

ASCII Mode Protocol

The sensor can be set to output data in ASCII format instead binary format. The sensor is default delivered in binary mode and to switch to ASCII mode the ASCII text "ASON" has to be transmitted to the sensor.

To switch the sensor back to binary mode the text "ASOFF" has to be send to the sensor.

To achieve full measurement speed (1000 Hz) in ASCII mode the baud rate has to be 115200 baud or above. If the baud rate is 38400 the output frequency of the sensor will only be 333 Hz (this only applies for ASCII mode. If the sensor is in Binary mode it will always give out the full measurement frequency of 1000 Hz).

Measurements output format in ASCII Mode: The measurements are send as 5 digits in mm (for results less than 5 digits there is a leading zero) with point separator and with LF (Line Feed) and CR (Carriage Return).

Example: "1"; "0"; "3"; "."; "4"; "3"; "LF"; "CR"; "1"; "0"; "3"; "."; "4"; "1"; "LF"; "CR"; etc.

Equals: 103.43
103.41
099.41
088.52
000.00

ASCII Commands:

(All case sensitive)

ASON : Starts ASCII Mode (the sensor will continue in ASCII mode also after it has been switched OFF and ON).

ASOFF : Stops ASCII Mode (the sensor will continue in BINARY mode also after it has been switched OFF and ON).

RAVG + 4 digits : Setup the running average filter. Has to be 0 or 2-1000. If the wished filter size has less than 4 digits then preset zero values has to be used (example: RAVG0050). Returns "RAVG OK" or "RAVG ERROR".

ZEROSP + 3 digits : Setup Zero suppression. Has to be less than the RAVG value. If the wished filter size has less than 3 digits then leading zero has to be used (example: ZEROSP049). Returns "ZEROSP OK" or "ZEROSP ERROR".

SIMAVG + 3 digits : Setup Simple Average filter. Has to be 0 (=disabled) or 2-200. If the wished filter size has less than 3 digits then leading zero has to be used (example: SIMAVG005). Returns "SIMAVG OK" eller "SIMAVG ERROR".

MEDIAN + 3 digits : Setup Median filter. Only Odd numbers 3-101 or 0 (= disabled). If the wished filter size has less than 3 digits then leading zero has to be used (example: MEDIAN021). Returns "MEDIAN OK" or "MEDIAN ERROR".

BAUD + 6 digits : Setup Baud rate. Has to be: 038400, 11522, 230400, 460800, 921600. At 38400 Baud a leading zero has to be used. (example: BAUD038400). Returns "BAUD OK" or "BAUD ERROR".

ODMON : Enable ON DEMAND Mode.

Q : Send one single measurement (works only if "ON DEMAND MODE" is enabled).

ODMOFF : Disable ON DEMAND Mode.

STATUS : Read out select settings + serial number.

Example:

```
SENSOR STATUS:
FIRMWARE VERS: 100.01
SERIAL NUMBER: 181020
RUNNING AVG: 50
ZERO SUPPRESSION: 49
SIMPLE AVG: 20
ON DEMAND MODE: OFF
MEDIAN: 31
BAUD: 38400
```

Select Programming Modes

The Select functionality consists of a number of modes and filter settings described below. Most of the settings can be combined and it is therefore important to know that the sequence in which they are implemented, and this corresponds to the order in which they appear here below.

Settings can easy be modified with ODS Explorer software. See user manual for commands to change settings.

Median Filter

In this setting one of 15 Group Seizes can be chosen from 3, 5, 7, 9, 11, 13 all the way up to 101. The filter ranks the values in the group, thus's in a sorted sequence value number 2, 3, 4, 5, 6 up to 50 will be the value outputted (converted).

Simple Average Filter

In this setting every new non zero value is averaged over an interval given by the compression factor. If all values in the interval are zero, a zero value will be output. It is important to note that only one averaged value will be output, and therefore the output frequency will be reduced according to the compression factor. If for example a compression factor 20 is used, the sensors output rate will be reduced to 50 Hz.

Running Average Filter

In this setting a group of measuring values are being averaged on the fly after the zero values has been suppressed/discarded in the calculation of the running average. The size of the group can be chosen from 2 to 1000 measuring points, and the maximum number of zero values to be ignored in the calculation can be chosen between 1 and 999. It is recommended to use maximum zero suppression. If a data stream contain more consecutive zero values than specified by the zero suppression parameter a zero value will be output.

Level Mode

In this Mode the values are inverted. For example will an ODS250(50-450 mm) output 450 mm at short haul and 50 mm when measuring at its longest range.

Sample-Hold Mode

In this Mode the latest valid measurement data will be output and any occurring zeros will be replaced with the latest valid measurement value until a new non zero measurement result is detected. Light Intensity Codes as well as zero values will never be output after the first valid measurement data has occurred.

Baud Rate Settings

A change of Baud rate is not activated before the sensor is turned of and powered up again.

Baud rate can either be 38400, 115200 or 230400 Baud.

In binary output mode 38400 will give out the full measurement speed (1000 Hz).

In ASCII mode 38400 Baud will reduce the measurement frequency to 333 Hz. The get full measurement output (1000 Hz) in ASCII mode the Baud rate has to be 115200 Baud or above.

Light Intensity Code Setting

"Zero" measurements are default an integer value less than 9.

The sensor can be reset to output zero values instead of the Codes.

Neither information type is output when Sample-Hold is enabled. If a measuring application give to many zero measuring results, it will be constructive to make an analyzes without any Select filtering done and save the captured raw measuring data to a file on hard disk for further scrutinizing or to be e-mailed to DSE.

The Light Intensity Codes can be explained as follows:

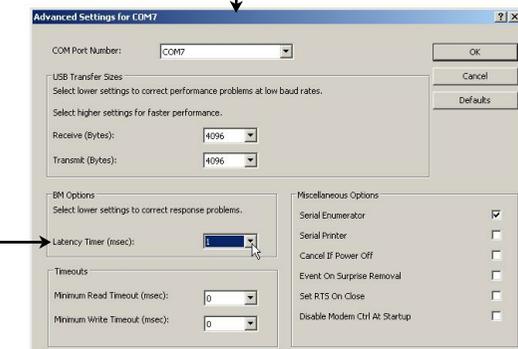
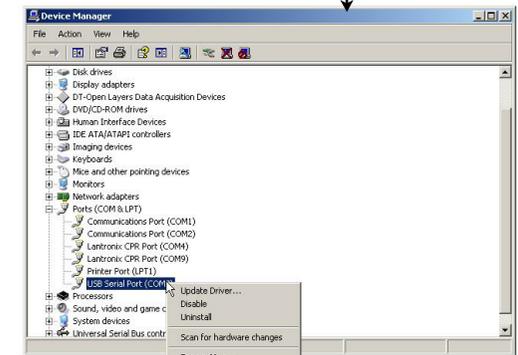
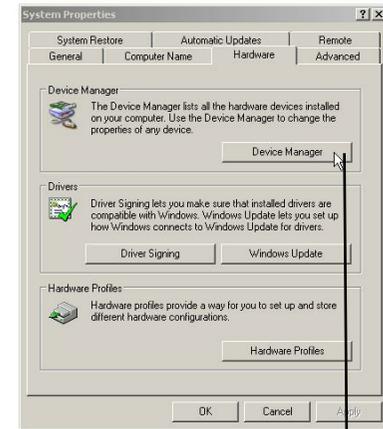
- 6: Too little light returned or there is no target at all.
- 5: Too much light returned/blinding or false light.
- 4: False light or an undefined spot recorded.

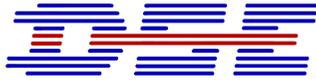
0/1/2: A target is observed, but is outside the measuring range.

Windows Set-up

When USB sensor (or a RS232/RS422 to USB converter) is connected to a Windows computer it will automatic configure a USB serial Port(ComX) for use in application software.

Important: The Latency Timer has to be set to 1ms (is default 16ms), see screen shot below:





Compact-Line Quick Start Guide



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Description

Compact-Line sensors are optical distance measuring devices for non contact precision measurement of distance.

The Compact-Line is a compact unit in which optics, sensor, and signal processing electronics are all integrated. The distance to an object is detected by means of the triangulation principle. A collimated laser beam forms a spot on the measuring object. The image of the spot is reflected onto a position detector, a CCD camera, and the electronic converts this position into the distance to the object by advanced mathematical procedures.

The output signal is binary as default, but can be switched to ASCII by sending command "ASON" to the sensor. Measuring frequency is 1000 Hz. Interface is USB 2.0, RS232 or RS422.

Connection is USB micro B, M8x1 male plug or fixed cable.

Automatic adjustment of the light intensity permits measurement on a wide variety of different surfaces. The Compact-Line can measure on most surfaces from white to black and all colours in between. Even though the sensor is constructed to measure on diffusely reflecting surfaces, many shiny surfaces can be measured too.

The Compact-Line is easy to mount correctly, since a light emitting diode on the upside of the sensor indicates, when the object is outside the range in which it can be detected, and when the object is at the center of the measuring range. Furthermore, the measuring spot is visible.

Laser Cautions

A Class 2 laser is considered to be eye safe because of the blink reflex. Intentional suppression of the blink reflex could lead to eye injury. For safety reasons, install the Compact-Line sensor in a location where the laser beam will not enter someone's eyes directly or reflected from a shiny surface.

Provide security installations as stated in relevant regulations, so that the laser beam will not go into someone's eyes, and also post a warning in the laser area.



Function of Light Indicators

LASER ON: Green light indicates that the laser is on.

www.sensor.dk
TYPE: ODS 80 (RS232 & 1-9V)
 Measure range: 50 - 100 mm
 Laser on ● S/N: 191-186
 Center ●
 Error ●

LASER RADIATION
 Do not stare into the beam.
 CLASS 2 LASER PRODUCT
 IEC 60825-1:2002
 Laser wavelength 655 nm
 Peak power < 1 mW Pulse frequency 1 - 10 kHz

RED: Constant red light means:

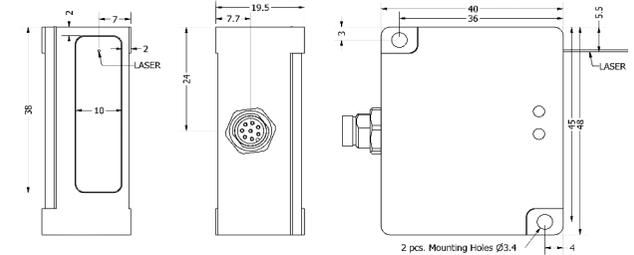
- The measuring object is outside the range in which the USB can detect an object,
- The reflect ability of the measuring object is so poor that the USB cannot detect the light reflected from the object.

GREEN: Constant green light means that the object is positioned at the center distance, i.e. at the center of the working range of the sensor.

NO LIGHT: If the sensor is turned on and the indicator diode light is off, this means that the object is within the measuring range of the sensor, but not exactly at the center distance.

Mounting

IMPORTANT: Only the two mounting points below the sensor (0.5 mm high foot) must be in contact with the mounting bracket/protection house.

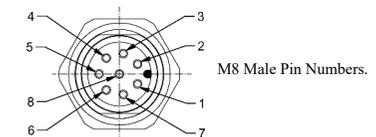


Connection

USB Models with M8 Connector or Fixed Cable		
M8 Pin	Cable Colour	Function
1	White	USB GND
2	Brown	NC
3	Green	NC
4	Yellow	NC
5	Grey	USB Vcc
6	Pink	NC
7	Blue	D +
8	Red	D -

RS232 Models with M8 Connector or Fixed Cable		
M8 Pin	Cable Colour	Function
1	White	RS232 RX
2	Brown	RS232 TX
3	Green	NC
4	Yellow	NC
5	Grey	4-20mA/1-9V Signal
6	Pink	4-20mA/1-9V GND
7	Blue	GND
8	Red	15-36 VDC Supply

RS422 Models with M8 Connector or Fixed Cable		
M8 Pin	Cable Colour	Function
1	White	RS422 RX+
2	Brown	RS422 TX+
3	Green	NC
4	Yellow	NC
5	Grey	RS422 RX-
6	Pink	RS422 TX-
7	Blue	GND
8	Red	15-36 VDC Supply



Specifications

Measurement Data:	
Measuring range	50 mm (ODS80), 200 mm (ODS155) or 400 mm (ODS250)
Center distance	75 mm (ODS80), 150 mm (ODS155) or 225 mm (ODS250)
Resolution	0.01 - 0.4 mm
Linearity	± 0.04 mm (ODS80), ± 0.15 mm (ODS155) ± 0.7 mm (ODS250)
Reproducibility	± Resolution
Updating frequency	1000 Hz
Temperature deviation	app. ± 0.03% of FS/°C
Light source	Visible laser (655 nm)
Size of light spot	< app. Ø 2 mm
Laser protection class	IEC 2

Output Data:	
Digital output	Binary or ASCII - USB 2.0, RS232 or RS422
Analog output	4-20 mA or 1-9 V (only available on RS232 models)

Environment Data:	
Operating temperature	0 - +50 °C
Storage temperature	-20 - +70 °C
Humidity (non condensing)	Max 90 % RH
Degree of protection	IEC IP65

Physical Data:	
Dimensions	WxHxD 48x40x19.5 mm
Weight exc. cable	55 g
Connector	USB micro-B, M8 8 pole male plug or fixed cable
Housing	Aluminum and glass

Electrical Data:	
Supply voltage	5V via USB or 15-36 VDC (RS232 and RS422 models)
Power consumption, max	0.75W (USB models) or 1.2W (RS232 and RS422 models)