Long Range Laser Displacement Sensors

DLS-B Series

Pictured above is a complete DLS-B Series Laser Distance Sensor. Pictured are the front and rear views.

General Description

The DLS-B Laser Distance Measuring Device is an optoelectronic laser device for measuring long distances accurately by phase shift technology.

Aiming alignment is easily achieved with the help of the red laser beam. The measuring range of the DLS-B series is between 0.05 to 500m. For measuring ranges over 65m, a reflective target may be required. It depends on the surface and the distance. For over 65m we offer an optional target which can be attached to the object being measured at the longer distance. See target details on page two of this data sheet under accessories and options.

Users have the option of using its serial RS 232, RS 422 and analog outputs to communicate with external devices. The DLS-B series also has the ability to operates as a stand alone device with its programmable inputs and outputs. In addition, an external display can be directly connected to the RS 232 or RS 422 interface. Multiple (up to 10) DLS-B Series sensors can be networked to one PC for multiple measurements economically.

The DLS-B series of Laser Distance Measuring Devices is designed for use both indoors and outdoors in industrial and harsh environments such as aluminum, copper, paper, steel, and saw mills.

Typical Applications

- Overhead crane positioning
- Elevator positioning
- Level measuring in silos
- Parking garage beam locations
- Vehicle locations
- Altitude measurements
- Steel Slab thickness and width (including hot steel)
- Wood products for width, thickness and length
- Paper roll products for width and diameter

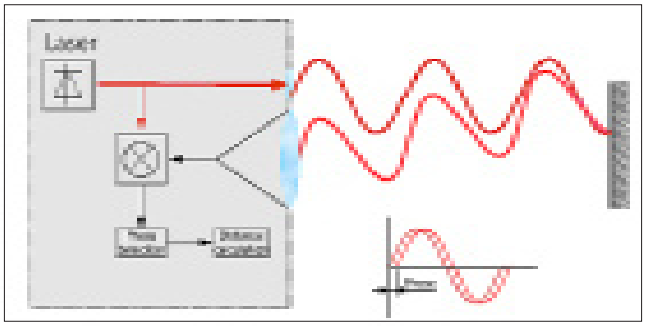
Features

- 0.05 to 500 meters measurement range
- > 65 meters may require reflectors depending on surface reflectivity
- 0.1mm (0.0039") resolution
- ± 1.5mm (0.059") accuracy
- Standard mode measurement rate, 6Hz.
- Moving target mode, measurment rates up to 20Hz.
- Complete system in one housing
- Outputs include analog and serial
- IP 65 protection class
- Indoor and outdoor operation (may require enclosure)
- Four different models are available for specific applications to meet a variety of needs

Benefits

- Cost effective solution for long distance measurements
- Class 2 laser for plant safety

Measurement Principle



The measurement principle of the DLS-B series operates on the basis of non-contact comparative phase measurements with amplitude modulation. It uses a laser diode as its source with a class 2 rating for plant safety. The sensor sends out a laser beam and the amount of phase shift is reflected back to determine the distance. This technique is superior to laser triangulation for measuring long distances. It provides better accuracy at a substantially lower cost and a small package size.

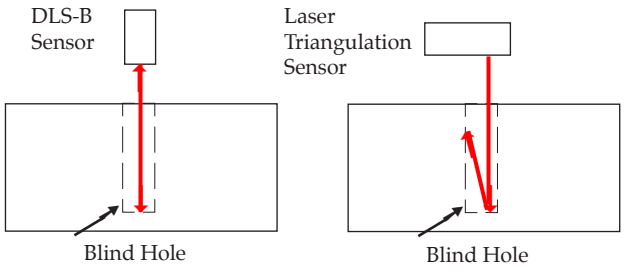
Phase Shift versus Laser Triangulation Technology

The DLS-B Series uses a different measurement technique as compared to the typical laser triangulation method used by displacement lasers. The laser triangulation technique requires the reflected light coming off the target to come back at some angle to hit a CCD line array whereas with the phase shift technology the laser beam comes back on itself.

Disadvantages of Laser Triangulation Technology

The disadvantage of this technique is that the separation between the Transmitter and Receiver gets longer as the measurement distance increases. For a laser triangulation sensor to measure a distance of 500 meters it would require the sensor to be very long. An estimate of the length would be approximately 1 meter long. Besides the long length, the cost is much higher without a significant accuracy improvement.

A laser triangulation sensor cannot make a depth measurement in a deep blind hole. As you can see below, the laser beam from the PMS sensor can make the measurement whereas the laser triangulation sensor cannot.



Operation Modes

Controlled Mode

In the controlled mode, each operation of a DLS-B sensor is triggered by a command sent by a host system over the serial line. While a single sensor can be connected to a host system using the RS 232 serial interface, up to ten (10) sensors can be connected to a single RS 422 serial line.

Automatic Mode

An automatic mode is provided for a hostless operation of the DLS-B sensor. The analog and digital outputs are updated according to the preset configuration as soon as the sensor is powered up.

External Trigger

The DLS-B sensor's measurements can be triggered with an external switch, pushbutton or a digital input from a PC.

Utility Software

A CD rom is provided with each DLS-B series sensor. The Utility Software is easy to use to configure the sensor. It has Diagnostics, Testing and Start up tools.

You can configure the Analog and Digital outputs, turn ON/OFF the Automatic Mode and download settings to the sensor.

External Display

An external display can be added to the DLS-B sensor by enabling the display mode. The DLS-B sensor formats the measured distance as an ASCII string. It is sent via the serial output to the external display.

Typical Applications

Because of the capability of the DLS-B Series a wide variety of applications are possible indoors and outdoors. A few of these aplications are pictured below for distance measurments. Do not hesitatge to contact us for your application.

Overhead Crane

Measuring distance to an object with an overhead crane is difficult when the distance from the control booth is far from the object. The DLS-B senor is ideal.

Silo Contents

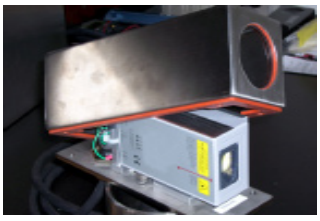
The networking capability of the DLS-B series enables multiple senors to be mounted in a number of silos. Control of contents is easily maintained for filling.

Logging

Even in outdoors the DLS-B series can be used to measure log length and location at a saw for cutting.

Enclosures

For environmental conditions we can provide a variety of enclosures for outdoor conditions. Our enclosures are NEMA type and we can also measure through a glass window in the enclosure.



Steel Mills

Even hot slabs of steel can be measured with a DLS-B sensor. Both width and thickness can be measured. The red hot color of the steel is not an issue with the phase shift technology whereas it is a major issue with laser triangulation.

Paper Mills

To measure diameter and width of paper rolls one DLS-B sensor is mounted above and two DLS-B sensors are mounted at the ends to simultaneously measure roll diameter and width.

Saw Mills

In saw mills one can easily measure width, thickness and cant. Due to the long range, the sensors can be located far enough away and yet provide adequate accuracy in this harsh environment.

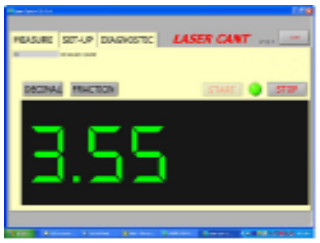
Woodworking

In the woodworking industry, the DLS-B series can be used. A popular application is to measure width and length of doors as well as thickness of plywood, OBS and a variety of other products.

Data Analysis Software

Pictured to the right is a display from our Data Analysis software on a Cant measuring system in a saw mill. It permits setting of all parameters, can display readings in decimal and fraction formats or any other desired format. A graphical plot is included as well as reporting results to a text file.

We can provide customized software for any desired application.



Long Range Laser Displacement Sensors

DLS-B Series

Technical Specifications

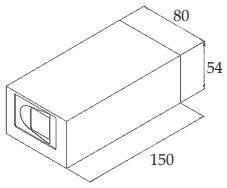
Model	DLS-B15	DLS-B30	DLS-BH15	DLSBH30
Application Type	Standard	Standard	Hi Temp.	Hi Temp.
Accuracy (mm)	± 1.5	± 3	± 1.5	± 3
Measuring range (M) (on reflective surface)	0.05 - 500	0.05 - 500	0.05 - 500	0.05 - 500
Measuring range (M) (on natural surface)	0.05 - 65	0.05 - 65	0.05 - 65	0.05 - 65
Operating temp. (ºC)	- 10 to + 50	- 10 to + 50	- 40 to + 50	- 40 to + 50
Resolution (mm)	0.1	0.1	0.1	0.1

General Specifications

Power requirements:	9 - 30 Vdc
Operating temp:	- 10 to + 50 ºC
Housing:	metal case, IP 65
Class 2 laser light:	visible laser, red
Dimensions (h x w x l)	54 x 80 x 150mm
Weight:	665 g
Spot size:	4mm @ 5 M distance 8mm @ 10 M distance

Interfaces:

Serial	1 serial, RS 232/RS422
Standard Analog	1 programmable , 0/4 to20ma (12 bit - scalable, 1% full scale accuracy)
Optional Analog	programmable, 0/4 to 20ma (0.5% full scale)
Digital I/O	programmable, (2) outputs or (1) output and (1) input, input can be used for external triggering one error indicator LED



dimensions in mm

Accessories and Options

- Telescopic viewfinder: for ease of alignment of long distances
- Target plate: provides a defined measuring target (210 x 297mm)
- RS 232 connection cable: three (3) meter cable connects PMS 200 to PC comm port (15 pin D-Sub female)
- Automatic mode cable, 3m long, flying leads for analog interfacing
- RS 422 connection cable, 5m long for connection to electronic cabinet or junction box, flying leads
- IP 65 cover for D-Sub connector if D Sub connector if not used
- IP 65 connector with 90 degree connection
- Environmental enclosures for extreme temperature conditions
- Higher analog output accuracy, 0.05% full scale
- Remote displays
- Data analysis software packages
- Certificate of calibration
- Additional options are available, contact us

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