

DIM10-087-00 Lighting Controller

Load Ratings: 1.2W @ 5 to 24V DC

Operating Temperature: -40 to +85 C / 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!**

WARNING AND CAUTIONS:

- If you are unsure about any part of these instructions, consult an electrician; all work should be performed by qualified personnel
- Disconnect power at circuit breaker or fuse when servicing, installing or removing fixture or changing lamps.

INSTALLATION GUIDE

SPECIFICATIONS

- Dim Control Max Load: 10 mA Source/Sink
- Radio Frequency: 2.4 GHz (IEEE 802.15.4)
- RF Transmission Output Power: +15dBm
- Operating Temperature: -40 to +85 C
- Operating Humidity: 10 to 90%, non-condensing
- Dimensions: 2"L x 1.6"W X .3"H
(51 X 40.7 X 6.4 mm)
- Configuration/Programming: Stored in non-volatile memory

CAUTION

- DIM10-087-00 Series controllers must be installed in accordance with national, state, and local electrical codes and requirements

NEEDED MATERIALS

- **u.FL Insertion Tool:** Part Number U.FL-LP-IN from Hirose Electric (for DIM10-087-00 only)
- **u.FL Extraction Tool:** Part Number U.FL-LP-N-2 from Hirose Electric (for DIM10-087-00 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 DIM10-087-00 through the fixture housing to an external antenna. Synapse has kits available for these cables as part numbers:
 - KIT-ANTUFL18-01
 - KIT-ANTUFL18-02
 - KIT-ANTUFL18-03
 - KIT-ANTUFL18-04Contact Synapse for further information.
- **50 OHM Terminator plug RP-SMA:** Part Number 132360RP from Amphenol.

- **Wiring Connectors:** All existing wiring connectors must be replaced with new UL listed wiring connectors. All wiring connectors must be correctly sized for the application and the number and the size of the electrical conductors.
- **Mounting:** Secure with 1 #4 screw (**max diameter of .312 inches**) and standoff.
- **Mounting Options:** Mount in an LED Fixture or a Troffer. For the DIM10-087-00, an external antenna utilizing a u.FL connector must be used to provide RF connectivity to the SNAP mesh network.

INSTALLATION INSTRUCTIONS

WARNING: TO AVOID FIRE, SHOCK, OR DEATH: TURN OFF POWER AT CIRCUIT BREAKER OR FUSE AND VERIFY THAT POWER IS OFF BEFORE WIRING!

1. Place the DIM10-087-00 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 DIM10-087-00, make sure the antenna is free of any objects within 3 in. of the internal or external antenna.

Note: When installing the DIM10-087-00 into an enclosure, consideration of the internal or external antenna position and interference is required in order to provide the most optimum wireless signal strength.

2. Connect the 5-24VDC Aux output from LED driver to terminal block pin J4.1 on the DIM10-087-00. (See Figure 2 to better identify terminal block pins.)
3. Connect the Aux ground from the LED driver to terminal block pin J4.2 on the DIM10-087-00.

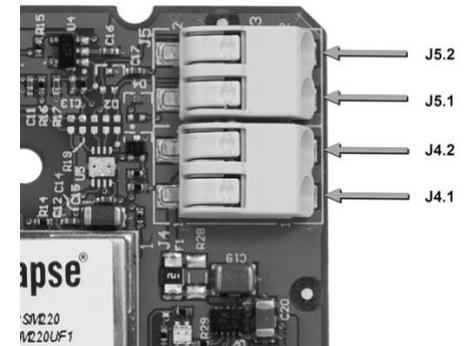


Figure 2 - Terminal Block PINS

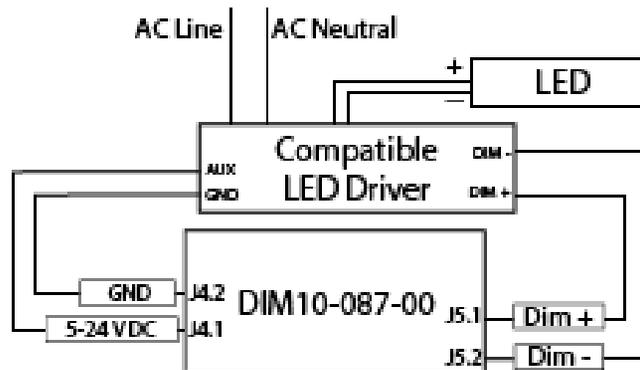


Figure 1 - Wiring Diagram

Note: Steps 4-7 are for Class 1/2 Dimming Control

4. Connect the DIM- wire on the LED driver to the DIM- input on terminal block pin J5.2 on the DIM10-087-00.
5. Connect the DIM+ wire on the LED driver to the DIM+ input on terminal block pin J5.1 on the DIM10-087-00.

- Switch power on to the fixture. The light should turn on. **Note: When switched on, lamps should turn on to full brightness; approximately 10 VDC signal on the DIM+ wire using the DIM- wire as reference.**
- Refer to the SimplySNAP User's Manual for information on provisioning the DIM10-087-00.

CONNECTING THE u.FL CABLE

An u.FL antenna may be connected to the DIM10-087-00 in order to get maximum RF connectivity. The recommended antenna kits are:

- KIT-ANTUFL18-01
- KIT-ANTUFL18-02
- KIT-ANTUFL18-03
- KIT-ANTUFL18-04

Please see the DIM10-087-00 Series cut sheet or contact Synapse sales for more information.

To install the antenna:

- Make sure the power is off.
- Attach the 50 OHM Terminator to the RP-SMA bulkhead hand tight before attaching the u.FL cable (Figure 3) to the u.FL Terminal (Figure 2). Keep the 50 OHM Terminator on the cable until mounting the bulkhead in the fixture or attaching an antenna for testing.
- Use the insertion tool, PN U.FL-LP-IN to mate the connectors. The mating axes 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.
- Route the antenna cable such that there is no upward tension between the cable and the u.FL connector.
- 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.

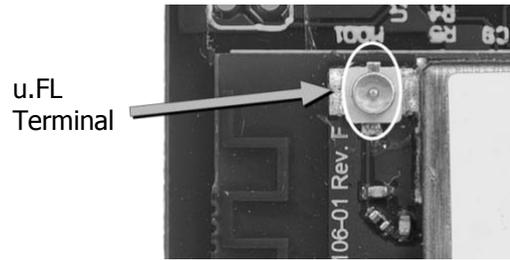


Figure 3- u.FL Terminal

ATTACHING THE BULKHEAD

Keep the 50 OHM Terminator on the bulkhead at all times until the antenna replaces the 50 OHM Terminator. When installing the bulkhead, the technician must be grounded with a proper ground strap. After installing the bulkhead in the fixture, replace the 50 OHM Terminator.

ATTACHING THE ANTENNA

When it is time to attach the antenna, touch a grounded surface, remove the 50 OHM Terminator and 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.

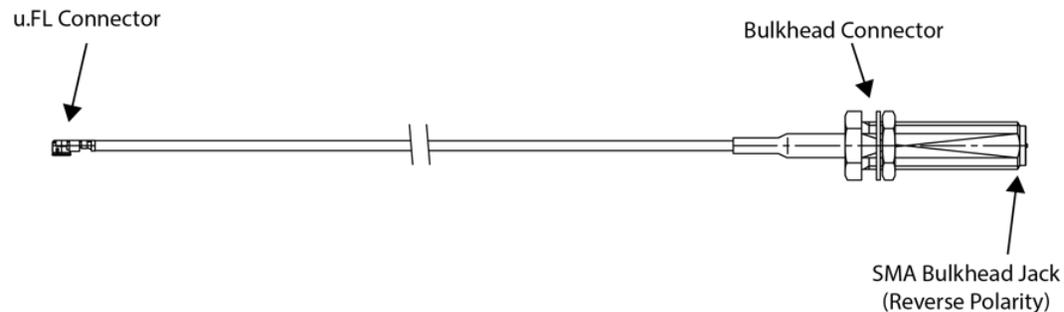


Figure 4- u.FL Connector

DIMMING

Below are some recommendations for successful dimming using the DIM10-087-00. The dimming control wires are referenced as Dim+ and Dim-. 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
- Number of fixtures that can be daisy-chained is dependent upon the following factors: dimming current, current requirements for LED driver, length of wire, quality of connection, and gauge of wire
- Verify dimming capability via a "test bed" with the number of actual fixtures, wire length, connectors, and wire gauge

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 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 présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère 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 "DIM10-087-00" and "DIM10-087-00-F" 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	: DIM10-087-00
Contains FCC ID	: U90-SM220
Contains IC	: 7084A-SM220
UL File No	: E346690

Contact Synapse for Support- (877) 982-7888