

# EncoderCas

USA & Canada

DMX Engineering LLC

<http://dmx.engineering>



## Quadrature Encoder w/Switch Interface Single Dry Contact In or Out

### Product Description

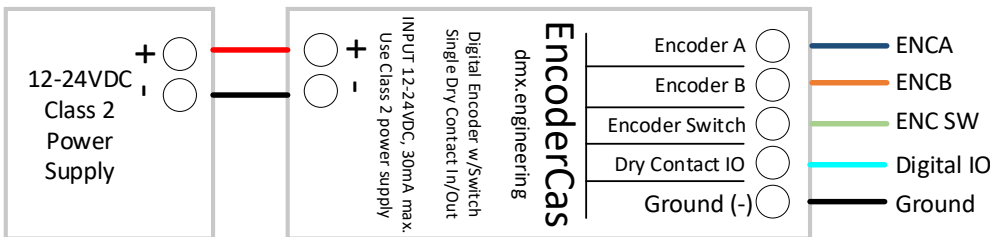
EncoderCas is a Casambi Bluetooth-enabled rotary encoder and dry-contact interface. It connects a conventional quadrature encoder using Encoder A, Encoder B, and a center push switch. Turning the encoder sends proportional level commands, while pressing the switch toggles the controlled function. One additional dry-contact channel can operate as an input or low-current output. Vendor Parameters configure encoder type, direction, full-range detents, acceleration, minimum and maximum levels, on/off memory, fixed on level, input mode, output polarity, and multiswitch Gang operation.

As inputs, the encoder phases, center switch, and dry-contact channel use passive contacts referenced to the common Ground (-) terminal. The 12–24 VDC Class 2 supply powers EncoderCas and provides the required internal bias. Do not apply an external voltage to any encoder or dry-contact terminal; connect these terminals only to passive switches or contacts.

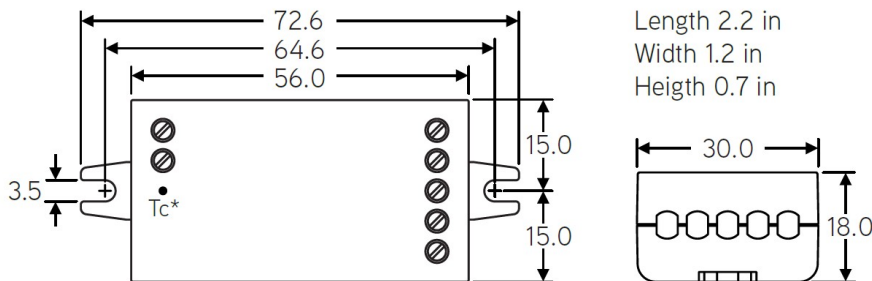
As an output, the dry-contact channel provides a low-current electronic closure to Ground (-). It is intended for equipment that accepts a non-powered dry-contact or contact-sense input within the released Encoder-Cas rating. It must not drive a relay coil, lamp, motor, solenoid, or other load.

Multiple EncoderCas and compatible NED devices can operate on the same Casambi network. Matching multiswitch Gang settings exchange level and direction information to keep separated controls synchronized. EncoderCas is commissioned and configured using the Casambi app for iOS or Android.

### Typical Connection Diagram



### Mechanical Data



Dimensions are in mm.

\* Tc point is on bottom side

Dimensions: 2.2 x 1.2 x 0.7 inch

72.6 x 30.0 x 18.0 mm

Weight: 0.8 oz (23 g)

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### Certifications

FCC ID: X8WBT40F

TELECC: 201-210217/01

Conforms to UL STD 916

Certified to CSA STD C22.2#205



### Technical Data

#### DC Voltage Input

Voltage range: 12-24 VDC, Class 2, input current: <30 mA.

#### Encoder and Dry-Contact Electrical Specs

EncoderCas provides three dedicated encoder inputs: Encoder A, Encoder B, and Encoder Switch. Each input expects a passive contact closure to Ground (-); do not apply an external voltage. Encoder A and B use 10K pullups, 1K series resistors, and 0.01  $\mu$ F filtering. Encoder Switch uses a 4.7K pullup, 1K series resistor, and 0.01  $\mu$ F filtering.

#### Digital Input and Output

The shared Dry Contact I/O terminal also expects no external voltage. Its input-sense circuit uses a 100-ohm series resistor, 200K bias resistor, 47K pulldown, and an NFET buffer. This provides high-impedance dry-contact sensing without requiring an externally powered input.

When configured as an output, the Dry Contact I/O terminal connects to Ground (-) through a separate NFET capable of sinking 25 mA. It is intended only for low-current contact-sense inputs, not relay coils or other loads.

All encoder and Digital I/O connections are dry contacts only. Do not drive them with voltage!

**Input:** Normal, Inverted, or Multi-Switch with ten Gang assignments. Modes include maintained contact, toggle, hold-to-dim, and double-tap functions.

**Output:** Normal or Inverted operation.

**Caution!** Connect passive contacts only between the applicable terminal and Ground (-).

#### Radio transceiver

Fanstel BT840 Radio Module

Operating frequencies: 2.401-2.483 Ghz

Maximum output power: typ. +3.4dBm

-103 dBm RX sensitivity in long-range mode

#### Antenna Options

Both external and internal (shown above) antenna models are available. Ask your distributor for either model.

#### Operating conditions

Ambient temperature, ta: -13...+113°F (-25...+45°C)

Max. case temperature, tc: +167°F (+75°C)

Storage temperature: -13...+167°F (-25...+75°C)

Max. relative humidity: 0...80%, non-condensing

#### Connectors

Wire range, solid & stranded: 0.5 - 1.5 mm<sup>2</sup>

14 - 22 AWG, Wire strip length: .25" (6 - 7 mm)

Tightening force: 0.4 Nm / 2.6 Lb-in

**\*\*RATED FOR INDOOR USE ONLY\*\***

## Installation

Connect a 12–24 VDC Class 2 power supply to the EncoderCas power connector, observing the marked polarity. Use a voltage-regulated supply, not a constant-current LED driver. Connect the rotary encoder phase contacts to Encoder A and Encoder B, its center switch to Encoder Switch, and the encoder common to Ground (-). The remaining Dry Contact I/O terminal may be configured as either an input or low-current output. Select the released Casambi fixture profile that matches the intended dry-contact function, then configure the Vendor Parameters before commissioning.

Encoder A, Encoder B, Encoder Switch, and Dry Contact I/O are dry-contact signaling terminals. Do not apply external power to these terminals. Input devices must open or close a passive electrical contact between the appropriate terminal and Ground (-). When used as an output, Dry Contact I/O provides a low-current electronic closure to Ground (-) for compatible contact-sense equipment; it must not drive a relay coil or other load.

Encoder Vendor Parameters configure encoder type, direction, full-range detents, acceleration, minimum and maximum levels, on/off memory, and fixed on level. Encoder Action provides standalone operation or ten multiswitch Gang assignments for synchronized multi-location control. Dry Input Action provides Normal, Inverted, and the same ten Gang selections. Dry Input Mode provides maintained On/Off, Toggle-on-Pulse, Hold to Brighten, Hold to Dim, Hold with alternating direction, Double-Tap to Maximum, Double-Tap to Off, and Double-Tap to either endpoint. Dry Output Polarity provides Normal or Inverted operation.

## Range

The range between two EncoderCas's or between a EncoderCas and a smart phone can vary depending on obstacles and surrounding material. In open air the range between two EncoderCas can be in excess of 200 ft, but if the unit is encapsulated into a metal structure, the range can be only few feet. Therefore, thorough testing is highly suggested. Casambi uses mesh network technology so each EncoderCas acts also as a repeater.

When testing the network, it is important to test that each unit can be controlled from any point of the network covered area.

EncoderCas should not be placed in a metal enclosure, such as metal junction boxes. Metal will attenuate radio signals which are crucial to the operation of the product. If the product will have to be installed into a junction box, make sure to use a plastic junction box. EncoderCas is an ETL Listed Open-Type device which means that it will have to be used together with a Class 2 power supply with maximum output power of 100VA. The product can be installed outside of junction box. Make sure to comply with National Electric Code in installation and when selecting installation wires.

## Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

## Warning

Changes or modifications not expressly approved by DMX Engineering LLC could void the user's authority to operate the equipment.

## FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## Radiation Exposure Statement for Canada

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

- (1) This device may not cause interference
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

This equipment is exempt from the routine RF exposure evaluation requirements of RSS-102. This equipment should be installed and operated with a minimum distance of 20 cm between the antenna and the user or bystanders.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage;
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Ce matériel n'est pas sujet à l'évaluation habituelle d'exposition RF selon RSS102. Ce matériel devrait être installé et exploité en gardant une dis-

