DMX ENGINEERING LLC

casDouglas

INSTALLATION + COMMISSIONING GUIDE

Casambi latching-relay and digital I/O node
Hardware platform: casDouglas

Project:	
Type:	
Contact:	

PRODUCT ROLE casDouglas is the software-defined casPower hardware variant for a latching Douglas-style relay: one timed H-bridge coil output, one solid-state digital output and one dry-contact input. It intentionally exposes fewer output-control features than casPower.

At a glance	Installation value
Power	12-24 VDC Class 2; polarity sensitive; controller current about 30 mA plus coil load
Relay output	One two-wire H-bridge pulse output for a polarity-controlled latching relay coil
Digital I/O	One ground-referenced solid-state output and one external dry-contact input
Environment	Indoor/open-type device; keep the radio clear of metalwork

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1 Product overview

casDouglas is a Bluetooth Low Energy Casambi node that operates a two-lead latching relay coil through an H-bridge pulse and provides two field I/O functions: a solid-state contact output and a dry-contact input. The node uses casPower Board C0 hardware with casDouglas-specific firmware.

Unlike casPower, casDouglas does not expose general motor direction, speed or continuous H-bridge control. Each Casambi relay-state transition produces one timed coil pulse, then disables the bridge. The output polarity parameter swaps the commanded set/reset relationship.

RELEASE GATE The reviewed MP6612 part suffix, H-bridge truth table and dry-input pin assignment do not presently agree. Treat this guide as an engineering draft and bench-verify both coil directions and both I/O terminals before field release.

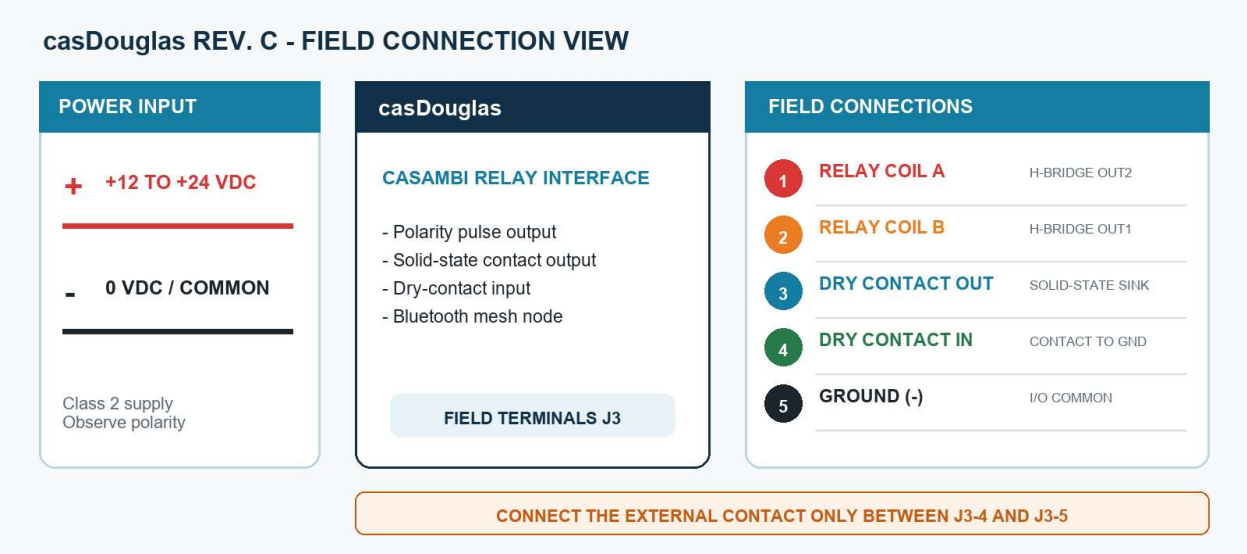
1.1 Technical data

Item	Rating / description
Supply	12-24 VDC Class 2, polarity sensitive (product-label range)
Controller current	Approximately 30 mA with no external coil load; supply must also support coil pulse current
Relay-coil output	Two-terminal H-bridge pulse output; default firmware pulse 750 ms
Dry Contact Out	Ground-referenced solid-state sinking output; non-isolated; released voltage/current rating TBD
Dry Contact In	External voltage-free contact to Ground (-); software-selectable static, pulse and dimming modes
Radio	Fanstel BT840F Casambi module, 2.4 GHz BLE mesh
Controller	Cypress PSoC 4 CY8C4245PVI-482
PCB outline	52.324 x 26.67 mm; production enclosure dimensions to be confirmed
Firmware basis	Source revision 1.04B0, dated 2026-02-23

1.2 MCU and hardware pin mapping

Function	PSoC pin	Board net / device
H-bridge IN1	P1[2]	IN_P -> MP6612 IN1
H-bridge IN2	P2[2]	IN_N -> MP6612 IN2
H-bridge sleep	P0[2]	!SLEEP -> MP6612 /SLEEP
H-bridge fault	P0[3]	!FAULT <- MP6612 /FAULT
Coil command	P2[7]	RELAY_CONTROL from Casambi module
Dry output command	P3[0]	DRYOUT_RELAY from Casambi module
Dry Contact Out drive	P0[0]	DRY_OUT_1 / IO1 / J3-3
Dry Contact In - intended	P4[3]	DRY_IN_2 / IO2 / J3-4
Dry Contact In - reviewed build	P0[1]	DRY_IN_1 / IO1 / J3-3; must be corrected/validated

2 Terminals and installation



2.1 Terminal mapping

Position	Signal	Field connection
Power +	+12 to +24 VDC	Class 2 supply positive
Power -	0 VDC / common	Supply negative and I/O common
J3-1	Relay Coil A	H-bridge OUT2; one side of two-lead latching coil
J3-2	Relay Coil B	H-bridge OUT1; other side of two-lead latching coil
J3-3	Dry Contact Out	Solid-state sink output referenced to J3-5; non-isolated
J3-4	Dry Contact In	External voltage-free contact input; close to J3-5
J3-5	Ground (-)	I/O common; do not connect to line voltage

NO EXTERNAL VOLTAGE Dry Contact In is for a voltage-free switch/contact only. Do not apply 12-24 V, line voltage or another controller's powered output to J3-4.

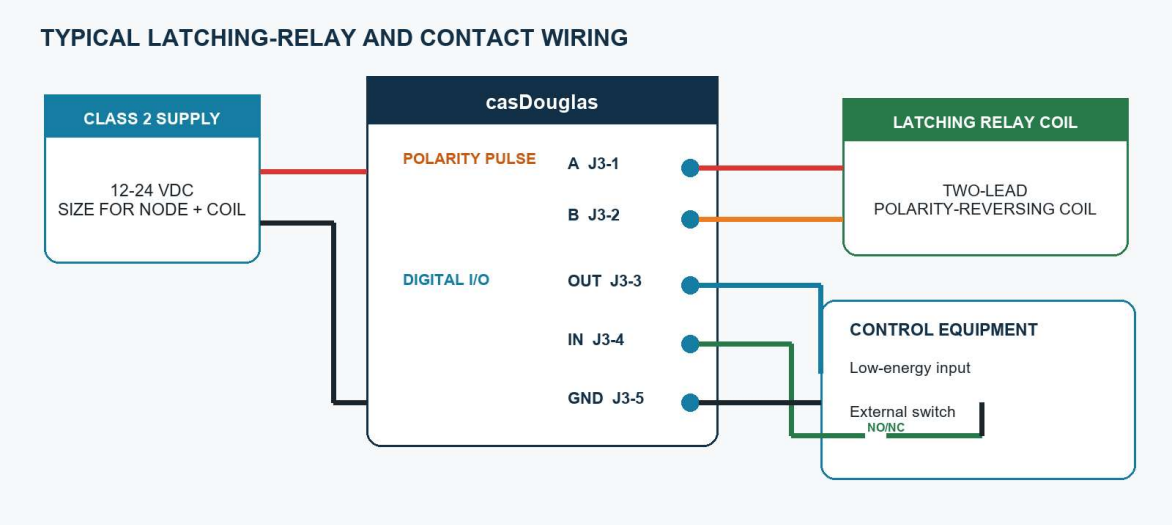
2.2 Installation procedure

1. **De-energize all circuits.** Turn off the Class 2 supply and isolate the controlled relay circuit before wiring.
2. **Mount the node.** Keep terminal openings accessible. Use a nonmetallic location and keep the Casambi radio end clear of grounded metal and dense wiring.
3. **Connect Class 2 power.** Land supply positive and common at the two-position input. Observe the 12-24 VDC product-label range and polarity.
4. **Connect the relay coil.** Connect only the two leads of a compatible polarity-controlled latching coil to J3-1 and J3-2. Do not connect a center-tapped coil without an approved interface.
5. **Connect digital I/O.** Connect the low-energy controlled input to J3-3/J3-5 and the external voltage-free contact to J3-4/J3-5.
6. **Inspect before power-up.** Check shorts, loose strands, polarity, coil resistance, contact wiring and separation from line-voltage conductors.

Installer pre-power checklist

Verification	Done
12-24 VDC Class 2 supply polarity and capacity are correct	[ ]
Relay coil is the approved two-lead latching type	[ ]
J3-1/J3-2 coil wiring has no connection to ground	[ ]
Dry Contact In uses only a voltage-free contact to J3-5	[ ]
Dry Contact Out load is within the released project rating	[ ]
Node is outside metalwork and protected from damage	[ ]

3 Application wiring and output behavior



3.1 H-bridge relay behavior

Casambi command	Normal polarity intent	Result
Relay ON transition	Drive reset/set polarity A	Timed coil pulse, then bridge disabled
Relay OFF transition	Drive opposite polarity B	Timed coil pulse, then bridge disabled
Output polarity = Inverted	Swap polarity A and B	Use when logical ON/OFF is reversed
No transition	Bridge asleep	No continuous coil drive

BENCH PROOF REQUIRED Before connecting the controlled circuit, measure J3-1 to J3-2 during ON and OFF commands. The two pulses must be opposite polarity and return to zero after the configured duration. Do not release the product if one command brakes or repeats the same polarity.

3.2 Coil and supply selection

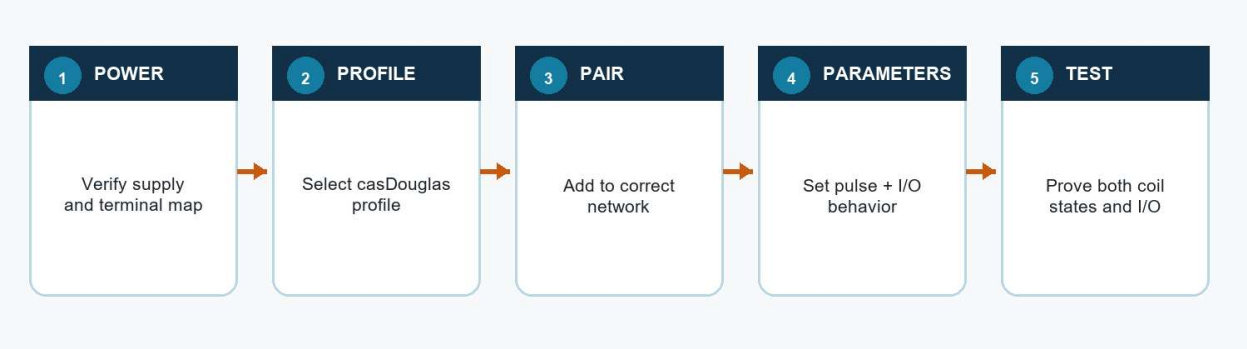
- Use a two-lead latching relay coil whose rated voltage matches the Class 2 supply.
- Size the supply for the casDouglas electronics plus the relay coil's measured pull-in current and cable loss.
- Use the shortest pulse that reliably transfers the relay at minimum supply voltage and worst-case temperature.
- Do not use this output for a continuously energized relay, variable-speed motor, PWM load or proportional actuator.
- Do not add an external flyback diode across J3-1/J3-2; a single diode blocks one polarity. Use only an approved bidirectional suppression network if required.

3.3 Digital I/O electrical use

Dry Contact Out is a ground-referenced solid-state sink, not an isolated relay contact. Connect it only to a compatible low-energy Class 2 control input. Dry Contact In senses a closure to J3-5 and must not receive external voltage.

4 Add casDouglas to the Casambi app

Use the standard Casambi App unless the project specifically calls for Casambi Pro. Profile selection defines the relay/output/input elements and which vendor parameters are exposed.



4.1 Pairing sequence

1. **Power casDouglas.** Confirm it appears in More > Nearby devices while working within Bluetooth range.
2. **Confirm the network.** Use the project Classic or Evolution network and the required credentials.
3. **Select the casDouglas profile.** Choose the released profile that exposes one relay output, the dry output and the intended dry-input behavior.
4. **Add and name the node.** Use the relay-panel, room or controlled-circuit identifier from the schedule.
5. **Apply vendor parameters.** Set output polarity, coil pulse duration, dry-input action/mode and dry-output polarity, then keep the node powered while settings are saved.
6. **Test every element.** Command relay ON/OFF, verify both pulse polarities, operate the dry output, and exercise the external contact in every configured mode.

PROFILE CHANGES After changing a paired device profile, re-check vendor parameters and repair affected scenes or automations. Repeat the complete acceptance test.

5 Vendor parameters and control modes

5.1 Firmware vendor parameters

ID	Parameter	Values / default	Firmware behavior
0	Output Polarity	Normal / Inverted; default Normal	Swaps which timed H-bridge command represents relay ON and OFF
1	Hold Duration	16-bit milliseconds + 250 ms; source default 750 ms	Sets each coil-pulse duration; minimum offset is 250 ms
2	Dry In Action	Normal, Inverted, MultiSwitch 1-10; default Normal	Selects direct local action or synchronized multi-gang group
3	Dry In Mode	0-7; default Static	Selects maintained, pulse-toggle, hold-dim or double-tap behavior
4	Dry Out Polarity	Normal / Inverted; default Normal	Inverts the solid-state output command

5.2 Dry Contact In modes

Value	Mode	Action
0	Static	Maintained contact closure commands ON; opening commands OFF; action polarity can invert
1	Pulsed	Each debounced closing edge toggles the stored ON/OFF state
2	Hold Dim Up	While held, ramps upward in 1/255 steps every 20 ms
3	Hold Dim Down	While held, ramps downward in 1/255 steps every 20 ms
4	Hold Dim Toggle	Alternates ramp direction on successive holds
5	Double Tap Dim Up	Hold ramps up; a second press within 400 ms auto-ramps to maximum
6	Double Tap Dim Down	Hold ramps down; a second press within 400 ms auto-ramps to minimum
7	Double Tap Dim Toggle	Alternating hold direction; double tap auto-ramps to the selected endpoint

5.3 MultiSwitch operation

Dry In Action values MultiSwitch 1 through MultiSwitch 10 assign a logical gang. Nodes with the same gang exchange vendor messages so their stored level and, for toggle-dim operation, direction remain synchronized. MultiSwitch messages command pushbutton index 2; solo modes command pushbutton index 0.

> **PARAMETER PERSISTENCE** The firmware writes the parameter structure when the Casambi module sends Parameters Complete. After editing parameters, leave the node powered and confirm the values survive a controlled power cycle.

6 Startup and acceptance testing

Check	Acceptance requirement
Power	Node remains powered, visible and stable at minimum and maximum specified supply voltage
Network	Node is paired to the correct network and named to the project schedule
Relay ON	One coil pulse occurs, the relay reaches the intended ON state, then coil voltage returns to zero
Relay OFF	One opposite-polarity pulse occurs, the relay reaches OFF, then coil voltage returns to zero
Pulse duration	Measured pulse agrees with the vendor parameter and reliably transfers the worst-case relay
Dry output	The intended control input changes state; no voltage/current limit is exceeded
Dry input	Each selected mode operates on both edges without bounce or duplicate commands
Power cycle	Relay state behavior and all vendor parameters recover as specified
Mesh	Control succeeds from representative occupied and service locations

6.1 Troubleshooting

Symptom	Likely cause	Corrective action
Not visible	No/wrong power; out of range; already paired	Measure input voltage, move closer, and inspect Nearby devices/network state
Relay changes only one way	H-bridge truth-table/part mismatch; wrong coil type	Scope J3-1/J3-2; confirm opposite pulse polarity and fitted MP6612 suffix
Relay logic reversed	Output Polarity parameter	Change Normal/Inverted and repeat ON/OFF tests
Relay chatters or fails	Pulse too short; low supply; excessive cable loss	Measure coil voltage/current and increase duration only within relay limits
Input does not respond	J3-4 pin assignment mismatch; external voltage; wrong mode	Remove voltage, short J3-4 to J3-5, verify P4[3] assignment and parameters
Output does not switch	Polarity inverted; incompatible load; rating exceeded	Test with a high-impedance input and verify sink action to J3-5
Short radio range	Metal enclosure or poor mesh spacing	Move the node outside metalwork and re-test coverage

7 Closeout, replacement, and support

7.1 Closeout record

Field	Project record
Project / area	
Controlled relay / tag	
casDouglas name in app	
Casambi network / profile	
Supply / measured voltage	
Coil type / resistance	
Output polarity / pulse duration	
Dry input action / mode	
Dry output polarity / load	
Firmware version	
Commissioned by / date	

7.2 Replacement

Use Casambi Replace device only with identical released casDouglas hardware and profile. Confirm the replacement is unpaired, powered and within range. Copy/confirm every vendor parameter, then repeat coil-polarity, I/O, scene and mesh acceptance tests.

7.3 Installation notes

- Indoor use only; install as an open-type Class 2 device in accordance with applicable electrical codes.
- Keep Class 2 wiring separated from line-voltage conductors and protect the node from contamination and mechanical damage.
- Use the final production label for certification marks, radio identifiers and released ratings; this draft does not establish approvals.

7.4 Technical support

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