

Zhaga casDMX

OUTDOOR INSTALLATION + COMMISSIONING GUIDE

Single-universe Casambi-enabled DMX-512 master
40 mm TE LUMAWISE Endurance S Z10 Key A interface

Project:
Type:
Contact:

INTERFACE CLASSIFICATION The TE Z10 Key A connector is used with a DMX Engineering proprietary signal assignment. Zhaga casDMX is not a Zhaga Book 18/D4i device and does not mate with Book 18 receptacles.



PRODUCT ROLE Zhaga casDMX translates Casambi controls into one non-isolated DMX-512 universe through a sealed outdoor 40 mm Z10 interface. The selected fixture profile determines which controls are presented and how many DMX channels are driven.

At a glance	Installation value
Power	12-24 VDC, Class 2; 30 mA no-load
DMX output	One 3-wire, non-isolated DMX-512 universe
Controlled DMX channels	Up to 12, depending on selected fixture profile
Environment	Outdoor, IP66, non-submersible; use a compatible 40 mm Z10 socket

1 Product overview

Zhaga casDMX is a Bluetooth Low Energy, Casambi-enabled DMX-512 master for outdoor luminaires and equipment using a compatible 40 mm TE LUMAWISE Endurance S Z10 Key A receptacle. It transmits one DMX universe and controls up to 12 DMX channels beginning at the configured DMX Start Address. The factory default is DMX address 1.

Use Zhaga casDMX for RGB, RGBW, tunable-white, dim-to-warm, individual-channel, and supported manufacturer-specific fixture personalities. It is a controller, not a DMX power supply or LED driver.

DO NOT USE Do not connect Zhaga casDMX to a constant-current LED output. Power it only from a 12-24 VDC Class 2 constant-voltage supply. The IP66 housing is non-submersible and depends on a compatible, correctly installed socket and seal.

1.1 Technical data

Item	Rating / description
Supply	12-24 VDC Class 2, polarity sensitive
No-load current	30 mA
DMX output	Single universe, 3-wire, non-isolated DMX-512
Controlled DMX channels	Up to 12; vendor parameter sets DMX Start Address (default 1)
Ambient temperature	-25 to +45 C (-13 to +113 F)
Maximum case temperature	+75 C (+167 F)
Storage temperature	-25 to +75 C (-13 to +167 F)
Relative humidity	0-80%, non-condensing
Environmental rating	IP66, non-submersible, when correctly installed
Overall size	48 mm round x 30 mm tall
Weight	2.2 oz
Interface	TE LUMAWISE Endurance S 40 mm Z10 Key A connector; proprietary DMX signal assignment
Radio	Casambi CBM-003B long-range module; 2.4 GHz BLE

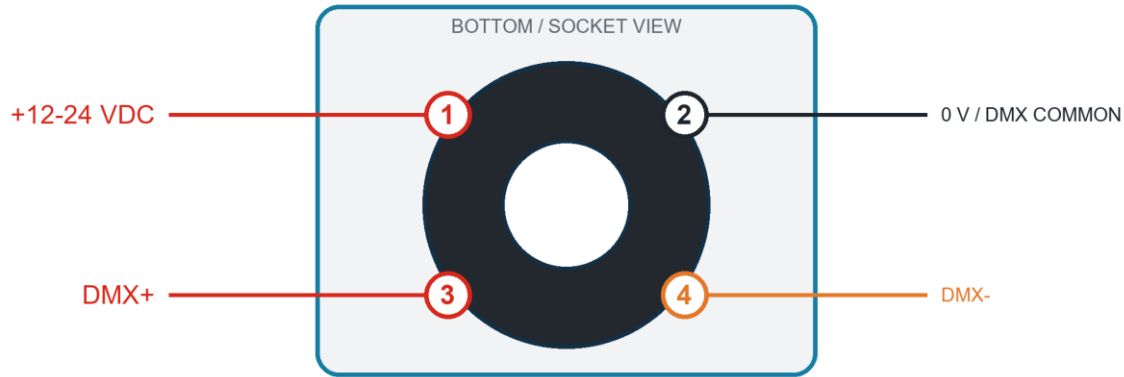
1.2 Mechanical and placement

Install the controller only in a compatible outdoor-rated 40 mm Z10 Key A receptacle, following the receptacle and luminaire manufacturers' instructions. Keep the dome exposed to free air and clear of metal obstructions so the Bluetooth antenna can operate. Do not submerge the product or use it where water can pool above the receptacle interface.

NOT BOOK 18 COMPATIBLE The similar 40 mm form factor does not make Z10 Key A interchangeable with Zhaga Book 18. Do not use a Book 18 receptacle, adapter, modified key, or DALI/D4i luminaire interface.

2 Connector and outdoor installation

ZHAGA casDMX - 40 mm Z10 FIELD CONNECTIONS



Pin 2 is both DC return and the required DMX reference/common.

SHARED REFERENCE Pin 2 is both the DC supply return and the required DMX common/reference. The DMX output is non-isolated; do not omit this conductor.

2.1 Pin mapping

Position	Signal	Field connection
Z10 pin 1	+12 to +24 VDC	Class 2 constant-voltage supply positive
Z10 pin 2	0 V / DC return / DMX common	Supply negative and required DMX reference/common
Z10 pin 3	DMX+	DMX data positive
Z10 pin 4	DMX-	DMX data negative

2.2 Socket and mechanical interface

Item	Requirement
Device envelope	48 mm round x 30 mm tall
Interface classification	TE LUMAWISE Endurance S 40 mm Z10 Key A; DMX Engineering proprietary signal assignment; not Zhaga Book 18/D4i
Compatible Z10 Key A receptacles	TE 2343403-1, 2363638-2, or 1-2363638-2; verify current TE documentation
Incompatible Book 18 parts	Do not use TE 2213858-1, 2363638-1, 1-2363638-1, or Book 18 base 2213837-1
Environmental seal	IP66, non-submersible, with compatible socket and correct installation

2.3 Installation procedure

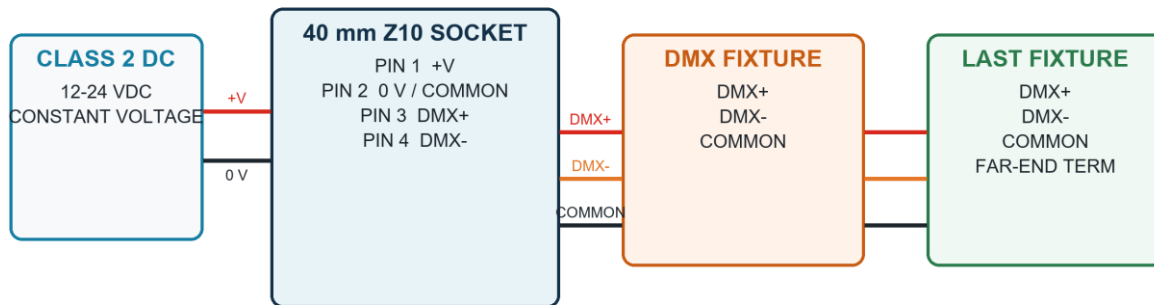
1. **De-energize the luminaire.** Verify that the Class 2 supply and every connected fixture power source are off.
2. **Install and wire the Z10 Key A receptacle.** Use only TE 2343403-1, 2363638-2, or 1-2363638-2. Follow the receptacle and luminaire manufacturers' instructions and connect pins 1 through 4 exactly as shown in the pin map. Do not substitute a Book 18 receptacle or defeat the mating key.
3. **Inspect the outdoor seal.** Confirm the gasket and sealing surfaces are clean, undamaged, and correctly seated. Prevent water from pooling at the socket.
4. **Mate the controller.** Align the keyed interface and fully engage the controller using the socket manufacturer's specified locking method. Do not force or cross-thread the interface.
5. **Connect the DMX bus.** Carry DMX+, DMX-, and common/reference as one continuous bus. Pin 2 must remain common to the supply return and the DMX reference.
6. **Provide far-end termination.** Terminate only at the last receiver when required by the fixture manufacturer or when reflections cause intermittent behavior.
7. **Inspect before power-up.** Check polarity, pin mapping, gasket seating, fixture DMX personality, bus continuity, and far-end termination.

Installer pre-power checklist

Verification	Done
12-24 VDC Class 2 supply and pin 1 polarity verified	[]
Pin 2 is continuous as both DC return and DMX common	[]
DMX+ pin 3 and DMX- pin 4 are correct end-to-end	[]
Socket, gasket, and keyed lock are fully seated	[]
Fixture personality/address and far-end termination are recorded	[]

3 DMX wiring and addressing

TYPICAL ZHAGA casDMX INSTALLATION



One continuous DMX bus - no passive tees or star branches

Terminate only at the final receiver when required.

3.1 Bus requirements

- Use DMX-rated, low-capacitance twisted-pair cable. Connect the reference/common/ground conductor continuously throughout the system.
- Connect the three conductors in parallel from one fixture to the next, with no stubs or tees. This is commonly described as a daisy-chain, but electrically it is one continuous parallel-connected wire bus. Use an active DMX splitter when branches are required.
- At each intermediate fixture, land the incoming and outgoing conductors together on the same DMX+, DMX-, and common/ground terminal positions. This is one three-position connection with two wires under each terminal, not separate DMX IN and DMX OUT terminal blocks.
- Keep DMX cabling separated from line voltage and noisy switching conductors.
- Zhaga casDMX is the DMX master. Do not install a field 120-ohm termination resistor at the Zhaga casDMX output.
- Provide termination only at the far end of the line. Enable it when required by the last fixture or when flicker, twitching, random levels, or intermittent response suggests signal reflections.
- Zhaga casDMX drives one complete DMX universe. Depending on the fixture profile selected, it controls up to 12 DMX channels beginning at the DMX Start Address vendor parameter. The default is DMX address 1.

ADDRESSING RULE Set the controlled fixture or DMX personality to the same value as the Zhaga casDMX DMX Start Address vendor parameter. Record any value other than the default DMX address 1 on the closeout schedule.

3.2 Good DMX field wiring practice

- Use a DMX/EIA-485 data cable: shielded twisted pair with approximately 120-ohm characteristic impedance. Do not substitute microphone or ordinary audio cable.
- Keep DMX+ and DMX- on the same twisted pair. Carry common/ground continuously through the run and maintain the same polarity at every device.
- Route one continuous parallel-connected bus from Zhaga casDMX through each receiver. Do not make passive T, Y, or star branches; use an optically isolated DMX splitter when branches are required.
- Keep splices and untwisted conductor length short. Use listed connectors or terminal blocks, secure the shield/common/ground, and prevent loose strands or shorts.
- Separate DMX wiring from line-voltage conductors, dimmer outputs, motors, relays, and switching power wiring. Cross power wiring at approximately 90 degrees when separation cannot be maintained.
- Keep each unsplit segment to 32 receiver loads or fewer and approximately 300 m (1,000 ft) or less. Use a splitter/repeater for additional loads, long runs, or branches.

FAR-END TERMINATION Zhaga casDMX is the transmitting master and does not need a field 120-ohm terminator. If the last fixture is not self-terminating, enable its END/TERM switch or place one 120-ohm resistor across DMX+ and DMX- at the last receiver only. Add it when the fixture manufacturer requires it or when the bus is flaky. Do not terminate intermediate fixtures and do not add the resistor at Zhaga casDMX.

3.3 If the fixtures flicker or behave randomly

1. **Check the topology.** Remove passive branches and confirm one continuous parallel-connected bus runs fixture-to-fixture to one final receiver, without stubs or tees.
2. **Check cable and polarity.** Verify DMX+, DMX-, and common/ground end-to-end; inspect for shorts, loose strands, damaged cable, and excessive untwisted length.
3. **Test with a short known-good cable.** Temporarily connect the affected fixture directly to Zhaga casDMX. Normal operation points to a field-wiring problem.
4. **Measure the DMX signal at the fixture.** Use a professional field tester such as a Swisson XMT-series DMX tester or City Theatrical DMXcat Multi Function Test Tool to confirm that DMX is arriving, inspect channel values and timing, and generate a known-good DMX signal when isolating a wiring or fixture problem.
5. **Terminate the far end.** At the last receiver only, enable its termination or install 120 ohms across DMX+ and DMX-. Re-test dimming, color, and scenes.
6. **Split difficult runs.** Use an optically isolated DMX splitter when the run has branches, ground-reference problems, excessive length, or more than 32 receiver loads.

3.4 Pre-commissioning record

Record	Project entry
Location / tag	
Network / profile	
Fixture model / personality	
DMX channels / termination	_____ through _____ far-end termination: _____

4 Add Zhaga casDMX to the Casambi app

The standard Casambi App is used for normal Zhaga casDMX commissioning. Casambi Pro is a different workflow; do not create a Pro network unless the project documents specifically require it.



4.1 Before pairing

1. **Power Zhaga casDMX and the DMX fixtures.** Confirm the controller appears in More > Nearby devices. Work within Bluetooth range.
2. **Confirm network type.** Use the network already specified for the project. A device can belong to only one Casambi network.
3. **Select the fixture profile first.** From Nearby devices, select the unpaired Zhaga casDMX, choose Change profile, and choose the profile that matches the fixture DMX personality.

WHY PROFILE FIRST The profile defines the controls and DMX channel mapping. Changing it later can disturb scenes, names, and other commissioning work.

4.2 Pair to the network

4. **Open More > Nearby devices.** Locate the unpaired Zhaga casDMX. Use Identify when available and confirm the intended physical unit.
5. **Select Add to a network.** Choose the project network. If prompted, enter the network credentials supplied by the commissioning authority.
6. **Name the luminaire.** Use the fixture schedule identifier and location, for example L2-17 | Lobby Cove.
7. **If needed, change Vendor Parameters.** Open the Zhaga casDMX device properties and set DMX Start Address, DMX Frame Length, or DMX Copy Channel Count only when required by the fixture schedule or application. Keep Zhaga casDMX powered for at least 3 seconds after a change so the setting is saved.
8. **Test live control.** From Luminaires, operate every control element through its full range and confirm the corresponding DMX function.
9. **Save commissioning records.** Record the network, profile, fixture personality, controlled DMX channel range, and any vendor parameters.

CHANGING A PAIRED PROFILE With Administrator or Manager rights, open the paired luminaire properties, select Model, then Change profile. After any profile change, verify every DMX channel and repair affected scenes or automations because the controls presented by the app may change.

5 Provisioning: what it means

For Zhaga casDMX, provisioning is the controlled process of matching the Casambi fixture profile to the connected fixture's DMX personality, pairing the controller to the correct network, applying project naming and settings, then proving every channel. It is more than simply adding the device to the app.

5.1 Provisioning sequence

Stage	Required result
1. Fixture personality	Set the connected fixture to the intended DMX mode/personality and match its address to the Zhaga casDMX DMX Start Address parameter (default DMX address 1).
2. Zhaga casDMX profile	Select the profile that presents the correct controls and number of DMX channels.
3. Network	Pair to the specified Evolution project network.
4. Identity	Assign a schedule-based name and location.
5. Properties	Set startup state, minimum/maximum level, control behavior, and approved vendor parameters.
6. Functional test	Exercise each dim, color, CCT, or custom element and compare it to the fixture schedule.
7. System test	Test scenes, switches, sensors, schedules, and mesh coverage from representative locations.

5.2 Vendor parameters

Zhaga casDMX vendor parameters are manufacturer-defined settings carried by the selected Casambi profile and applied by the PSoC firmware. They are separate from normal Casambi properties such as minimum level, maximum level, startup state, and manual-control timeout. Access them from the luminaire's device properties when the installed profile and user access level expose them.

Parameter	Range / default	Firmware behavior	Field rule
DMX Start Address ID 0	1-512 Default: DMX address 1	Sets the DMX channel where the selected fixture profile mapping begins. Earlier DMX channels are transmitted at zero.	Set the fixture to the same DMX address. Record any non-default value.
DMX Frame Length ID 1	16-512 DMX channels Default: 512	Sets the total number of DMX channels transmitted after the start code. The firmware enforces a 16-channel minimum.	Must include the highest controlled DMX channel. Normally leave at 512.
DMX Copy Channel Count ID 2	0-8 DMX channels Default: 0	0 disables copying. A value N repeats the first N Casambi-controlled DMX channels throughout the outgoing DMX frame.	Set to the number of DMX channels used by one downstream driver block.

5.3 DMX Copy Channel Count for linear fixtures

DMX Copy Channel Count is primarily used for linear fixtures containing multiple cascaded DMX drivers. Set it to the number of DMX channels used by one driver. Zhaga casDMX repeats that channel block throughout the outgoing DMX frame. Each driver removes its own DMX data, then presents the remaining data to the next driver as a new DMX frame whose next driver's data begins again at DMX address 1. For example, a value of 3 repeats an RGB channel block for successive three-channel drivers. After changing any vendor parameter, keep Zhaga casDMX powered for at least 3 seconds before cycling power so the deferred EEPROM write can complete.

6 Available Zhaga casDMX fixture profiles

The following profiles are supported for the Zhaga_casDMX_3 profile group. Profile names and Casambi database IDs are shown exactly as listed so the commissioning team can select the intended entry. The fixture manufacturer's DMX personality remains the authority for exact channel definitions.

PROFILE SELECTION Match the fixture personality by function and DMX channel order, not merely by the number of channels. Profiles marked NoMix or Evolution can produce materially different behavior.

Profile	ID	Casambi controls	DMX use
Zhaga 12 Dim EVO	38085	Evolution: 12 independent dimmer controls	DMX channels 1-12, sequential
Zhaga 2 CCT	38086	Two-channel CCT control	Two profile-defined DMX channels
Zhaga 4-Dim	38087	Four independent dimmer controls	DMX channels 1-4, sequential
Zhaga 8 Dim	38088	Eight independent dimmer controls	DMX channels 1-8, sequential
Zhaga CCT (Warm/Cool)	38089	Warm/cool tunable-white control	Two profile-defined DMX channels
Zhaga DTW	38090	Dim-to-warm control	Two profile-defined DMX channels
Zhaga Elements	38091	Casambi Elements interface	Profile-defined mapping
Zhaga RGB	38092	RGB color picker with master dimming	DMX channels 1-3: R, G, B
Zhaga RGB-TW	38093	RGB plus tunable-white control	Four profile-defined DMX channels
Zhaga RGB/White	38094	RGB color plus independent white	DMX channels 1-4: R, G, B, W
Zhaga RGBW	38095	Standard RGBW color control	DMX channels 1-4: R, G, B, W
Zhaga RGBW Sliders	38096	Four independent RGBW sliders	DMX channels 1-4, sequential

6.1 Profile selection examples

Connected load / personality	Starting profile
Four independent single-channel dimmers	Zhaga 4-Dim
Four-channel RGBW fixture	Zhaga RGBW or Zhaga RGBW Sliders, depending on desired app controls
Three-channel RGB fixture	Zhaga RGB
Warm/cool two-channel white fixture	Zhaga CCT (Warm/Cool) or the approved Zhaga 2 CCT profile
Twelve independent DMX functions	Zhaga 12 Dim EVO; Evolution network required

7 Startup and acceptance testing

Check	Acceptance requirement
Power	Zhaga casDMX remains powered and visible in Nearby devices.
Network	Unit is paired to the correct network and has a project-standard name.
Profile	Profile name/ID matches the fixture schedule and DMX personality.
Dimming	0%, minimum, mid-level, and 100% operate correctly.
Color/CCT	Each control moves the intended fixture channel without cross-coupling.
Scenes	All assigned scenes recall correct levels and colors.
DMX bus	No flicker, random output, or intermittent response at any receiver.
Mesh	Control succeeds from representative occupied locations.
Record	Profile, fixture personality, DMX channel range, and settings are entered on the closeout schedule.

7.1 Troubleshooting

Symptom	Likely cause	Corrective action
Not visible in Nearby devices	No/incorrect power; out of range; already paired; hidden device	Measure 12-24 VDC at input. Move phone closer. Check device/network status.
Visible but will not pair	Already paired; weak signal; wrong network access	Unpair only with authorization. Confirm network credentials and signal.
Pairs but no DMX response	Wrong polarity/common/ground; fixture address does not match DMX Start Address; wrong personality/profile	Verify DMX+, DMX-, common/ground, both address settings, personality, and selected profile.
Wrong colors or channels	Profile/fixture channel order mismatch	Compare the fixture DMX chart to the Zhaga casDMX profile; select the correct profile and re-test.
Flicker or intermittent control	Cable/termination/topology issue; electrical noise	Check twisted-pair cable, continuous parallel bus, far-end termination, common/ground, and separation from power wiring. Verify the signal at the fixture with a DMX field tester.
Short radio range	Metal enclosure or obstruction; poor mesh spacing	Move Zhaga casDMX outside metalwork or use a nonmetallic enclosure; test mesh coverage.
Profile change missing	No alternate profiles exposed or insufficient rights	Use Administrator/Manager access; contact DMX Engineering LLC if the expected profile is absent.

8 Closeout, replacement, and support

8.1 Closeout record

Field	Project record
Project / area	
Fixture type / tag	
Zhaga casDMX name in app	
Casambi network	
Profile name / ID	
Fixture DMX personality	
Controlled DMX channel range	_____ through _____
Vendor parameters changed	None / attach record
Socket / seal inspected	Yes / corrective action attached
Commissioned by / date	

8.2 Replacement

Use the Casambi Replace device function when replacing failed hardware with an identical Zhaga casDMX and profile. De-energize the luminaire before removing the controller. Inspect the socket and gasket, install the replacement, then repeat the channel, scene, seal, and mesh acceptance tests.

8.3 Regulatory and installation notes

- Outdoor IP66, non-submersible product. Use only with a compatible, correctly installed 40 mm Z10 Key A receptacle and Class 2 supply in accordance with the National Electrical Code and local requirements.
- The Z10 Key A interface uses a DMX Engineering proprietary signal assignment and is not Zhaga Book 18/D4i compatible. Do not substitute Book 18 parts or modify the mating key.
- Operation is subject to the two FCC Part 15 conditions: the device may not cause harmful interference and must accept interference received, including interference that may cause undesired operation.
- Changes or modifications not expressly approved by DMX Engineering LLC may void the user's authority to operate the equipment.
- Install and operate with at least 20 cm separation between the antenna and users or bystanders, consistent with the product's Canadian RF exposure statement.
- Use the current product label as the authority for certification marks, model number, FCC ID, IC identifier, electrical rating, and environmental marking.

8.4 Technical support

DMX Engineering LLC | 1908 N. 101st Place, Mesa, Arizona 85207
480-993-7972 | sales@dmx.engineering | <https://dmx.engineering>

8.5 Product identification and certification label

The installed unit's bottom label is the authority for the exact certification marks and radio identifiers. Do not substitute the indoor product label or redraw this artwork.



LABEL CONTROL Do not redraw, omit, reposition, or substitute certification marks or radio identifiers without engineering and compliance approval.