA 305 V1.0)

GB

- Setting the node ID by

Master sends:

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	CS		
Byte3	Byte4	Byte5	Byte6	Byte7

Byte 0 11h
Byte 1 Node-ID
Byte 2-7 res

Device responds:

ID	DLC	Byte0	Byte1	Byte2
7E4h	8	CS		
Byte3	Byte4	Byte5	Byte6	Byte7

Byte 0 11h
Byte 1 Errorcode (0=Protocol successfully completed)
1= Node-ID beyond valid range)
Byte 2 Specific Error (not used)
Byte 3-7 res.

- Change from configuration mode to operation mode Switch mode global

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	04h	00h	
Byte3	Byte4	Byte5	Byte6	Byte7

6.3 Configure bit timing parameters

- Set device to stopped mode
- Change from operation mode to configuration mode
Switch model global:

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	04h	01h	
Byte3	Byte4	Byte5	Byte6	Byte7

- Set Baud rate

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	13h		
Byte3	Byte4	Byte5	Byte6	Byte7

Byte 1 00h (Table Selector: CiA Bit Timing Table)
 Byte 2 Table Index (see chapter 7.4 Bit rate Table)

Device responds:

ID	DLC	Byte0	Byte1	Byte2
7E4h	8	13h		
Byte3	Byte4	Byte5	Byte6	Byte7

Byte 1 Error-Code	Byte 2	Specific Error
00h		Protocol successfully completed
FFh	01h	Table Selector invalid
FFh	02h	Table index out of range

6. Communication (LSS-Services acc. to CiA 305 V1.0)

GB

- Activate bit timing by

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	15h		
Byte3	Byte4	Byte5	Byte6	Byte7

Byte 1-2 Switch Delay (time in ms, which is to pass until the new Baud rate is activated).

- Change from configuration mode to operation mode via switch model global:

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	04h	00h	
Byte3	Byte4	Byte5	Byte6	Byte7

6.4 Bit timing table

Baud Rate	Index Table
1000 kBit	0
800 kBit	1
500 kBit	2
250 kBit	3
125 kBit	4
100 kBit	5
50 kBit	6
20 kBit	7
10 kBit	8

7. Trouble Shooting

Error	Cause	Recovery action	GB
The setting of the node-ID has been confirmed as successful, but it is not active.	Settings are taken over by the DIP-switch.	Change over DIP-switch so that the parameters from the device-internal memory are loaded.	
The setting of the data transfer rate has been confirmed as successful, but it is not active.	Settings are taken over by the DIP-switch.	Change over DIP-switch so that the parameters from the device-internal memory are loaded.	

7.1 Error Coding

This applies only for error reports which are sent by means of emergency messages. The error register supports only error 1(= general error).

Telegram structure

Emergency Message (EMCY) Slave sends

ID	DLC	Byte 1	Byte 2	Byte 3
80h + NID	8			
Byte 4	Byte 5	Byte 6	Byte 7	Byte 8

- Byte 1 = Low byte of error codes
- Byte 2 = High byte of error codes
- Byte 3 = Current contents of error registers
- Byte 4 = Manufacturer -specific error
- Byte 5 - 8 Unused

Error Code	Meaning
00 00h	Non error
10 00h	Generic Error
FF 00h	Device Specific Error

The following specific fields are supported

7. Trouble Shooting, 8. Service

GB

Contents Byte 4	Meaning	Note
01h	internal error	*
02h	internal error	possibly mechanical failure
04h	Pressure value more than 5 % of span above MBA	
08h	Pressure value more than 5 % of span below MBA	
10h	Temperature at sensor exceeds 80°C	
40h	internal error	*

* internal device error, hardware reset required for recovery

8. Service

WIKA pressure transmitters require no maintenance!

For further information



++49 9372.132-295

Our current terms of sales and delivery are valid, please find them on www.wika.de/download.

WIKA reserves the right to alter these technical specifications.

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1. Allgemeines

D

- D-10-9:** Druckmessumformer mit CANopen-Schnittstelle, Standardausführung.
- D-11-9:** Druckmessumformer mit CANopen-Schnittstelle mit frontbündiger Membrane.

Die in der Betriebsanleitung beschriebenen WIKA-Druckmessumformer werden nach den neuesten Erkenntnissen konstruiert und gefertigt. Alle Komponenten unterliegen während der Fertigung strengen Qualitätskriterien.



Hinweis

Bitte untersuchen Sie die Geräte auf eventuell aufgetretene Transportschäden. Sind offensichtlich Schäden vorhanden, teilen Sie dies bitte dem Transportunternehmen und WIKA unverzüglich mit.

Die nachfolgenden Einbau- und Bedienungshinweise haben wir mit Sorgfalt zusammengestellt. Es ist jedoch nicht möglich, alle erdenklichen Anwendungsfälle zu berücksichtigen.

Sollten Sie Hinweise für Ihre spezielle Aufgabenstellung vermissen, können Sie über unsere Internet Adresse (www.wika.de / www.wika.com / download) weitere Informationen (Datenblätter, Hinweise, etc.) erhalten oder sich mit einem unserer Anwendungsberater (siehe Punkt 8, Service) in Verbindung setzen.

Die im Datenblatt angegebenen technischen Spezifikationen zur Genauigkeit werden nach einer Anwärmzeit von ca. 10 Minuten erreicht.



Beachten Sie unbedingt vor Montage, Inbetriebnahme und Betrieb, dass das richtige Druckmessgerät hinsichtlich Messbereich, Ausführung und aufgrund der spezifischen Messbedingungen der geeignete messstoffberührte Werkstoff (Korrosion) ausgewählt wurde. Weiter sind die entsprechenden nationalen Sicherheitsvorschriften (z. B.: VDE 0100) zu beachten.

Bei Nichtbeachten entsprechender Vorschriften können schwere Körperverletzungen und/oder Sachschäden auftreten.

Druckmessgeräte nur durch ausgebildetes und vom Anlagenbetreiber autorisiertem Fachpersonal montieren und warten lassen.

Bei gefährlichen Messstoffen wie z.B. Sauerstoff, Acetylen, brennbaren oder giftigen Stoffen, sowie bei Kälteanlagen, Kompressoren etc. müssen über die gesamten allgemeinen Regeln hinaus die jeweils bestehenden einschlägigen Vorschriften beachtet werden.

Bitte beachten Sie die Betriebsparameter gemäß Punkt 3 „Technische Daten“.

Ein anderer Betrieb als der in der folgenden Anleitung beschriebene ist bestimmungswidrig und muss deshalb ausgeschlossen werden.

Können Störungen nicht beseitigt werden, ist das Gerät außer Betrieb zu setzen und gegen versehentliche Inbetriebnahme zu schützen.

Reparaturen dürfen nur vom Hersteller durchgeführt werden. Eingriffe und Änderungen am Gerät sind unzulässig.

Überlastgrenze des entsprechenden Messbereiches nicht überschreiten!

Alle Anschlüsse dürfen nur im drucklosen Zustand geöffnet werden!

Messstoffreste in ausgebauten Druckmessgeräten können zur Gefährdung von Menschen, Umwelt und Einrichtung führen.

Ausreichende Vorsichtsmaßnahmen sind zu ergreifen.

3. Technische Daten

D

Technische Daten

Typ D-10-9 / Typ D-11-9

Messbereich	bar	0,25	0,4	0,6	1	1,6	2,5	4	6	10	16	25	40
Überlastgrenze	bar	2	2	4	5	10	10	17	35	35	80	50	80
Berstdruck	bar	2,4	2,4	4,8	6	12	12	20,5	42	42	96	250	400
Messbereich	bar	60	100	160	250	400	600	1000 ¹⁾					
Überlastgrenze	bar	120	200	320	500	800	1200	1500					
Berstdruck	bar	800	800	1000	1200	1700	2400	3000					
Werkstoffe													
■ Messstoffberührte Teile		Cr-Ni-Stahl											
		(Andere Werkstoffe siehe WIKA Druckmittler-Programm)											
■ O-Ring		Nur bei Ausführungen mit frontbündiger Membrane: NBR {EPDM; FPM/FKM}											
■ Gehäuse		CrNi-Stahl											
■ Druckanschluss / Membrane		CrNi-Stahl											
Interne Übertragungsflüssigkeit		Synthetisches Öl. Nur bei Messbereichen bis 16 bar oder bei frontbündiger Membrane {Halocarbonöl für Sauerstoff-Ausführungen} ²⁾ {FDA-gelistet für Nahrungsmittelindustrie}											
Hilfsenergie U _B	DC V	10 ... 30											
Leistungsaufnahme	W	0,7											
Ausgangssignal		CANopen Protokoll gemäss CiA DS-301, Geräteprofil DSP 404 (Siehe Kapitel 5.2 PDO-Aufbau)											
Kommunikationsdienste		LSS (CiA DSP 305, Version 1.0) Services, Konfiguration der Geräte-Adresse und Baudrate Sync/Async Node/Lifeguarding											
Diagnosedaten		Emergency Message, wenn Druck 5% unter Messbereichsanfang bzw. 5% über Messbereichsende bzw. Temperatur am Sensor > 80 °C											
Abschlusswiderstand		Interner Abschlusswiderstand über integrierten DIP-Switch zuschaltbar											
Interne Messrate	Hz	100											
Anwärmzeit	min	< 10											
Kennlinienabweichung *)	% d. Spanne	≤ 0,25 {0,10} im Bereich 0 °C ... +50 °C											
Hysterese	% d. Spanne	≤ 0,10 {0,04}											
Reproduzierbarkeit	% d. Spanne	≤ 0,05 {0,03}											
Stabilität pro Jahr	% d. Spanne	≤ 0,10 (bei Referenzbedingungen)											
Zulässige Temperaturbereiche													
■ Messstoff	°C	-20 ... +80											
■ Umgebung	°C	-20 ... +80											
■ Lagerung	°C	-40 ... +85											
■ Kompensiert	°C	-20 ... +80											

3. Technische Daten

Technische Daten		Typ D-10-9 / Typ D-11-9	D
Temperaturkoeffizienten im kompensierten Temperaturbereich			
■ Mittlerer TK des Nullpunktes	% d. Spanne	≤ 0,20 / 10 K {0,10}	
■ Mittlerer TK der Spanne	% d. Spanne	≤ 0,20 / 10 K {0,10}	
		(Die Temperaturfehler im Bereich 0 ... +50 °C sind bereits in der Kennlinienabweichung enthalten)	
CE - Kennzeichen		89/336/EWG Störemission und Störfestigkeit nach EN 61 326 97/23/EG Druckgeräterichtlinie, Anlage 1 Konformitätserklärung auf Anfrage	
Schockbelastbarkeit	g	< 100 nach IEC 770 (Schock mechanisch)	
Vibrationsbelastbarkeit	g	< 5 nach IEC 770 (Vibration bei Resonanz)	
Elektrische Schutzarten		Verpolungs- und Kurzschlusschutz, galvanische Trennung	
Schutzart		nach IEC 60 529 / EN 60 529, siehe Seite 30	
Masse	kg	Ca. 0,4	

* Einschließlich Linearität, Hysterese und Wiederholbarkeit, Grenzpunkteinstellung kalibriert bei senkrechter Einbaulage Druckanschluss nach unten.

1) Nicht für frontbündige Geräte

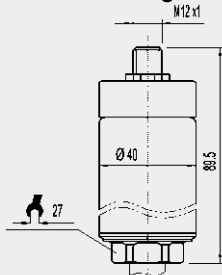
2) Bei Ausführung für Sauerstoff darf eine Messstofftemperatur von 60 °C nicht überschritten werden. Die Ausführung für Sauerstoff ist nicht möglich bei Unterdruck-Messbereichen sowie bei Absolutdruck-Messbereichen < 1 bar abs.

{ } Angaben in geschweiften Klammern beschreiben gegen Mehrpreis lieferbare Sonderheiten

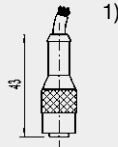
3. Technische Daten

D

3.1 Abmessungen

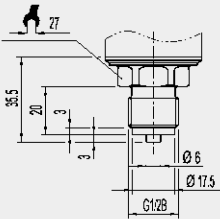


Rundsteckverbinder *)
M 12x1, IP 65
Bestellcode: M5

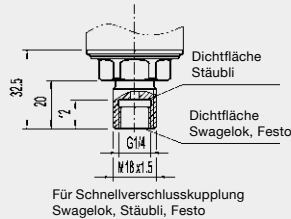


Druckanschlüsse

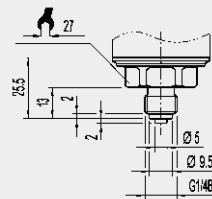
G 1/2 B, EN 837-G 1/2B
Bestellcode: GD



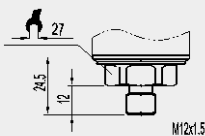
M 18x1,5
Bestellcode: M6



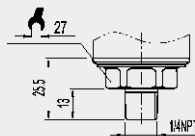
G 1/4 B
Bestellcode: GB



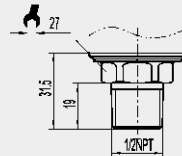
M 12x1,5
Code: MK



1/4 NPT
nach „Nennmaße
für US-Standard kegeliges
Rohrgewinde NPT“
Bestellcode: NB

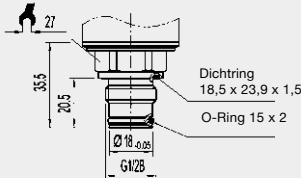


1/2 NPT nach „Nennmaße für US-
Standard kegeliges Rohrgewinde NPT“
Bestellcode: ND

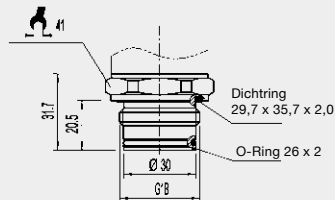


Drückanschlüsse frontbündig

G 1/2 B
Bestellcode: 86



G 1 B
Bestellcode: 85



Einschraubblöcher und Einschweißstutzen siehe Datenblatt IN 00.14 oder unter www.wika.de/download.

*) Andere elektrische Anschlüsse, sowie IP 67 auf Anfrage. 1) Gegenstecker sind nicht im Lieferumfang enthalten.

4. Montage

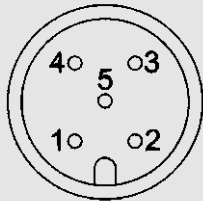
4.1 Elektrischer Anschluss

Rundsteckverbinder M 12x1, 5-polig

D

Einbau-Gerätestecker Draufsicht (nach CiA DR-303-1)

Anschlussbelegung



1-

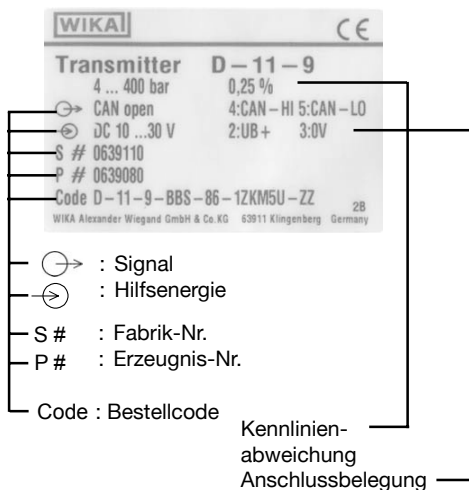
2 - U_B+

3 - U_B-

4 - Bus-Signal CAN-High

5 - Bus-Signal CAN-Low

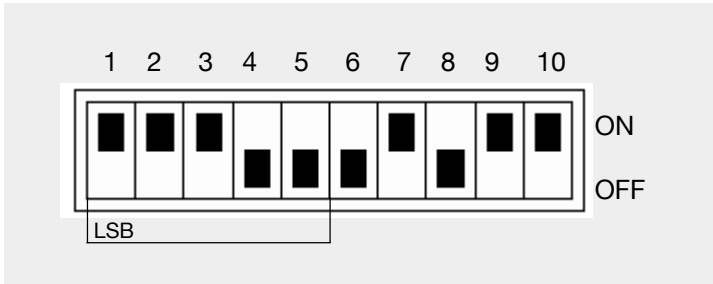
4.2 Beschreibung Typenschild



2439316.01 D/GB/F 02/2003

5. Inbetriebnahme

D 5.1 DIP-Schalter-Belegung



Dipschalter 1 bis 5: Adresseinstellung, Adresse 1...31

Dipschalter 6: Baudrate
ON=20kBd
OFF=250kBd

Dipschalter 7: Einstellungen
ON: von DIP-Schalter
OFF: aus geräteinternem Speicher

Dipschalter 8: Umschalten der Messwertausgabe
ON: aktuell konfigurierte PDO wird alle 10 ms gesendet
(z.B. für Diagnosezwecke)
OFF: Ausgabe nach Einstellung im Objektverzeichnis

Dipschalter 9 und 10: Abschlusswiderstand
ON: Abschlusswiderstand eingeschaltet
OFF: Abschlusswiderstand ausgeschaltet

Werkseinstellung: Dipschalter 1-10: OFF

5. Inbetriebnahme

5.2 PDO-Aufbau

D

Telegrammstruktur PDO

ID	DLC	Byte 1	Byte 2	Byte 3	Byte 4
Identifizier	8			Prozesswert	
Byte 5	Byte 6	Byte 7	Byte 8		

Der Aufbau der synchronen und asynchronen PDO ist identisch.

Byte 1 bis Byte 4 enthalten den aktuell konfigurierten Prozesswert. Die Codierung entspricht DS 301, Kapitel 9.1.4.5.

Dabei stellt Byte 1 das least und Byte 4 das most significant Byte dar.

Werkseinstellung: Objekt 91 30 01

Die folgenden INTEGER-Datentypen werden verwendet.

octet number	1.	2.	3.	4.
INTEGER32	b ₇ ..b ₀	b ₁₅ ..b ₈	b ₂₃ ..b ₁₆	b ₃₁ ..b ₂₄

5. Inbetriebnahme

D 5.3 Objektverzeichnis-Communication Profile Area (according CiA Draft Standard 301), Teil 1

Index	Sub-Index	Object Name	Type	Attr	Default-Value	Remarks
34	1000 h 0	var device type	unsigned 32	ro	00 02 01 94 h	DSP 404, analogue input block
	1001 h 0	var error register	unsigned 8	ro	00 h	
	1005 h 0	var COB-ID SYNC	unsigned 32	ro	80 h	
	1009 h 0	var manufacturer hardware version	visible string	ro		
	100A h 0	var manufacturer software version	visible string	ro		
	100C h 0	var guard time	unsigned 16	rw	00 h	only multiple of 10
	100D h 0	var life time factor	unsigned 8	rw	00 h	
	1010 h	array store parameters	unsigned 32			*1
	0	var number of entries	unsigned 8	ro	01 h	
	1	var save all parameters	unsigned 32	rw	01 h	
	1011 h	array restore default parameters	unsigned 32			*2
	0	var number of entries	unsigned 8	ro	01 h	
	1	var restore all default parameters	unsigned 32	rw	01 h	
	1014 h 0	var COB-ID Emergency message	unsigned 32	ro	81 h	80h + Node-ID
	1018 h	record Identity Object				
	0	var number of entries	unsigned 8	ro	04 h	
	1	var Vendor ID	unsigned 32	ro	00 00 00 47 h	
	2	var Product code	unsigned 32	ro	P#	
	3	var Revision number	unsigned 32	ro		
	4	var Serial number	unsigned 32	ro	S#	
	1800 h	record 1st transmit PDO parameter				
	0	var number of entries	unsigned 8	ro	02 h	
	1	var COB-ID used by PDO	unsigned 32	ro	01 81 h	
	2	var transmission type	unsigned 8	ro	FE h	

5. Inbetriebnahme

5.3 Objektverzeichnis-Communication Profile Area (according CiA Draft Standard 301), Teil 2

D

Index	Sub-Index	Object Name	Type	Attr	Default-Value	Remarks
1801 h	record	2nd transmit PDO parameter				
	0	number of entries	unsigned 8	ro	02 h	
	1	COB-ID used by PDO	unsigned 32	ro	02 81 h	
	2	transmission type	unsigned 8	ro	01 h	
1A00 h	record	1st transmit PDO mapping				
	0	number of mapped application objects in PDO	unsigned 8	ro	01 h	
	1	PDO mapping for the 1. application object to be mapped	unsigned 32	ro	91 30 01 20 h	
1A01 h	record	2nd transmit PDO mapping				
	0	number of mapped application objects in PDO	unsigned 8	ro	01 h	
	1	PDO mapping for the 2. application object to be mapped	unsigned 32	ro	91 30 01 20 h	

*1: By writing the signature "save" 65766173h, all settings are saved on the module

*2: By writing the signature "load" 64616F6Ch, the factory default settings are loaded

5. Inbetriebnahme

D 5.4 Objektverzeichnis-Manufacturers Specific Profile Area

Index	Sub-Index	Object	Name	Type	Attr	Default-Value	Remarks
2001 h	0	var	measure mode	unsigned 8	ro		
2002 h	0	var	sampling time	unsigned 16	ro		
2003 h		record	next calibration	unsigned 16			
	0	var	number of entries	unsigned 8	ro	2	
	1	var	month	unsigned 16	rw		
	2	var	year	unsigned 16	rw		
2004 h		record	last calibration	unsigned 16			
	0	var	number of entries	unsigned 8	ro	2	
	1	var	month	unsigned 16	rw		
	2	var	year	unsigned 16	rw		
2005 h	0	var	maximum temperature	integer 16	ro		
2006 h	0	var	cycle timer	unsigned 8	rw	00 h	0 or 10 allowed
20FD h			reserved				
20FE h			reserved				
20FF h			reserved				

5.5 Objektverzeichnis-Device Profile Area (according CiA DSP 404)

Index	Sub-Index	Object	Name	Type	Attr	Default Value	Remarks
6110 h		array	AL_Sensor_Type	unsigned 16			
	0	var	number of entries	unsigned 8	ro	01 h	
6131 h		var	AL_Sensor_Type_1	unsigned 16	ro	5A h	Pressure Transducer
	0	array	AL_Physical_Unit_PV	unsigned 16	ro	01 h	
6132 h		var	number of entries	unsigned 8	ro	00 22 h	pressure unit Pascal
	1	var	AL_Physical_Unit_PV_1	unsigned 16	ro		
7100 h		array	AL_Decimal_Digits_PV	unsigned 8	ro	01 h	
	0	var	number of entries	unsigned 8	ro	00 h	
7100 h		var	AL_Decimal_Digits_PV_1	unsigned 8	ro		
	1	array	AL_Input_FV	unsigned 16	ro	01 h	
9130 h		var	number of entries	unsigned 8	ro		
	1	var	AL_Input_FV_1	unsigned 16	ro		
9148 h		array	AL_Input_PV	integer 32			
	0	var	number of entries	unsigned 8	ro	01 h	pressure value
9148 h		var	AL_Input_PV_1	integer 32	ro		
	1	array	AL_Span_Start	integer 32	ro	02 h	
9149 h		var	number of entries	unsigned 8	ro		min. operating pressure (Pa)
	1	var	AL_Span_Start_1	integer 32	ro		
9149 h		array	AL_Span_End	integer 32			
	0	var	number of entries	unsigned 8	ro	02 h	
	1	var	AL_Span_End_1	integer 32	ro		max. operating pressure (Pa)

5. Inbetriebnahme

D

5.6 Objektverzeichnis-Beschreibung des Herstellerspezifischen Profils

Nachfolgende Beschreibung ist in englischer Sprache, gemäß der CiA-Definition !

Description of Manufacturer Specific Profile Area

Object 2001 Measure Mode

This read only entry stores the transducer type.

This is coded as follows:

128 gauge, 000 absolute.

Object 2002 Sampling Time

This read only entry stores the maximum interval between successive pressure readings in the units of ms.

Object 2003 Next calibration (Year / Month)

The date of the next calibration in year / month format is stored. Initially this is the date of the factory calibration + 1 year. When a calibration is performed the user should update this date.

Object 2004 Last calibration (Year / Month)

The date of the last calibration in year / month format is stored. Initially this is the date of the factory calibration. When a calibration is performed the user should update this date.

5.7 Objektverzeichnis-Beschreibung des Kommunikationsprofils

Nachfolgende Beschreibung ist in englischer Sprache, gemäß der CiA-Definition !

Description of Communication Profile Area

1010h Store parameters

- Guard Time (100Ch)
- Life Time Factor (100Dh)

1011h Restore default parameters

- Guard Time (100Ch)
- Life Time Factor (100Dh)

1800h 1st transmit PDO parameter (asynchronous PDO)

Subindex 1: COB-ID used by PDO

180h + Node-ID

Subindex 2: Transmission Type (FEh)

(dependent on object 2006h cycle timer)

1801h 2nd transmit PDO parameter (asynchronous PDO)

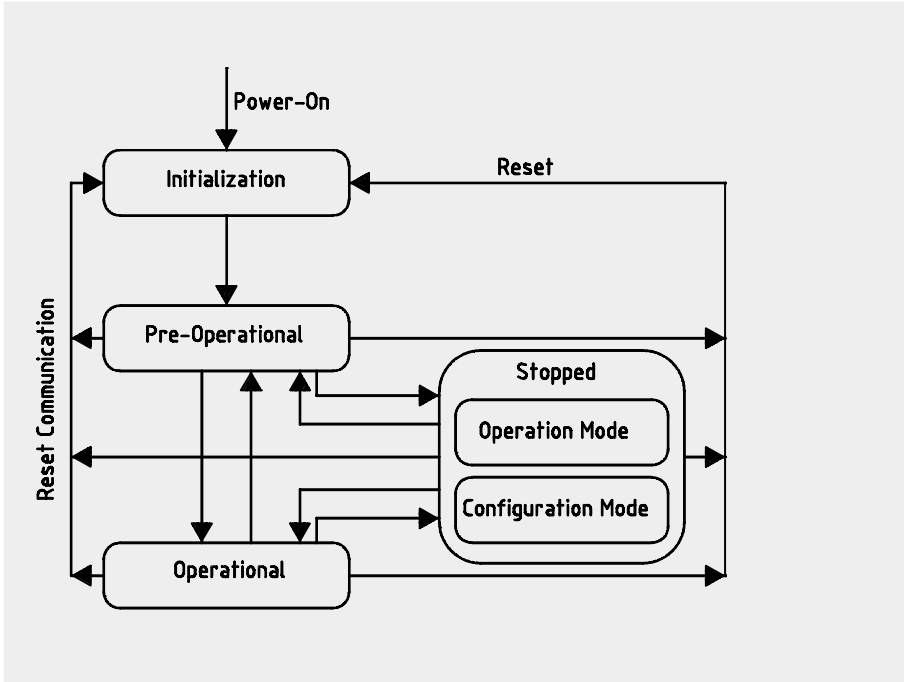
Subindex 1: COB-ID used by PDO

280h + Node-ID

Subindex 2: Transmission Type (01h)

Slave answers on every SYNC

D 6.1 NMT Slave State Diagramm



6.2 Einstellung der Knoten-Nummer

- Gerät in Stopped Mode bringen
- Wechsel vom Operation Mode in den Configuration Mode über Switch Mode Selective:

Master sendet:

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	CS	LSB	
Byte3	Byte4	Byte5	Byte6	Byte7
	MSB	res.	res.	res.

CS: Command Specifier

Byte 0	Byte 1-4	Byte 5-7
40h	Vendor-ID (00000047h)	res.
41h	Productcode (siehe Typenschild: P#)	res.
42h	Revision Number	res.
43h	Serial Number (siehe Typenschild: S#)	res.

(Die entsprechenden Gerätedaten sind im Objektverzeichnis, Index 1018h enthalten)

Gerät antwortet:

ID	DLC	Byte0	Byte1	Byte2
7E4h	8	CS	LSB	
Byte3	Byte4	Byte5	Byte6	Byte7
	MSB	res.	res.	res.

Byte 0 44h
 Byte 1 Mode
 Byte 2-7 res.

Mode 0: Operation Mode
 Mode 1: Configuration Mode

6. Kommunikation (LSS Dienste nach CiA 305 V1.0)

D

- Einstellung der Knoten-Nr. durch

Master sendet:

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	CS		
Byte3	Byte4	Byte5	Byte6	Byte7

Byte 0 11h
Byte 1 Node-ID
Byte 2-7 res

Gerät antwortet:

ID	DLC	Byte0	Byte1	Byte2
7E4h	8	CS		
Byte3	Byte4	Byte5	Byte6	Byte7

Byte 0 11h
Byte 1 Errorcode (0=Protokoll erfolgreich beendet)
1= Node-ID ausserhalb des gültigen Bereichs)
Byte 2 Specific Error (nicht benutzt)
Byte 3-7 res.

- Wechsel vom Configuration Mode in den Operation Mode über Switch Mode Global

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	04h	00h	
Byte3	Byte4	Byte5	Byte6	Byte7

6.3 Einstellung der Übertragungsrate

- Gerät in Stopped Mode bringen
- Wechsel vom Operation Mode in den Configurations Mode über Switch Model Global:

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	04h	01h	
Byte3	Byte4	Byte5	Byte6	Byte7

- Einstellen der Baudrate

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	13h		
Byte3	Byte4	Byte5	Byte6	Byte7

Byte 1 00h (Table Selector: CiA Bit Timing Table)
 Byte 2 Table Index (siehe Kapitel 7.4 Bitrate Tabelle)

Gerät antwortet:

ID	DLC	Byte0	Byte1	Byte2
7E4h	8	13h		
Byte3	Byte4	Byte5	Byte6	Byte7

Byte 1 Error-Code	Byte 2 Specific Error	
00h		Protokoll erfolgreich beendet
FFh	01h	Table Selector ung Itig
FFh	02h	Table index out of range

6. Kommunikation (LSS Dienste nach CiA 305 V1.0)

D ■ Aktivierung der neuen Übertragungsrate durch

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	15h		
Byte3	Byte4	Byte5	Byte6	Byte7

Byte 1-2 Switch Delay (Zeit in ms, die bis zur Aktivierung der neuen Baudrate vergehen soll).

■ Wechsel vom Configuration Mode in der Operations Mode über Switch Model Global:

ID	DLC	Byte0	Byte1	Byte2
7E5h	8	04h	00h	
Byte3	Byte4	Byte5	Byte6	Byte7

6.4 Bitrate Tabelle

Baud Rate	Index Table
1000 kBit	0
800 kBit	1
500 kBit	2
250 kBit	3
125 kBit	4
100 kBit	5
50 kBit	6
20 kBit	7
10 kBit	8

7. Fehlersuche

Fehler	Ursache	Abstellmaßnahme
Die Einstellung der Node-ID wurde erfolgreich bestätigt, aber sie ist nicht aktiv.	Einstellungen werden vom DIP-Schalter übernommen.	DIP-Schalter umschalten, so dass die Parameter aus dem geräteinternen Speicher geladen werden.
Die Einstellung der Übertragungsrate wurde erfolgreich bestätigt, aber sie ist nicht aktiv. geladen werden.	Einstellungen werden vom DIP-Schalter übernommen.	DIP-Schalter umschalten, so dass die Parameter aus dem geräteinternen Speicher geladen werden.

D

7.1 Error-Codierung

Dies gilt nur für die Fehlermeldungen die mittels Emergency Messages gesendet werden. Im ErrorRegister wird nur der Fehler 1 unterstützt (= allgemeiner Fehler).

Telegrammstruktur Emergency Message (EMCY) Slave sendet				
ID	DLC	Byte 1	Byte 2	Byte 3
80h + NID	8			
Byte 4	Byte 5	Byte 6	Byte 7	Byte 8

- Byte 1 = Low Byte des ErrorCodes
- Byte 2 = High Byte des ErrorCodes
- Byte 3 = aktueller Inhalt des ErrorRegisters
- Byte 4 = Herstellerspezifischer Fehler
- Byte 5 - 8 unbenutzt

Error Code	Meaning
00 00h	Non error
10 00h	Generic Error
FF 00h	Device Specific Error

Folgende spezifischen Felder werden unterstützt:

7. Fehlersuche, 8. Service

D

Inhalt Byte4	Bedeutung	Anmerkung
01h	interner Fehler	*
02h	interner Fehler	evtl. Sensor mech. defekt
04h	Druckwert mehr als 5 % der Spanne über MBE	
08h	Druckwert mehr als 5 % der Spanne unter MBA	
10h	Temperatur am Sensor größer 80°C	
40h	interner Fehler	*

* interner Gerätefehler, zur Behebung Hardwarereset erforderlich

8. Service

WIKA- Druckmessumformer sind wartungsfrei!

Bei Rückfragen



++49 9372.132-295

Es gelten unsere aktuellen Verkaufs- und Lieferbedingungen siehe unter www.wika.de/download.

Technische Änderungen vorbehalten.

Europe/Middle East/ Africa

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Benelux	WIKA Benelux Tel.: 0031/475/53 55 00 E-Mail: info@wika.nl
Finland	WIKA Finland Oy Tel.: 00358/9/68 24 920
France	WIKA Instruments s.a.r.l. Tel.: 0033/1/34 30 84 84 E-Mail: info@wika-instruments.fr
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