Laser Height Sensor
User Guide

For use with P/N 22101438-0001, 22293215, 22293215-0001

The optional displacement Laser Height Sensor is interchangeable with the standard Contact Surface Sensor. Either device can be quickly installed in the same location on a GPD Global DS Series or MAX Series dispense system.

Safety Notice

CAUTION: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CAUTION: Laser Radiation: Do not stare into beam.

CAUTION: Laser Aperture: Avoid exposure. Laser radiation is emitted from this aperture.

Proper Use

The displacement sensor OD Value is an opto-electronic sensor and is used for optical determination of object distances without contact.

Installation & Set Up

NOTE: The sensor is typically factory installed. If your system is equipped with the optional capability of easily replacing the existing sensor with a different type of sensor, then refer to the following instructions.

Installing Laser Sensor

The surface sensor hardware operates mounted between the first and second head mount stations of a GPD Global dispense system.

To install the Laser Height Sensor:

1. If a Contact Surface Height Sensor is installed on the dispense system:
   a. Remove height sensor by disconnecting its power cable and two air hoses
   b. While holding the height sensor so it does not fall, use a 7/64 Allen wrench to remove the two (2) bolts from the back of the Z-axis plate that secure the height sensor to the Z-axis plate.
   c. Store the height sensor in a safe place.

2. Mount the Laser Surface Sensor to the Z-axis plate to the Z-axis plate, inserting two (2) bolts into the back of the Z-axis plate. Make sure the sensor is vertically plumb before tightening the screws.
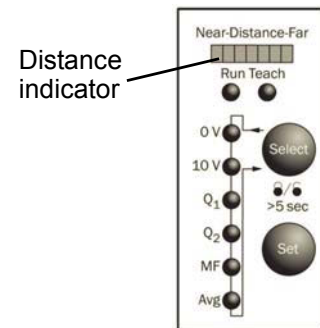
3. Connect the power cable to the height sense E receptacle.

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HEIGHT SENSE
 A      E      B
 ↓      ↓      ↓
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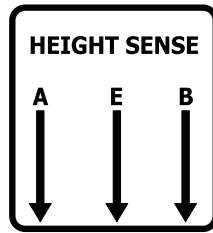
Set Base Location for Sensor

Reteach the "Touch Probe to Target (XYZ)" base location. Raise/lower the sensor vertically (Z-axis) until the laser sensor "sees" the physical target location - indicated by lights centered in the Distance indicator. If both outer-most red LEDs light up, the sensor is out of range and no measurement is possible.

For additional details, refer to *Base Locations Reference Guide* (PN 22100025).

Distance indicator

Interchanging Laser Sensor with Contact Sensor

To remove the Laser Height Sensor from the dispense system and replace it with a Contact Surface Sensor:

1. Disconnect the laser power cable from the height sensor outlet plate.

2. While holding the height sensor so it does not fall, use a 7/64 Allen wrench to remove the two (2) bolts from the back of the Z-axis plate that secure the height sensor to the Z-axis plate. Store the height sensor in a safe place.

3. The Contact Surface Height Sensor can now be installed by bolting it into place on the Z-axis plate, making sure it is vertically plumb. Plug the power cable and both air lines (A and B) into the height sensor outlet plate.

4. As needed, reteach the "Touch Probe to Target (XYZ)" base location.

Angle Adjustment

To adjust the angle at which the laser beam is projected:

1. Loosen the locking set screw (see at right).

2. Turn the adjusting screw (see at right) in/out to adjust laser position. To adjust the laser to a greater degree, replace the adjustment screw with another of a different length. A set of adjustment screws in various lengths is provided with the Laser Height Sensor to increase the range of possible angle adjustment.

3. When desired angle is achieved, tighten the locking set screw.

Adjusting screw

Locking set screw
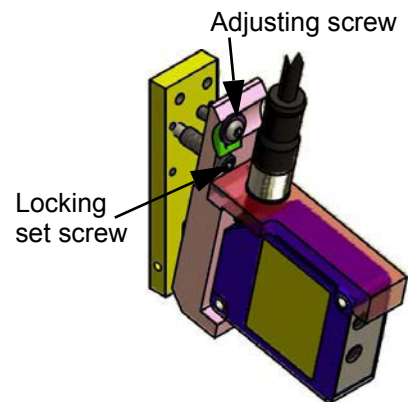
Maintenance

The laser sensor does not require maintenance; however, it is recommended that you clean the external lens surfaces and check the screw connections and plug-in connections at regular intervals.

Specifications

Performance

Measuring frequency . . . . 2 kHz
Light source . . . . Laser, red
Typ. light spot size (distance) . 0.1 mm x 0.1 mm (30 mm)
Response time . . . . 1 mx/10 mx/ 35 ms
Laser protection class . . . . 2 (EN 60825-1)
Measuring range . . . . 26-34 mm, 6-90% remission
Resolution . . . . 2 µm
Repeatability . . . . 6 µm
Linearity . . . . ±8 µm
Light spot size . . . . 30 mm
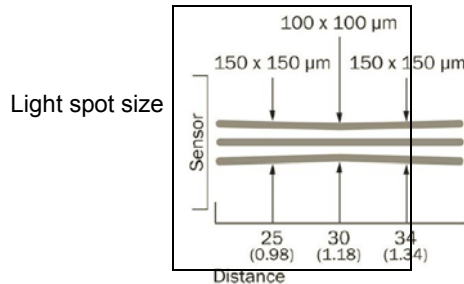
All dimensions in mm (inch)

Mechanics/Electronics

Maximum output . . . . 1 mW
Wave length . . . . 655 nm
Medium . . . . semiconductor laser
Classification . . . . Class 2 Laser product
Warm-up time . . . . ≤ 5 minutes
Weight . . . . 70 g (2.47 oz)

Ambient Data

Operating temperature . . . . . . -10-40° C
Storage temperature . . . . -20-60° C
Max. relative humidity . . . . 35-95% non-condensing
Vibration resistance . . . . 10-55 Hz (amplitude 1.5 mm, x-, y-, z-axis 2 hours ea.)
Protection class III
Typ. ambient light safety . . . . . Artificial light: ≤3,000 lx, Sunlight: ≤10,000 lx
Shock resistance . . . . 50 g (x-, y-, z-axis 3 times each)
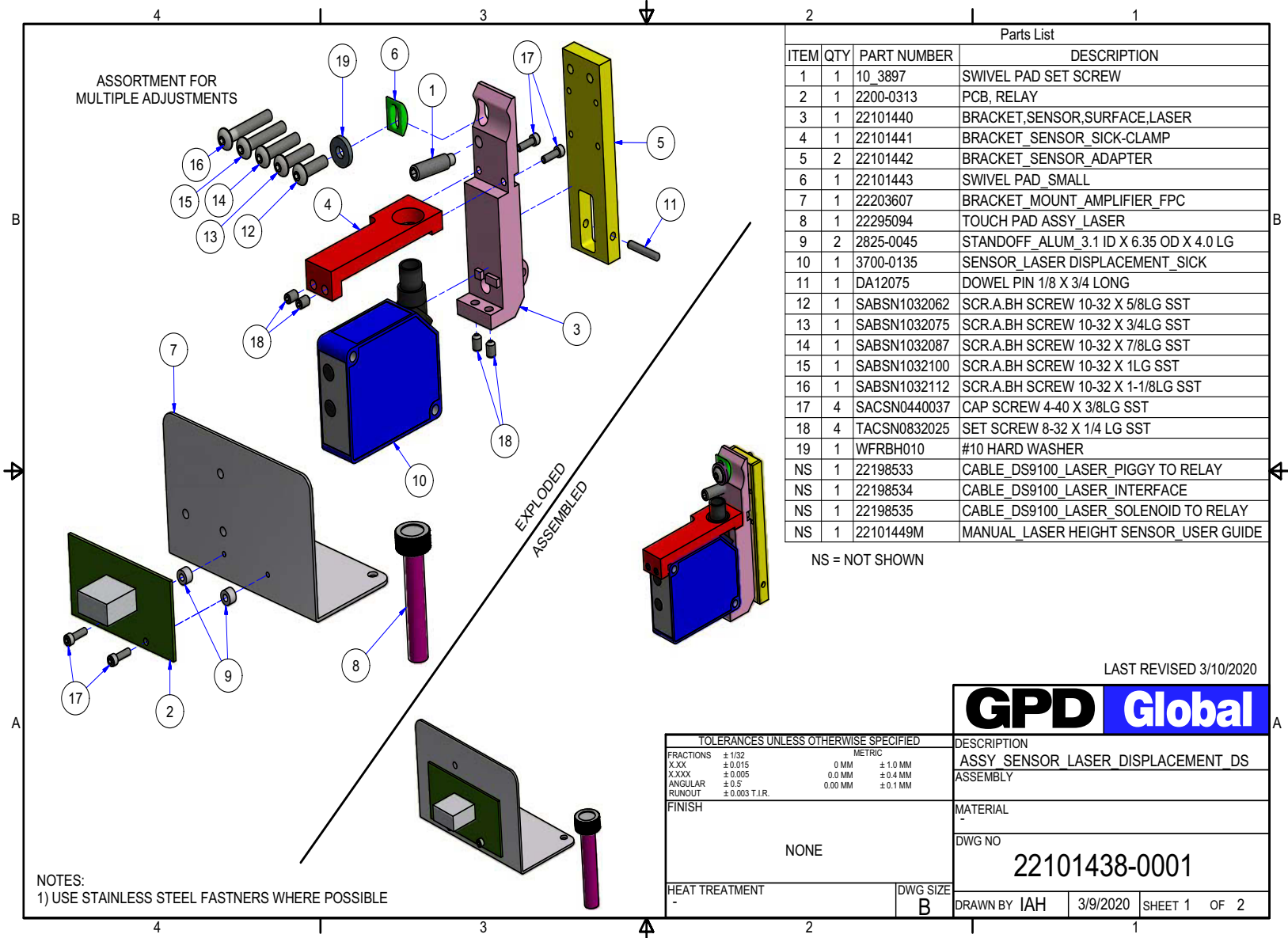
References

DS Series

- [Interchangeable Laser Height Sensor - DS Series](#) (pg 5)

MAX Series

- [Interchangeable Laser Height Sensor - MAX Series](#) (pg 6)
- [Interchangeable Laser Height Sensor and Receptacle Panel - MAX Series](#) (pg 7)

Interchangeable Laser Height Sensor - DS Series

ASSORTMENT FOR
MULTIPLE ADJUSTMENTS

EXPLODED

ASSEMBLED

Parts List

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10_3897	SWIVEL PAD SET SCREW
2	1	2200-0313	PCB, RELAY
3	1	22101440	BRACKET,SENSOR,SURFACE,LASER
4	1	22101441	BRACKET_SENSOR_SICK-CLAMP
5	2	22101442	BRACKET_SENSOR_ADAPTER
6	1	22101443	SWIVEL PAD_SMALL
7	1	22203607	BRACKET_MOUNT_AMPLIFIER_FPC
8	1	22295094	TOUCH PAD ASSY_LASER
9	2	2825-0045	STANDOFF_ALUM_3.1 ID X 6.35 OD X 4.0 LG
10	1	3700-0135	SENSOR_LASER DISPLACEMENT_SICK
11	1	DA12075	DOWEL PIN 1/8 X 3/4 LONG
12	1	SABSN1032062	SCR.A.BH SCREW 10-32 X 5/8LG SST
13	1	SABSN1032075	SCR.A.BH SCREW 10-32 X 3/4LG SST
14	1	SABSN1032087	SCR.A.BH SCREW 10-32 X 7/8LG SST
15	1	SABSN1032100	SCR.A.BH SCREW 10-32 X 1LG SST
16	1	SABSN1032112	SCR.A.BH SCREW 10-32 X 1-1/8LG SST
17	4	SACSN0440037	CAP SCREW 4-40 X 3/8LG SST
18	4	TACSN0832025	SET SCREW 8-32 X 1/4 LG SST
19	1	WFRBH010	#10 HARD WASHER
NS	1	22198533	CABLE_DS9100_LASER_PIGGY TO RELAY
NS	1	22198534	CABLE_DS9100_LASER_INTERFACE
NS	1	22198535	CABLE_DS9100_LASER_SOLENOID TO RELAY
NS	1	22101449M	MANUAL_LASER HEIGHT SENSOR_USER GUIDE

NS = NOT SHOWN

LAST REVISED 3/10/2020

GPD Global

TOLERANCES UNLESS OTHERWISE SPECIFIED			DESCRIPTION
FRACTIONS ± 1/32	METRIC		ASSY_SENSOR_LASER_DISPLACEMENT_DS
X.XX ± 0.015	0 MM	± 1.0 MM	ASSEMBLY
X.XXX ± 0.005	0.0 MM	± 0.4 MM	
ANGULAR ± 0.5°	0.00 MM	± 0.1 MM	
RUNOUT ± 0.003 T.I.R.			

FINISH		MATERIAL
NONE		-
		DWG NO
		22101438-0001

HEAT TREATMENT	DWG SIZE	DRAWN BY IAH	3/9/2020	SHEET 1 OF 2
-	B			

NOTES:
1) USE STAINLESS STEEL FASTNERS WHERE POSSIBLE

Interchangeable Laser Height Sensor - MAX Series

SPARES (FOR DIFFERENT ADJUSTMENTS)

THE INDENT ON THE BACK OF THE LASER FITS OVER THESE INDENTS ON THE BRACKET

REVISION HISTORY

REV	DATE	BY	DESCRIPTION
A	5/17/2016	IHD	ADDED PARTS 16,17

Parts List

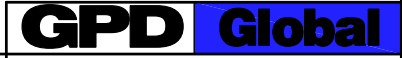| ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10_3897	SWIVEL PAD SET SCREW
2	1	22101440	BRACKET,SENSOR,SURFACE,LASER
3	1	22101441	BRACKET_SENSOR_SICK-CLAMP
4	1	22101442	BRACKET_SENSOR_ADAPTER
5	1	22101443	SWIVEL PAD_SMALL
6	1	22198200	CABLE LASER INTERFACE ASSY
7	1	3700-0135	SENSOR_LASER DISPLACEMENT_SICK
8	1	DA12075	DOWEL PIN 1/8 X 3/4 LONG
9	1	SABSN1032062	SCREW,BUTTON HEAD,10-32 X 5/8 SST
10	1	SABSN1032075	SCREW,BUTTON HEAD, 10-32 X 3/4 SST
11	1	SABSN1032087	SCREW,BUTTON HEAD,10-32 X 7/8 SST
12	1	SABSN1032100	SCREW,BUTTON HEAD, 10-32 X 1 SST
13	1	SABSN1032112	SCREW,BUTTON HEAD,10-32 X 1 1/8 SST
14	2	SACSN0440037	SCREW,CAP HEAD, 4-40 X 3/8 SST
15	1	WFRBH008	#8 HARD WASHER
16	1	10/3965	WASHER,WAVE_.194ID X .242OD X .015 THICK
17	4	TAPSN0832025	SET.A.PT.SST. 8-32 X 1/4

NOTES:
1) USE STAINLESS STEEL FASTNERS WHERE POSSIBLE

GPD Global

TOLERANCES UNLESS OTHERWISE SPECIFIED				DESCRIPTION
FRACTIONS	± 1/32	METRIC		ASSY_INTERCHANGE_TOUCH PROBE_LASER
X.XX	± 0.015	0 MM	± 1.0 MM	ASSEMBLY
X.XXX	± 0.005	0.0 MM	± 0.4 MM	
ANGULAR	± 0.5°	0.00 MM	± 0.1 MM	
RUNOUT	± 0.003 T.I.R.			

FINISH

NONE

MATERIAL
-

HEAT TREATMENT
-

DWG SIZE
B

DWG NO
22293215

DRAWN BY IAH 6/11/2014 SHEET 1 OF 2

Interchangeable Laser Height Sensor and Receptacle Panel - MAX Series

| | 4 | | 3 | | 2 | | 1 | |

REVISION HISTORY			
REV	DATE	BY	DESCRIPTION
-	-	-	ORIGINAL ISSUE

LABEL FOLDS OVER BEND
ONTO VERTICAL SURFACE
AS SHOWN

HEIGHT SENSE

2.13

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Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	22293215	ASSY_INTERCHANGE_TOUCH PROBE_LASER
2	1	2100-0865	CONN_M-16_FEMALE 8 PIN_PANEL MOUNT
3	1	22204406	COVER_SURFACE SENSE_LASER OPTION
4	1	22204406L	COVER_SURFACE SENSE_LASER OP_DECAL
5	2	2675-0021	COUPLER_BULKHEAD_4MM_SELF SEAL

GPD Global

TOLERANCES UNLESS OTHERWISE SPECIFIED		DESCRIPTION
FRACTIONS	± 1/32	METRIC	DEV_INTRCHNG_TOUCH PROBE_LASER_2M
X.XX	± 0.015	0 MM	± 1.0 MM
X.XXX	± 0.005	0.0 MM	± 0.4 MM
ANGULAR	± 0.5°	0.00 MM	± 0.1 MM
RUNOUT	± 0.003 T.I.R.	

ASSEMBLY
MICROMAX OPTION

FINISH

MATERIAL
AS SHOWN

DWG NO
22293215-0001

HEAT TREATMENT	DWG SIZE	DRAWN BY BM	6/26/2017	SHEET 1	OF 1
NA	B				