XICATO®

DETAILED DATA SHEET

XIM LED Modules
with Corrected Cold Phosphor Technology®

Designer Series

About Xicato

Xicato designs and develops light sources and electronics that enable architects, designers and building managers to create beautiful, smart spaces in which people love to live and work. With thousands of installations around the globe, Xicato continues to be a leading supplier of high quality lighting solutions. Xicato is defining the future of intelligent light sources by integrating electronics, software and connectivity. Founded in 2007, Xicato's headquarters is based in Silicon Valley and the company has offices in China, Europe and the US.

For further information, visit www.xicato.com.

ABOUT THIS DOCUMENT

This datasheet is just one of many documents and tools available from Xicato to assist lighting designers, specifiers, and luminaire manufacturers in understanding and using Xicato products. These include:

ACCESSORY SELECTION TOOLS (HEATSINKS, OPTICS, DRIVERS)

Xicato has a searchable database of driver, reflectors, and heat sinks that have been evaluated by Xicato and can be integrated with Xicato's light sources. Users can search and filter on a wide range of parameters to match the desired solution for their application. Contact your sales representative or technical application representative for more details.

CAD FILES & DRAWINGS

2D and 3D files are available for download on the Xicato website.

APPLICATION & TECHNICAL NOTES

Xicato has an extensive list of application notes for proper handling and usage of the modules.

TABLE OF CONTENTS

GENERAL DESCRIPTION

XIM

The Xicato Intelligent Module (XIM) is a compact, integrated LED lighting module designed to fit a wide variety of downlight and spot fixtures, and to simplify the design and assembly of controllable LED luminaires. The XIM includes:

- LED emitting core
- Drive electronics – constant voltage to constant current (dimmable)
- Microprocessor with firmware and static random access memory (SRAM)
- Internal sensors that detect intensity, LED and PCB temperature, power, and other operating parameters
- Bluetooth Smart wireless transceiver (XIM Gen4 only)

The extremely high quality, integrated XIM driver dims more smoothly and deeply than high-end standalone LED drivers. Combined with Xicato's industry leading color quality, consistency and application-optimized light spectra, XIM provides simply the most beautiful lit effect.

Integration makes the XIM more affordable to implement and enables smaller downlight or spotlight fixtures.

Xicato is the only light source provider to give a long term warranty on both output and color consistency, creating a strong case for lowest total cost of ownership and smallest ecological footprint, while insuring consistent lighting design quality for the life of the installation.

Over its broad dimming range, XIM exceeds the highest international standards for avoiding health effects related to flicker - it is the only LED solution to achieve this.

XIM GENERATION 4 (XIM GEN4)

To the standard XIM, XIM Gen4 adds Bluetooth wireless connectivity and the distributed intelligence required to respond to all types of sensors, switches, and mobile app commands. XIM Gen4 is a control system, a beacon, and an intelligent IoT (Internet of Things) node that fundamentally changes the economics of lighting control, smart spaces and the lighting industry. XIM Gen4 dramatically simplifies and cost reduces the planning, installation, provisioning, control and management of controlled lighting, while enabling new location-based information services.

XIM Gen4 is about more than Lighting. XIM Gen4 can advertise Google Eddystone and/or Apple iBeacons, providing wayfinding and other location-based information about such things as museum exhibits, retail merchandise, or restaurant menus.

XIM Gen4 is part of a total ecosystem with compatible software, motion, lux, temperature, humidity and vibration sensors, switches, and gateways. Built on the ubiquitous Bluetooth standard already in billions of smartphones and tablets, Xicato has opened its software interfaces (APIs) to enable third-party developers to write their own apps, expanding opportunities for OEMs, lighting designers, M&Es, and end users.

DESIGNER SERIES

Xicato Designer Series products provide an optimal balance between accurate, natural color rendition, lumen output and efficacy. Designer Series comes in 9mm and 19mm LES, in 2700K, 3000K and 4000K CCT, and in lumen packages from 700LM to 4500LM. Designer Series delivers minimum CRI R_a of 90 and R9 of 50, TM-30 R_f of 88 and R_g of 101, and a consistent white point.

XICATO CORRECTED COLD PHOSPHOR PORTFOLIO (SEE ALSO XLT)

Xicato Portfolio	Lumen Output	Correlated Color Temperature 2700K		3000K		3500K		4000K	
Artist Series® CIE CRI: Ra 95+, R9 90+ IES TM-30: Rf 96, Rg 103	700	⊙		⊙		⊙		⊙	
	1300	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	2000	•	⊙	•	⊙	•	⊙	•	⊙
	3000		•		•		•		•
	4000		•		•		•		•
Beauty Series™ CIE CRI: Ra 95 IES TM-30: Rf 91, Rg 107									
	1300		⊙						
	2000		⊙						
Designer Series™ CIE CRI: Ra 90+, R9 50+ IES TM-30: Rf 88, Rg 101	700	⊙		⊙		⊙		⊙	
	1300	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	2000	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	3000		⊙		⊙		⊙		⊙
	4500				•		•		•
Standard Series CIE CRI: Ra 80+ IES TM-30: Rf 78, Rg 101	700	⊙		⊙		⊙		⊙	
	1300	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	2000	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	3000		⊙		⊙		⊙		⊙
	4000		•		•		•		•
	5000		•		•		•		•
Vibrant Series® V80 CIE CRI: Ra 80+ IES TM-30: Rf 73, Rg 105	700			⊙					
	1300			⊙	⊙				
	2000			⊙	⊙				
	3000				⊙				
	4000				•				
	5000				•				
Vibrant Series® V95 CIE CRI: Ra 95+ IES TM-30: Rf 93, Rg 106	700			⊙					
	1300			⊙	⊙				
	2000			•	⊙				
	3000				•				
	4000				•				

LEGEND	XCA+XTM	+XIM
9mm LES	•	⊙
19mm LES	•	⊙

Note:
CRI listed as XX+ are guaranteed minimum values. Typical values are min+3.

ORDERING GUIDE

PART NUMBERING SYSTEM

NOTE that all combinations are not available. Please see listing, below.

XIM	19	95	30	13	A2	A
XCA: Xicato Core Array XIM: Xicato Intelligent Module XTM: Xicato Thin Module	Light Emitting Surface (LES mm) 09: 9 19: 19	Series 80: Standard 90: Designer 95: Artist BT: Beauty V8: Vibrant 80 V9: Vibrant 95	CCT (K) 27: 2700 30: 3000 35: 3500 40: 4000 01: NA	Flux (nominal) 07: 700 13: 1300 20: 2000 etc.	Feature Group A2: DALI A3: 1-10V A5: BLE+DALI A6: BLE+1-10V CC: constant current	Revision

PART CODES AND DESCRIPTIONS

XIM DESIGNER SERIES WITH 9MM LIGHT EMITTING SURFACE

Part Number	Description
XIM09902707A2A	LED Module, XIM, LES09, Designer, 2700K, 700LM, DALI
XIM09902707A3A	LED Module, XIM, LES09, Designer, 2700K, 700LM, 1-10V
XIM09902707A5A	LED Module, XIM, LES09, Designer, 2700K, 700LM, DALI+BLE
XIM09902707A6A	LED Module, XIM, LES09, Designer, 2700K, 700LM, 1-10V+BLE
XIM09902713A2A	LED Module, XIM, LES09, Designer, 2700K, 1300LM, DALI
XIM09902713A3A	LED Module, XIM, LES09, Designer, 2700K, 1300LM, 1-10V
XIM09902713A5A	LED Module, XIM, LES09, Designer, 2700K, 1300LM, DALI+BLE
XIM09902713A6A	LED Module, XIM, LES09, Designer, 2700K, 1300LM, 1-10V+BLE
XIM09902720A2A	LED Module, XIM, LES09, Designer, 2700K, 2000LM, DALI
XIM09902720A3A	LED Module, XIM, LES09, Designer, 2700K, 2000LM, 1-10V
XIM09902720A5A	LED Module, XIM, LES09, Designer, 2700K, 2000LM, DALI+BLE
XIM09902720A6A	LED Module, XIM, LES09, Designer, 2700K, 2000LM, 1-10V+BLE
XIM09903007A2A	LED Module, XIM, LES09, Designer, 3000K, 700LM, DALI
XIM09903007A3A	LED Module, XIM, LES09, Designer, 3000K, 700LM, 1-10V
XIM09903007A5A	LED Module, XIM, LES09, Designer, 3000K, 700LM, DALI+BLE
XIM09903007A6A	LED Module, XIM, LES09, Designer, 3000K, 700LM, 1-10V+BLE
XIM09903013A2A	LED Module, XIM, LES09, Designer, 3000K, 1300LM, DALI
XIM09903013A3A	LED Module, XIM, LES09, Designer, 3000K, 1300LM, 1-10V
XIM09903013A5A	LED Module, XIM, LES09, Designer, 3000K, 1300LM, DALI+BLE
XIM09903013A6A	LED Module, XIM, LES09, Designer, 3000K, 1300LM, 1-10V+BLE
XIM09903020A2A	LED Module, XIM, LES09, Designer, 3000K, 2000LM, DALI
XIM09903020A3A	LED Module, XIM, LES09, Designer, 3000K, 2000LM, 1-10V

Suggested Cable Harness
(one per unit, order separately)

XSA-331

XIM 6-pin 600mm 1-10V/DALI Wire Harness

XIM09903020A5A	LED Module, XIM, LES09, Designer, 3000K, 2000LM, DALI+BLE
XIM09903020A6A	LED Module, XIM, LES09, Designer, 3000K, 2000LM, 1-10V+BLE
XIM09903507A2A	LED Module, XIM, LES09, Designer, 3500K, 700LM, DALI
XIM09903507A3A	LED Module, XIM, LES09, Designer, 3500K, 700LM, 1-10V
XIM09903507A5A	LED Module, XIM, LES09, Designer, 3500K, 700LM, DALI+BLE
XIM09903507A6A	LED Module, XIM, LES09, Designer, 3500K, 700LM, 1-10V+BLE
XIM09903513A2A	LED Module, XIM, LES09, Designer, 3500K, 1300LM, DALI
XIM09903513A3A	LED Module, XIM, LES09, Designer, 3500K, 1300LM, 1-10V
XIM09903513A5A	LED Module, XIM, LES09, Designer, 3500K, 1300LM, DALI+BLE
XIM09903513A6A	LED Module, XIM, LES09, Designer, 3500K, 1300LM, 1-10V+BLE
XIM09903520A2A	LED Module, XIM, LES09, Designer, 3500K, 2000LM, DALI
XIM09903520A3A	LED Module, XIM, LES09, Designer, 3500K, 2000LM, 1-10V
XIM09903520A5A	LED Module, XIM, LES09, Designer, 3500K, 2000LM, DALI+BLE
XIM09903520A6A	LED Module, XIM, LES09, Designer, 3500K, 2000LM, 1-10V+BLE
XIM09904007A2A	LED Module, XIM, LES09, Designer, 4000K, 700LM, DALI
XIM09904007A3A	LED Module, XIM, LES09, Designer, 4000K, 700LM, 1-10V
XIM09904007A5A	LED Module, XIM, LES09, Designer, 4000K, 700LM, DALI+BLE
XIM09904007A6A	LED Module, XIM, LES09, Designer, 4000K, 700LM, 1-10V+BLE
XIM09904013A2A	LED Module, XIM, LES09, Designer, 4000K, 1300LM, DALI
XIM09904013A3A	LED Module, XIM, LES09, Designer, 4000K, 1300LM, 1-10V
XIM09904013A5A	LED Module, XIM, LES09, Designer, 4000K, 1300LM, DALI+BLE
XIM09904013A6A	LED Module, XIM, LES09, Designer, 4000K, 1300LM, 1-10V+BLE
XIM09904020A2A	LED Module, XIM, LES09, Designer, 4000K, 2000LM, DALI
XIM09904020A3A	LED Module, XIM, LES09, Designer, 4000K, 2000LM, 1-10V
XIM09904020A5A	LED Module, XIM, LES09, Designer, 4000K, 2000LM, DALI+BLE
XIM09904020A6A	LED Module, XIM, LES09, Designer, 4000K, 2000LM, 1-10V+BLE

Part Number	Description
XIM19902713A2A	LED Module, XIM, LES19, Designer, 2700K, 1300LM, DALI
XIM19902713A3A	LED Module, XIM, LES19, Designer, 2700K, 1300LM, 1-10V
XIM19902713A5A	LED Module, XIM, LES19, Designer, 2700K, 1300LM, BLE+DALI
XIM19902713A6A	LED Module, XIM, LES19, Designer, 2700K, 1300LM, BLE+1-10V
XIM19902720A2A	LED Module, XIM, LES19, Designer, 2700K, 2000LM, DALI
XIM19902720A3A	LED Module, XIM, LES19, Designer, 2700K, 2000LM, 1-10V
XIM19902720A5A	LED Module, XIM, LES19, Designer, 2700K, 2000LM, BLE+DALI
XIM19902720A6A	LED Module, XIM, LES19, Designer, 2700K, 2000LM, BLE+1-10V
XIM19902730A2A	LED Module, XIM, LES19, Designer, 2700K, 3000LM, DALI
XIM19902730A3A	LED Module, XIM, LES19, Designer, 2700K, 3000LM, 1-10V
XIM19902730A5A	LED Module, XIM, LES19, Designer, 2700K, 3000LM, BLE+DALI
XIM19902730A6A	LED Module, XIM, LES19, Designer, 2700K, 3000LM, BLE+1-10V
XIM19903013A2A	LED Module, XIM, LES19, Designer, 3000K, 1300LM, DALI
XIM19903013A3A	LED Module, XIM, LES19, Designer, 3000K, 1300LM, 1-10V
XIM19903013A5A	LED Module, XIM, LES19, Designer, 3000K, 1300LM, BLE+DALI
XIM19903013A6A	LED Module, XIM, LES19, Designer, 3000K, 1300LM, BLE+1-10V
XIM19903020A2A	LED Module, XIM, LES19, Designer, 3000K, 2000LM, DALI
XIM19903020A3A	LED Module, XIM, LES19, Designer, 3000K, 2000LM, 1-10V
XIM19903020A5A	LED Module, XIM, LES19, Designer, 3000K, 2000LM, BLE+DALI
XIM19903020A6A	LED Module, XIM, LES19, Designer, 3000K, 2000LM, BLE+1-10V
XIM19903030A2A	LED Module, XIM, LES19, Designer, 3000K, 3000LM, DALI
XIM19903030A3A	LED Module, XIM, LES19, Designer, 3000K, 3000LM, 1-10V
XIM19903030A5A	LED Module, XIM, LES19, Designer, 3000K, 3000LM, BLE+DALI
XIM19903030A6A	LED Module, XIM, LES19, Designer, 3000K, 3000LM, BLE+1-10V
XIM19903513A2A	LED Module, XIM, LES19, Designer, 3500K, 1300LM, DALI
XIM19903513A3A	LED Module, XIM, LES19, Designer, 3500K, 1300LM, 1-10V
XIM19903513A5A	LED Module, XIM, LES19, Designer, 3500K, 1300LM, BLE+DALI
XIM19903513A6A	LED Module, XIM, LES19, Designer, 3500K, 1300LM, BLE+1-10V
XIM19903520A2A	LED Module, XIM, LES19, Designer, 3500K, 2000LM, DALI
XIM19903520A3A	LED Module, XIM, LES19, Designer, 3500K, 2000LM, 1-10V
XIM19903520A5A	LED Module, XIM, LES19, Designer, 3500K, 2000LM, BLE+DALI
XIM19903520A6A	LED Module, XIM, LES19, Designer, 3500K, 2000LM, BLE+1-10V
XIM19903530A2A	LED Module, XIM, LES19, Designer, 3500K, 3000LM, DALI
XIM19903530A3A	LED Module, XIM, LES19, Designer, 3500K, 3000LM, 1-10V
XIM19903530A5A	LED Module, XIM, LES19, Designer, 3500K, 3000LM, BLE+DALI
XIM19903530A6A	LED Module, XIM, LES19, Designer, 3500K, 3000LM, BLE+1-10V

Suggested Cable Harness
(one per unit, order separately)

XSA-331

XIM 6-pin 600mm 1-10V/DALI
Wire Harness

XIM19904013A2A	LED Module, XIM, LES19, Designer, 4000K, 1300LM, DALI
XIM19904013A3A	LED Module, XIM, LES19, Designer, 4000K, 1300LM, 1-10V
XIM19904013A5A	LED Module, XIM, LES19, Designer, 4000K, 1300LM, BLE+DALI
XIM19904013A6A	LED Module, XIM, LES19, Designer, 4000K, 1300LM, BLE+1-10V
XIM19904020A2A	LED Module, XIM, LES19, Designer, 4000K, 2000LM, DALI
XIM19904020A3A	LED Module, XIM, LES19, Designer, 4000K, 2000LM, 1-10V
XIM19904020A5A	LED Module, XIM, LES19, Designer, 4000K, 2000LM, BLE+DALI
XIM19904020A6A	LED Module, XIM, LES19, Designer, 4000K, 2000LM, BLE+1-10V
XIM19904030A2A	LED Module, XIM, LES19, Designer, 4000K, 3000LM, DALI
XIM19904030A3A	LED Module, XIM, LES19, Designer, 4000K, 3000LM, 1-10V
XIM19904030A5A	LED Module, XIM, LES19, Designer, 4000K, 3000LM, BLE+DALI
XIM19904030A6A	LED Module, XIM, LES19, Designer, 4000K, 3000LM, BLE+1-10V

Suggested Cable Harness
(one per unit, order separately)

XSA-331

XIM 6-pin 600mm 1-10V/DALI
Wire Harness

MECHANICAL CHARACTERISTICS

MECHANICAL SPECIFICATIONS

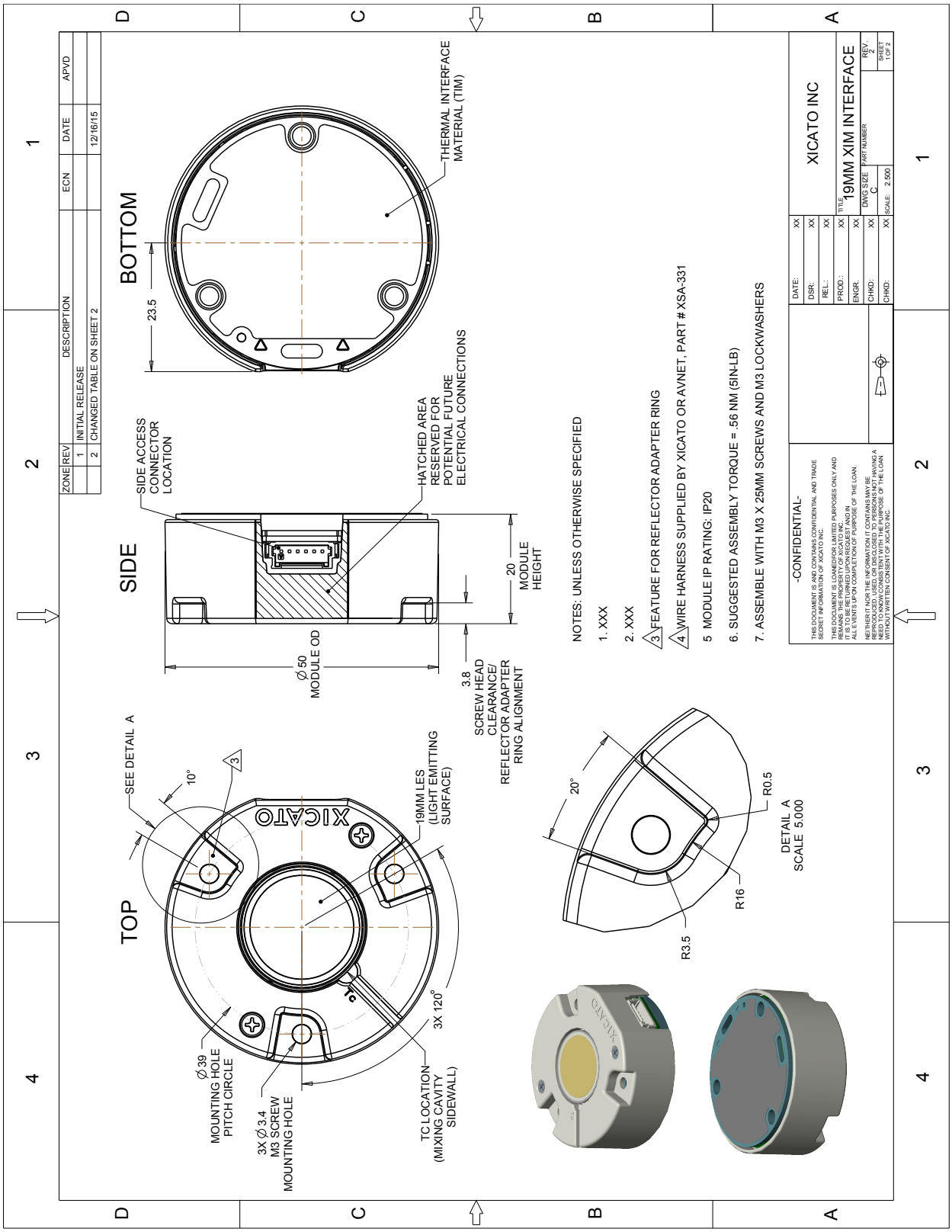
Module Source Type	Corrected Cold Phosphor Technology®
Phosphor Proximity	Remote
Module Housing	Injection molded glass filled PBT
Dimensions	Ø 50mm x 20mm (1.97" x 0.78") * Xicato recommends an insertion space of Ø 52mm
Weight	48 grams (1.69 oz.)
Light Emitting Surface options	Ø 9mm (0.35") Ø 19mm (0.75")
Interfaces: Electrical	6-Pin terminal. TE part # 353908-6P. Mating connector TE 353907-1. Pin-out: P1 + power, P2 - power, P3 open, P4 open, P5 control+, P6 control-. 600mm wire harness accessory available through Avnet (part #2829114-2), Xicato Part # XSA-331.
Interfaces: Mechanical	Recommended mounting screws: M3 x 0.5mm x 25mm with split lock washer.
Mounting Torque	Min: 0.36N-m (3.2in-lbs). Max: 0.43N-m (3.8in-lbs)
Interface: Thermal	Integrated thermal pad. A mating thermal interface (i.e. heatsink) surface flatness of ≤ 0.1 mm and center hole less than Ø12 mm is recommended in order to maintain thermal performance.
Maximum Case Temperature	90°C
Shipping (20 pc MOQ):	20 count box: 347mm x 230mm x 9mm (14" x 9" x 4"), 1.4 kg (3 lbs.) gross weight 100 count box: 533mm x 254mm x 153mm (21" x 10" x 6"), 3 kg (7 lbs.) gross weight
Storage Temperature	-40°C to +85°C
Ingress Protection:	IP20

XIM 19mm

XIM 19mm top

MECHANICAL DRAWINGS

XIM 9mm is identical except for the diameter of the LES.



ELECTRICAL & DIMMING CHARACTERISTICS

Module Electronics Lifetime	5,400,000 hrs MTBF calculated @ 90°C, 0.6 CL, per Telcordia SR-332 Issue 3
Power in Off State (XIM Gen4)	DALI+BLE (A5A): 270mW, 1-10V+BLE (A6A): 380mW

OVER TEMPERATURE PROTECTION

Fold Back Temperature	93°C (reduces to 85% of set level)
Shut-off Temperature	98°C
Restore Temperature	85°C (increases back to 100% of set level)

DIMMING INFORMATION: ALL PROTOCOLS

Dim to Off (0%)	Yes
On/off threshold	≤ 0.05% of module maximum rated intensity. Subject to change.

DIMMING INFORMATION: BLUETOOTH SMART

Dimming Profile	Logarithmic (default) or linear, configurable
Minimum Dim Setting	0.1% of maximum intensity
Dimming Granularity	0.01% resolution (10,000 steps from 100% to 0.01%)

DIMMING INFORMATION: DALI (IEC 62386-101/102:2009 AND IEC 62386-207)

Dimming Profile	Logarithmic (default) or linear, configurable
Minimum Dim Setting	0.1% of maximum intensity
Dimming Granularity	255 steps
Dimming Compatibility	DALI 1.0. Additional compatibility information available at www.xicato.com

DIMMING INFORMATION: 1-10V / 0-10V (IEC 60929 ANNEX E)

Dimming Profile	< 0.5V	0% (off) (> 0.75V to turn back on)
	≥ 0.5V and < 1.0V	1%
	≥ 1.0V and < 9.0V	12.375% x ($V_{1\text{-}10V}$ – 1) + 1%
	≥ 9.0V	100%
Dimming Compatibility	XIM is compatible with a wide range of 1-10V sink dimming systems. Refer to dimming compatibility documentation at www.xicato.com.	
Potentiometer Compatibility	100kOhm typical	

DIMMING AND FLICKER

Reference	Luminous Intensity	Modulation Frequency	Risk Level
Reference IEEE Std 1789-2015: "IEEE Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers"	100% - 1.25% of max	≥ 3,000 Hz	No Effect
	1.25% - 0.5% of max	≥ 1,250 Hz	Low Risk
	0.5% - 0.1% of max	> 250 Hz	Medium Risk

WIRELESS SPECIFICATIONS & COMPLIANCE

Processor	ARM Cortex M0, 32-bit, 48 MHz
Protocol	Bluetooth 4.1
Spectral band	2.4 GHz
Bandwidth	1 Mbps
Channels	40
Transmission Power	-18 dBm to +9.5 dBm
Receive Sensitivity	-95 dBm
RSSI Resolution	1 dB resolution
Signal to Noise Ratio (SNR)	> 5:1

WIRELESS COMPLIANCE

Bluetooth 4.1 qualified End Product device

- QDID: 82951
- Declaration ID: D032980

UNITED STATES:

FCC NOTICE: This device complies with Part 15 of the FCC Rules. The device meets the requirements for the modular transmitter approval as detailed in FCC public Notice DA00-1407. Transmitter Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

LABELING REQUIREMENTS: The Original Equipment Manufacturer (OEM) must ensure that FCC labelling requirements are met. This includes a clearly visible label on the outside of the OEM enclosure specifying the appropriate FCC identifier for this product as well as the FCC Notice above. The FCC identifier is FCC ID: WAP4110. In any case the end product must be labeled on the exterior with “FCC ID: WAP4110”.

CANADA:

ISED NOTICE: The device complies with Canada RSS-GEN Rules. The device meets the requirements for modular transmitter approval as detailed in RSS-GEN. Operation is subject to the following two conditions: (1) This device may

not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

L'appareil est conforme aux Règles RSS-GEN de Canada. L'appareil répond aux exigences d'approbation de l'émetteur modulaire tel que décrit dans RSS-GEN. L'opération est soumise aux deux conditions suivantes: (1) Cet appareil ne doit pas causer d'interférences nuisibles, et (2) Cet appareil doit accepter toute interférence reçue, y compris les interférences pouvant entraîner un fonctionnement indésirable.

ISED INTERFERENCE STATEMENT FOR CANADA

This device complies with Innovation, Science and Economic Development (ISED) Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme à la norme sur l'innovation, la science et le développement économique (ISED) norme RSS exempte de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

ISED RADIATION EXPOSURE STATEMENT FOR CANADA

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment.

Cet équipement est conforme aux limites d'exposition aux radiations ISED prévues pour un environnement incontrôlé.

LABELING REQUIREMENTS:

The Original Equipment Manufacturer (OEM) must ensure that ISED labelling requirements are met. This includes a clearly visible label on the outside of the OEM enclosure specifying the appropriate IC identifier for this product as well as the ISED Notice above. The IC identifier is 7922A-4110. In any case, the end product must be labeled in its exterior with “IC: 7922A-4110”.

EUROPE

Declaration of Conformity: Hereby, Xicato declares that the XIM series products comply with the essential requirements and other relevant provisions of RED 2014/53/EU.

JAPAN

MIC Japan certificate 203-JN0568

KOREA

KC Korea certificate MSIP-CRM-Cyp-4110

SOFTWARE & FIRMWARE FEATURES

Protocol Security	AES-128 (128-bit encryption)
Site Scalability	Over 140 trillion individually addressable nodes per site (2^37)
	4,294,967,296 secure networks per site (2^32). Secure networks CANNOT overlap.
	32,767 nodes per secure network (2^15 – 1). One secure network per node.
	16,383 groups per secure network (2^14 – 1). Groups can overlap.
	65,535 scenes per secure network (2^16 – 1). Scenes can overlap.
XIM scalability	Each XIM can be a member of one secure network at a time.
	Each XIM can be a member of up to 16 groups at one time. Groups can overlap.
	Each XIM can participate in up to 32 scenes at one time. Scenes can overlap.

INTERNAL SENSOR DATA COLLECTION & STORAGE

Real-time reporting	Current Intensity level Current Temperature of LED core (Tc) Current Temperature of electronics printed circuit board (PCB). Current Input power, voltage and ripple current Current Group membership (provisioned) Current Scene membership (provisioned)
Stored operating history	Total operating hours (time at > 0% intensity) Power cycles (power on/off) LED cycles (LEDs turned on/off, unit still powered) Histogram representing time spent in operating parameter range: temperature, intensity
Stored module Information	Module part number GTIN Serial number XIM hardware revision XIM firmware revision Bluetooth firmware revision Maximum flux Programmed flux LES (light emitting surface diameter) CCT CRI Enabled dimming protocol(s)
Stored OEM programming	OEM serial number (12 bytes) 36 bytes optional free text data

XIM WARRANTY

Warranty duration:	Verifiable 7 years or 50,000 hours of operation at luminous intensity > 0%. Verification based on actual operating data stored in each module.
Warranty coverage:	Covers initial color consistency, lumen maintenance, color maintenance, and drive electronics on EVERY module (B0). No failures.
Initial Color Consistency:	Every light source is within 1x2 MacAdam Ellipse (1x2 SDCM) of target color point. Flux and color point tuned at case temperature 70°C.
Lumen Maintenance:	Better than 70% (L70, B0, F0) at 50,000 hours at maximum operating drive current and maximum case temperature (90°C).
Color Maintenance:	Luminaires within a contiguous space shall remain within ± 0.003 Δu'v' of each other at maximum case temperature (90°C) for the duration of the warranty.
Full warranty text at:	www.xicato.com/support/warranty

INITIAL COLOR CONSISTENCY – DETAILS

NOTES:

1. Artist Series, Designer Series, and Standard Series color point targets are on the Planckian locus at each specified CCT
2. Vibrant Series color point target is -0.003 Duv
3. Beauty Series color point target is -0.006 Duv
4. All metrics are calculated according to the proprietary Xicato color matching function

Correlated Color Temp		Initial Color Consistency		
Nominal	Actual	CCT	Duv	SDCM
2700K	2700K	± 40K	± 0.001	± 1x2
3000K	2950K	± 50K		
3500K	3420K	± 60K		
4000K	4000K	± 70K		

COLOR METRICS: DESIGNER SERIES

Optimized for accurate, natural color rendering with high lumen output and efficacy.

Designer Series is designed to balance extremely high color rendering with high lumen output and efficacy, for demanding retail, hospitality, and residential applications.

All color rendering data at highest rated drive current and 70°C case temperature (T_c)
Tester consistency (reproducibility) ± 0.0002 Duv (CIE 1964) from NIST reference

Correlated Color Temperature: 2700K, 3000K, 3500K or 4000K nominal.

Initial Color Consistency: ≤ 1 x 2 Macadam ellipses (SDCM) at 70°C, B0

CIE CRI Minimums: $R_a \geq 90$, R9 ≥ 50

Color Maintenance: Group consistency maintained < 0.003 Δu'v' at 50,000 hours

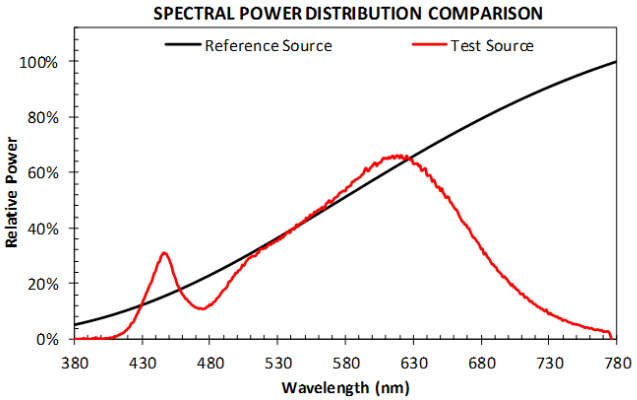
Lumen Maintenance: L70/B0 at 50,000 hours

Warranty: 5 year for individual modules (B0) on mortality, color and lumen maintenance.
Details at www.xicato.com/support/warranty

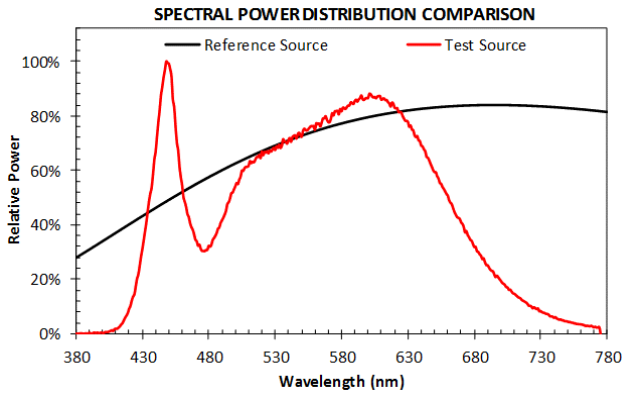
CIE CRI COLOR METRICS (3000K TYPICAL)

	R_a	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	GAI
Designer Series	91	91	94	97	92	91	93	91	80	55	87	93	84	92	98	87	104

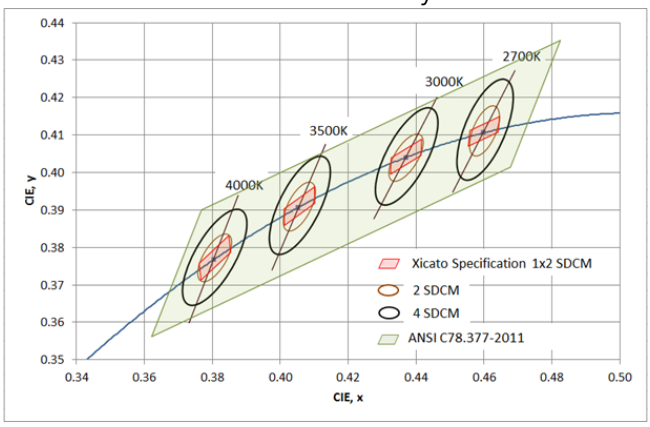
Spectral Power Distribution vs. Reference Source: 3000K



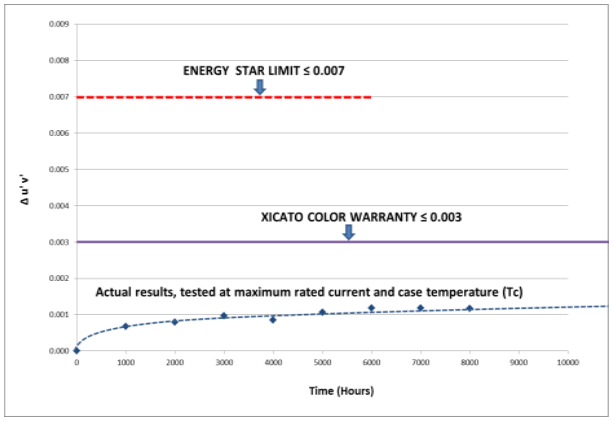
Spectral Power Distribution vs. Reference Source: 4000K



Color Consistency



Color Maintenance



IES TM-30 COLOR METRICS

(Values are typical. Based on 3000K CCT)

IES TM-30 Color Fidelity (R_f) 88

IES TM-30 Color Gamut (R_g) 101

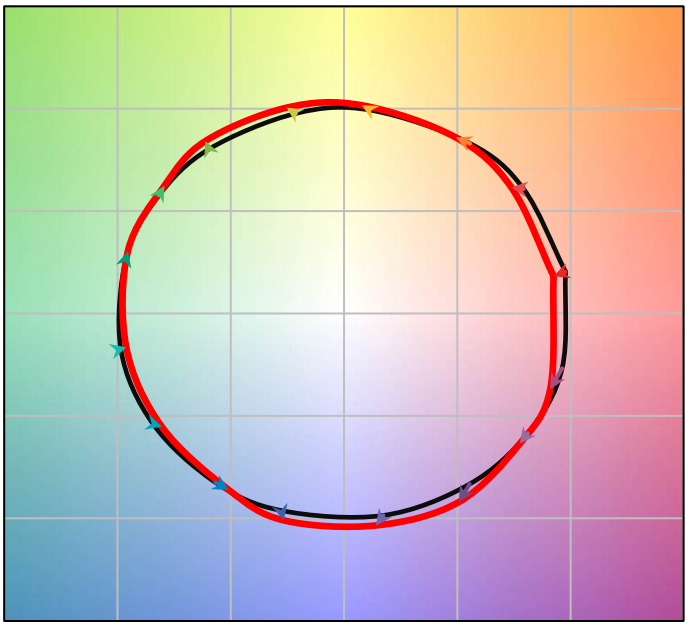
COLOR VECTOR GRAPHIC: 3000K

This plot shows the average chromaticity shift for the samples within each of 16 hue bins, which are compiled out of the 99 IES TM-30 Color Evaluation Samples. The values are normalized so that the reference is a circle.

Vector arrows indicate the direction and degree of the shift for each hue bin.

- Radial shift indicates an increase/decrease in saturation.
- Tangential shift indicates a shift in hue.

Length of arrow indicates degree of shift.

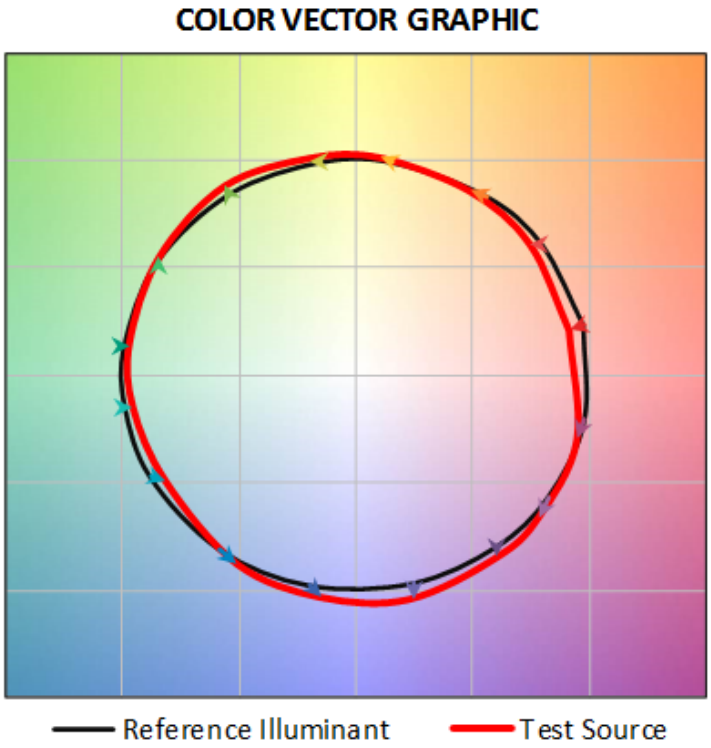


COLOR VECTOR GRAPHIC: 4000K

This plot shows the average chromaticity shift for the samples within each of 16 hue bins, which are compiled out of the 99 IES TM-30 Color Evaluation Samples. The values are normalized so that the reference is a circle.

Vector arrows indicate the direction and degree of the shift for each hue bin.

- Radial shift indicates an increase or decrease in saturation.
- Tangential shift indicates a shift in hue.
- Length of arrow indicates the degree of shift.

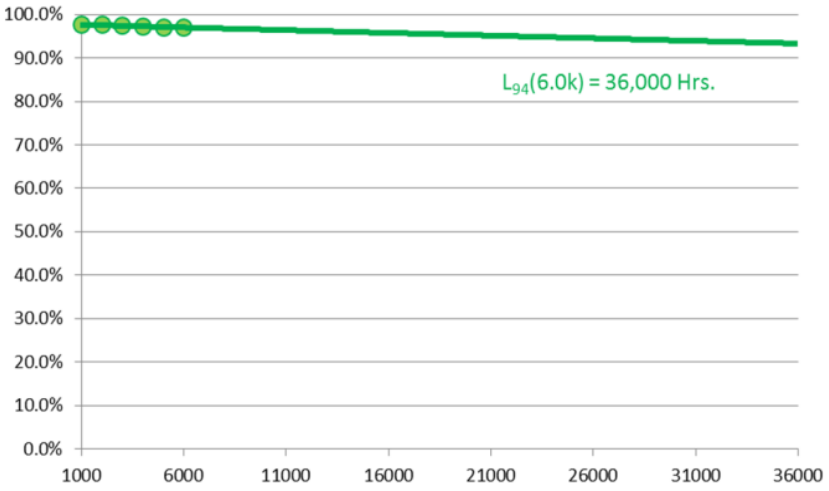


IES LM-80

DESIGNER SERIES™ 19MM, 2700K, 2000LM

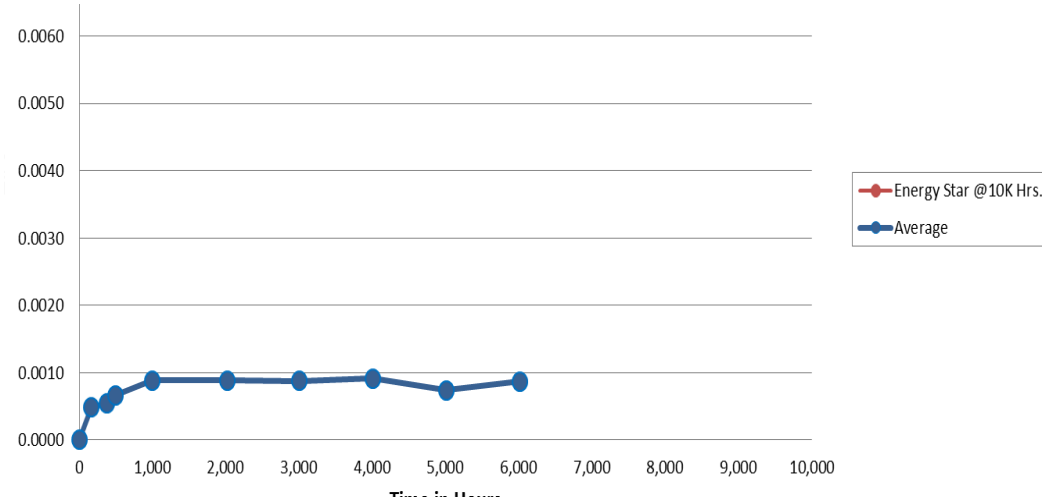
Testing conducted at T_c = 90°C, I_f = 1050mA, HTOL, 6000 Hrs.

LUMEN MAINTENANCE

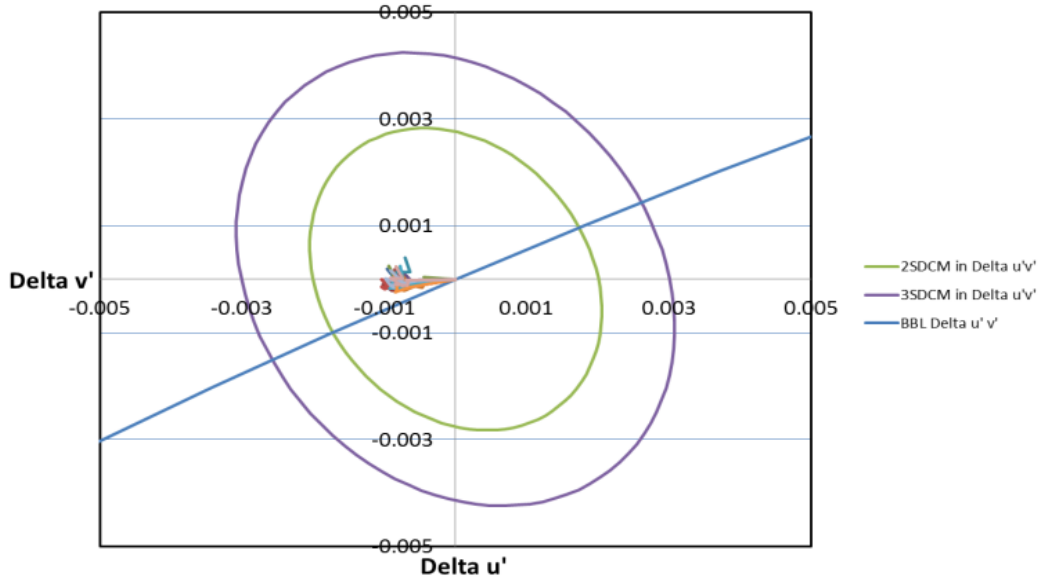


Time (hrs)	L70B50
50000	93.02%
70000	91.18%
80000	90.27%
90000	89.37%
100000	88.48%

COLOR MAINTENANCE



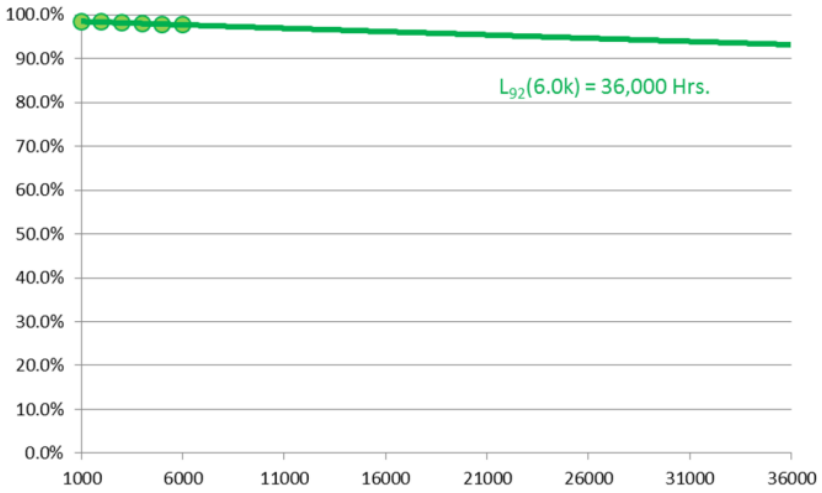
COLOR MAINTENANCE (NORMALIZED)



DESIGNER SERIES™ 19MM, 3000K, 3000LM

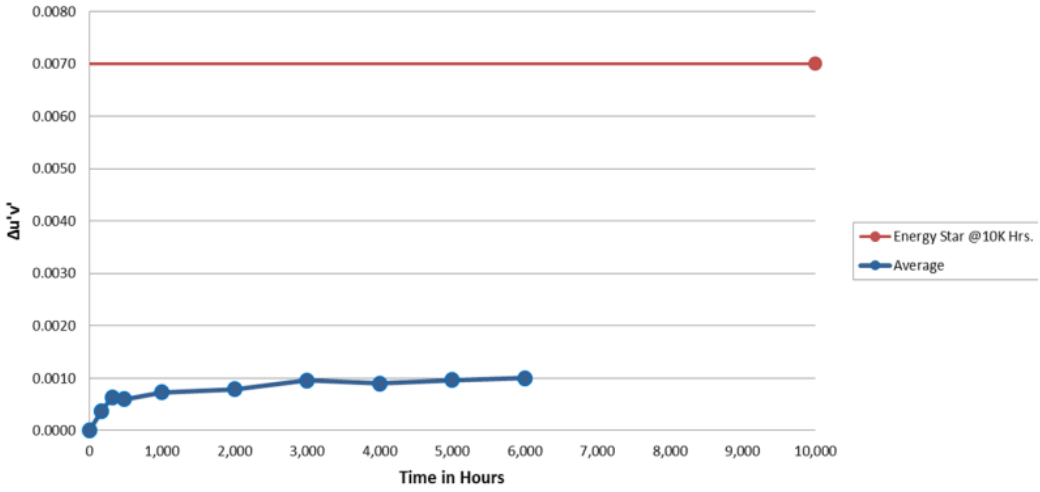
Testing conducted at T_c = 90°C, I_f = 1050mA, HTOL, 6000 Hrs.

LUMEN MAINTENANCE

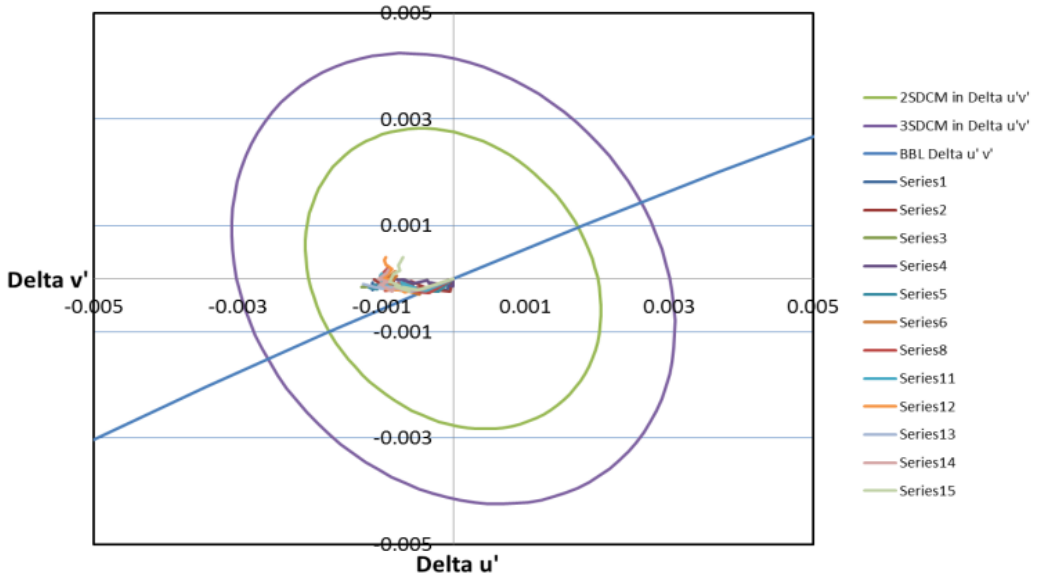


Time (hrs)	L70B50
50000	89.24%
70000	85.74%
80000	84.04%
90000	82.37%
100000	80.74%

COLOR MAINTENANCE



COLOR MAINTENANCE (NORMALIZED)



PERFORMANCE CHARACTERISTICS

More extensive performance data is available from your Xicato sales representative.

NOTES:

1. Absolute range of lumen output is ± 10% of typical value.
2. Specifications are subject to change without notice.

ABSOLUTE MAXIMUM RATINGS

Supply Input Voltage (V_{in}+)	56V DC, referenced to V_{in}-
(0-10V) DIM+	20V DC, referenced to DIM- (Vin- is directly connected to DIM- in the XIM)
Tc	90˚C

RECOMMENDED OPERATING CONDITIONS

	Min	Typical	Max
Input Voltage	45.6	48	50.4
Turn on Voltage		40	
Turn off Voltage		38	
Shutdown Voltage		30	

POWER SUPPLY REQUIREMENTS

Listed below are the power consumption ratings of the XIM. These ratings should be used to determine the minimum rating of the power supply (PSU) used to power the XIM.

MAXIMUM POWER (W)

The PSU power rating must meet or exceed the Max Power rating of the XIM selected. If multiple XIM are powered by a single PSU, then the power rating of the PSU must meet or exceed the sum of the Max Power ratings of all of the XIM being driven, combined.

Part Family	Max W
XIM0990xx07AxA	10.1
XIM0990xx13AxA	18.8
XIM0990xx20AxA	35.3
XIM1990xx13AxA	12.6
XIM1990xx20AxA	19.1
XIM1990xx30AxA	31.3

POWER AND EFFICACY VS. INTENSITY

Note that the XIM with Bluetooth consumes a small amount of power due to its periodic wireless transmissions of operating data. Power shown at 0% is worst-case, based on full power and high frequency transmission, which is configurable.

Power in W Efficacy in Lm/W	100%	75%	50%	24%	10%	5%	1%	0%
XIM0990xx07A5A	9.5	6.9	4.5	2.4	1.1	0.69	0.35	0.27
Efficacy (typ)	73	76	77	73	64	51	20	NA
XIM0990xx07A6A	9.6	7.0	4.7	2.5	1.2	0.80	0.46	0.38
Efficacy (typ)	73	75	75	70	58	44	15	NA
XIM0990xx13A5A	17.8	12.7	8.2	4.2	1.8	1.05	0.43	0.27
Efficacy (typ)	73	77	79	78	72	62	30	NA
XIM0990xx13A6A	17.9	12.9	8.3	4.3	1.9	1.2	0.54	0.38
Efficacy (typ)	72	76	78	76	68	56	24	NA
XIM0990xx20A5A	33.6	22.9	14.1	6.8	2.9	1.6	0.54	0.27
Efficacy (typ)	59	66	71	74	70	64	37	NA
XIM0990xx20A6A	33.8	23.0	14.3	6.9	3.0	1.7	0.65	0.38
Efficacy (typ)	59	65	70	72	67	60	31	NA
XIM1990xx13A5A	11.9	8.6	5.7	3.0	1.3	0.81	0.38	0.27
Efficacy (typ)	110	113	115	109	97	81	34	NA
XIM1990xx13A6A	12.0	8.7	5.8	3.1	1.5	0.92	0.49	0.38
Efficacy (typ)	108	112	112	105	89	71	27	NA
XIM1990xx20A5A	18.1	13.0	8.5	4.3	1.9	1.1	0.43	0.27
Efficacy (typ)	111	115	118	115	107	93	46	NA
XIM1990xx20A6A	18.2	13.1	8.6	4.5	2.0	1.2	0.54	0.38
Efficacy (typ)	110	114	117	112	101	85	37	NA
XIM1990xx30A5A	29.8	21.1	13.5	6.7	2.9	1.6	0.53	0.27
Efficacy (typ)	101	107	111	111	105	96	56	NA
XIM1990xx30A6A	29.9	21.2	13.6	6.9	3.0	1.7	0.64	0.38
Efficacy (typ)	100	106	111	109	101	90	47	NA

PERFORMANCE GRAPHS

The latest graphs of XIM flux, CCT, and efficacy performance at different intensity and case temperature levels are available on Xicato website under Support / Documents and Tools.

(1) In the "Choose a category" pull down menu, select "datasheets".
(2) In the "Choose a product" pull down menu, select "XIM Generation 4".

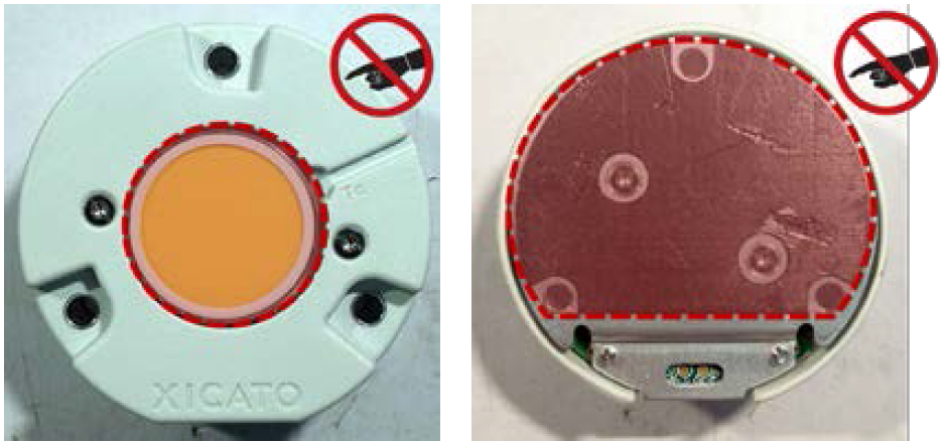
BASIC HANDLING AND ASSEMBLY

GENERAL HANDLING

Make sure your **hands and tools are clean** before handling module.

Do not drop module or allow modules to rattle in a loosely packed container. This may dislodge internal electrical components, or scratch the phosphor or thermal interface pad.

Do not touch the phosphor coating on top of the LED array (the light emitting surface) **or 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 either surface, clean the surface by blowing on it with clean air. The phosphor surface can also be cleaned by gently wiping with isopropyl alcohol.



Do not touch sensitive surfaces. Keep them clean.

ASSEMBLY

Always use recommended screws and fasteners, and apply recommended torque. Take caution not to exceed these values as this may damage the module. 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.

Be sure not to reverse polarity on the electrical leads to the module, as this may damage the module. Be absolutely certain to use the proper wire gauge and color and, when required, poke them into the proper connector. One-time poke-in connectors are not guaranteed to function properly if wires are pulled loose and reinserted.

Make sure that surfaces of thermal interface pad and heat sink are clean and free of debris before assembly. Visually verify that there are no gaps between thermal surfaces, and that pressure has been evenly applied across the entire surface.

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

For more detailed handling and assembly instructions, including:

- How to mount reflectors, adapters, fasteners
- How to mount unit to heat sinks
- Wiring and wire harness
- How to test the module for thermal performance

…and more, please see "Application Note - XIM Assembly Instructions" on the Xicato website.

REGULATORY INFORMATION

DRIVE CURRENT

The product is designed for use with a constant voltage power supply. Refer to the Performance Characteristics section for details on operating voltage and current requirements.

ELECTRICAL SAFETY & HANDLING

CE:	IEC 62031:2008 + A1:2012
UL:	8750 recognized. Class 2. Suitable for dry and damp locations.
Ingress Protection rating:	IP20
CSA:	C22.2 No. 250.13-12.

ESD Class 3B (HBM). No special ESD handling procedures required.

EYE SAFETY

The product is tested in accordance with IEC TR 62778.
For Blue Light it is rated for Risk Group 1.

CHEMICAL SAFETY

The following chemicals should be avoided, even in small quantities, within the module:

Hydrochloric Acid	MEK (Methyl Ethly Ketone)	Dichloromethane
Sulfuric Acid	MIBK (Methyl Isobutyl Ketone)	Rosin Flux Solder
Nitric Acid	Toluene	Castor Oil
Acetic Acid	Xylene	Lard Oil
Sodium Hydroxide	Benzene	Linseed Oil
Potassium Hydroxide	Gasoline	Petroleum Oil
Ammonia	Mineral Spirits	Silicone Oil
Sulfur (Used in Rubber Processing)	Tetracholoromethane (Carbon tetrachloride – CCl_4)	Halogenated Hydrocarbons (Containing F, Cl, or Br)

ENVIRONMENTAL SAFETY

RoHS compliant

Lead content:	None
Mercury content:	None
UV or IRC Emissions:	None

WIRELESS COMPLIANCE

See Wireless Specifications

LUMINAIRE SPECIFICATION: RECOMMENDED LED MODULE

GENERAL DESCRIPTION

Color Point and Spectral Power Distribution shall be optimized for precise, accurate, natural color rendering.

Initial Color Consistency:	Every light source shall be within a 1x2 MacAdam Ellipse (1x2 SDCM) Flux and color point tuned at case temperature 70°C
Initial Color Point Accuracy:	Shall be within ± 0.001 Duv of Black Body Locus (BBL)
Color Maintenance:	Luminaires within a contiguous space shall remain within 3 MacAdam Ellipses of each other at 50,000 hours at maximum operating drive current and maximum case temperature (90°C). LM-80 data at maximum rated current and 90°C shall show Δu'v' < 0.003 at 6,000 hours.
Lumen Maintenance:	Shall be better than 70% (L70, B0, F0) at 50,000 hours at maximum operating drive current and maximum case temperature (90°C). LM-80 data at maximum rated current and 90°C shall show LM > 94.8% at 6,000 hours.
Phosphor Technology:	Corrected Cold Phosphor Technology®
Dimming	Luminaire shall be capable of dimming to 1% or less of maximum intensity. Modulation and frequency for luminaire at 2% of maximum intensity shall fall within the No Effect area, and at 1% within the Low Risk area, of IEEE Std 1789-2015 (IEEE Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers).
Warranty:	Verifiable 7 years or 50,000 hours, including minimum on mortality, lumen maintenance, and color maintenance. Mortality: B0 – No failures. Lumen maintenance: L70, B0 (better than 70% on <u>all</u> units). Color maintenance: < 0.003 Δu'v' at 50,000 hours

DETAILED COLOR SPECIFICATIONS

IES TM-30-15 Color rendering fidelity (R_f) shall be ≥ 88

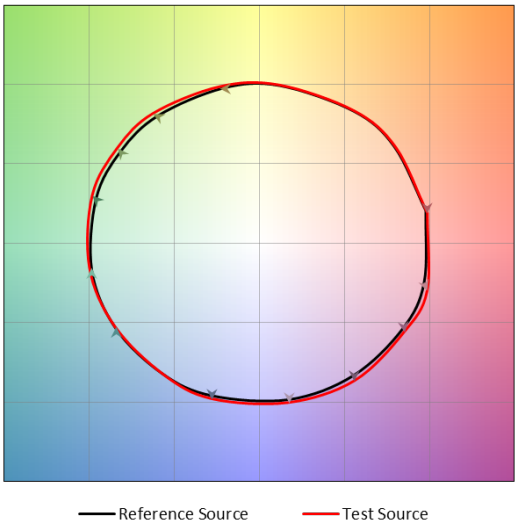
IES TM-30-15 Color rendering gamut (R_g) shall be ≥ 101

CIE CRI (Ra) shall be ≥ 90; R9 shall be ≥ 50

Typical CIE CRI R values at 3000K shall be:

R1: 91	R9: 55
R2: 94	R10: 87
R3: 97	R11: 93
R4: 92	R12: 84
R5: 91	R13: 92
R6: 93	R14: 98
R7: 91	R15: 87
R8: 80	

COLOR VECTOR GRAPHIC



LED module shall be Xicato Intelligent Module (XIM), Designer Series: XIM1990****A*A, or equivalent.