

# Laser Non Contact Measurement

Distance, Thickness, Difference, Level, Height and Shape

## HIGH ACCURACY LASER TRIANGULATION



**ATI Systems**

*Committed to Quality*

**Head Office**

**011 383 8300**

International: +27 11 383 8300

sales@atisystems.co.za - www.atisystems.co.za

159 Galjoen Rd, Wadeville, Germiston

**Durban Branch**

**031 303 1587**

International: +27 31 303 1587

sales@atisystems.co.za - www.atisystems.co.za

10 Ballance Rd, Windermere, Durban



Management  
System  
ISO 9001:2008  
www.tuv.com



## Non Contact Measurement

### Specifications ODS Black-Line Select - 2 & Select - 10



### ODS Thickness Measurement

The ODS Black-Line sensors are calibrated for measuring thickness when paired.

The ODS Black-Line sensor will automatically turn itself into either the Master or the Slave half part of a thickness measuring system when the serial interfaces are connected to an identical ODS sensor model.

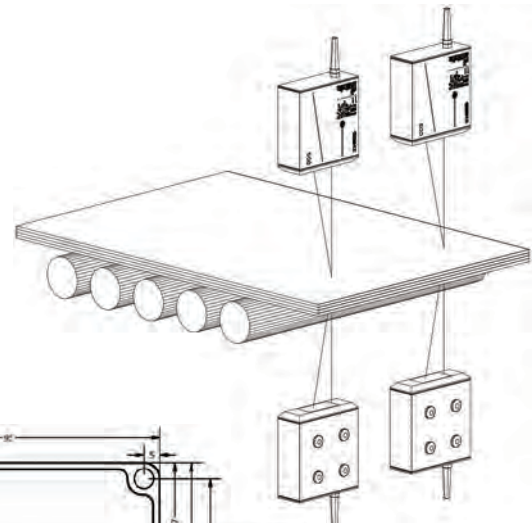
The Master sensor reads the digital distance data as it is sent from the slave sensor over the RS232 or RS422 serial interfaces, and after taking its own distance information into account, it will output the change in thickness in its calculated digital form as well as a converted analog signal. The sensors must always be synchronized, and will measure on transparent targets alternately from one side or the other if they are wired to measure at 1 kHz (half) frequency.

A couple of ODS sensors will thus measure thickness or width without any control box or special calibration from the factory. The ODS sensors can also be programmed to operate in Difference Mode instead of measuring thickness.

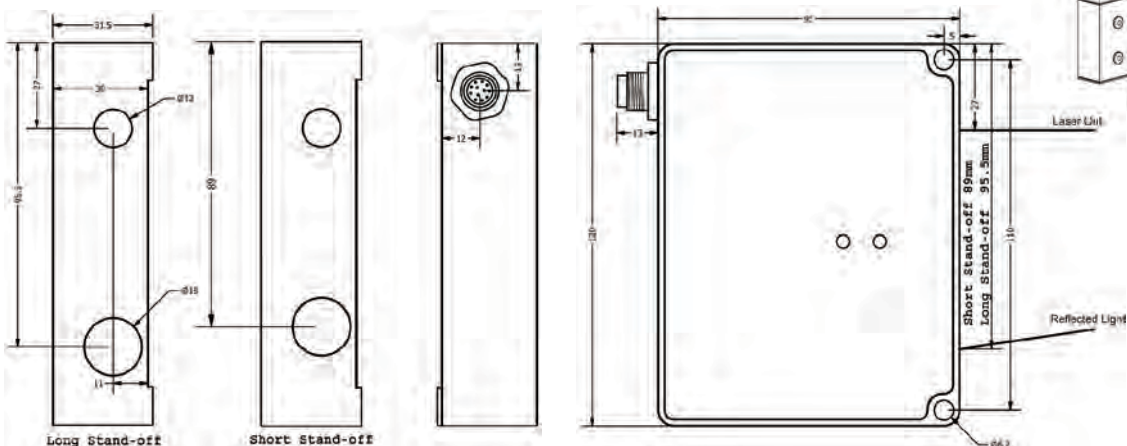
### Measuring Frequency 2 & 10 kHz

Output rates are user specified, but the sensor can be programmed to make an average of up to 200 measurements (disregarding all zero/missing values) and output it as a single point. This way, the output rate can be lowered from 2000 Hz or 1000 Hz in steps down to 10 Hz or 50 Hz. This is done with the Simple Average Filter.

The baud rate can also be changed. An output frequency of 2 kHz requires a baud rate of 115200, 10 kHz requires 460800. A baud rate of 38400 will reduce the serial output to 1 kHz.



### Dimensions



### ODS High Temperature Models

The ODS Black-Line sensors can be specified to measure up to 1000°C in HT form or 1300°C in VHT form with a Red Diode. When VVHT is specified, a Blue Diode is used and the target temperature can reach 1500°C or even higher if ordered so.



## Non Contact Measurement

### Specifications ODS Black-Line Select - 2 & Select - 10

HT / High target temperature (1000°C) versions and VHT (1300°C) as well as VVHT (1500 up to 2200°C) are also available.

#### Short Stand-off Models

Measurement Data	ODS 205	ODS 230	ODS 280	ODS 330	ODS 445
Measuring range (~Full Scale)	50 mm	100 mm	200 mm	300 mm	500 mm
Measuring range	180-230 mm	180-280 mm	180-380 mm	180-480 mm	200-700 mm
Center distance	205 mm	230 mm	280 mm	330 mm	450 mm
Nomimnal digital resolution	0.001	0.01	0.01	0.01	0.01
Resolution: Minnimum range *)	0.003 mm	0.01 mm	0.01 mm	0.01 mm	0.01mm
Resolution: Maximum range *)	0.006 mm	0.01 mm	0.03 mm	0.04 mm	0.08mm
Measurement Linearity *)	± 0.010 mm	± 0.02 mm	± 0.04 mm	± 0.12 mm	± 0.20 mm
Updating frequency *)	2 kHz/10 kHz	2 kHz/10 kHz	2 kHz/10 kHz	2 kHz/10 kHz	2 kHz/10 kHz
Temperature deviation	± 0.03% FS/C°	± 0.03%FS/C°	± 0.03% FS/C°	± 0.03%FS/C°	± 0.03%FS/C°
Light source / wave length	LASER 650 nm	LASER 650nm	LASER 650 nm	LASER 650nm	LASER 650nm
Size of spot	Ø 0.5 mm	Ø 0.6 mm	Ø 0.7 mm	Ø 0.8 mm	Ø 0.5 mm
Laser protection class *****)	IEC 2	IEC 2	IEC 2	IEC 2	IEC 2

#### Long Stand-off Models

Measurement Data	ODS 455	ODS 510	ODS 550	ODS 650	ODS 775
Measuring range (~Full Scale)	100 mm	200 mm	300 mm	500 mm	750 mm
Measuring range	400-500 mm	400-600 mm	400-700 mm	400-900 mm	400-1150 mm
Center distance	450 mm	500 mm	550 mm	650 mm	775 mm
Nomimnal digital resolution	0.01	0.01	0.01	0.01	0.01
Resolution: Minnimum range *)	0.01 mm	0.01 mm	0.01 mm	0.01mm	0.01
Resolution: Maximum range *)	0.02 mm	0.02 mm	0.03 mm	0.04 mm	0.10
Measurement Linearity *)	± 0.02 mm	± 0.04 mm	± 0.06 mm	± 0.10 mm	± 0.30
Updating frequency *)	2 kHz/10 kHz	2 kHz/10 kHz	2 kHz/10 kHz	2 kHz/10 kHz	2 kHz/10 kHz
Temperature deviation	± 0.03%FS/C°	± 0.03%FS/C°	± 0.03%FS/C°	± 0.03%FS/C°	± 0.03%FS/C°
Light source / wave length	LASER 650nm	LASER 650nm	LASER 650nm	LASER 650nm	LASER 650nm
Size of spot	Ø 0.6 mm	Ø 0.7 mm	Ø 1.0 mm	Ø 1.5 mm	Ø 2 mm
Laser protection class *****)	IEC 2	IEC 2	IEC 2	IEC 2	IEC 2

#### Output Data

**Analog Output \*\*):** 4-20 mA or 1-9 V  
**Digital Output \*\*\*):** RS232 or RS422  
**Baud Rate:** 115200 baud rate for 2 kHz output frequency  
**Baud Rate:** 460800 baud rate for 10 kHz output frequency

#### Electrical Data

**Supply Voltage:** 22 - 36 Vdc  
**Power Consumption:** max 4.5 W

#### Environment Data

**Operating Temperature:** 0 - +45 °C  
**Storage Temperature:** -20 - +70 °C  
**Humidity Non Condensing:** Max 90 % RH  
**Degree of Protection:** IEC IP65

#### Physical Data

**Dimensions:** 120 x 95 x 31.5 mm  
**Weight excl. Cable:** 390 g  
**M12 Connector:** 12 pin male code A  
**Housing:** Aluminium/Glass Windows

- \*) Static measurement on white paper at measuring/sampling frequency, without any averaging of the serial output signal: 2-6 » 2 times the standard deviation.
- \*\*) Analog output Resolution: 14 Bit DAC's are used for the conversion of the 18 bit digital distance result, an integer value with a nominal resolution of 0.01 mm.
- \*\*\*) Serial/Digital and Analog output are updated at the measuring frequency of 2 kHz/10 kHz except if the Simple Average Filter is activated.
- \*\*\*\*) 10kHz measuring frequency requires RS422, Ethernet is a Serial Interface option for distance measurement.
- \*\*\*\*\*) Laser class IEC 3R may be needed for some HT and VHT sensor versions.





## Non Contact Measurement

### Specifications ODS Grey-Line Select - 2 & - 10

0.5 and 1 kHz versions are also available in all models of the ODS Grey-Line sensor family.

HT / High target temperature (1000°C) versions and VHT (1300°C) as well as VVHT (1500 up to 2200°C) are available additionally.

Measurement Data	ODS 72.5	ODS 75	ODS 82.5	ODS 95	ODS 120
Measuring range (FS)	5 mm	10 mm	25 mm	50 mm	100 mm
Measuring range	70-75 mm	70-80 mm	70-95 mm	70-120 mm	70-170 mm
Center distance	72.5 mm	75 mm	82.5 mm	95 mm	120 mm
Resolution at short range *)	0.001 mm	0.001 mm	0.001 mm	0.001 mm	0.001 mm
Resolution at long range *)	0.001 mm	0.001 mm	0.002 mm	0.002 mm	0.005 mm
Measurement Linearity *)	± 0.003 mm	± 0.004 mm	± 0.008 mm	± 0.013 mm	± 0.025 mm
Updating frequency *)	2 kHz	2 kHz	2 kHz	2 kHz	2 kHz
Temperature deviation	± 0.03% FS/C°	± 0.03% FS/C°	± 0.03% FS/C°	± 0.03% FS/C°	± 0.03% FS/C°
Light source / wave length	LASER / 650 nm	LASER / 650 nm	LASER / 650 nm	LASER / 650 nm	LASER / 650 nm
Size of spot	Ø 0.2 mm	Ø 0.3 mm	Ø 0.3 mm	Ø 0.4 mm	Ø 0.4 mm
Laser protection class ****)	IEC 2	IEC 2	IEC 2	IEC 2	IEC 2

#### Output Data

<b>Analog Output **):</b>	4-20 mA or 1-9 V
<b>Digital Output ***):</b>	RS232 or RS422
<b>Baud Rate:</b>	115200 for: 2 kHz output frequency
<b>Baud Rate:</b>	38400 for: 1 kHz output frequency

#### Environment Data

<b>Operating Temperature:</b>	0 - +45 C°
<b>Storage Temperature:</b>	-20 - +70 C°
<b>Humidity Non Condensing:</b>	Max 90 % RH
<b>Degree of Protection:</b>	IEC IP65

#### Electrical Data

<b>Supply Voltage:</b>	22 - 36 Vdc
<b>Power Consumption:</b>	max 4.5 W

#### Physical Data

<b>Dimensions:</b>	120 x 95 x 31.5 mm
<b>Weight excl. Cable:</b>	370 g
<b>M12 Connector:</b>	12 pin male code A
<b>Housing:</b>	Aluminum/Glass Windows

\*) Static measurement on white paper at measuring/sampling frequency, without any averaging of the serial output signal: 2·6 » 2 times the standard deviation.

\*\*) Analog output Resolution: 14 Bit DAC's are used for the conversion of the 18 bit digital distance result, an integer value with a nominal resolution of 0.001 mm.

\*\*\*) Serial/Digital and Analog output are updated at the measuring frequency of 2 kHz & 10 kHz except if the Simple Average Filter is activated.

\*\*\*\*) Ethernet is a Serial Interface option for distance measurement.

\*\*\*\*\*) Laser class IEC 3R may be needed for some HT and VHT sensors versions.





## Non Contact Measurement

### Specifications ODS Red-Line 1 kHz Series

2, 5 & 10 kHz versions of all ODS Red-Line models are available.

Measurement Data	ODS 505	ODS 500-1100	ODS 925	ODS 1150	ODS 1950	ODS 1400	ODS 3000
Measuring range	100 mm	200 mm	650 mm	900 mm	900 mm	1400 mm	2000 mm
Measuring range	450-550 mm	Center $\pm$ 100 mm	600-1250 mm	700-1600 mm	1500-2400 mm	700-2100 mm	2000-4000 mm
Center distance (mm)	500 mm	500, 700, 950 & 1100	925 mm	1150 mm	1950 mm	1400 mm	3000 mm
Resolution *)	0.01 mm	0.05 mm	0.1 mm	0.1 mm	0.2 mm	0.3 mm	0.5 mm
Reproducibility*)	$\pm$ Resolution	$\pm$ Resolution	$\pm$ Resolution	$\pm$ Resolution	$\pm$ Resolution	$\pm$ Resolution	$\pm$ Resolution
Linearity *)	$\pm$ 0.05 mm	$\pm$ 0.10 mm	$\pm$ 0.3 mm	$\pm$ 0.4 mm	$\pm$ 0.5 mm	$\pm$ 0.7 mm	$\pm$ 1.0 mm
Updating frequency	1 kHz	1 kHz	1 kHz	1 kHz	1 kHz	1 kHz	1 kHz
Temperature deviation	$\pm$ 0.03% FS/C°	$\pm$ 0.03% FS/C°	$\pm$ 0.03% FS/C°	$\pm$ 0.03% FS/C°	$\pm$ 0.03% FS/C°	$\pm$ 0.03% FS/C°	$\pm$ 0.03% FS/C°
Light source ( nm )	LASER (655)	LASER (655)	LASER (655)	LASER (655)	LASER (655)	LASER (655)	LASER (655)
Size of spot	App. Ø 1 mm	Ø 2-3 mm	Ø 4 mm	Ø 4 mm	Ø 5 mm	Ø 5 mm	Ø 5 mm
Laser protection class	IEC 2	IEC 2	IEC 2	IEC 2	IEC 2	IEC 2	IEC 2

#### Output Data

<b>Analog Output **):</b>	4-20 mA or 1-9 Vdc
<b>Digital Output **):</b>	RS232 or RS422
<b>Ethernet Output ☒):</b>	Alternative to RS output
<b>Baud Rate: 38400:</b>	1 kHz output frequency

#### Environment Data

<b>Operating Temperature:</b>	0 - +45 C°
<b>Storage Temperature:</b>	-20 - +70 C°
<b>Humidity Non Condensing:</b>	Max 90 % RH
<b>Degree of Protection:</b>	IEC IP65

#### Electrical Data

<b>Supply Voltage:</b>	22 - 36 Vdc
<b>Power Consumption:</b>	max 4.5 W

#### Physical Data

<b>Dimensions:</b>	255 x 70 x 205 mm
<b>Weight excl. Cable:</b>	4.5 Kg
<b>Cable Length:</b>	2.5 m
<b>Housing:</b>	Aluminum / Glass

- \*) Static measurement on white paper at measuring frequency of 1 kHz, without any averaging of the output signals. Sampling and output frequency being equal.
- \*) Data are for digital as well as analog outputs, because 14 Bit DAC's are used for the conversion.
- \*\*) The serial/digital and analog outputs are updated at the measuring frequency of 1 kHz except if the Simple Average Filter is set to be active.
- ☒) The Ethernet interface can be used for distance measurement only, i.e. connection for sensor internal thickness or difference measurement is not available.

