

7. I²C-Interface

7.1 Configuration of I²C-Interface

Concerns only DCT 532i

Factory setting	050	0	0	0	0	0	00001
Slave address							
address	1						
	...						
	127						
Type of result register							
32bit IEEE float				0			
16bit integer				1			
Byte order of values							
Low byte first				0			
High byte first				1			
Mode of result register							
Value				0			
Percent of nominal				1			
Restore of address pointer							
no restore						0	
to last set address on next start						1	
Digital meaning							
Count of result							00001 ... 10000

7.2 Register overview

Re-gister	Type 0 (Float)	Type 1 (Int 16)
0x00	Status	Status
0x01	Pressure	Pressure
0x02		
0x03		
0x04		
0x05	Temperature	Temperature
0x06		
0x07		
0x08		

Re-gister	Type 0 (Float)	Type 1 (Int 16)
0x40	Configuration	Configuration
0x41	Oversampling	Oversampling
0x42		
0x43		
0x44	Slave Address	Slave Address
0x45	Pressure unit	Pressure unit
0x46	Nominal pressure lower	Nominal pressure lower
0x47		Decimal places
0x48	Nominal pressure upper	Nominal pressure upper
0x49		
0x4A		
0x4B		
0x4C	Temperature unit	Temperature unit
0x4D		
0x4E	Nominal temperature lower	Nominal temperature lower
0x4F		Decimal places
0x50		Nominal temperature upper
0x51		
0x52		
0x53		
0x54		
0x55		

7.3 Explicit register description

Explanation:

r = only readable

r/w = read and write capable

d = don't care

0x00 – Status register:

7	6	5	4	3	2	1	0
ABS			ERR	SAT	OVER	UNDER	READY
r	d	d	r	r	r	r	r

bit 0	Result registers is READY
0 b =	Outdated values will be read
1 b =	Registers contain new values
Note:	This bit has same behaviour as hardware ready connector. Logic level is inverted because of open collector at output stage.
Note:	It is possible to poll update without using hard wiring, or to check which sensor has updated if more than one is used on bus.
bit 2	Value is out of UNDER nominal range
0 b =	Pressure value is in nominal range
1 b =	Pressure is too low
Note:	OVER and UNDER flags are stored until state register is read.
bit 3	Value SAT urated
0 b =	No saturation
1 b =	Output value or ADC is out of range
bit 4	Internal ERR or, transmitter does not work
0 b =	Transmitter is in normal operation
1 b =	Internal error or wrong setting is active
bit 7	Transmitter is ABS olute
0 b =	Pressure type of transmitter is relative
1 b =	Pressure type of transmitter is absolute

0x40 – Configuration register

7	6	5	4	3	2	1	0
ADD			RESTORE	MODE	ORDER	TYPE	
r/w	d	d	r/w	r/w	r/w	r/w	r/w

bit 0	TYPE of result register
0 b =	32bit IEEE float
1 b =	16bit integer
bit 1	Byte ORDER of values
0 b =	Low byte first
1 b =	High byte first
bit 2...3	MODE of result register
00b =	Value
01b =	Percent of nominal
10b =	reserved
11b =	reserved
bit 4	RESTORE address pointer
0 b =	No restore
1 b =	Restore to last set address on restart
Note:	Using this setting causes reset of register pointer to last written after each stop condition of readout.
bit 7	Set new I2C slave ADDRESS
0 b =	Slave address stays as it is
1 b =	Set this bit to apply previously set slave address

0x43 – Slave address register

7	6	5	4	3	2	1	0
SLAVE_ADDRESS							
r/w							d

bit 1...7	SLAVE ADDRESS which this transmitter acknowledges
Note:	To apply new address, it is necessary to set ADD bit in configuration register after new address is written.

0x44 – Pressure unit register

7	6	5	4	3	2	1	0
UNIT							
r/w							

bit 0...7	Pressure UNIT (according to units in HART protocol)
0x01	inH ₂ O @ 68°F
0x02	inHg @ 0°C
0x03	ftH ₂ O @ 68°F
0x04	mmH ₂ O @ 68°F
0x05	mmHG @ 0°C
0x06	psi
0x07	bar
0x08	mbar
0x09	g/cm ²
0x0A	kg/cm ²
0x0B	Pa
0x0C	kPa
0x0D	Torr
0x0E	atm
0x0F	inH ₂ O @ 60°F
0x10	cmH ₂ O @ 4°C
0x11	mH ₂ O @ 4°C
0x12	cmHg @ 0°C
0x13	lb/ft ²
0x14	hPa
0x15	kg/m ²
0x16	ftH ₂ O @ 4°C
0x17	ftH ₂ O @ 60°F
0x18	mHg @ 0°C
0x19	Mpa
0x1A	inH ₂ O @ 4°C
0x1B	mmH ₂ O @ 4°C

0x4d – Temperature unit register

7	6	5	4	3	2	1	0
UNIT							
r/w							

bit 0...7	Temperature UNIT (according to units in HART protocol)
0x20	°C
0x21	°F
0x22	°R
0x23	K
Note:	If pressure or temperature unit is set to an invalid value, slave will not acknowledge.
Note:	If 16bit integer mode is selected and nominal values can not be displayed with 0...5 decimal places, ERROR flag is set and DECIMAL_PLACES will be 0xff.

0x47 / 0x50 – Decimal places register

7	6	5	4	3	2	1	0
DECIMAL_PLACES							
r							

bit 0...7	Count of DECIMAL_PLACES
Note:	Available only when 16bit integer type is selected.
Note:	Value will be calculated automatically according to nominal range.

8. Maintenance

	Danger of death from airborne parts, leaking fluids, electric shock - Always service the device in a depressurized and de-energized condition!
	Danger of injury from aggressive fluids or pollutants - Depending on the measured medium, this may constitute a danger to the operator. - Wear suitable protective clothing e.g. gloves, safety goggles.

If necessary, clean the housing of the device using a moist cloth and a non-aggressive cleaning solution.

The cleaning medium for the media wetted parts (pressure port/diaphragm/seal) may be gases or liquids which are compatible with the selected materials. Also observe the permissible temperature range according to the data sheet.

Deposits or contamination may occur on the diaphragm/pressure port in case of certain media. Depending on the quality of the process, suitable maintenance intervals must be specified by the operator. As part of this, regular checks must be carried out regarding corrosion, damage to the diaphragm and signal shift.

If the diaphragm is calcified, it is recommended to send the device to BD SENSORS for decalcification. Please note the chapter "Service/Repair" below.

NOTE – Wrong cleaning or improper touch may cause an irreparable damage on the diaphragm. Therefore, never use pointed objects or pressured air for cleaning the diaphragm

9. Troubleshooting

	Danger of death from airborne parts, leaking fluids, electric shock - If malfunctions cannot be resolved, put the device out of service (proceed according to chapter 10 up to 12)
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In case of malfunction, it must be checked whether the device has been correctly installed mechanically and electrically. Use the following table to analyse the cause and resolve the malfunction, if possible.

Fault: no output signal	
Possible cause	Fault detection / remedy
Connected incorrectly	Checking of connections
Conductor/wire breakage	Checking of all line connections.
Defective measuring device (signal input)	Checking of ammeter (miniature fuse) or of analogue input of your signal processing unit
Fault: incorrect signal behaviour	
Possible cause	Fault detection / remedy
Load resistance too high	Checking of load resistance (value)
Supply voltage too low	Checking of power supply output voltage
Defective energy supply	Checking of the power supply and the supply voltage being applied to the device
Diaphragm of sensor is severely contaminated or damaged	Checking of diaphragm; if necessary, send the device to BD SENSORS for repair
Fault: wrong or no output signal	
Possible cause	Fault detection / remedy
Cable damaged mechanically, thermally or chemically	Checking of cable; pitting corrosion on the stainless-steel housing as a result of damage on cable; when damaged, send the device to BD SENSORS for repair

10. Removal from Service

	Danger of death from airborne parts, leaking fluids, electric shock - Disassemble the device in a depressurized and de-energized condition!
	Danger of injury from aggressive media or pollutants - Depending on the measured medium, this may constitute a danger to the operator. - Wear suitable protective clothing e.g. gloves, goggles.

NOTE - After dismounting, mechanical connections must be fitted with protective caps.

11. Service/Repair

Information on service / repair:

- www.bdsensors.com
- info@bdsensors.de
- Service phone: +49 (0) 92 35 98 11 0

11.1 Recalibration

During the life-time of a transmitter, the value of offset and span may shift. As a consequence, a deviating signal value in reference to the nominal pressure range starting point or end point may be transmitted. If one of these two phenomena occurs after prolonged use, a recalibration is recommended to ensure furthermore high accuracy.

11.2 Return

	Danger of injury from aggressive media or pollutants - Depending on the measured medium, this may constitute a danger to the operator. - Wear suitable protective clothing e.g. gloves, goggles.
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Before every return of your device, whether for recalibration, decalcification, modifications or repair, it has to be cleaned carefully and packed shatter-proofed. You have to enclose a notice of return with detailed defect description when sending the device. If your device came in contact with harmful substances, a declaration of decontamination is additionally required.

Appropriate forms can be downloaded from our homepage. Download these by accessing www.bdsensors.com or request them:

info@bdsensors.de | phone: +49 (0) 92 35 / 98 11 0

In case of doubt regarding the fluid used, devices without a declaration of decontamination will only be examined after receipt of an appropriate declaration!

12. Disposal

	Danger of injury from aggressive media or pollutants - Depending on the measured medium, this may constitute a danger to the operator. - Wear suitable protective clothing e.g. gloves, goggles.
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The device must be disposed of according to the European Directive 2012/19/EU (waste electrical and electronic equipment). Waste equipment must not be disposed of in household waste!



NOTE - Dispose of the device properly!

13. Warranty Terms

The warranty terms are subject to the legal warranty period of 24 months, valid from the date of delivery. If the device is used improperly, modified or damaged, we will rule out any warranty claim. A damaged diaphragm will not be accepted as a warranty case. Likewise, there shall be no entitlement to services or parts provided under warranty if the defects have arisen due to normal wear and tear.

14. EU Declaration of conformity / CE

The delivered device fulfils all legal requirements. The applied directives, harmonised standards and documents are listed in the EC declaration of conformity, which is available online at: <http://www.bdsensors.com>. Additionally, the operational safety is confirmed by the CE sign on the manufacturing label.