

casCCDrive

INSTALLATION + COMMISSIONING GUIDE

Dual-channel Casambi constant-current LED driver
Hardware reference: casCCDrive

Project:
Profile:
Contact:



PRODUCT ROLE casCCDrive converts Casambi dimming commands into two independent constant-current LED outputs. A fifth field terminal is exposed by the selected Casambi profile as either one dry-contact input or one low-current electronic output.

At a glance	Installation value
Power	12-48 VDC Class 2 - production rating pending final engineering confirmation
LED outputs	Two independent channels; 25-700 mA setpoint per channel in 25 mA steps
Digital I/O	One shared terminal; profile selects input or output role
Environment	Indoor, open-type device; keep radio outside metal enclosures

DRAFT 0.1 - ENGINEERING REVIEW COPY - NOT FOR FIELD ISSUE

1 Product overview

casCCDrive is a Bluetooth Low Energy, Casambi-enabled, dual-channel constant-current LED driver. It connects between a Class 2 constant-voltage DC supply and one or two constant-current LED loads, eliminating a separate external LED driver for supported installations.

The two LED channels may be presented as independent dimmers or as a profile-defined two-channel lighting function. A single digital I/O terminal uses the casIO4 configuration model: the input profile exposes a PushButton Element, while the planned output profile will expose a fixture-page toggle.

LOAD TYPE Connect only constant-current LED loads to the LED output terminals. Do not feed casCCDrive from another constant-current LED driver and do not connect either LED cathode to supply Ground.

1.1 Technical data

Item	Rating / description
Supply	12-48 VDC Class 2, polarity sensitive - confirm production release rating
LED outputs	Two independent constant-current channels
Current setpoint	25-700 mA per channel, parameter values 0-27 in 25 mA increments
Factory current default	100 mA per channel (firmware parameter value 3)
Dimming	16-bit PWM engine; profile controls Casambi-facing channel behavior
LED voltage	DC supply must be at least 2 V above the connected LED string forward voltage
Digital I/O	One profile-selected input or low-side electronic output; final output voltage/current envelope is TBD - ENGINEERING
Radio	Fanstel BT840

1.2 Placement and radio

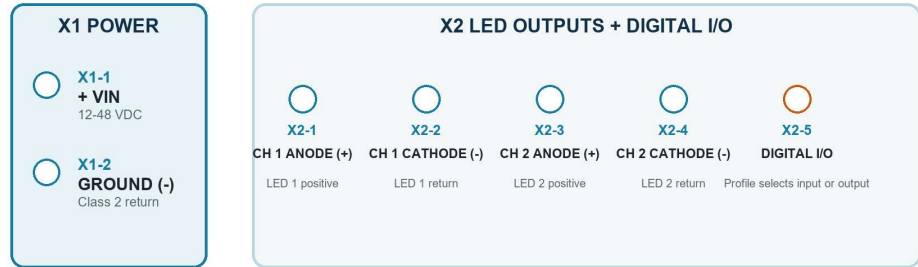
Mount where the terminal openings remain accessible, conductors can be strain-relieved, and the product is protected from contamination and mechanical damage. Keep the antenna region clear of wiring, grounded metal, and large conductive surfaces.

METAL ATTENUATES BLUETOOTH Do not place an internal-antenna unit inside a metal junction box. Use a nonmetallic enclosure or an approved external-antenna product variant, then verify mesh performance from representative occupied locations.

2 Terminals and installation

casCCDrive REV. B FIELD TERMINALS

Schematic-derived connector order - verify against production label before field issue



Never common either LED cathode to Ground or to the other channel.
Each LED channel is a floating, independent current path.

Terminal	Function	Field connection
X1-1	+VIN	Positive lead from Class 2 constant-voltage DC supply
X1-2	Ground (-)	DC supply return and digital-I/O common
X2-1	Channel 1 Anode (+)	Positive connection to LED string 1
X2-2	Channel 1 Cathode (-)	Negative connection to LED string 1; do not ground
X2-3	Channel 2 Anode (+)	Positive connection to LED string 2
X2-4	Channel 2 Cathode (-)	Negative connection to LED string 2; do not ground
X2-5	Digital I/O	Passive contact input or low-side output according to selected profile

CHANNEL ISOLATION Treat the two LED outputs as independent current paths. Do not tie channel anodes or cathodes together, share a return conductor, or bond either cathode to Ground.

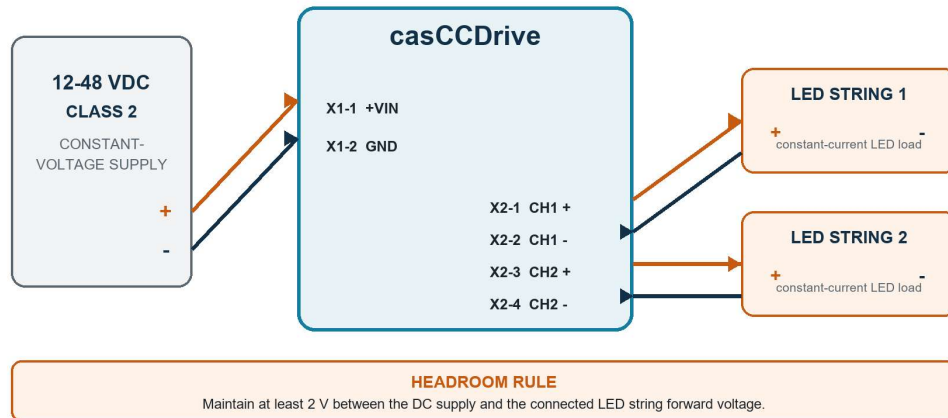
2.1 Installation sequence

- De-energize and verify** Remove power from the Class 2 supply. Confirm the source is constant voltage, within the released casCCDrive input range, and correctly polarized.
- Verify each LED load** Record the LED string forward-voltage range and rated constant current. Set each channel current no higher than the connected LED manufacturer's rating.
- Wire both LED channels** Connect each LED string only to its matching anode and cathode pair. Keep channel wiring separate end-to-end.
- Wire the digital I/O** For an input profile, connect only a passive contact between X2-5 and X1-2 Ground. For the placeholder output profile, connect only engineering-approved contact-sense equipment.
- Connect DC power** Land +VIN on X1-1 and Ground on X1-2. Check polarity, conductor security, spacing, and enclosure protection before energizing.
- Provision before full output** Pair the unit, select the intended profile, set both channel currents, and test at minimum level before commanding full output.

3 LED wiring and current setup

TYPICAL TWO-CHANNEL CONSTANT-CURRENT WIRING

One Class 2 constant-voltage supply; two independent LED strings



3.1 Supply and LED voltage

The input must come from a constant-voltage Class 2 DC supply. Maintain at least 2 V between the DC supply voltage and the highest expected forward voltage of each connected LED string, including temperature and wiring-drop effects.

DO NOT USE A CC SOURCE A constant-current driver feeding another constant-current driver can regulate unpredictably or fail to start. Use a constant-voltage DC supply at X1.

3.2 First-turn-on adjustment

Each LED channel has a 16-bit First-Turn-On parameter. It establishes the low-end PWM floor used when the channel first illuminates. The firmware default is 400. Increase only enough to obtain reliable, repeatable first light; excessive values create an objectionable jump at the bottom of the dimming curve.

3.3 Set output current before commissioning

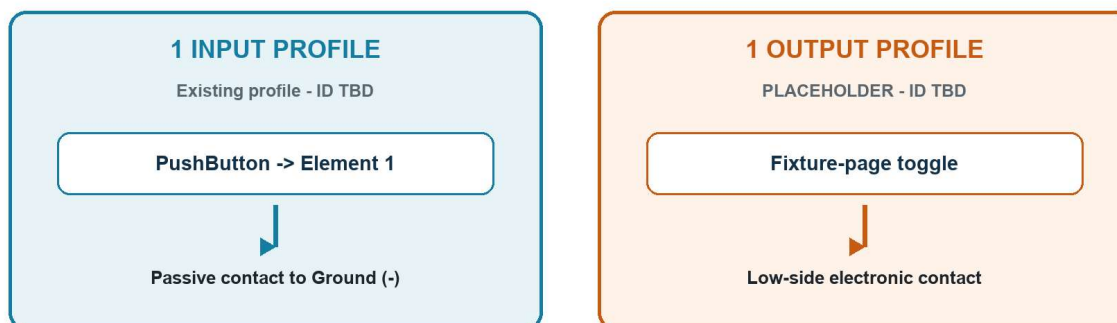
Each channel current parameter uses the formula $25 \text{ mA} + (\text{parameter value} \times 25 \text{ mA})$. The firmware accepts values 0 through 27 for 25 through 700 mA. Both channels default to parameter value 3, or 100 mA.

Parameter value	Channel current	Typical use
0	25 mA	Initial low-current proving where compatible with the LED load
1	50 mA	Low-current LED string
3	100 mA	Firmware factory default
7	200 mA	Example only - verify LED rating
13	350 mA	Common nominal LED rating; verify actual load
27	700 mA	Firmware maximum; engineering thermal limits still apply

4 Casambi profiles and digital I/O

CASAMBI PROFILE CONTROLS THE DIGITAL I/O ROLE

The hardware and firmware support both directions; the selected fixture profile exposes one role.



Changing profiles can alter app controls, Elements, scenes, and switch assignments. Re-test the complete device after any profile change.

The profile determines how the digital terminal appears in the Casambi app. The direction is not stored as a firmware parameter. Firmware continuously supports both the input-sense and output-sink paths; the selected profile exposes the intended role.

Profile	Status	Digital terminal	App behavior
casCCDrive - 1 Input	Existing; fixture ID TBD	Passive contact between X2-5 and Ground	PushButton mapped to Element 1
casCCDrive - 1 Output	PLACEHOLDER; profile and ID not yet released	Low-side electronic contact on X2-5	Fixture-page toggle; exact label TBD

OUTPUT PROFILE PLACEHOLDER Do not commission X2-5 as an output from this draft. The final profile ID and the allowable receiving-circuit voltage, current, leakage, polarity, and power-loss state require engineering release.

4.1 Pairing and profile selection

1. **Open Nearby devices** Power casCCDrive and place the commissioning phone within reliable Bluetooth range.
2. **Select the required profile** Choose the approved input profile. Use the output profile only after its placeholder status has been removed by engineering.
3. **Pair to the project network** Use the specified Casambi network and access level. Give the device a schedule-based name and location.
4. **Set vendor parameters** Set both channel currents first, then first-turn-on values, digital Input Action, Input Mode, and Output Polarity as applicable.
5. **Test all exposed controls** Exercise both LED channels, the digital Element or output toggle, scenes, switches, automations, and mesh coverage.

5 Vendor parameters

The firmware interface contains seven vendor parameters in a fixed order. The Casambi fixture definition must preserve these indexes and numeric option values. Labels may be made friendlier after the final profile is reviewed.

ID	Parameter	Values / default	Field purpose
0	Channel 1 Current	0-27 -> 25-700 mA; default 3 = 100 mA	Constant-current ceiling for LED channel 1
1	Channel 2 Current	0-27 -> 25-700 mA; default 3 = 100 mA	Constant-current ceiling for LED channel 2
2	Channel 1 First-Turn-On	16-bit; default 400	Low-end first-light PWM floor for channel 1
3	Channel 2 First-Turn-On	16-bit; default 400	Low-end first-light PWM floor for channel 2
4	Digital Input Action	0-11; default 0	Normal, inverted, or Multiswitch Gang 1-10
5	Digital Input Mode	0-7; default 0	Follow, toggle, hold-dim, or double-tap-dim behavior
6	Digital Output Polarity	0 normal; 1 inverted; default 0	Defines whether Casambi ON closes or releases the output

SAVE DELAY After changing vendor parameters, keep casCCDrive powered for at least 3 seconds before cycling power so the deferred nonvolatile write can complete.

5.1 Digital Input Action

Value	Selection	Behavior
0	Standalone - Normal	Closed contact reports ON; open contact reports OFF.
1	Standalone - Inverted	Closed contact reports OFF; open contact reports ON.
2-11	Multiswitch Gang 1-10	Shares logical level and dim direction with compatible NED inputs using the same Gang number.

5.2 Digital Input Mode

Value	Mode	Recommended contact
0	On / Off (follow contact)	Maintained switch
1	Toggle	Momentary pushbutton
2	Hold dim up	Momentary pushbutton; hold to brighten
3	Hold dim down	Momentary pushbutton; hold to dim
4	Hold alternating	Momentary pushbutton; next hold reverses direction
5	Double-tap dim up	Profile-supported pushbutton Element
6	Double-tap dim down	Profile-supported pushbutton Element
7	Double-tap alternating	Profile-supported pushbutton Element

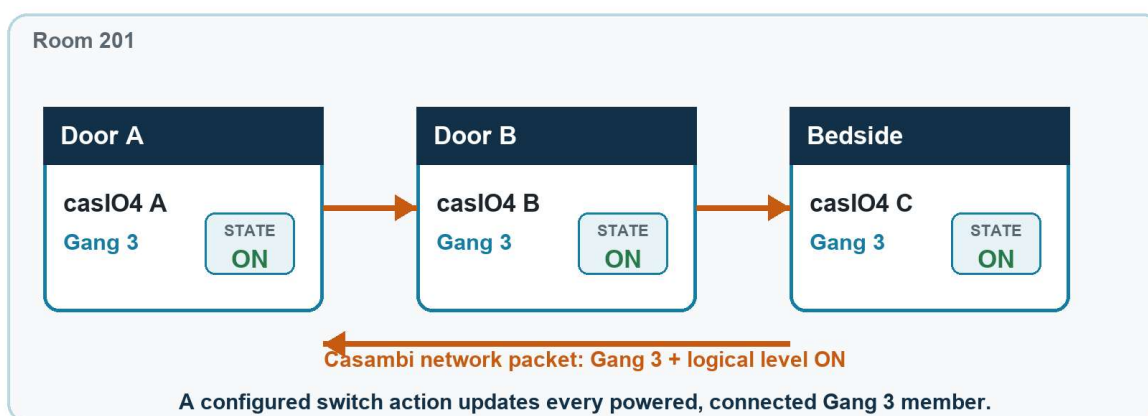
5.3 Digital Output Polarity

Value	Selection	Logical result
0	Normal	Casambi ON closes the electronic contact to Ground; OFF releases it.
1	Inverted	Casambi ON releases the electronic contact; OFF closes it to Ground.

6 Multiswitch Gang operation

A Multiswitch Gang synchronizes the internal switch memory of compatible NED devices at separated wall stations. Gang 1 through Gang 10 are logical identifiers, not physical channel numbers. Every participating input uses the same Gang value.

ONE ROOM - SEPARATE SWITCHES - ONE SHARED LOGICAL STATE



6.1 Why gangs are used

Without gang synchronization, one remote switch can remember OFF after another station has already turned the room ON. The first operation at the stale station may then update only its local memory, forcing the user to operate it twice. A gang packet keeps every powered member at the same logical level and, for dimming modes, the same next dim direction.

SEPARATE FROM CASAMBI GROUPS A Multiswitch Gang synchronizes NED input memory. It is not a normal Casambi luminaire group, scene, or Element mapping. The gang keeps wall stations in step; the mapped Element determines what the lighting system controls.

6.2 Commission the complete gang

1. **Assign one Gang number** Use the same Gang n value on every input that must behave as one multi-location control.
2. **Match the contact type** Use On / Off for a maintained switch or Toggle for a momentary pushbutton unless the project intentionally requires a hold/double-tap mode.
3. **Prove the opposite station** Turn the room ON at station A, then operate station B once. The room must turn OFF on that first operation.
4. **Prove every pair** Repeat among all stations and verify dim direction, network recovery, replacement behavior, and power-cycle recovery.

7 Startup and acceptance testing

Check	Acceptance requirement
Visual	Polarity, conductor security, separation, enclosure, and antenna clearance are correct.
LED wiring	Each LED uses only its own anode/cathode pair; neither cathode is grounded or shared.
Current	Both current parameters are recorded and do not exceed the connected LED ratings.
First light	Each channel starts cleanly at low level without an objectionable jump or unstable flicker.
Dimming	0%, minimum, mid-level, and 100% commands operate smoothly on both channels.
Profile	Profile name/ID and digital I/O role match the project schedule.
Digital input	Contact action, mode, Element mapping, and any Gang behavior operate on the first action.
Digital output	Not accepted until the output profile and electrical envelope are released.
Scenes / mesh	Scenes, switches, automations, and control from representative occupied locations pass.
Record	Profile, parameters, LED loads, supply, and commissioning results are documented.

7.1 Troubleshooting

Symptom	Likely cause	Corrective action
Not visible in Nearby devices	No/incorrect power; out of range; already paired	Measure input voltage/polarity, move closer, and check pairing status.
LED never illuminates	Reversed LED; insufficient headroom; current set too low; wrong profile	Verify anode/cathode, supply versus LED Vf, current parameter, and profile.
LED flashes or cycles	Supply current limit; thermal protection; marginal headroom; wiring fault	Measure supply during load, inspect wiring, reduce current, and confirm thermal conditions.
Low-end pop	First-Turn-On value too high	Reduce the affected channel value, then prove reliable first light repeatedly.
Fails to start at low level	First-Turn-On value too low	Increase in small steps and re-test from fully off.
Digital input never changes	No Ground return; powered signal applied; output profile selected	Remove external voltage, wire passive contact to Ground, and select the input profile.
Gang requires two actions	Gang number mismatch or wrong input mode	Match Gang n; use On / Off for maintained or Toggle for momentary contacts.
Short radio range	Metal enclosure or obstruction	Relocate outside metalwork or use an approved external-antenna variant.

8 Closeout, replacement, and support

8.1 Closeout record

Field	Project record
Project / area	
Fixture / LED type	
LED 1 rated current / Vf	
LED 2 rated current / Vf	
DC supply voltage / rating	
casCCDrive name in app	
Casambi network	
Profile name / ID	
Ch. 1 / Ch. 2 current and first-turn-on	
Digital action / mode / polarity / gang	
Commissioned by / date	

8.2 Replacement

Use Casambi Replace device when replacing failed hardware with an identical casCCDrive and released profile. Before energizing the replacement, copy and verify both current settings against the LED ratings. Repeat the complete LED, digital I/O, scene, gang, and mesh acceptance test.

8.3 Draft regulatory note

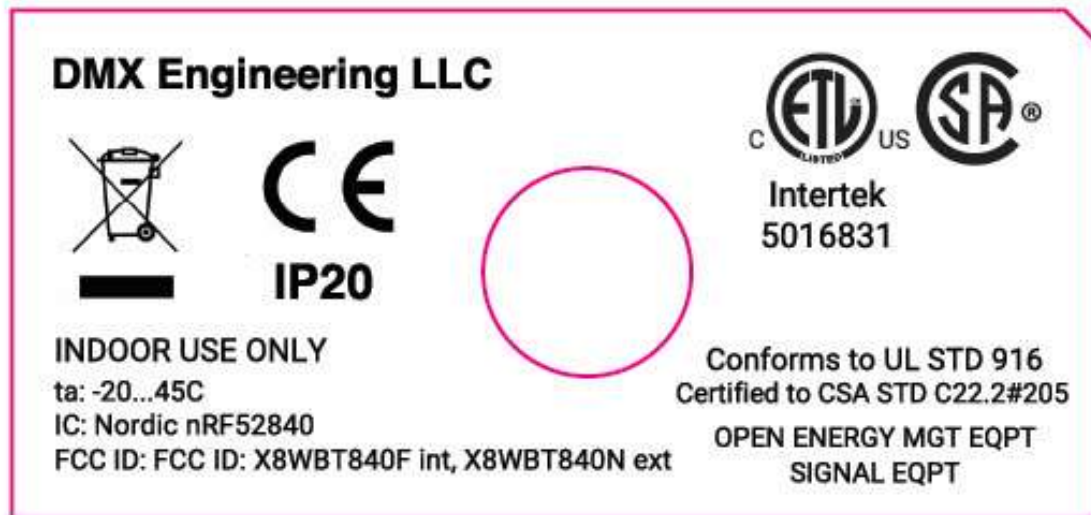
The production product label is the authority for certification marks, radio identifiers, ambient ratings, and required regulatory statements. Those identifiers remain TBD - ENGINEERING for this Rev. B draft and must be inserted without paraphrasing before field release.

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 bottom product label is the authority for the marks and identifiers applied to the installed unit. Retain the ETL certification mark and control number 5016831, indoor-use and ambient markings, CE and IP20 markings, WEEE symbol, FCC ID, IC identifier, and equipment-category wording exactly as shown on the approved artwork.



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

DRAFT STATUS Resolve the separate casCCDrive Engineering Review Items before removing DRAFT markings or issuing this guide to contractors.