Universal LightProbe™ Installation & Use - Check List

Universal LightProbes are fine instruments that should be treated with care.

All Universal LightProbes are fully tested before shipment and are warranted against manufacturing defects. The warranty does not apply to damage caused by accident, misuse, or damage caused by modification of the product. This includes soldering, gluing, cutting or otherwise modifying the product.

ATE FIXTURE INSTALLATION:

Please read through all instructions carefully before beginning installation.

❑ **1. Position and Secure Fiber-optic Probes**

a. **Centering:** Ensure each Fiber-optic Probe is centered (on-axis) on the LED under test, using Optomistic Products' probe clamps (**see ULP AN 22**). Using glue or other adhesive is not recommended, since it does not allow for later adjustment/replacement .

b. Air-gap: The distance (air-gap) between the tip of the Fiber-Optic Probe and the LED under test should be set at 1mm minimum, and up to 3mm. If a larger air-gap is used, it will create a wider field-of-view and can compensate for misalignment errors; however, a greater air-gap can also diminish the sensitivity of the Sensor, and could allow ambient light or light from adjacent LEDs to affect the response of the Sensor.

c. Contacting Tips: If utilizing the Contacting Tip Fiber-optic Probes, the plastic tip should be contacting the LED under test with a 1.5mm/0.06 in. retraction to the stainless-steel sleeve, to achieve consistent LED intensity measurements regardless of small variations in the height of the LED above the circuit-board. Do not remove the plastic tips.

d. Tridents: For "Trident" Fiber-optic Probes, where three Fiber-optic Probes utilize a single Sensor, note that the 3 LEDs being tested by each Sensor must be turned-on and off , one-at-a-time.

e. Clamshell Design: Use bushings to align the probe-plate with circuit-board tooling pins to avoid the possibility of misalignment, and to achieve the same accuracy as ICT probing, particularly for LED intensity measurements.

f. Axial Concentricity: As for ICT probing, verify +/- 0.13mm (0.005in) of all Fiber-optic Probes and corresponding LED centers (per circuit-board HXY drill drawing/program listing, circuit-board and LED dimensional data) after fixture vacuum/circuit-board push-down actuation. Double-check for consistency. This is most important for accurate LED intensity tests, since all LED manufacturers' data sheets specify on-axis luminous intensity .

g. Fiber-optic Cable Bend Radius: See specific Fiber-optic Probe data-sheets for specific bend radii information. In general, ensure there are no visible cuts or kinks. With the exception of the "SuperFlex" (SF) cable, for reliable /consistent LED intensity measurements there should be no change in the radii from one fixture actuation to another. Color measurements are essentially unaffected by fiber-optic cable bend radii.

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ATE FIXTURE INSTALLATION: Continued

h. Fiber-optic Probe Position for Single Color Sensors: For Unicolor (ULP SCI/V) and Unicolor Digital (ULP SCC) Sensors, ensure that their Fiber-optic Probes are positioned over the correct LED – i.e: a Unicolor Digital/ Red Sensor (ULP SCC/R) will need to be positioned over a red LED.

i. Clean Apertures: The fiber-optic probe tips should be kept clean and free of dust or dirt. It is best to use "Dust-Off" or cans of compressed clean air, but not factory-compressed air. Do not use Isopropyl or rub bing alcohol on the probe tip apertures as it can cause the face of the tips to darken.

❑ **2. Analog and Digital Sensor Wiring** (see separate installation instructions – **ULP AN 41** – for the Universal LightProbe Spectra USB Sensor)

Caution!: Applying power to the Signal pins can cause permanent damage to the Sensor.
Caution!: We do not recommend the use of solder on the Sensor pins as over-heating can cause damage to the Sensors.

a. Pin-out – Signal Pins: Using wire-wrap or the Universal LightProbe Connector Cable (ULP CC), to ensure the Sensor's Signal Pins ("S" - Signal, or "Int"- Intensity, and "C" – Color) are correctly connected to the fixture ATE interface. Refer to each Sensor's data sheet for Sensor specific Pin-out information. ***DO NOT APPLY POWER TO THE SIGNAL PINS.***

b. Pin-out – Ground and Power Pins: It is recommended that the Ground ("G")and Power ("P") pins – are connected last to avoid wiring mistakes. Refer to each Sensor's data sheet for Sensor specific Pin-out information.

c. After Wiring is Checked, Connect Regulated D.C. Power Supply: After wiring is complete and checked for accuracy, connect Sensor to a regulated D.C. power supply to the "P" (+) and "G" (-) pins, using +5 volts minimum and +28 volts maximum. Sensors can withstand up to +40 volts and reverse polarity wiring mistakes and inductive line transients of up to -18 volts without permanent damage. Use separate D. C. power and signal ground wires for each Sensor and single-point grounding to prevent ground loops and common-mode noise in signal measurements.

❑ **3. General Considerations**

a. Exclude Ambient /Extraneous Light: Ensure that ambient/extraneous light-either from adjacent LEDs or general room/factory lighting, is excluded from all displays/LEDs under test/Fiber-optic Probe Tips, both after the fixture is activated and during display tests.

b. Sensor Response Time: See separate Sensor data sheets for specific response times of Sensor (all are 450mS or less). To accommodate extremely dim LEDs allow from 500mS up to 1.5 seconds after the LED is switched on, before reading the Sensor output; the LED should remain on during this period of time. Sampling too soon could provide erroneous or inconsistent outputs.

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UNIVERSAL LIGHTPROBE™ INSTALLATION & USE - CHECK LIST

ATE SOFTWARE: Continued

❑ 4. ATE Software

Caution!: Do not apply a voltage (V_F) across the LED to turn it "ON," since the resulting LED forward current (I_F) and LED intensity will be indeterminate, due to the steep slope and variations in LED IF versus V_F characteristics. The result could be serious over-driving or under-driving of the LED.

a. LED Forward Current: Set to a constant and stable value determined by a current limiting resistor on the circuit board or constant current source per the data sheet for the LED under test.

b. 3070: For specific programming techniques for the 3070 platform, contact us for details.

❑ 5. Troubleshooting

Optomistic Products is always happy to supply support. You may contact us by email or telephone. Also check the Optomistic Products' website for Application Notes and a full list of troubleshooting tips.

The following trouble-shooting items are most commonly encountered.

a. Under-range/Unstable Color Voltage Outputs: If the output voltage on the Sensor's Intensity ("Int") pin is 50mV or less for any given LED under test, the Sensor could be 'under-ranging' (ie: the Sensor cannot readily detect the LED). This can cause unstable Color ("C") pin voltage outputs.

i. **Check the distance between the fiber-optic probe tip and the LED under test**: recommended 1mm to 3mm max.

ii. **Check for misalignment**: to be sure the fiber-optic probe is centered on the LED under test.

iii. **Steady State LED:** Check that the LED under test is steady-state (not pulse-width modulated PWM).

iv. **Solution:** If all of these checks are satisfactory, the sensitivity of the Sensor needs to be increased, either by using a Wide-Aperture or Very Wide-Aperture Fiber-optic Probe (assuming that a Small-Aperture Probe is being used); or to use a Penta High Sensitivity Sensor (ULP PCI/V HS) or an Ultra High Sensitivity Sensor (ULP UHS).

b. Over-range: If the output voltage on the Sensor's Intensity ("Int") pin is 4 volts, for any given LED under test, then the Sensor is over-ranging (ie: the LED is too bright).

i. **Solution:** Increase the air-gap between the tip of the Fiber-optic Probe and the LED under test to 3mm or more, until the output voltage on the Sensor's Intensity "Int) pin is 3.0 volts or less. Or, replace the Sensor with a Low, or Very Low Sensitivity model. Please see **ULP AN 35** on Sensor Sensitivity Ranges for more information.

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