

**Step 5: Wire Sensor Inputs**

If sensors are wired to the BMF follow these guidelines.

- A. All sensors and keypads are Class 2 low voltage. Do not combine any sensor wiring with mains wiring. Follow all national and local electrical code restrictions when wiring Class 2 devices.
- B. Wire sensors as instructed by each sensor's instruction sheets.
- C. Only one solid #22 AWG (0.33 mm<sup>2</sup>) wire may be used in each low voltage terminal on the BMF.
- D. Programming of each sensor and keypad is performed via the EcoSystem Programmer (C-PDA-CLR)

**Step 6: Troubleshooting**

Lights on Full/Not dimming

If the BMF and attached ballasts and lamps are fixed at full light output, the BMF is likely in emergency mode. Verify the EcoSystem Bus wiring is properly terminated, powered via the EcoSystem Bus Power Supply, and 18 V<sup>DC</sup> is present between the E1 and E2 terminals on the BMF.

Lights on Full or OFF/Not dimming

Verify the wiring between the BMF and the ballast. Confirm that the black terminals are not wired to the orange input on a ballast. When the orange input to a ballast receives switched HOT input, the ballast will be at either full intensity or off, not dimming.

**Ballast Module Warranty**

Lutron warrants each new ballast module for a period of three years from the date of shipment, to be free from defects in materials or workmanship under conditions of normal use when installed and operated under Lutron product specifications and in accordance with the applicable National Electrical Code and Safety Standards of Underwriters Laboratories. Lutron shall, at its option, repair or replace any defective unit that, in its opinion, has been properly installed, wired, insulated, used and maintained, provided that Lutron shall not be required to remove, install or re-install any defective unit and provided that Lutron is promptly notified of said defect within the aforementioned warranty period. The foregoing warranty and optional remedies are exclusive and, except for the foregoing warranties, THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR OF ANY OTHER TYPE. In no event shall Lutron or any other seller be liable for consequential or special damages, nor for any repair work undertaken without its prior consent, nor shall Lutron's liability on any claim for damages arising out of or connected with the manufacture, sale installation, delivery or use of said unit ever exceed the price paid therefor. Lutron will not be responsible for any ancillary equipment not furnished by Lutron which is attached to or used in connection with the ballast module, or for operation of the ballast with any ancillary equipment and all such equipment is expressly excluded from this warranty. Furthermore, Lutron will not be responsible for any damage to the ballast module resulting from the use of ancillary equipment not furnished by Lutron for use with the ballast module.

Lutron Electronics Company, Inc., reserves the right to make improvements or changes in its products without prior notice. Although every attempt is made to ensure that this information is accurate and up-to-date, please check with Lutron to confirm product availability, latest specifications, and suitability for your application.

U.S. and foreign patents pending.

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Optional field commissioning service available — extends warranty to 8 years (limited).

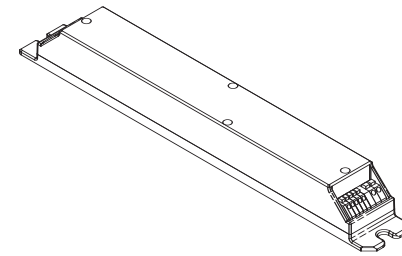
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ATTENTION: Please read this guide before installing

**EcoSystem C5-BMF-2A**

Ballast Module Fixture Mount with EcoSystem inputs for control of Lutron Ballasts.



**Overview**

A C5-BMF-2A (BMF) converts a Lutron Eco-10™ or Hi-lume® dimming ballast into an EcoSystem component. BMFs wire onto the EcoSystem Bus and accept occupant sensor, daylight sensor, infrared, and keypad control inputs to drive the attached dimming ballast.

In most applications it is desirable to mate one BMF to one dimming ballast. In this case the ballast is addressable and independently configurable and operates like an EcoSystem ballast.

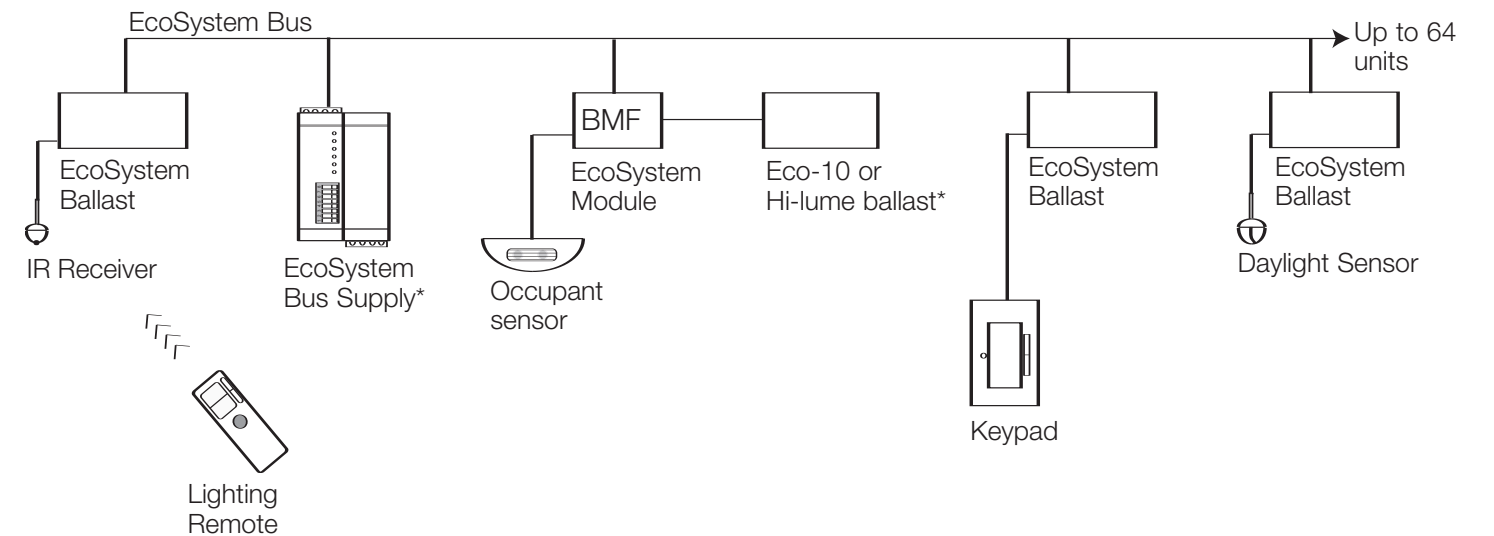
**Specifications**

BMFs control Lutron 3-wire dimming ballasts (Hi-lume and Eco-10 only). BMFs have the following characteristics:

- Input voltage 120 to 277 V~
- Maximum ballast load 2 A max
- Provides both dimming and switching output
- BMF power draw: 2 VA
- 200 feet (61 m) maximum wire length between BMF and controlled dimming ballast
- Dim range is 100 % down to specified low end of the attached ballast load
- Addressable via the EcoSystem Bus
- Accepts up to three sensors, one each of the following types:
  1. Daylight Sensor
  2. Occupant Sensor
  3. Infrared Receiver or Keypad

Note:

It is possible to connect more than 1 ballast to a BMF. The BMF controls up to 2 A of connected load. If more than one ballast is attached, the ballasts are controlled as a zone - individual control of the attached ballasts is not allowed.



\* does not count as one of the 64 ballasts or modules allowed on the EcoSystem bus

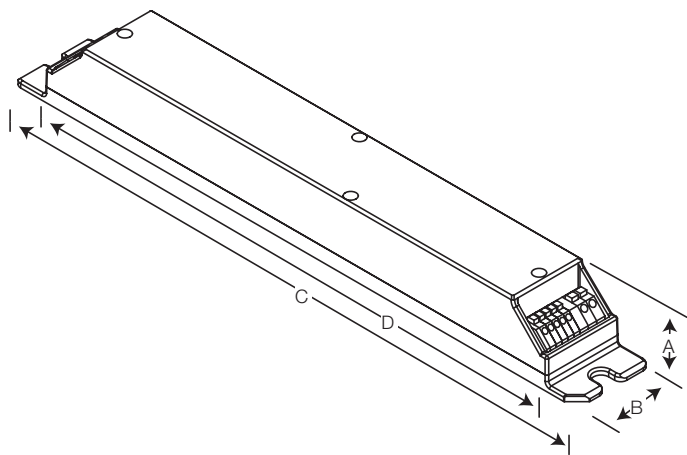
**Step 1: Mount BMF**

BMFs must be mounted in a UL<sub>c</sub>/NEC<sub>c</sub> recognized electrical enclosure, either a fluorescent lighting fixture or a suitable UL508 listed enclosure. Follow applicable local and national codes.

BMF must be mounted within 200 feet (61 m) of the ballast(s) it is controlling.



- A. DO NOT INSTALL WHILE ENERGIZED. Do not connect any electrically live circuits to the BMF prior to installation.
- B. Use the notched tabs on the end of the BMF for mounting.
- C. Use the dimensioning guide below to properly mount the BMF
  - A = 1.0 in. (25 mm)
  - B = 1.18 in. (30 mm)
  - C = 9.3 in. (236 mm)
  - D = 8.9 in. (226 mm) mounting centers
- D. Tighten screws/bolts onto BMF's tabs.



BMF dimensions

**Step 2: Wire BMF to Ballast**

Three wires are used between the BMF and a Hi-lume or Eco-10 ballast. The three wires are color coded as follows:

- BLACK = switched hot (120 — 277 V~) (SH)
- ORANGE = dimmed hot output (DH)
- WHITE = neutral (NEU)

Lutron ballasts must be selected for appropriate input voltage. Verify that a 120 V~ ballast is used only with 120 V~ mains, and a 277 V~ ballast is used only with 277 V~ mains. BMFs may be used at either voltage.

BMFs can only support up to 2 A of attached Lutron ballast load current.

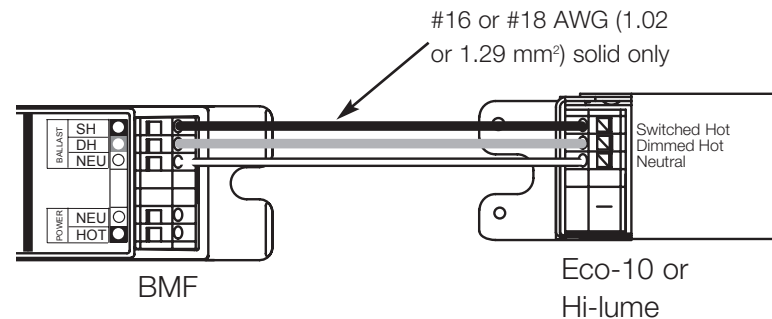
Use the following steps to wire a BMF to a ballast.



- A. DO NOT WIRE LIVE. Interrupt power via breaker before wiring between the BMF and a ballast.
- B. Use #16 or #18 AWG solid conductors to wire between the BMF and the Hi-lume or Eco-10 ballast.
- C. Wire the BMF's switched hot (SH) (BLACK) output to the ballast's Hot (BLACK) input
- D. Wire the BMF's dimmed hot (DH) (ORANGE) output to the ballast's Dimmed Hot input (ORANGE)
- E. Wire the BMF's neutral (NEU) (WHITE) output to the ballast's Neutral input (WHITE).

If multiple ballasts are being driven by a BMF, wire the BLACK, ORANGE, and WHITE wires to each ballast.

Do not use different voltage ballasts with the same BMF.



Wiring between a BMF and a ballast

**Step 3: Wire Mains to the BMF**

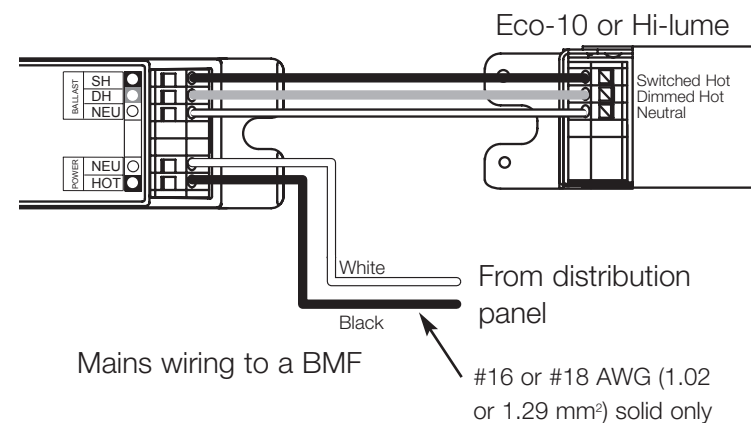
Hot and neutral from a distribution panel is required for the BMF. Verify that the mains voltage matches the voltage rating of the ballasts that the BMF is controlling.

Use the following guidelines for wiring mains voltage to the BMF.



- A. DO NOT WIRE LIVE. Interrupt power via breaker before wiring and servicing the BMF
- B. BMF terminals only accept solid wire. Join mains input hot (HOT) and neutral (NEU) to #16 or #18 solid wire before connecting to a BMF.
- C. Wire the hot input to the black terminal on the BMF ONLY! Do not wire the hot directly to any ballast the BMF controls.
- D. Wire the neutral input to the white terminal on the BMF ONLY! Do not wire the neutral directly to any ballasts the BMF controls.
- E. Make sure ballasts are correctly connected to BMF (step 2).
- F. Turn on breaker to energize the BMF.
- G. Attached ballasts and lamps will turn onto full light output.

Note: if lamp(s) do not turn on, verify that 120 V~ or 277 V~ is present at the input of the BMF and at the input of each ballast.



Mains wiring to a BMF

**Step 4: Wire EcoSystem Bus**

The EcoSystem Bus Supply controls up to 64 ballasts and BMFs. EcoSystem Bus wiring may be run daisy chain, t-tap, and/or star pattern. Bus wiring may be either Class 1 or Class 2.

Class 1: Low voltage bus wiring may be run with mains voltage to any fixture the bus is controlling.

Class 2: Low voltage bus wiring must be separated from all mains and Class 1 wiring.

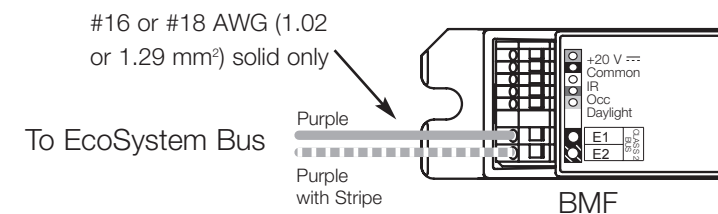
Consult all applicable national and local codes for compliance.

Lutron recommends using two different colors for E1 and E2 (EcoSystem Bus) wire. This helps prevent bus wiring mistakes.

Use the following guidelines for wiring the EcoSystem Bus to the BMF.



- A. DO NOT WIRE LIVE. Interrupt power to the BMF and the EcoSystem Bus Supply before wiring and/or servicing the EcoSystem Bus.
- B. BMF terminals only accept solid wire. Join EcoSystem Bus input E1 and E2 to #16 or #18 solid wire (only) before connecting to a BMF.
- C. Connect EcoSystem Bus wires E1 and E2 to BMF terminals E1 and E2.
- D. Energize the EcoSystem Bus Supply only. Verify that 18 V<sup>DC</sup> is present at the E1 and E2 terminals on the BMF.
- E. Energize the BMF.



EcoSystem Bus wiring to the BMF

**Wiring Size and Bus Length**

EcoSystem Bus length is limited by the wire gauge used for E1 and E2 as follows:

Wire Gauge	Bus Length (max)
#12 AWG (2.05 mm)	2,200 ft (671 m)
#14 AWG (1.63 mm)	1,400 ft (427 m)
#16 AWG (1.29 mm)	900 ft (275 m)
#18 AWG (1.02 mm)	570 ft (175 m)