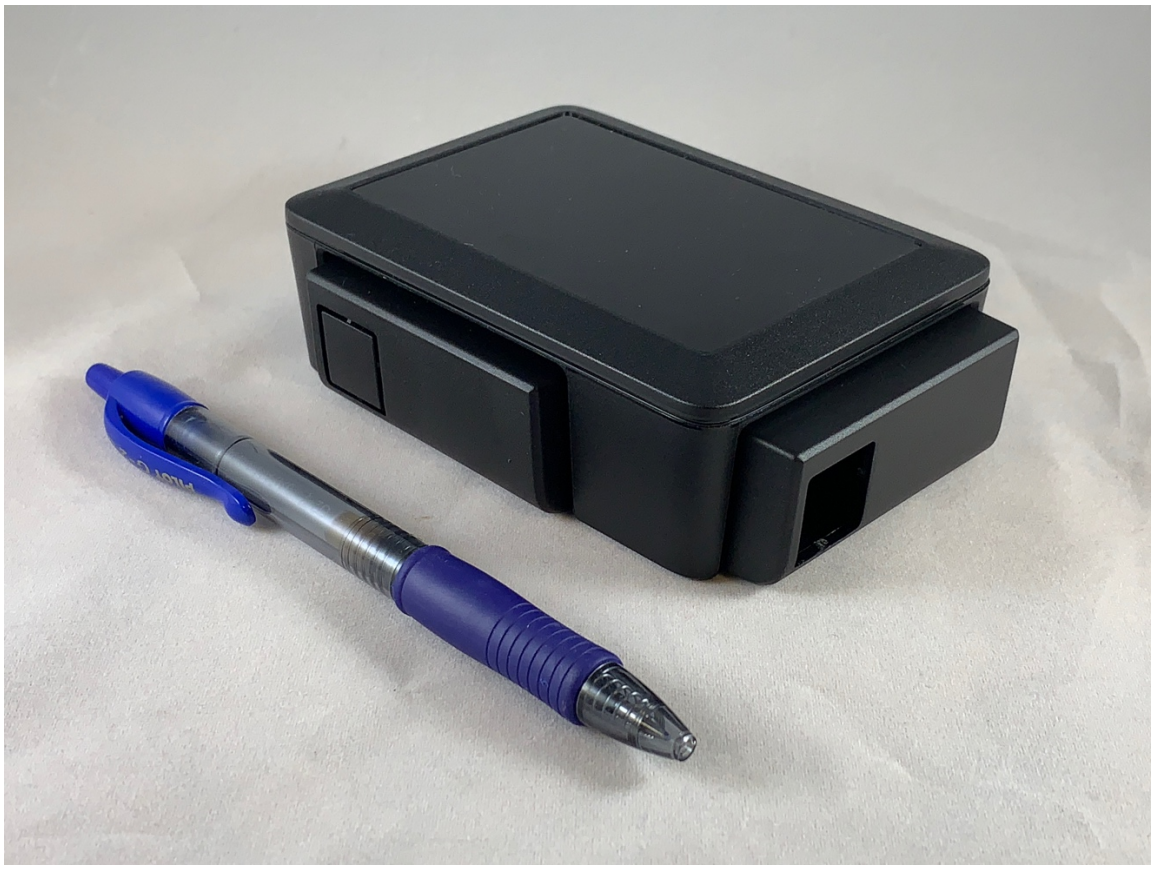
XICATO® GalaXi™

DATA SHEET

XIG-0102: Xicato Intelligent Gateway



About Xicato

Xicato designs and develops light sources and control 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 Hong Kong, Europe and the US.

For further information, visit www.xicato.com.

ABOUT THIS DOCUMENT

This 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 Datasheets, Test reports, including third party LM-80, UL, CE, and FCC, Accessory selection tools for heatsinks, optics, and drivers, CAD files and drawings, IES files, Application and Technical Notes, Training presentations, Sales brochures, Technical whitepapers, and much more.

Go to the Xicato website under Support / Documents and Tools, or contact your local Xicato representative for more information

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GENERAL DESCRIPTION

XIG – THE XICATO INTELLIGENT GATEWAY

The Xicato Intelligent Gateway (XIG) is a small, robust appliance that provides wired or wireless IP access to a wireless Bluetooth Low Energy (BLE) network of Xicato GalaXi™ devices and software, including XIM modules, drivers (XID), sensors (XIS), switches (XSW), and protocol bridges built by Xicato and Xicato GalaXi partners. XIG integrates Xicato GalaXi firmware and software into a standard, Linux-based embedded computing platform.

Xicato GalaXi products employ wireless Bluetooth mesh communication for peer-to-peer interaction, improving system performance and reliability. GalaXi lighting nodes contain embedded intelligence… there is no single point of network failure… and can be programmed by standard computers and mobile devices to respond to sensors, switches, and schedules, as well as mobile and remote commands. XIG provides remote monitoring, control, configuration and management functions, as well as general range extension. It also enables interaction with building management systems and third-party lighting control systems through its open HTTP protocol interface.

XIG is powered using standard Power over Ethernet (PoE) through its RJ45 port. It can be powered from a standard PoE switch or router, or using an inexpensive PoE injector or power supply.

XIG allows end users to monitor and control a virtually unlimited number of BLE devices over any geographic distance (see Figure 1), as long as they have access to the private wired or wireless local area network (LAN) connected to the XIG(s). XIG can also connect to a standard cellular modem for access over the cellular data network.

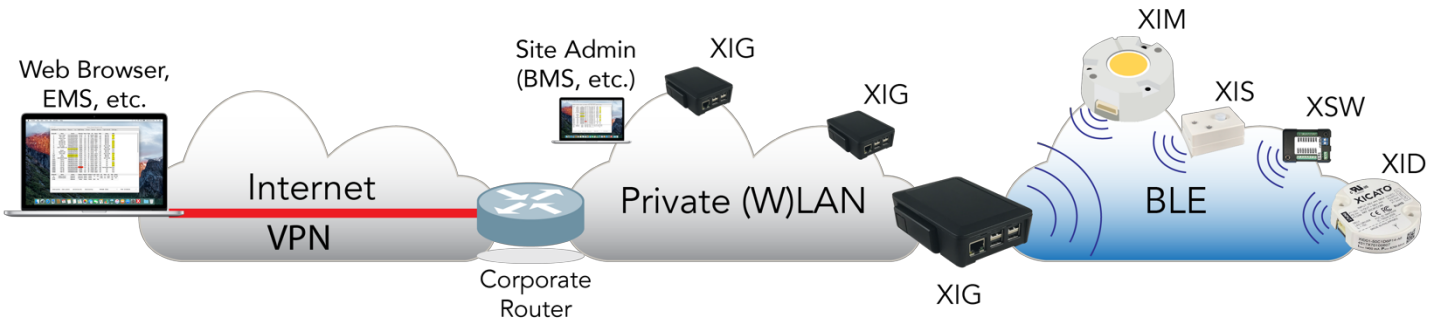


Figure 1: XIG access can be over wired or wireless LAN or Internet VPN using a web browser, EMS/BMS, or 3rd party control software

XIG OPEN SOFTWARE INTERFACES

OPEN HTTP OR EMBEDDED BROWSER INTERFACE

XIG communicates on the IP network using an open, standard HTTP API interface that is available free of charge from Xicato. The HTTP interface enables any building management system (BMS), enterprise management system (EMS) or 3rd party audio-visual or lighting control system to control the GalaXi network as a subset of a larger, multi-vendor network that might include HVAC, audio-visual, or other environmental controls.

For convenience, Xicato has integrated an Apache web server that is accessible using any standard browser. Users simply enter the IP address of an XIG in their local area network – or over an Internet VPN – and the XIG provides the interface. Access is secure – users must log into the network – and up to 5 levels of security can be defined to enable e.g. administrator, manager, and user access.

Consult the XIG User Guide for usage, screen shots, and other information about the XIG web interface.

MONITORING FEATURES

MULTIPLE GATEWAY VISIBILITY

An XIM network has almost unlimited scalability. It can be configured with over 4 billion separately secure networks, each of which can contain over 32,000 devices, for a total capacity of over 140 trillion nodes! Large networks may take the form of multi-story office buildings with multiple tenants, each of which has one or more secure network zones. Or it may be a corporate or university campus, where different secure networks are assigned to different buildings or departments. Or it may encompass an entire multi-site, geographically distributed enterprise or property management portfolio. This makes an IP gateway such as XIG absolutely essential for proper management.

To simplify the user experience, the XIG interface allows you to add a second, third, or more additional XIG to the browser interface. Devices can be grouped in Unified view, where devices seen by all gateways are on a single list, sorted by secure network; or in Physical view, sorted by both XIG and secure network, in a list that can scroll indefinitely in a single browser window.

DEVICE REAL-TIME DATA MONITORING

XIG monitors devices within its radio range as well as more distant devices communicating through a Bluetooth mesh, tracking real-time data and enabling access to historical data stored in GalaXi devices.

Real-time data monitoring of lighting nodes includes:

- Unique Device ID
- Device Name
- Device Model
- Lighting Intensity
- LED Temperature (˚C)
- Power Consumption (W)
- Module Supply Voltage (V)
- Total Operating Hours
- Received Signal Strength Indication (RSSI)
- Device Status
- Total power consumption of viewed devices

Temperature monitoring allows users to proactively maintain modules that have been incorrectly installed in hostile ambient temperature environments. Supply voltage monitoring allows users to detect when a power supply is mismatched, or when it is nearing end of life. Operating hour monitoring allows users to anticipate when LED modules are nearing the end of their initial warranty period (50,000 hours).

Users can set refresh intervals for how frequently the data is updated, and can switch between secure networks in the XIG's Bluetooth domain.

DETAILED DEVICE DATA RETRIEVAL

XIG can also retrieve data stored in devices in non-volatile memory, including:

- Hardware version
- Base Firmware revision
- Bluetooth Firmware revision
- Bluetooth address
- Module color temperature
- Module CRI
- Module maximum luminous flux
- Programmed flux
- Power on/off cycles
- LED commanded on/off cycles
- PCB temperature

SENSOR DATA MONITORING

Users can monitor data coming from GalaXi sensors, including both device health data and sensed environmental conditions such as occupancy (motion), temperature, relative humidity, current lux level, and total lux-hours since last reset. Administrators can see and change the network membership of each sensor, and can see and update device firmware revision.

CONTROL FEATURES

INDIVIDUAL LIGHT CONTROL

XIG allows a remote user to control individual lighting nodes within the XIG's BLE domain. Commands can include:

- Simple on/off,
- Fixed dim level
- Scene commands

Users can also set fade time – how quickly the device or device group achieves the requested dim level.

LIGHTING GROUP CONTROL

Users can manually control entire lighting groups, including on/off/dim and scenes.

GROUP CONFIGURATION

Each secure GalaXi network can be configured with up to 16,383 groups. Users can configure (add or delete) the group membership of individual nodes remotely through the XIG. Each node can be a member of up to 16 groups, and stores the group numbers internally. Group numbers become, in effect, another shared name for the node in addition to its unique NodeID.

SCENE CONFIGURATION

XIG allows users to configure individual nodes and groups with their scenes and scene behaviors. Each secure GalaXi network can be configured with up to 64,535 scenes. Users can configure up to 32 scenes in each node. Each scene has a scene number, an optional scene name, a target intensity level (0-100%), a fade rate (time in seconds it takes to achieve the target intensity from its current intensity level), and a delay time (the time it waits before beginning its fade).

SENSOR RESPONSE CONFIGURATION

XIG allows users to configure lighting responses to sensors, switches, and other control commands using the XIG API. Occupancy and lux sensors such as the Xicato Intelligent Sensor (XIS), Bluetooth switch messages and commands, mobile device commands, and even designated lighting node messages can all determine individual lighting behavior, and that behavior can change depending on time-of-day and day-of-week scheduling.

XIG gives users the power to create the most interesting, the most energy-efficient, and the most user-responsive lighting control in the industry, and gives them the ability to manage it from anywhere in the world.

SPECIAL FEATURES

BEACON CONFIGURATION

Devices can be configured with Bluetooth beacons, including iBeacons, Alt Beacons and/or Eddystone URI beacons. Up to one of each type of beacon can be configured in each node, with individually configured transmit power, transmit cadence (how often the beacon is transmitted), and beacon message content (Major/Minor, URI, power at 1m, etc.). These beacons can be used for location-based information and/or wayfinding services.

NETWORK AND DEVICE MANAGEMENT FEATURES

NETWORK TIME DISTRIBUTION

XIG synchronizes its time clock to a network timeserver, and can be the single time source for an entire network, sending a periodic network time synchronization signal into the Bluetooth network to ensure the coordination of scheduled behavior between XIM modules.

RADIO CONFIGURATION

XIG can set the transmission parameters of lighting, sensor and switch nodes, including transmission power, transmission cadence (frequency), and trigger thresholds (status or event-driven messages).

FIRMWARE UPDATES

Administrators can efficiently update device firmware by distributing firmware loads to XIG for distributed, sequential updates. This saves a great deal of time, especially in large installations with hundreds or thousands of nodes, by allowing updates to occur in parallel in multiple locations. And the performance of the XIG is superior to USB dongles attached to macOS or Windows computers.

GATEWAY ADMINISTRATION AND MANAGEMENT FEATURES

With the use of the XIG Administration Panel, users who have the XIG administration password, can:

- Change the XIG login password that allows users to access monitoring and control
- Set XIG time zone
- Distribute XIG Firmware updates over the IP network – update the Bluetooth capabilities of the XIG
- Distribute XIG Software updates over the IP network – update feature capabilities of the XIG, bug fixes, etc.
- Program secure network keys into XIG – determine what devices are visible in the Bluetooth network
- Configure the XIG Wi-Fi interface
- Change the XIG host name – allows use of a unique name instead of a fixed IP address in DHCP environments, allowing use of Bonjour, Zeroconf, or mDNS for device discovery in the LAN
- Get the XIG's IP configuration information
- Set the XIG's fixed IP address
- Reboot the XIG system (shut down and restart the XIG operating system)
- See detailed status information on the XIG (total uptime, etc.)
- Kill the XIG Apache server process
- Collect logs from the XIG for diagnosis and debugging

MECHANICAL SPECIFICATIONS

Module Housing	ABS Plastic (Acrylonitrile butadiene styrene)
Dimensions	105 x 80 x 36 mm (4.1 x 3.1 x 1.4 in)
Weight	160 grams (5.64 oz.)
Shipping weight	310 grams (10.9 oz.)
Operating Temperature	0 to 40°C
Storage Temperature	-40°C to +55°C
Relative Humidity	15% to 85% non-condensing

ELECTRICAL SPECIFICATIONS

Power Supply	Power over Ethernet (PoE) through Ethernet RJ45 port
Supply Voltage	44Vdc to 56Vdc PoE, 802.3af compliant
Power Consumption	2W to 6W depending on WiFi activation and HTTP parameters
Processor	Quad-Core ARM A53, 64-bit, 1.4 GHz
Memory	1 GB LPDDR2 RAM, 900 MHz
Wired I/O Interface	Gigabit Ethernet (10/100/1000, RJ-45)
Wired data rate (max)	300 Mbps
Bluetooth I/O	Bluetooth 4.1
	Bluetooth 5.0 (future field upgrade)
Wireless LAN (WiFi) I/O	802.11b/g/n/ac

WIRELESS SPECIFICATIONS

Spectral band	2.4 GHz
Bandwidth	1 Mbps (Bluetooth 4.1). Up to 2 Mbps with Bluetooth 5.0
Channels	40
Transmission Power	-2.5 dBm to +9.5 dBm (Bluetooth 4.1)
	+8 dBm (Bluetooth 5.0)
Receive Sensitivity	-95 dBm (Bluetooth 4.1)
	-93 dBm (Bluetooth 5.0)
RSSI Resolution	1 dB resolution

REGULATORY CERTIFICATIONS

UL and CSA Listed: The XIG-0102-0A is UL Listed under filing number E502142 Vol. X1 Sec. A6002. The XIG-0102-0A is rated for indoor use only and has been found compliant to UL 62368-1 and CAN/CSA C22.2 No. 62368-1-14 as well as UL 60950-1 and CAN/CSA C22.2 No. 60950-1-07 + A1:2011.

CE Safety: Rated for indoor use only. Compliant to IEC 60950-1:2005/AMD1:2009, IEC 60950-1:2005/AMD2:2013, IEC 60950-1:2005 IEC 62368-1:2014 per report R1809282-12

FCC Certified: Report R1809282

CE RED: ETSI EN 301 489-1 V2.2.0 (2017-03), ETSI EN 301 489-17 V3.2.0 (2017-03), ETSI EN 300 328 V2.1.1 (2016-11)[1]

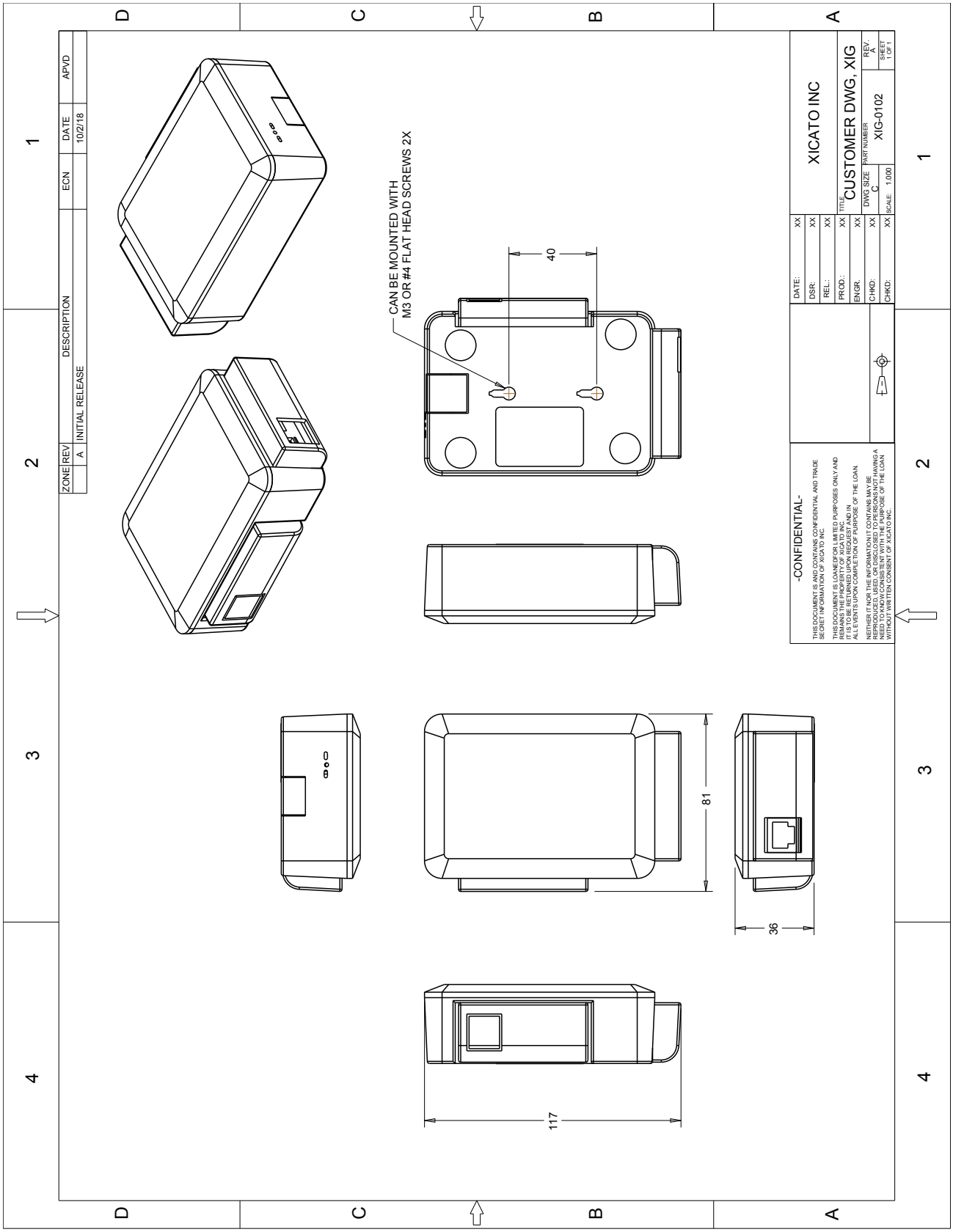
RCM approved: XIG-0102 has satisfied the ACMA RCM requirements. The SDoC can be supplied upon request.

ORDERING GUIDE

Part Number	Description
XIG-0102	Xicato Intelligent Gateway
XSA-241	Microsemi PD-3501G PoE injector (required IEC320 C13 power cord not included)

[1] Conformity based on conformity of the underlying fully certified radio module

MECHANICAL DRAWINGS



ENVIRONMENTAL SAFETY

RoHS compliant

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

Figure 2: XIG-0102 showing RJ45 Ethernet/PoE port

Figure 3: XIG-0102 bottom, showing mounting holes and certifications