

# OEM Design-in Guide



**DIALOG**<sup>®</sup>  
Wireless Control System

**WARNING!**

**SYSTEM MUST BE INSTALLED IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES**

## For indoor installations.



Risk of Electric Shock. All servicing should be performed by qualified service personnel. To reduce the risks of electric shock disconnect power supplies before servicing.

## IMPORTANT SAFEGUARDS

- READ AND FOLLOW ALL SAFETY INSTRUCTIONS.
- Do not use outdoors.
- Do not mount near gas or electric heaters.
- Equipment should be mounted in locations and at heights where it will not be subjected to tampering by unauthorized personnel.
- The use of accessory equipment is not recommended by the manufacturer and may cause an unsafe condition.
- Do not use this equipment for other than intended use
- Wireless devices are only for lighting control
- Wireless controls cannot be used with portable heating appliances

## SAVE THESE INSTRUCTIONS

# Contents

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## Intelligent Fixture Sensor & Controller - OEM Design-in Guide

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# 1. Installation Instructions

## 1.1 General Description

The Douglas Lighting Controls Intelligent Fixture™ Controller and Intelligent Fixture™ Sensor are luminaire level lighting controls featuring Bluetooth Wireless Mesh and Bluetooth Beacon technology. The controller and sensor are installed directly into luminaires to enable control, communication and functional coordination with companion fixtures and other components of the Douglas Bluetooth wireless lighting control system.

The Intelligent Fixture™ Sensor includes an occupancy sensor and a photo sensor. The Intelligent Fixture™ Controller has the same form factor but excludes both sensing functions.

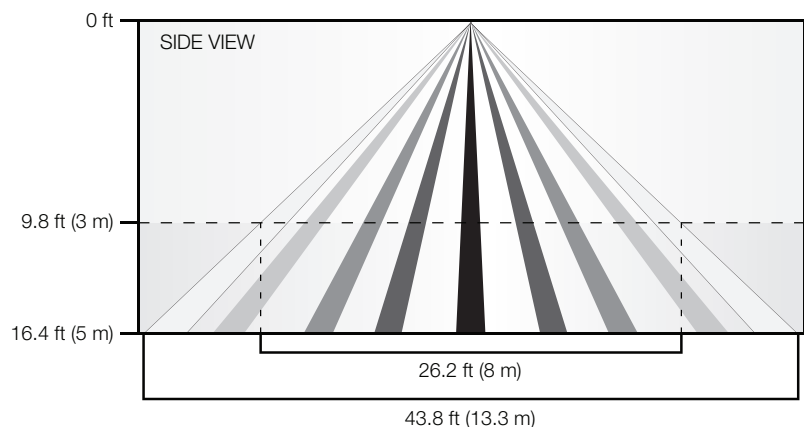
Both devices feature dimming and on/off functionality when used with 0-10V LED drivers equipped with DIM-to-OFF capability. Each can control one or two 0-10V channels. These sensors must be powered by an LED driver with an auxiliary power output function or by a local power pack.

The Intelligent Fixture™ Sensor provides both occupancy and photo control functions. Occupancy modes include: Occupancy, Vacancy, Partial OFF, and Partial ON modes.

The devices work within the existing Douglas Lighting Controls Bluetooth wireless ecosystem, which includes: switches, sensors and load controllers.

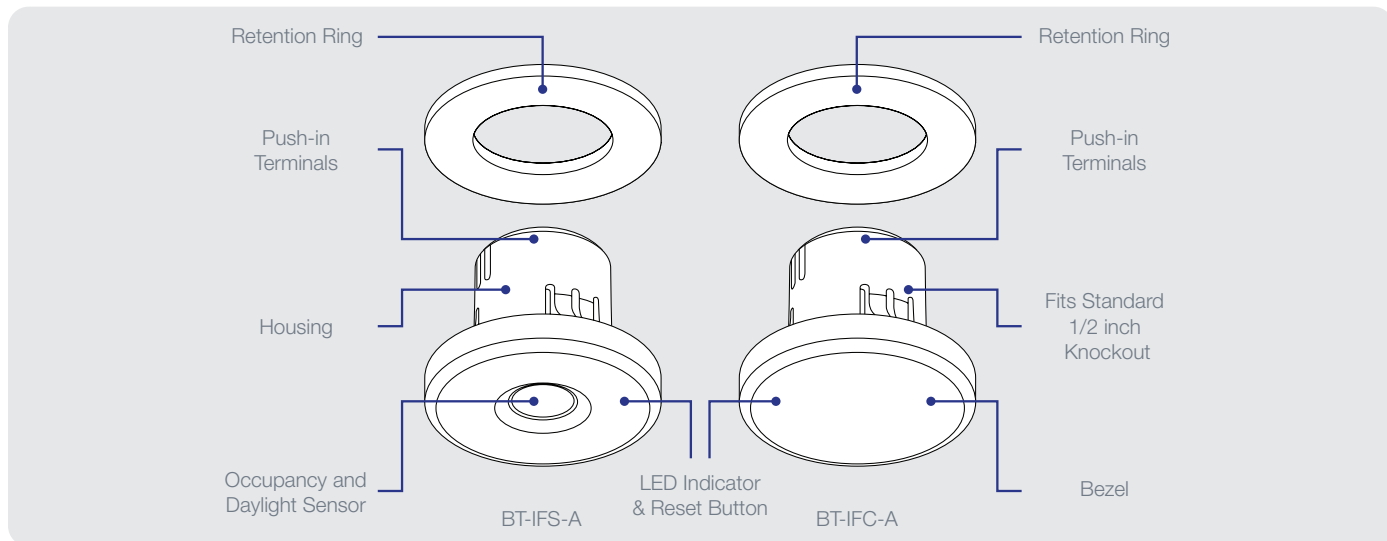
The device configuration and system set-up are both accomplished using the free Douglas Lighting Controls App (BTCC) on the iTunes App Store.

PART NUMBER	DESCRIPTION	ORDER NUMBER	QTY/CARTON
BT-IFS-A	Bluetooth Intelligent Fixture™ Sensor	BT-IFS-A010C	10
BT-IFC-A	Bluetooth Intelligent Fixture™ Controller	BT-IFC-A010C	10



# 2. Design Features

Figure 2.1 shows the Intelligent Fixture™ Sensor on the left and the Intelligent Fixture™ Controller on the right.



# 3. Specifications

<b>PART NUMBER</b>	<ul style="list-style-type: none"> <li>BT-IFS-A</li> </ul>	<ul style="list-style-type: none"> <li>BT-IFC-A</li> </ul>
<b>NAME</b>	<ul style="list-style-type: none"> <li>Intelligent Fixture™ Sensor</li> </ul>	<ul style="list-style-type: none"> <li>Intelligent Fixture™ Controller</li> </ul>
<b>FUNCTIONALITY</b>	<ul style="list-style-type: none"> <li>0-10V Dimming with DIM-to-OFF (LED Driver dependent)</li> <li>Occupancy, Vacancy, Partial ON, &amp; Partial OFF</li> <li>Adjustable Occupancy Timeout: 5 to 90 minutes</li> <li>Primary &amp; Secondary Daylight Harvesting (CLC)</li> <li>Bluetooth beacon for digital ceiling, IoT, and location services strategies</li> <li>Commissioning via BTCC App on the iTunes Store</li> </ul>	<ul style="list-style-type: none"> <li>0-10V Dimming with DIM-to-OFF (LED Driver dependent)</li> <li>Listed for emergency lighting control when used on a dedicated emergency power bus</li> <li>Occupancy and daylighting control features as shown at left when networked with one or more BT-IFS-A sensors</li> <li>Bluetooth beacon for digital ceiling, IoT, and location services strategies</li> <li>Commissioning via BTCC App on the iTunes Store</li> <li>UL924 certified devices for Emergency Fixtures</li> </ul>
<b>OCC. SENSOR MOUNTING HEIGHT</b>	<ul style="list-style-type: none"> <li>Up to 16.4ft (5m)</li> </ul>	<ul style="list-style-type: none"> <li>Not applicable</li> </ul>
<b>WIRING</b>	<ul style="list-style-type: none"> <li>Use #20 to #26 AWG solid copper conductors stripped to 4mm</li> </ul>	
<b>INPUT VOLTAGE</b>	<ul style="list-style-type: none"> <li>12VDC - 26.5VDC; Power draw: 0.6W maximum, 0.25W typical</li> </ul>	
<b>WIRELESS RANGE</b>	<ul style="list-style-type: none"> <li>150ft Clear line of sight, 50ft through standard walls</li> <li>Distances may vary based on location and environment</li> <li>Additional devices may be required at time of commissioning to ensure Bluetooth network integrity</li> </ul>	
<b>NOTIFICATIONS</b>	<ul style="list-style-type: none"> <li>LED indicator for commissioning and occupancy (IFS)</li> </ul>	
<b>ENVIRONMENT</b>	<ul style="list-style-type: none"> <li>Indoor, stationary, non-vibrating, non-corrosive atmosphere, and non-condensing humidity</li> <li>Suitable for Use in Other Environmental Air Space (Plenums) in Accordance with Section 300.22, (C) of the National Electrical Code.</li> </ul>	
	<ul style="list-style-type: none"> <li>Operating temperature: 32°F to 131°F (0°C to 55°C)</li> <li>Storage temperature: -4°F to 158°F (-20°C to 70°C)</li> </ul>	<ul style="list-style-type: none"> <li>Operating temperature: 32°F to 185°F (0°C to 85°C)</li> <li>Storage temperature: -40°F to 185°F (-40°C to 85°C)</li> </ul>
<b>DIMMING</b>	<ul style="list-style-type: none"> <li>Two 0-10V dimming channels, each capable of sinking up to 25mA</li> <li>Typical use is with single channel 0-10V LED drivers providing auxiliary output power and DIM-to-OFF capability</li> <li>May also be used with dual-channel, tunable white LED drivers providing auxiliary output power and DIM-to-OFF capability</li> </ul>	
<b>CERTIFICATIONS</b>	<ul style="list-style-type: none"> <li>UL916, UL2043 (Plenum), UL924 (Emergency Lighting - BT-IFC only)</li> <li>May be installed through a knockout in the luminaire wiring enclosure or installed external to the enclosure and powered with a Class 2 circuit using Class 2 wiring methods</li> </ul>	
<b>WARRANTY</b>	<ul style="list-style-type: none"> <li>Standard 5-year warranty</li> </ul>	

# 4. Functionality

## General Description

Each device, when installed in a luminaire with a suitable LED driver having 0-10V dimming, Dim-to-OFF capability and an auxiliary power output, performs the following functions:

- LED status indicator for network status and commissioning. For the Intelligent Fixture™ Sensor, the LED also indicates occupancy detection events.
- ON/OFF control, using the DIM-to-OFF feature of a suitably equipped LED driver
- UP/DOWN dimming control
- On-board Reset (press bezel and hold for 10 seconds)

## Intelligent Fixture™ Sensor provides:

- Occupancy Control modes (see table below)
- Primary and Secondary Daylight Harvesting (CLC)

	When occupancy is detected	When time-out occurs
Occupancy	Auto ON	Auto OFF
Vacancy	Manual ON required	Auto OFF
Partial ON	Auto ON to 50% Manual ON to 100% required	Auto OFF
Partial OFF	Auto ON to Zone MAX	Transition to Zone MAX

## Power-up Sequences for Non-Networked Devices

Intelligent Fixture™ Sensor & Intelligent Fixture™ Controller:

When initially powered up or if power is cycled, the unassociated sensor will initiate the following start sequence:

1. 3 seconds OFF
2. 6 seconds at 100%
3. 3 seconds OFF
4. 3 seconds at 30%
5. Transition to 100%

\*LED will rapidly blink GREEN to indicate unassociated devices

The power-up sequence will fully test the wiring and functionality of the device. For further occupancy testing, wait 45 seconds for the PIR sensor to warm up and do a motion trigger to start the timer. After 20 minutes, the light will time out to OFF (0%). If the power-up sequence does not occur, check the wiring or if the device is associated. If the device is associated, to remove the association, hold down the bezel button for 10 seconds.

## Out-of-Box Functionality for Non-Networked Devices

Intelligent Fixture™ Sensor:

- Occupancy mode (Auto ON/Auto OFF)
- Timeout: 20 minutes
- Local occupancy (independent of other sensors)
- 100% Max output level on both output channels

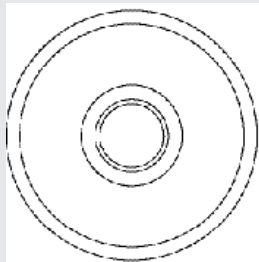
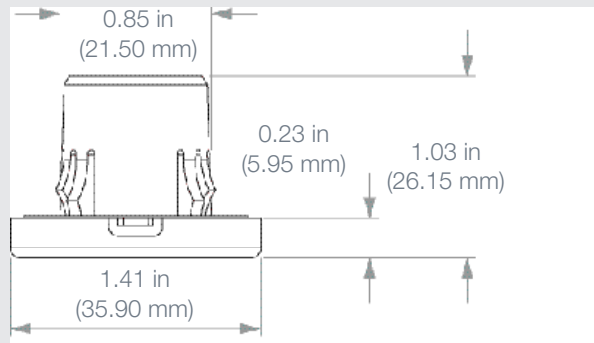
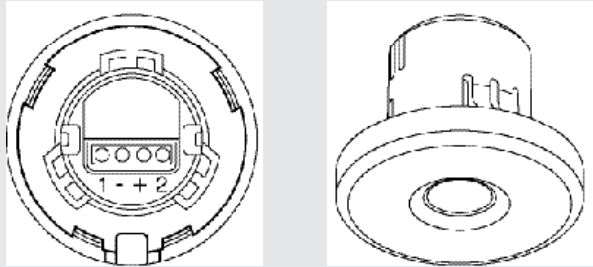
Intelligent Fixture™ Controller:

- Once it is fully powered, the BT-IFC-A will go to 100%.

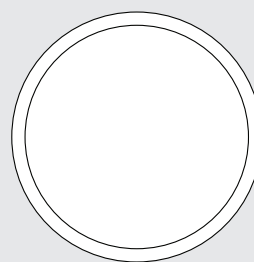
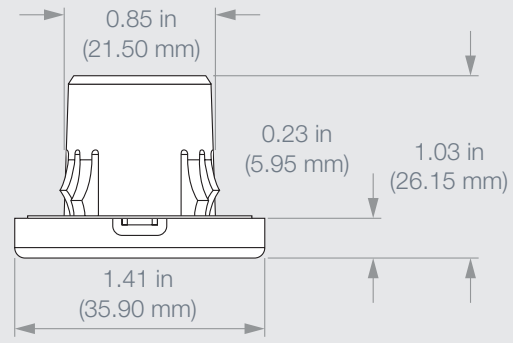
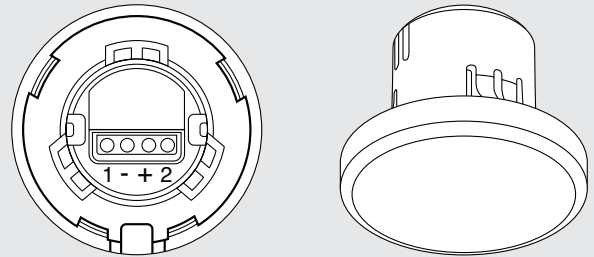
# 5. Dimensions

Dimensions and markings for the Intelligent Fixture™ Sensor and Intelligent Fixture™ Controller are provided below.

Intelligent Fixture™ Sensor  
BT-IFS-A



Intelligent Fixture™ Controller  
BT-IFC-A

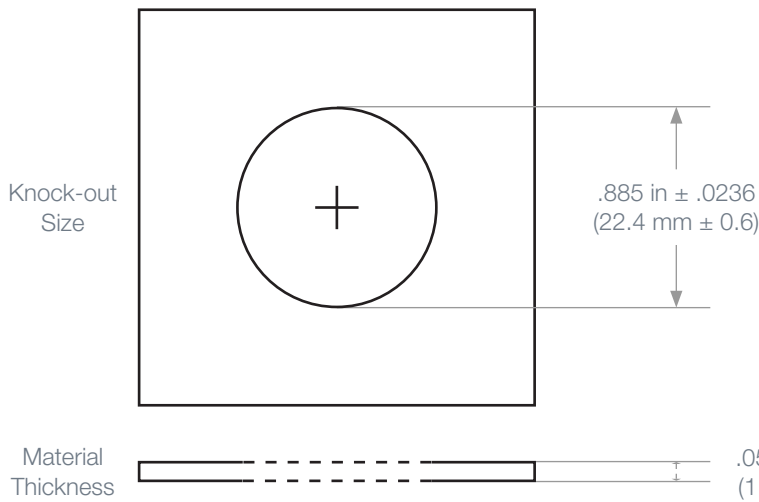


# 6. Installation Features

- Mounts into a standard 1/2" electrical knockout
- Push-in connection terminals for #20-#26 AWG solid Copper (twist to remove)
- Silicon retention ring
- Out-of-Box functionality (see section #4)
- Push bezel and hold for 10 seconds to implement factory reset

# 7. Installation Dimensions

## 7.1 Knock-out Dimensions

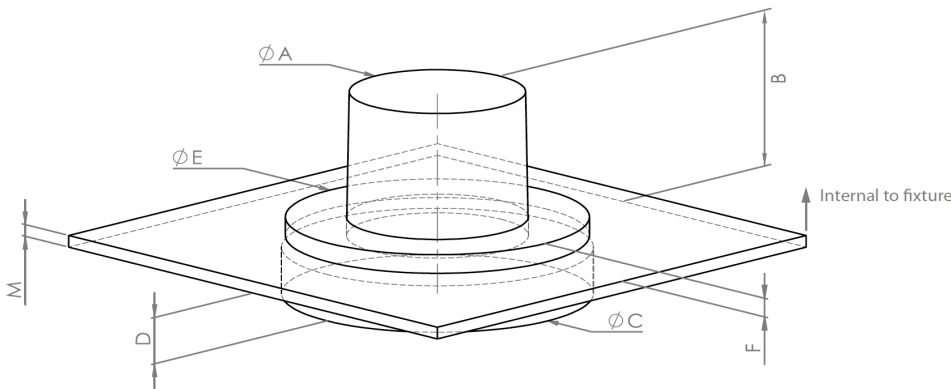


**CAUTION**

DO NOT enclose the lower housing in metal, the antenna is embedded in the face of the product.

Mounting location on the fixture must take into consideration line of sight installation in the ceiling grid. Anything that prevents line of sight is likely to reduce Bluetooth range.

## 7.2 Spacing



### Minimum Spacing Requirements:

- A = 0.85 in (21.5 mm)
- B = 1.18 in (30.0 mm)
- C = 1.41 in (35.9 mm)
- D = 0.24 in (6.0 mm)
- E = 1.38 in (35.0 mm)
- F = 0.09 in (2.4 mm)
- M = 0.055 in (1.4mm)



# 8. Installation

## CAUTION



**Risk of Electric Shock.** All servicing should be performed by qualified service personnel. To reduce the risks of electric shock disconnect power supplies before servicing.

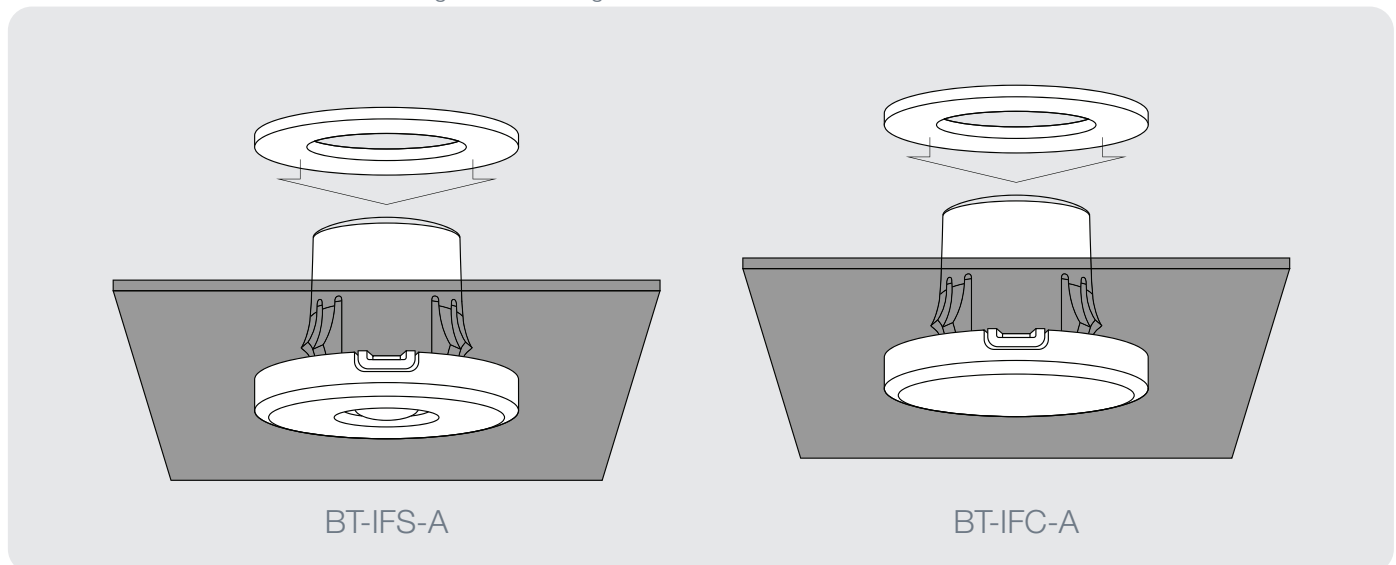
### Installation Advice

- Install the BT-IFS-A in a location where direct light from the fixture does not enter the sensor
- Install the BT-IFS-A vertically with sensor facing directly to the floor or work surface below
- BT-IFC-A may be installed in non-horizontal location. Mounting location on the fixture must take into consideration line of sight installation in the ceiling grid. Anything that prevents line of sight is likely to reduce Bluetooth range.
- Neither device may be installed in a location surrounded by metal; installation in a metallic enclosure will interfere with Bluetooth communications
- Product must be installed in accordance with local electrical codes

### Installation Steps

- Refer to Fig. 8.1
- Remove retention ring
- Push sensor through standard ½ inch electrical knockout
- Affix retention ring over device to secure in place
- Connect wires by pushing stripped conductor firmly into terminal and according the appropriate wiring diagram below
- Use #20 - #26 AWG solid copper conductors, stripped to 4 mm

Fig. 8.1: Mounting details for sensor/controller



# 9. Wiring

## Wire Specifications

- #20-#26 AWG solid wire, stripped to 4mm
- Wire ratings must comply with luminaire listing requirements
- Recommended minimums: 600V / 90°C

## Wiring Diagrams

Fig. 9.1: Connections for a single-channel / single-driver system

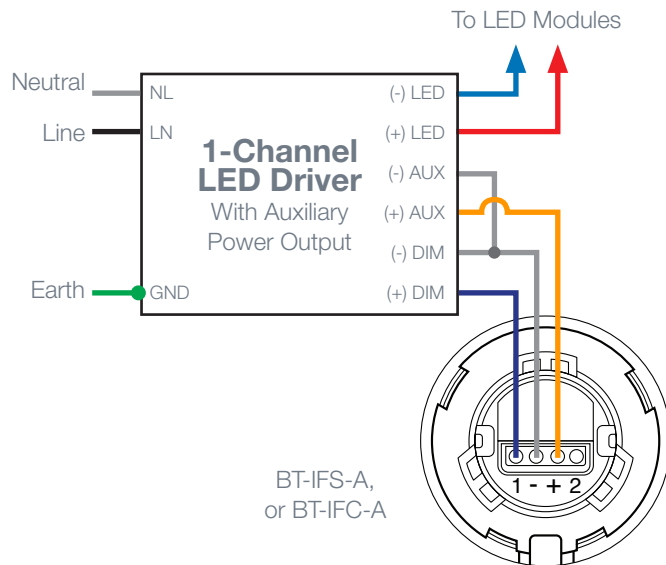
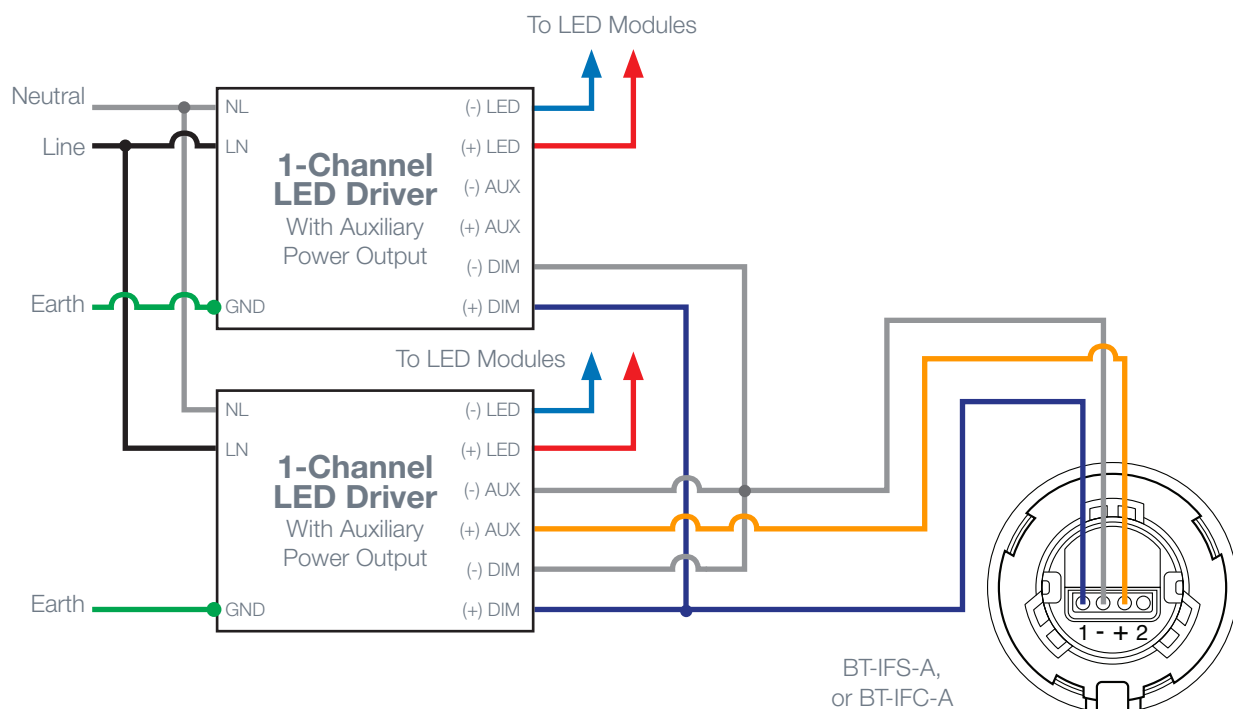
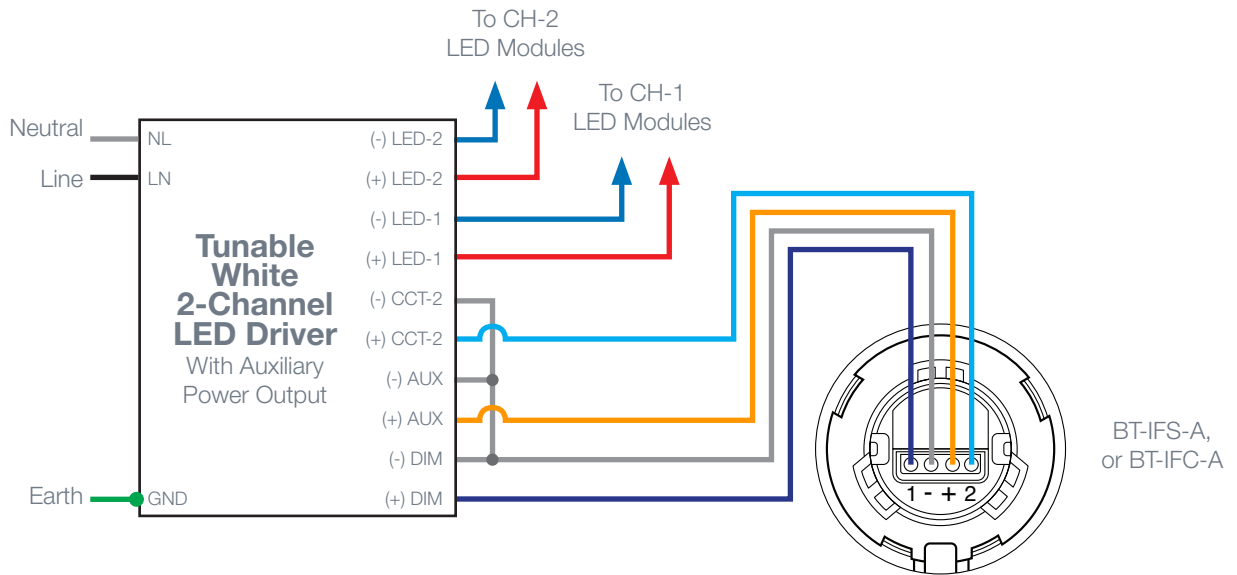


Fig. 9.2: Connections for a single-channel / multi-driver system



# 9. Wiring

Fig. 9.3: Connections for a dual-channel tunable-white, single driver



# 10. Approval

- UL Listed: UL916, UL924 (Emergency Lighting - BT-IFC only)
- Plenum Rated: UL2043
- Meets ASHRAE Standard 90.1 requirements
- Meets CEC Title 24 requirements
- Meets WSEC requirements

## FCC Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## FCC Guidelines for Human Exposure

Douglas Lighting Control products comply with FCC radiation exposure limits set forth for an uncontrolled environment. The equipment should be installed and operated with a minimum distance of 20cm between the radiator and all persons.

- Industry Canada Notifications

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; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

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.

## IMPORTANT NOTE: Radiation Exposure Statement

Douglas Lighting Controls products comply with IC radiation exposure limits set forth for an uncontrolled environment.

Douglas Lighting Controls products should be installed and operated with a minimum distance of 20cm between the antenna of the radiator and all persons.

## NOTE IMPORTANTE: Déclaration d'exposition aux radiations

Produits Douglas Lighting Controls sont conformes aux limites IC d'exposition aux rayonnements définies pour un environnement non contrôlé. Produits Douglas Lighting Controls doivent être installés et utilisés avec distance minimum de 20cm entre le radiateur et votre corps.

## PMN: BT-IFC-A and BT-IFS-A

# 11. OEM Setup Procedures

## Step 1

**Inspection:** Confirm product ordered matches the product received. Carefully remove control device from packaging. Inspect housing, wire connection terminals, and lens (if BT-IFS) for defects. Confirm each device comes with a silicon retention ring.



## Step 2

**Mounting:** Remove retention ring from control device. Push device through a standard 1/2" electrical knockout until flush with surface. Slide retention ring back down the neck of the device until it meets the backside of the mounting surface. Make sure silicon ring and device are securely sealed and affixed to the luminaire.



## Step 3

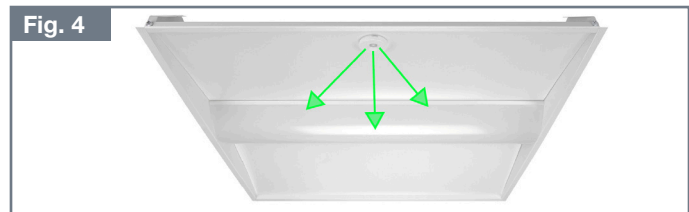
**Wiring:** Insert driver wiring leads into appropriate push-in connection terminals on back of control device using #20-#26 AWG solid copper wires stripped to 4mm.



## Step 4

**Testing:** Verify default programming and operation of control device by providing power to the luminaire and observing the following power-up sequence:

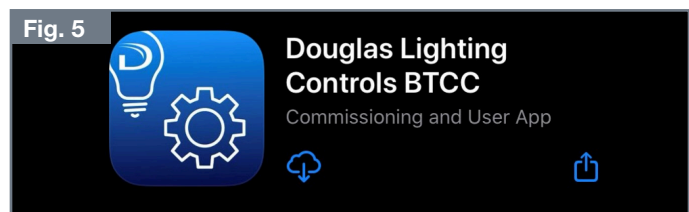
1. 3 seconds OFF (minimum level for non-"dim-to-off" drivers)
2. 6 seconds at 100%
3. 3 seconds OFF (minimum level for non-"dim-to-off" drivers)
4. 3 seconds at 30%
5. Transition to 100%



\*\*\*NOTE: BT-IFS out-of-box functionality is local occupancy sensing (100% Auto On/Auto Off) independent of other sensors with 20 minute timeout. BT-IFC out-of-box functionality is 100% ON.

## Step 5 (Optional)

**Advanced Configuration:** Download the free Douglas Lighting Controls BTCC Commissioning and User App from Apple App store to edit the control device out-of-box settings.



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