DIM10-087-06 Controller
Load Ratings: 12 to 24VDC, +/-10%, 900mW max
Operating Humidity: 10 to 90%, non-condensing

WARNING AND CAUTIONS:

- **TO AVOID FIRE, SHOCK, OR DEATH; TURN OFF POWER** AT CIRCUIT BREAKER OR FUSE AND TEST THAT POWER IS OFF BEFORE INSTALLING!
- **PROPER GROUNDING REQUIRED TO AVOID STATIC DISCHARGE WHICH CAN DAMAGE CONTROLLERS DURING INSTALLATION.**

WARNING AND CAUTIONS:

- If you are unsure about any part of these instructions, consult an electrician; all work should be performed by qualified personnel.
- DIM10-087-06 controllers must be installed in accordance with national, state, and local electrical codes and requirements.

WARNING: The maximum numb

drivers may be on the bus, but only 4 may have active power supplies. SimplySnap will not support more than 6 D4i LED drivers on the Synapse lighting controller. The DALI bus is limited to 250mA. Having more than 4 DALI power supplies on the bus may void the D4i LED driver warranty.

SPECIFICATIONS

- Dim Control Max Load: 10 mA Source/Sink
- Radio Frequency: 2.4 GHz (IEEE 802.15.4)
- RF Transmission Output Power: +20 dBm
- Operating Temperature: -40°C to +80°C
- Operating Humidity: 10 to 90%, non-condensing
- Max D4i Drivers: Limited to 4 D4i LED drivers
- Dimensions: 2.25”L x 2.0”W X .3”H
  (57 X 50.8 X 7.6 mm)

MODELS

- **DIM10-087-06 (Uses external antenna)**
- **DIM10-087-06-F (internal antenna)**

DESIGN CONSIDERATIONS

Below are some recommendations for successful dimming using the DIM10-087-06. The dimming control wires are referenced as DIM+ and DALI-/COM. The dimming signals have a Maximum voltage of 10V DC.

- Use multi-strand 18 Gauge Wire for noise immunity and current capability.
- Do not ground the dimming wire; this is a return signal and is critical for dimming.
- Route dimming wires away from AC lines if possible.
- Use connections with properly sized connectors.
- Eliminate excess wire between fixtures; Line length will cause voltage drop.
- Maximum of 4 LED Drivers per controller, consult Synapse Support if a greater ratio is needed.

NOTE: LED Driver must support DIM to OFF functionality.

NEEDED MATERIAL

- **u.FL Insertion Tool:** Part Number U.FL-LP-IN from Hirose Electric (for DIM10-087-06 only)
- **u.FL Extraction Tool:** Part number U.FL-LP-N-2 from Hirose Electric (for DIM10-087-06 only)
- **u.FL Connector and 14mm bulkhead:** A cable with a u.FL connector on one end and a female 14mm bulkhead connector on the other end is required to route the signal from the DIM10-087-06 through the fixture housing to an external antenna.
- **Mounting Hardware:** (1) #4 or M3 screw and standoff recommended
- **Antenna Kit:** For available antenna options please refer to our latest documents located on our website. www.synapsewireless.com/documentation

INSTALLATION INSTRUCTIONS

MOUNTING

Secure with 1 #4 screw (**max diameter of .312 inches)** and standoff.

1. **Mounting Options:** Mount in an LED Fixture or a Troffer. For the DIM10-087-06, an external antenna utilizing a u.FL connector must be used to provide RF connectivity to the SNAP mesh network.

2. Place the DIM10-087-06 in desired location and secure it using #4 sized screw and stand-off using the mounting hole located in the center of the board. Prior to permanently mounting the DIM10-087-06, make sure the antenna is free of any objects within 3 in. of the internal or external antenna.

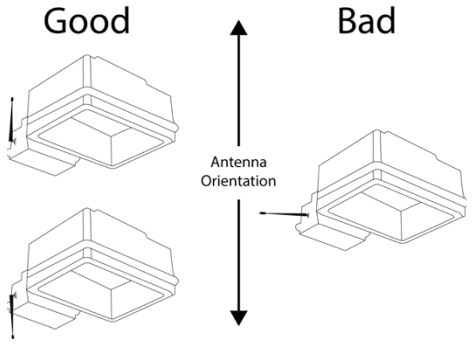


Figure 1 - Proper External Antenna Installation

INSTALLING THE ANTENNA

To install the antenna:

3. Make sure the power is off.
4. Attach the u.FL cable (Figure 5) to the u.FL terminal (Figure 4).

5. Use the insertion tool, PN U.FL-LP-IN, to mate the connectors. The mating axis of both connectors must be aligned so that the connectors can be mated. The "click" will confirm a fully mated connection. Do not attempt to insert on an extreme angle.
6. Route the antenna cable such that there is no upward tension between the cable and the u.FL connector.

7. To disconnect the connectors, insert the end portion of the Extraction Tool, U.FL-LP-N-2, under the connector flanges and pull off vertically, in the direction of the connector mating axis.

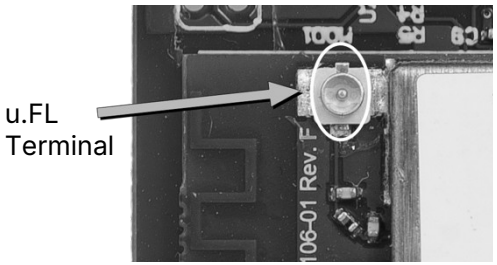


Figure 4- u.FL Terminal

CONNECTING THE u.FL CABLE

An u.FL antenna may be connected to the DIM10-087-06 in order to get maximum RF connectivity. The recommended antenna kits are:

- KIT-ANTUFL18-01
  18" u.FL cable with right angle antenna
- KIT-ANTUFL18-02
  18" u.FL cable with straight antenna
- KIT-ANTUFL18-03
  18" u.FL cable with right angle stubby antenna
- KIT-ANTUFL18-04
  18" u.FL cable with straight stubby antenna

Please see the DIM10-087-06 cut sheet or contact Synapse sales for more information.

ATTACHING THE ANTENNA

8. Make sure the power is off. When handling the antenna cable, the technician must be grounded with a proper ground strap.
9. Remove red rubber dust cover, the washer, and nut from the antenna connector.
10. Determine best location for external antenna position and create an opening to mount the antenna and bulkhead (See Figure 6 for measurements).
11. Feed the bulkhead through the opening in the fixture. (Note: Recommended max thickness of fixture wall is 6mm or 0.25 inches. This allows enough threads on the outside of the fixture for a good antenna connection.)
12. Place the washer and the nut back on the antenna connector and secure to fixture.
13. Screw on the antenna hand tight. Tighten a 1/4 turn with a pair of needle nose pliers. Do not over tighten or the RF pin in the bulkhead will crack, creating poor RF link quality.

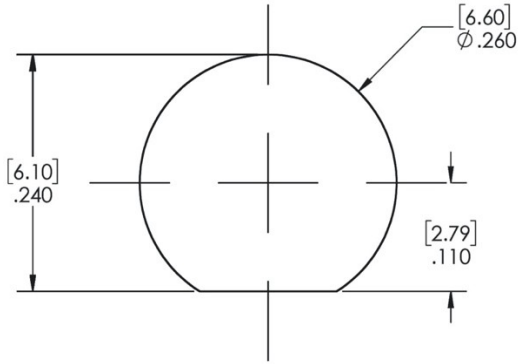


Figure 6 – Recommended mounting hole for 1/4-36UNS-2A threaded antenna with flat

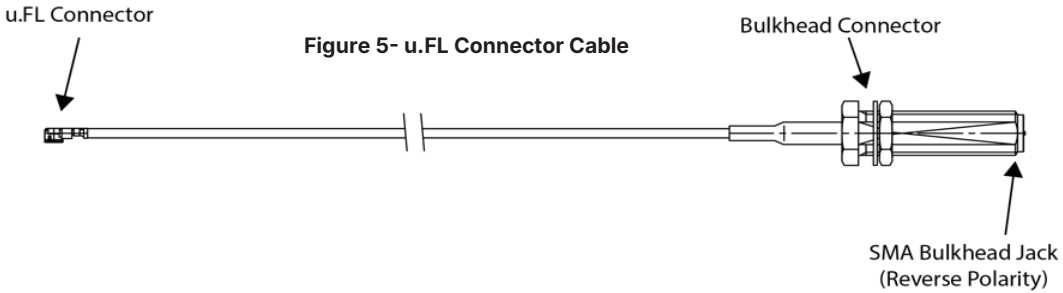


Figure 5- u.FL Connector Cable

CONNECTING SENSORS

Note: Steps 14-18 are for adding sensors to the DIM10-087-06 controller; if you are not connecting sensors skip this section.

There are two sensor inputs on the DIM10-087-06 designed for low powered (24v DC) type sensors.

- The Input A is used to connect sensor A.
- The Input B is used to connect sensor B.

14. Connect the sensor power wire to the AUX out on the LED driver (the LED driver powers the sensor).
15. Connect the sensor common to the COMMON/DIM-.
16. Connect the sensor CTRL/Control wire to the Input A+ or Input B+ of the DIM10-087-06 controller.
17. If you are using more than one sensor, then duplicate the installation as described above.
18. Sensors must be configured in software before they are functional in a SimplySnap system.

(See Figures 2 and 3)

WIRING THE DIM10-087-06 CONTROLLER

Note: Unless specified, the connections to a standard Dim to Off LED driver and the DALI 2 LED driver are the same.

19. Connect the 12-24VDC Aux output from LED driver to the DIM10-087-06.
20. Connect the Aux ground from the LED driver to the DIM10-087-06.

(Figure 2 and 3)

CONNECTING THE DIMMING CIRCUIT

Note: Steps 21-22 are for connecting to a Standard Dim to Off LED driver; if you are using a DALI 2 LED driver skip to steps 23-24.

21. Connect the DIM- wire on the LED driver to the DIM- output on the DIM10-087-06.
22. Connect the DIM+ wire on the LED driver to the DIM+ output on the DIM10-087-06. (See Figure 2)

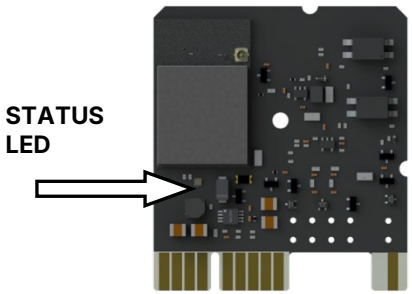
Note: Steps 23-24 are for connecting to a DALI 2 LED driver.

23. Connect the DALI- from the DIM10-087-06 to the DALI-/COMMON wire on the LED driver.
24. Connect the DALI+ from the DIM10-087-06 to the LED driver DALI+. (See Figure 3)

POWERING UP THE FIXTURE AND CONTROLLER

After connecting the Controller to the LED Driver and any sensors, make sure to cap any unused wires. Switch power on to the fixture. The light should turn on.

Note: Upon power up, the device will turn on the lamps to 100%, then ramp down to off over 2 seconds, stay off for 2 seconds, and then ramp back up to 100% over 2 seconds.



STATUS LED

Note: When the controller is powered, the following colors indicate the status.

- **Red** = No Network Found (Communication Lost)
- **Blinking Green** = Network Found, Controller Not Configured (Device not yet added to SimplySnap)
- **Green** = Network Found, Controller Configured (Normal Operation)

For more information on SimplySnap and the DIM10-087-06, refer to the website at http://help.synapsewireless.com/.

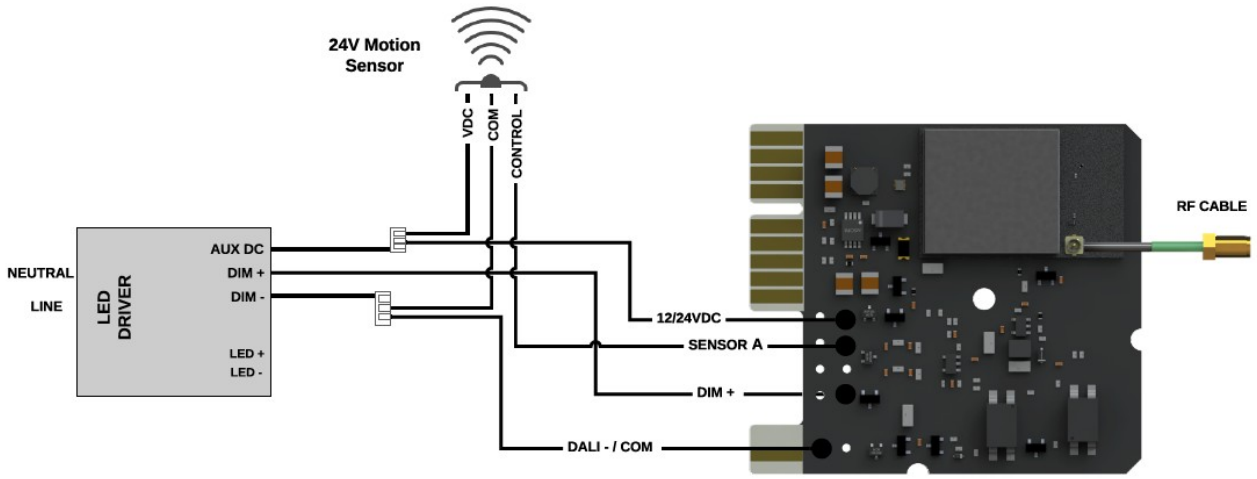


Figure 2 – Dim to OFF Wiring Diagram

WARNING:

· If a single Synapse controller is used to drive the DIM+ input of multiple LED drivers, then all of the DIM- lines from all drivers MUST be directly tied/shorted together to provide a common return/ground to the controller.

· Synapse will not warranty or be liable for designs with any other electronic means of coupling DIM- lines from multiple drivers.

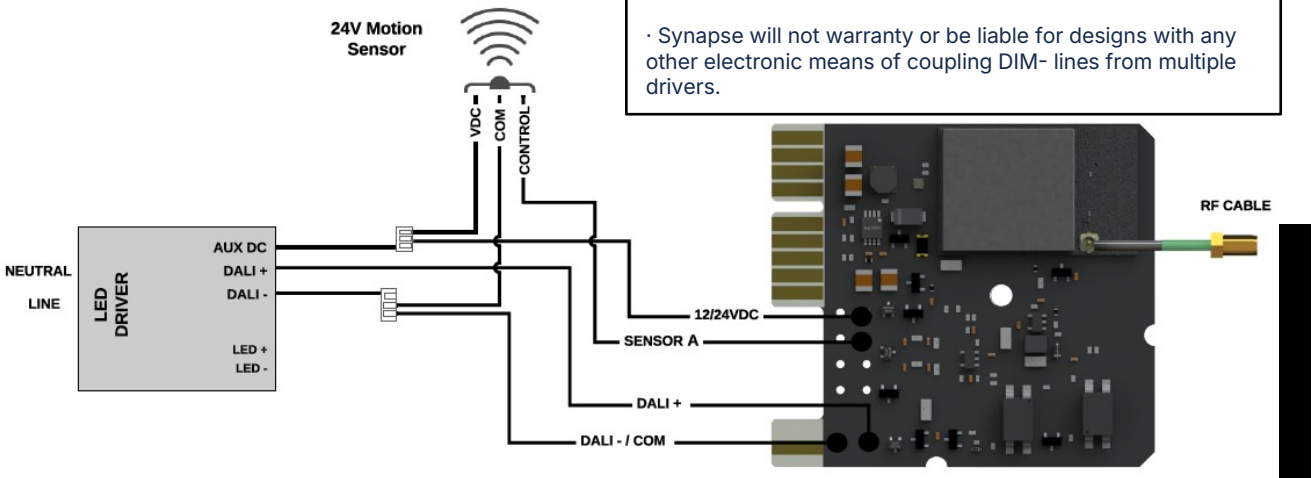


Figure 3 – D4i Wiring Diagram

REGULATORY INFORMATION AND CERTIFICATIONS

RF Exposure Statement: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada (IC) certifications: This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.
Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicable aux appareils numeriques de la class B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

FCC certifications and regulatory information (USA only)
FCC Part 15 Class B: This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) These devices may not cause harmful interference, and (2) These devices must accept any interference received, including interference that may cause harmful operation.

RADIO FREQUENCY INTERFERENCE (RFI) (FCC 15.105):
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 or more of the following measures:
(1) Re-orient or relocate the receiving antenna; (2) Increase the separation between the equipment and the receiver; (3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected; (4) Consult the dealer or an experienced radio/TV technician for help.

Declaration of Conformity (FCC 96-208 & 95-19):
Synapse Wireless, Inc. declares that the product name "DIM10-087-06" to which this declaration relates, meet the requirements specified by the Federal Communications Commission as detailed in the following specifications:
• Part 15, Subpart B, for Class B equipment
• FCC 96-208 as it applies to Class B personal computers and peripherals
• This product has been tested at an External Test Laboratory certified per FCC rules and has been found to meet the FCC, Part 15, Emission Limits. Documentation is on file and available from Synapse Wireless, Inc.
If the FCC ID for the module inside this product enclosure is not visible when installed inside another device, then the outside of the device into which this product is installed must also display a label referring to the enclosed module FCC ID. Modifications (FCC 15.21): Changes or modifications to this equipment not expressly approved by Synapse Wireless, Inc., may
void the user's authority to operate this equipment.

CERTIFICATIONS
Model : DIM10-087-06
Contains FCC ID : U9O-SM220
Contains IC : 7084A-SM220
UL File No : E346690
DALI-2 Certified Application Controller
CE
UKCA

NCC 警語(台灣)
安裝該模組之主體裝置或設備上須標示：
『內含發射器模組：**CCAM23Y10101T0**』
取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

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