UNIVERSAL LASER SENSOR

PUTTING YOU IN COMPLETE CONTROL

Introducing the ULS - a fully programmable pulsed-laser sensor that gives you the ability to obtain accurate measurements in the most challenging conditions. Where other measurement technologies fall short in performance, the ULS executes with precision, while improving reliability and increasing your efficiency.

Key Advantages of Pulsed-Laser Technology:

- Easily identifies difficult targets such as liquids, non-reflective material and fast moving objects.

- Performs non-contact and non-intrusive measurements without the need for frequent calibration.

- Recognizes small targets at long distances, within narrow openings and from sharp angles.

- Unaffected by temperature variations, background noise, vapor pressure and low dielectric or acoustically absorbing materials.

LASER TECHNOLOGY inc
Measurably Superior

UNIVERSAL LASER SENSOR

Considering all the variables in material characteristics, environmental conditions and even physical space restrictions, the ULS was designed to be easily configured to optimize its performance to targets within a particular application. Adjusting the sensor's range within a predetermined distance for presence detection, averaging the number of individual measurements for increased accuracy, and modifying how often you want data values generated are just some of the many parameters you can control.

Ideal Applications

Collision Avoidance • Ground Profiling • UAV Auto Landing & Take-off • Altimetry • Level monitoring (clear & dusty cond.)
Outdoor water measurements • In-line Positioning (tripper car) • Object Counting • Ship Docking • Camera Focusing
Presence Detection • Scanning • Proximity Verification • Traffic Engineering • Custom O.E.M. Projects

Averaging Mode

Sends out individual laser pulses and analyzes their time-of-flight to calculate a distance. The number of pulses averaged for a given measurement can be configured by the operator. The ULS, as a key component in a collision avoidance system, can pay for itself by preventing just one major accident!

KEY BENEFITS:
- Provides the highest accuracy possible
- Provides the highest data rate possible
- Offers an adjustable return shot criteria

Last Target Mode

This mode has the same speed of averaging mode, but can penetrate more airborne particulates, such as dust or fog. A high speed option is available in this mode that offers good performance in the presence of moderate particulates. There is also a successive gating option that dynamically eliminates known targets to find the last target available.

KEY BENEFITS:
- Best airborne particulate penetration
- Automatic intermediate target discrimination.
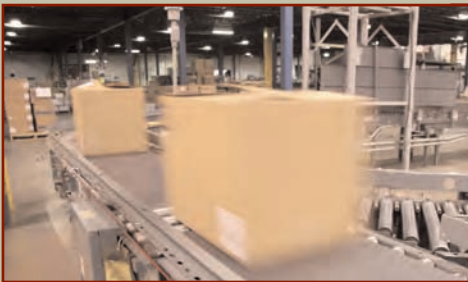
Detection Mode

This mode analyzes distance data on a pulse-to-pulse basis, providing the fastest possible response by minimizing timing latency for object presence detection. Distance data is not generated, but instead outputs a 'trip' signal that signifies object presence at a user-defined distance. A signal can also be sent, when a minimum or maximum change in distance is detected.

KEY BENEFITS:
- Ultra quick detection with precision timing signals
- 2 modes: One looks for a change in distance, the other looks for an object inside a desired range
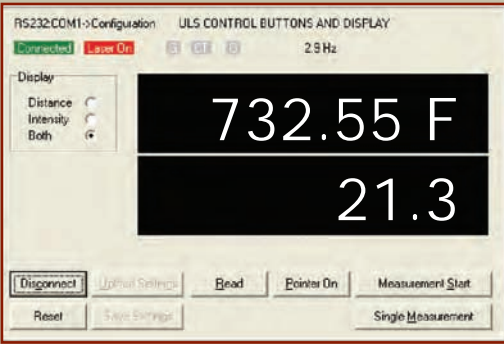
Binning Mode

Sends out individual laser pulses and places the pulse returns in fixed increments of flight time. When several pulses end up in a given time bin, the ULS determines that there is a target present. Increasing the bin size will increase the maximum acquisition distance, whereas decreasing it will improve measurement resolution and accuracy.

KEY BENEFITS:
- Enhanced measurement range capability
- Dynamically tracks multiple targets
- Adjustable target definition criteria

ULS Interface Features

- Set specific operating parameters within the ULS
- Control the sensor's operation
- View output data from the device

RS232:COM1->Configuration   ULS CONTROL BUTTONS AND DISPLAY

Connected   Laser On   2.9 Hz

Display
Distance
Intensity
Both

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Disconnect   Upload Settings   Read   Pointer On   Measurement Start

Reset   Save Settings   Single Measurement

ULS Control Buttons & Display

System Configuration: Data output format and selected ULS output data are displayed in the upper left corner.

Measurement Output Rate: Value expressed in Hz (ex. 2.9 Hz).

Display/Target Selection: Depending upon the measurement mode, this displays the distance to the target, return signal intensity or both.
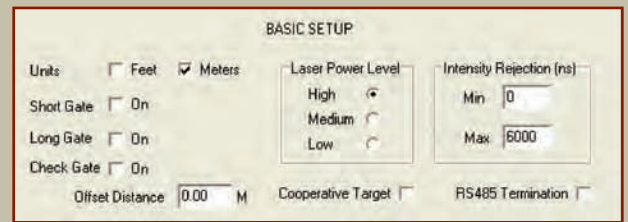
Basic Setup Parameters

Short Gate: The laser will not measure to a target within this distance.

Long Gate: The laser will not measure to a target beyond this distance.

Laser Power Level: This controls the distance measuring capability of the sensor. Use a high level for attaining maximum range in clear conditions and use a low level for shooting through airborne particulates.

Intensity Rejection: This function is used to reject returned pulses that are either less than the minimum (Min) value or greater than the maximum (Max) value, specified as a pulse width (nanoseconds).

BASIC SETUP

Units   Feet   Meters   Laser Power Level   Intensity Rejection (ns)
Short Gate   On   High   Min   0
Long Gate   On   Medium   Max   6000
Check Gate   On   Low
Offset Distance   0.00   M   Cooperative Target   RS485 Termination

Output Setup Parameters

Port: Defines which port you want the output measurement data to be sent to.

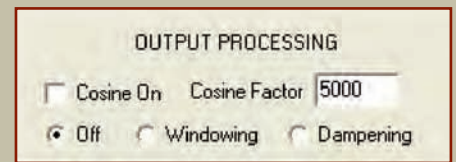**Continuous Output:** The ULS downloads and displays each measurement completed.

ULS Autostart: The laser will automatically start measuring, when powered up.

OUTPUT SETUP

Port   RS232 Configuration Port

Continuous Output   ULS Autostart

Output Processing

Cosine Factor: A multiplier, typically used to convert a measured slope distance to either a vertical or horizontal value.

Windowing / Dampening: Filters affecting the processing of successive measurements.

OUTPUT PROCESSING

Cosine On   Cosine Factor   5000

Off   Windowing   Dampening

Terminal Window

ULS Terminal

File   Edit

12 items

$EG,7
$OK
$SG,10.000
$OK
$LG,100.000
$OK
$EG

Command:
$us   Send

Input: Easily control every parameter of the ULS from your PC by sending the appropriate command.

Output: Displays all ULS communications on the serial bus.

Data Logging: Save your entire session's data to a text file.

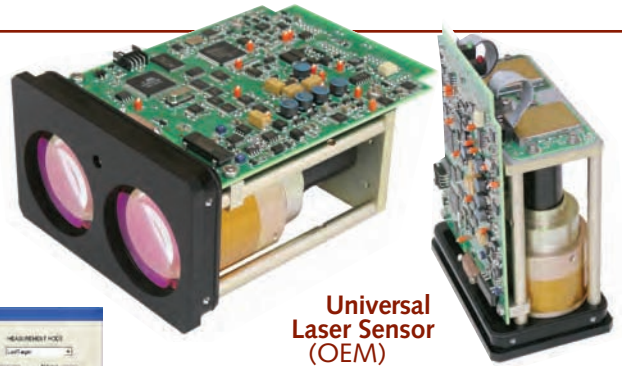**Configuration Filing:** Save and restore application-specific parameters.

Measurement Systems and Accessories

Universal Laser Sensor
(#7005400)
Includes:
Power / Data Cable

Universal Laser Sensor
(OEM)
(#7005395)
Includes: Power &
Download Cables

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21.3

ULS PC Interface Package
(#7034740)
Includes: ULS Manual, Interface Software
& Download Cable

ULS Power / Data Cable
(#4824689)
12 pin to open leads

Optional Zoom Scope
(#3502786)

ULS Pocket PC Interface
(#3254720)

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UNIVERSAL LASER SENSOR

LEVEL
4.6m
240,178.6 liters

PROXIMITY
39.2'

SPECIFICATIONS

Measurement Laser:
Wavelength: 905 nm (infrared)
3 Power Settings: 400 nJ, 200 nJ and 100 nJ per pulse
Average Power: Proportional to laser pulse firing rate
Eye Safety: Class I, 7mm (FDA, CFR21)
               Class I M (IEC 60825-1:2001)
Beam Divergence: 3 milliradians (~ 0.3 m @ 100 m)

Aiming Laser (for alignment only):
Wavelength: 650 nm (visible red)
Eye Safety: Class IIm (FDA, CFR21)
Activation: Software controlled
Average output power: 1mW

Optical Sighting Scope (optional):
Zoom: 1.5-4 x 16

Input Power:
Absolute Min/Max: 10 - 30V DC
Nominal: 12 - 24V DC
Max. Current: 170 mA

Communications:
Configuration Interface: RS232 serial
4 pin connector: data I/O and input power
Mating Cordset: Turck #PSG 4M-2 picofast
Serial data baud rate: 1200 to 115200
(up to 1000 readings per second)

Output Interface: RS232 and RS485 serial;
4-20 mA analog*
12 pin connector: data I/O and input power
Mating Cordset: Turck #RKC 12T-2/S618 eurofast
(2 meter cable supplied with flying leads for user termination)
Serial data baud rate: 1200 to 230400
(up to 2000 readings per second)

*Analog output: 4-20 mA isolated, with user selected
load resistor. 9 volt maximum voltage compliance.
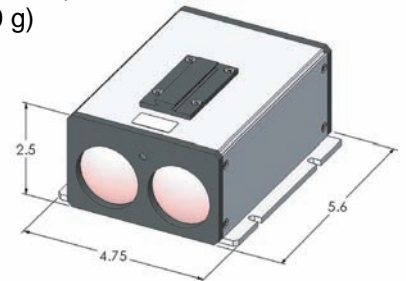Configurable to measurement scale
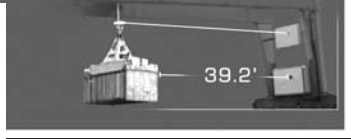
Environmental:
Sealing: IP 54 - NEMA 4
Operatiing & Storage Temperature:
-22° F to +140° F (-30° C to +60° C)
Shock/Vibration: MIL-STD-810E

Physical:
Dimensions: 5.6" L x 4.75" W x 2.5" H
(14.5 cm x 12 cm x 6.4 cm)
Weight: 1.75 lbs (800 g)
Enclosure:
Anodized Aluminum
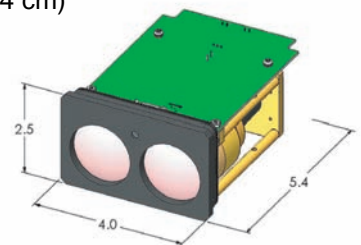Mounting:
Four hole pattern
(75 mm x 110 mm)

ULS Interface Program Requirements:
Operating System: Windows 95, 98, 2000, NT, & XP
Media: CD-ROM

ULS O.E.M. Version:
Dimensions: 5.4" L x 4" W x 2.5" H
(13.7 cm x 10.2 cm x 6.4 cm)
Weight: .98 lbs (444 g)
Enclosure: None
Mounting: Custom
Connections:
Data & power cable
available on back
of unit with flying lead
cables supplied.

OPERATING MODE	MAXIMUM RANGE			MEASUREMENT RESOLUTION	TYPICAL ACCURACY	TYPICAL REPEATABILITY
	White Wall (90% diffuse)	Grey Wall (20% diffuse)	Reflector (prism)			
Averaging	450 m	225 m	1700 m	1 mm	± 2 cm	< 5 mm***
Last Target	450 m	225 m	1700 m	1 mm	± 5 cm	< 2 cm
Binning	765 m	382 m	1664 m	Varies**	Same as resolution	Varies**
Detection (absolute)	450 m	225 m	500 m	N/A	± 5 cm	N/A
Detection (relative)	65 m	65 m	65 m	1 pulse	± 1 pulse	N/A

** Varies depending upon maximum range from 2.5 cm @ 13 m to ± 3.25 m @ 1664 m.
*** Varies depending upon the number of shots averaged.

Note: Minimum range is 15 cm in all modes.
All maximum ranges are for clear conditions
All specifications are subject to change without notice (Rev.06.01.07)