PIXEL MODULE SERIES | DYNAMIC SIGNAGE

The SMX is a compact, high-performance RGBW pixel module for signage, light boxes, and shallow illuminated surfaces. Its integrated lens ensures consistent light diffusion, delivering smooth and uniform illumination even in tight or low-profile applications.

With IP68 protection, UV-resistant housing, and compatibility with LED CTRL controllers, SMX delivers dynamic pixel-level control and reliable outdoor performance accross a wide range of architectural and signage applications.

Modules can be individually cut, mounted with adhesive or screws, and are ideal for depth-critical installations from 10-25cm.

At a glance

Emitters

RGBW
(W = 2200K, 2700K, 3000K, 4000K, 6000K, 7000K)

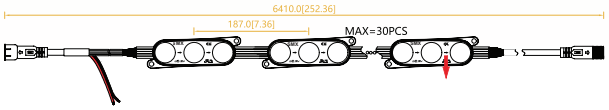
OR

Dynamic White
(2500k-12000k)

OR

White
(W = 2200K, 2700K, 3000K, 4000K, 6000K, 7000K)

SMX Run



Controls

Wattage

RGBW (0.8W/pc)

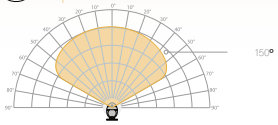
Protection

Ingress – IP68

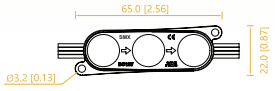
Temperature

-20°C to 60°C
-4°F to 140°F

Optics



Dimensions



FIXTURE PRODUCT CONFIGURATOR

Prefix	LED String Qty	LED Colour	White CCT	Control
SMX	1 2 3 4 30	RGBW DW – Dynamic White (2500K-12000K) W – White (2200K-7000K)	22K – 2200K 27K – 2700K 30K – 3000K 40K – 4000K 60K – 6000K 70K – 7000K	D – DMX S – SPI X – X-Stream XB – X-Stream Boosted

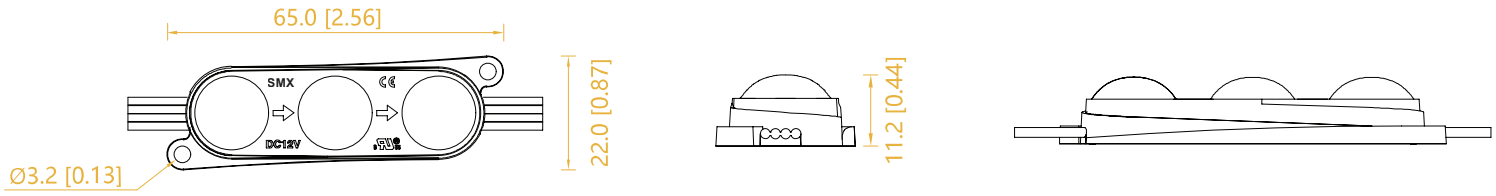
EXAMPLE: SMX – 5 – RGBW – 27K – D

FIXTURE SPECIFICATIONS

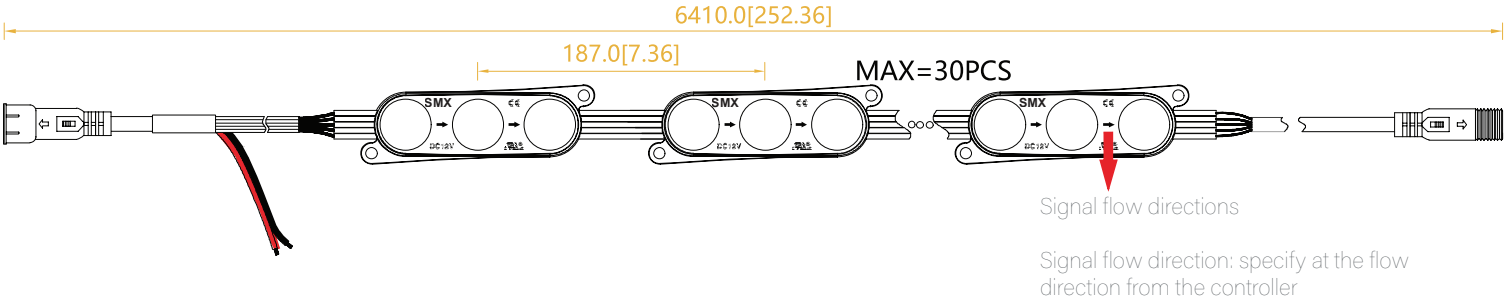
ELECTRICAL	POWER CONSUMPTION	RGBW (0.8W/PC)
	OPERATING VOLTAGE	12V DC
	OPERATING TEMPERATURE	-20°C TO 60°C (-4°F TO 140°F)
	STORAGE TEMPERATURE	-20°C TO 70°C (-4°F TO 158°F)
PHYSICAL	STANDARD FIXTURE DIMENSIONS	L: 65MM – W: 22MM – H: 11.2MM
	LED QTY/PCS	3 LEDS
	CRI	80+
	IP RATING	IP68
	MOUNTING OPTIONS	ADHESIVE TAPE, SCREWS
	MAX RUN (PCS)	30PCS
	SPACING	187MM (CENTRE TO CENTRE)
OPTICAL	BEAM ANGLE	150°
	COLOUR RANGE	DYNAMIC WHITE (2500K-12000K), WHITE (2200K, 2700K, 3000K, 4000K, 6000K, 7000K)
	ACCURATE COLOUR CONTROL	RGBW CONFIGURATIONS WITH SELECTABLE CCT
	LUMINOUS FLUX (LM(PC)	RGBW (19LM/PC)
	LED TYPE	SMD 5050
DIMING & CONTROL	CONTROL PROTOCOLS	X-STREAM PROTOCOL WITH DATA REDUNDANCY AND DMX, SPI
	DIMMING RESOLUTION	8 BIT RESOLUTION DOING 65536 STEP WITH BUILT-IN GAMMA 2.2, 12-BIT, 14-BIT, 16-BIT.
FIXTURE RATING & CERTIFICATIONS	CE / IP68	
LIMITED WARRANTY	5 YEARS *Extendable warranty available	

FIXTURE DIMENSIONS

SIGNAGE MODULE DIMENSIONS



SIGNAGE MODULE MAX RUN

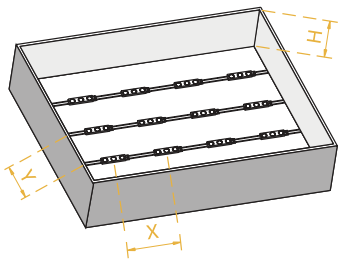


Signal flow direction: specify at the flow direction from the controller

INSTALLATION REFERENCE

SIGNAGE MODULE INSTALLATION

Model No.	Surface Material	Depth(H)cm	Illumination(lux)	Evenness	Density (pcs/m²)	Spacing (X*Y)cm	Watt Density (W/m²)	Visual Effects
SMX	White Soft Film	10	1287-1538	0.84	10*10	10*10	100	OK
		12	712-838	0.85	7*8	14*12	56	
		15	578-672	0.86	6*6	16*16	36	
		18	443-502	0.88	5*5	20*18	25	

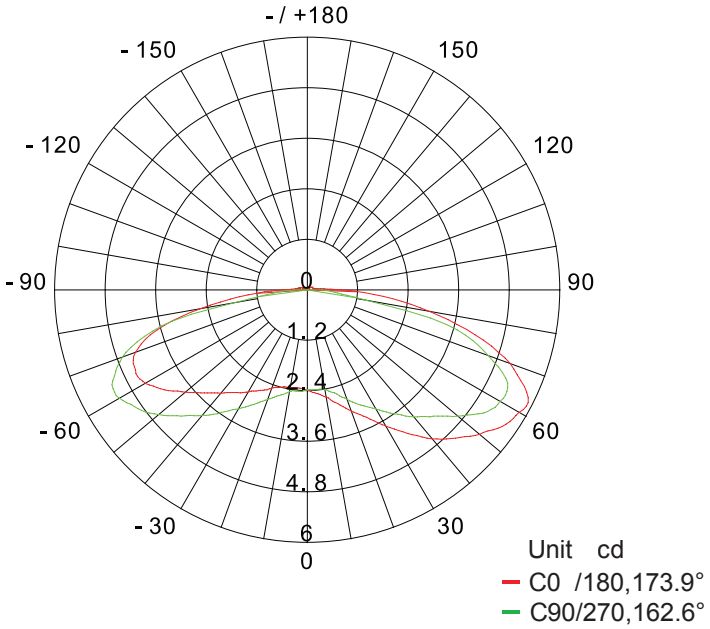


Note:

1. X indicates the horizontal center spacing between modules;
2. Y indicates the longitudinal center spacing between modules;
3. Single LED modules are arranged in a square, X= Y.
4. When the depth of light box H>18cm, use more products to satisfy Illumination demand
5. Please contact the sales for other data.
6. Customised wire length available.
7. The above data is for common demand , you can increase the density for actual demand.
8. The above data are obtained when four color of SMX are all bright

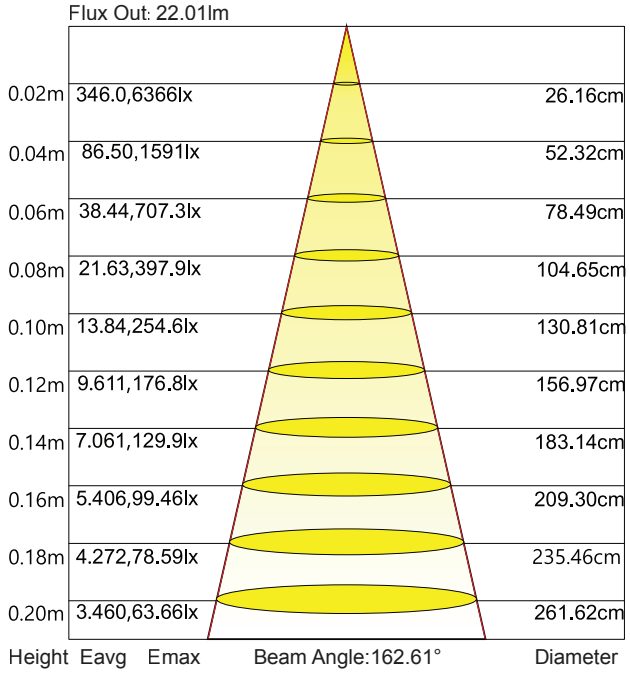
FIXTURES LUMINOUS CHARACTERISTICS

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



AVERAGE BEAM ANGLE(50%): 168.2°

AVERAGE BEAM ANGLE

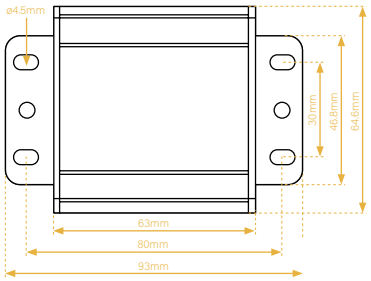


PXT/R BOOSTERS

The PXT and PXR qork together as a transmitter/receiver pait ro allow you yo extend SPI signals up to 100 metres. The units convert the standard API signal to/from a differential pair to allow the signal to travel this distance while minimising interference

Wide input voltage range allows support for many LED products, and the compact size makes it easy to accomodate in installations.

D1 and B1 inputs support standard data (D1) and backup data (B1) for pixel protocols supporting data redundancy.



PXT TRANSMITER	INPUT VOLTAGE	12V – 48V DC
	AMP	6A MAX
	INPUT	SPI OR X-STREAM FROM CONTROLLER OR LEDS
	OUTPUT	X-STREAM DIFFERENTIAL SIGNAL
	IP RATING	IP20
PXT RECEIVER	INPUT VOLTAGE	12V – 48V DC
	AMP	6A MAX
	INPUT	X-STREAM DIFFERENTIAL SIGNAL
	OUTPUT	SPI OR X-STREAM TO LEDS
	IP RATING	IP20

X-STREAM® COMMUNICAITON OPTIONS

X-Stream® technology is LED CTRLs premium communication platform, delivering high-speed data transmission, intelligent redundancy, and exceptional signal integrity across large-scale lighting installations. It is available in two configurations to suit different installation requirements.

X – X-Stream (EXTERNAL)
In the standard X-Stream configuration, all communication hardware sits outside the fixture. A PXT (Transmitter) and PXR (Receiver) pairs is mounted externally, converting the standard SPI signal to a differential pair for long-distance, interference-resistant data transmission.
- Communication distance up to 100 metres between fixtures. .
- D1 and B1 inputs support standard and backup data for full signal redundancy.
- Wide input voltage range for compatibility across the LED CTRL product ecosystem.
- For longer runs, additional pXT/PXR pairs can be added at intervals to maintain signal integrity.
- Best suited for installations where external access to communication hardware is preferred, or where fixtures do not support internal integration.

XB – X-Stream Boosted (INTEGRATED)
X-Stream Boosted moves the signal repeating capability inside the fixture run, eliminating external hardware and simplifying installation. An external PXT transmits the signal to a PXR housed inside the product, which receives, processes, and re-transmits via a built-in PXT to the next fixture – effectively turning each boosted point into a signal relay
- Eliminates external junction boxes and separately mounted communication hardware.
- Each boosted point fully regenerates the signal, preventing degradation over distance.
- Supports extended runs without compromising data quality
- Cleaner installation with fewer visible components.

Integration depends on the product:
- High refresh rates (up to 16 kHz) furthr ensure stable, flicker-free performance and accurate colour rendering.
- Factory-integrated (e.g. LXB): The PXT/PXR hardware is built directly into the fixture, no additional components required.
- Dedicated boost housing (e.g. PUX): A purpose-built fixture shell, identical in form but wihtout LEDs, houses the PXT/PXR pair. Placed at the beginning of each run and at intervals along longer runs, it integrates seamlessly without disrupting the visual continuity of the installation.

Both configurations share the same underlying X-Stream platform, ensuring identical signal quality, redundancy, and compatibility with LED CTRL controllers and fixtures.

X-STREAM® TECHNOLOGY

X-Stream® Technology is LEDCTRL's premium communication and power delivery platform, built on the advanced UCS7604 driver IC. It is designed to deliver high speed data transmission, exceptional reliability, and superior visual performance across large-scale and demanding lighting installations.

At its core, the system integrates intelligent signal processing, high-precision constant current control, and advanced error-detection mechanisms to ensure stable operation and consistent output, even in complex or long-distance configurations.

KEY FEATURES

Built-in Redundancy

X-Stream® incorporates dual-channel signal transmission with intelligent fault detection. In the event of a pixels or signal failure, the system automatically bypasses the faulty node and continues data transmission without interruption.

- Dual signal channels with real-time monitoring
- Automatic switching between channels in case of failure
- Fault identification accuracy greater than 99%
- No visible disruption during signal switching

This ensures continuous operation and eliminates single-point failures across the installation.

Auto-Addressing

Fixtures require no manual addressing or pre-configuration. Each unit automatically interprets incoming data, allowing for flexible installation and simplified maintenance.

- Plug-and-play installation
- No addressing sequence required
- Fixtures can be installed in any order

This significantly reduces installation time and minimises the risk of configuration errors.

High-Speed Communication

X-Stream® supports high-speed PWM data transmission, enabling smooth and dynamic lighting effects across long runs.

- Transmission speeds: 800 Kbps and 1.6 Mbps
- Supports high frame rates and fast data refresh
- Capable of filming environments up to 533 FPS without flicker
- Stable performance regardless of frame frequency

This ensures high-quality visual output suitable for media façades, dynamic content, and camera-facing applications.

Advanced Dimming Performance

The system supports multiple dimming resolutions, delivering precise brightness control and smooth transitions across the full output range.

- 8 / 12 / 14 / 16-bit dimming options
- Up to 65,536 levels of greyscale
- Built-in gamma correction (8-bit to 16-bit equivalent)
- Seamless dimming from 0% to 100%

High refresh rates (up to 16 kHz) further ensure stable, flicker-free performance and accurate colour rendering.

Signal Integrity & Reliability

X-Stream® integrates advanced anti-interference and signal enhancement technologies to maintain reliable communication in challenging environments

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- S-AI anti-interference technology reduces radiation and conduction interference
- Enhanced signal receiving and transmission stability
- Consistent performance across varying environmental conditions
- Extended standard spacing between fixtures (>15 m)

These features ensure robust operation in large-scale and electrically complex installations.

Data Booster Technology

To support extended installation distances, X-Stream® incorporates data boosting capabilities both within fixtures and via external booster units.

- Extends communication distance up to 100 m between fixtures
- Maintains signal integrity over long data runs
- Supports large-scale linear and distributed installations

This allows for greater design flexibility without compromising system performance.

Long-Distance Power Distribution

X-Stream® systems are designed to support extended power runs through intelligent power management and integrated hardware.

- AC fixtures with built-in, replaceable power supplies
- High power factor for efficient energy distribution
- Managed startup and inrush current control
- Smart load regulation for stable operation
- Supports continuous runs of up to 96 m of linear product

This ensures reliable power delivery across extended fixture runs while maintaining system safety and efficiency.

System Overview

By combining high-speed communication, intelligent redundancy, and advanced signal processing, X-Stream® Technology enables the creation of large-scale, high-performance lighting systems with minimal installation complexity and maximum operational reliability.

Its integration of the UCS7604 chipset ensures that each fixture operates with precision, consistency, and resilience, making it suitable for demanding architectural, façade, and media lighting applications.

WIRING CONSIDERATIONS

TYPICAL SYSTEM WIRING DIAGRAM