

## Application Note – Xicato XIM LED Module Assembly Instructions Version 20141002

### General Handling

When handling the XIM module, it is important to avoid touching both the phosphor coating on top of the LED array as well as the integrated thermal pad underneath. These surfaces are sensitive to scratches, contamination, and debris which may decrease module performance. If any dust or debris accumulates on the phosphor coating, clean the surface by blowing on it with air or gently wipe the surface clean with isopropyl alcohol.



Figure 1: XIM areas sensitive to scratches, contamination & debris.

### Module Installation

To install the Xicato XIM module, attach a heatsink to the bottom of the XIM using M3 x 0.5mm x 25mm screws. Ensure the module has sufficient contact with the surface of the heatsink by visually verifying there are no air gaps between the thermal pad and the top of the heatsink. Xicato recommends that the heatsink have a surface flatness  $\leq 0.1\text{mm}$  and no center hole. Center holes are only permitted if the diameter is  $\leq 12\text{mm}$ .

Using a calibrated torque driver, torque each fastener between 3.2in·lbs (0.36N·m) and 3.8in·lbs (0.43N·m). Take caution not to exceed these values as this may damage the XIM. Xicato recommends using a spring lock washer with either a flat washer or adapter ring at all mounting locations to reduce the likelihood that the fasteners will loosen under shock, vibration, or thermal cycling. It is important for optic attachment that the combined height of the screw head, spring washer, and flat washer or adapter ring does not exceed the 3.8mm pocket depth.



Figure 2: XIM Assembly (Exploded View)

## Mounting Examples

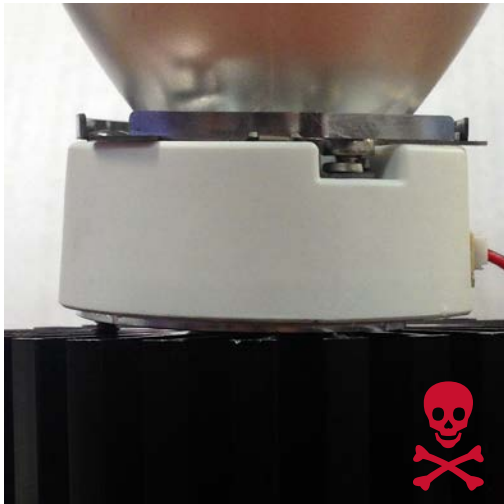


Figure 3: XIM is **INCORRECTLY** mounted with visible gaps between the bottom surface of the module and the top of the heatsink. Any gap between the thermal pad and the heatsink significantly decreases thermal performance.

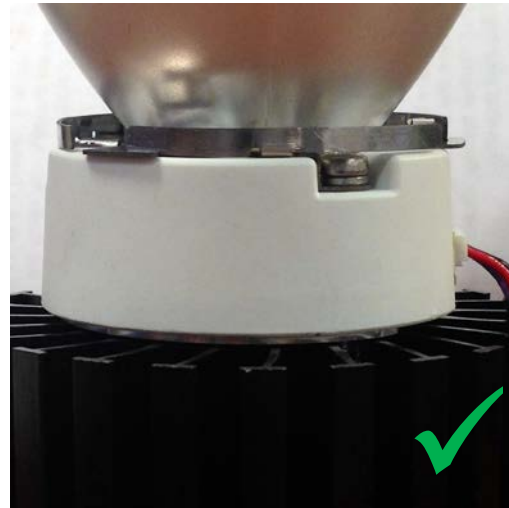


Figure 4: XIM is **CORRECTLY** mounted. The bottom surface of the thermal pad is completely flush with the top surface of the heatsink. Additionally, the screw head, lock washer, and adapter ring flange fit inside the pocket (3.8mm depth) which allows the reflector to sit flush to the optics plane.

## Reflector Attachment

Xicato offers a twist-lock reflector adapter ring to aid in attaching secondary optics. Rings mount to the top surface of the XIM module and incorporate the same M3 fasteners used to mount the module to the heatsink.

When installing the adapter ring, the attachment flanges of the ring should sit inside the XIM housing pockets between the module surface and the locking spring washer. Once adapter rings are tightly fastened to the module to their appropriate torque values, Xicato twist-lock compatible reflectors can then be installed into the assembly by placing the bottom surface of the reflector flush against the top surface of the module and slowly rotating the reflector clockwise until the reflector is fully engaged and secured underneath the restraining tabs of the adapter rings. Reflector alignment surfaces on the perimeter of the ring will automatically center the axis of the reflector with the light emitting surface of the module. Be careful not to over torque the reflector when rotating it into its locked position; this may damage the reflector or adapter ring.

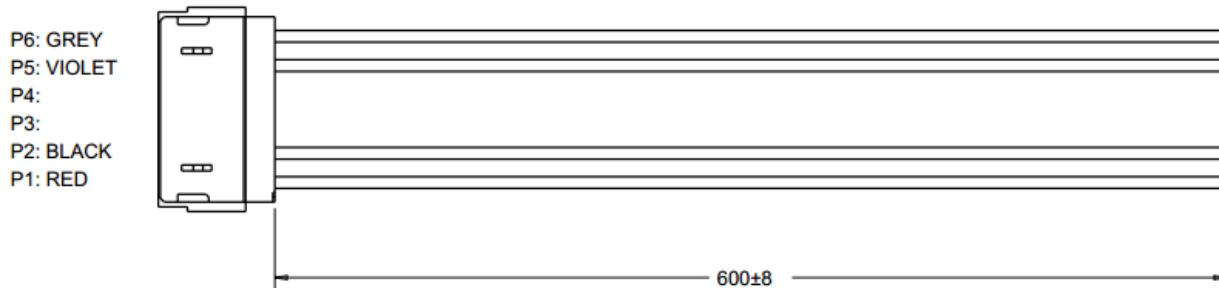


Figure 5: Twist-Lock Adapter Ring

Please note that Xicato is the only authorized distributor and supplier of the twist-lock adaptor ring. For more information on the adapter ring, contact your Xicato account manager or technical representative.

## Wire Connection

Both DALI & 1-10V series XIM modules use the same electrical wire harness connection. The harness mating connector has 4 of its 6 socket terminals active with 600 mm (23.6 in) 24 AWG wire leads. The following table shows the electrical pinout of the wire harness accessory.



Socket #	Wire Color	Description		AWG	Length
1	Red	Positive (+) Power		24 (1.12 mm max insulation OD)	600 mm
2	Black	Negative (-) Power		24 (1.12 mm max insulation OD)	600 mm
3	N/A	Open		N/A	N/A
4	N/A	Open		N/A	N/A
5	Violet	1-10V	Dim (+)	24 (1.12 mm max insulation OD)	600 mm
		DALI	Control 1		
6	Grey	1-10V	Dim (-)	24 (1.12 mm max insulation OD)	600 mm
		DALI	Control 2		

To install the wire harness, hold the harness connector firmly with two fingers and verify that the connector is oriented correctly by confirming the red positive power wire is located on the left when looking down on the module. Then insert the plug into the harness receptacle of the XIM module until an audible click is heard. This signals that the harness connector is fully engaged with the pins of the module. To disengage, pull the wire harness out by its connector. Do not pull directly from the wires.

For more information on harness connectors or to order sample harnesses, contact your Xicato account manager or technical representative.

## T<sub>C</sub> Measurement

On the top surface of the XIM module, between the thermal ring and the plastic housing case, is the module's T<sub>C</sub> measurement location. This site must be utilized for attaching a thermocouple to the thermal ring of the LED array in order to verify that the XIM module is running below its maximum design temperature limit of 90°C. Xicato recommends attaching the thermocouple using the following method accepted by UL1598-2008, Section 19.7.4, Rev January 11, 2010.

1. Verify that the T<sub>C</sub> location is clean, dry, and free from debris. Any debris between the module thermal ring and the thermocouple bead may add thermal resistance to the test and could deliver erroneous results.
2. Apply cyanoacrylate adhesive sparingly to the surface of the thermocouple bead. Press surface of bead to thermal ring immediately. Hold in place until bond sets per manufacturer's instructions. Do not reposition.
3. In a separate mixing container, add recommended ratio of two-part thermally conductive adhesive and blend per adhesive manufacturer's instructions. Avoid high mixing speeds which could entrap excessive amounts of air or cause overheating of the mixture resulting in reduced working life.
4. Apply the adhesive around the surfaces of the bonded thermocouple bead such that the bead is fully contained within the adhesive. Let the adhesive fully cure per the manufacturer's instructions. Stress relieve the thermocouple wire to further protect the joint.

Note: Only a minimal amount of adhesive should bridge the gap between the thermal ring and the XIM housing. The CTE mismatch between the two materials can weaken the adhesive bond between the thermal ring and thermocouple bead particularly during repeated thermal testing. Xicato recommends inspecting the T<sub>C</sub> joint between thermal tests to ensure it is still attached properly.

**Important:** The thermocouple bead must make direct, reliable contact with the surface of the thermal ring; otherwise, unknown thermal impedance between the thermal ring and the thermocouple appears. This could result in lower temperature readings. It is the responsibility of the test engineer or test party to ensure the thermocouple bead is properly attached to the T<sub>C</sub> point.

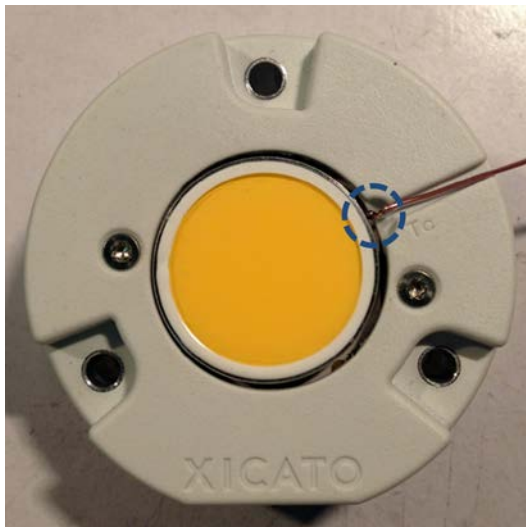


Figure 6: Typical T-type thermocouple attachment at the T<sub>C</sub> measurement location. Adhesive omitted for clarity.

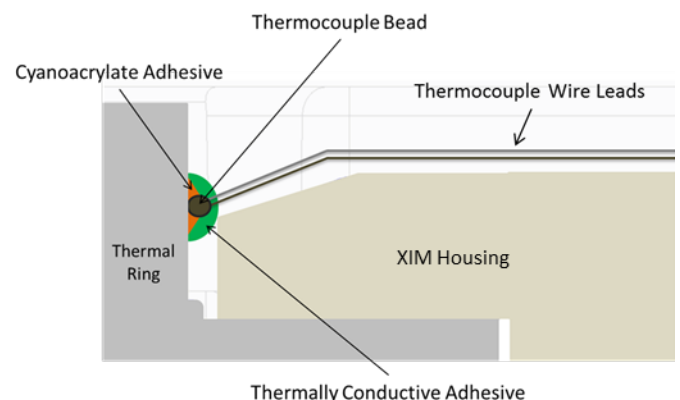


Figure 7: Cross-section of Xicato recommended thermocouple attachment.

**CAUTION:** Quick-drying adhesives or cyanoacrylate adhesive, popularly known as superglue, should not be used in any luminaire design or for long term testing. These adhesives are known to be destructive to LED components over time.