DIM10-283-20 Lighting Controller
0-10V DIMMING CONTROL, 2 ANALOG INPUTS

Operating Temperature: -25 to +60 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 WIRING!
- **Risk of Electric Shock -** More than one disconnect switch may be required to de-energize the equipment before servicing.
- To be installed and/or used in accordance with appropriate electrical codes and regulations.
- If you are unsure about any part of these instructions, consult an electrician.
- Use this device with copper or copper clad wire only.
- Switched output is energized by default at power up

WARNINGS AND CAUTIONS:

- Disconnect power at circuit breaker or fuse when servicing, installing or removing fixture or changing lamps.
- **Mounting:** It is critical to the performance of this device that the antenna be oriented vertically. It must point straight up or down for proper operation.
- **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.
- Metal conduit connector must be grounded.

INSTALLATION GUIDE

DESCRIPTION

The **DIM10-283-20** is a California Title 24 compliant lighting controller that provides real-time light monitoring and control with power monitoring. It includes two 24V sensor inputs to connect sensors into the SimplySNAP wireless lighting solution. The DIM10-283-20 is adaptable for use in either 277V systems or 480V systems (with external step-down transformer).

FEATURES

- Power Monitoring
- Two sensor interfaces for direct connect to 24V Occupancy Sensors and Photocells
- Self-healing SNAP® Mesh Networking
- Supports a wide range of LED drivers and fixtures
- Adaptable to 480V control with external step-down transformer

SPECIFICATIONS

Dim Control	: 0-10V; 30mA Sink Max
Radio Frequency	: 2.4 GHz (IEEE 802.15.4)
RF Transmission Output Power	: +20dBM
Operating Temperature	: -25 to +60 C
Operating Humidity	: 10 to 90%, non-condensing
Configuration/Programming	: Stored in non-volatile memory
Dimensions	: 5.3L x 2.0W X 0.85H in (135 X 51 X 22 mm)

INSTALLATION INSTRUCTIONS

CAUTION

- DIM10-283-20 controllers must be installed in accordance with national, state, and local electrical codes and requirements
- All work must be performed by qualified personnel
- Disconnect all power before installation or service
- The relay driver output is energized by default at power up

NEEDED MATERIALS

Wiring Connectors: All existing wiring connectors must be replaced with new UL listed wiring connectors. All wiring connectors must be sized for the application and the size of the electrical conductors.

u.FL Insertion Tool: Part Number U.FL-LP-IN from Hirose Electric

u.FL Extraction Tool: Part Number U.FL-LP-N-2 from Hirose Electric

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 DIM10-283-20 through the fixture housing to an external antenna. Synapse has kits available for these cables as part numbers GLP-KIT-ANTUFL18-01 and GLP-KIT-ANTUFL18-02. Contact Synapse for further information.

50 OHM Terminator plug RP-SMA: Part Number 132360RP from Amphenol.

CONNECTING THE U.FL CABLE

Make sure the power is off. Attach the 50 OHM Terminator to the RP-SMA bulkhead hand tight before attaching the U.FL cable to the U.FL button. 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 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 connectors, insert the end portion of Extraction Tool, U.FL-LP-N-2, under the connector flanges and pull off vertically, in the direction of the connector mating axis.

ATTACHING THE BULKHEAD

Keep the 50 OHM Terminator on the bulklhead 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.

MOUNTING

It is critical to the performance of this device that the antenna be oriented vertically. It must point straight up or down for proper operation.

For standard installation, place the light controller in the desired location inside the fixture and secure it using (4) #4 machine screws. Make sure the head of the screw does not extend outside the silk-screened circular pattern on the printed circuit board at each hole location. A nylon standoff at least 1/4” in length should be used between the board and the mounting surface to prevent shorts. Prior to permanently mounting it, verify the antenna can be mounted external to the fixture and allows adequate room for connecting the coax cable from the DIM10-283-20 to the antenna. Also make sure the antenna can be oriented vertically and is free from blockage by any surrounding metal. (see Figure 1).

FOR 100 TO 277VAC INSTALLATION (FIG. 2)

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

1. Connect the electrical service black wire (hot) to the black LINE input and the brown LINE_A input on the DIM10-283-20.
2. Connect the electrical service white wire (neutral) to the white NEUTRAL input and the orange LINE_B input on the DIM10-283-20.
3. Connect the yellow LOAD_A line to one terminal of the AC side of the relay. Connect Connect the yellow LOAD_A line to one terminal of the AC side of the relay. Connect the other terminal of the AC side of the relay to the line input of the LED driver.
4. Connect the orange LOAD_B wire to the neutral input on the LED driver.
5. Connect the white RLY- wire to the negative terminal of the control coil on the external relay.
6. Connect the brown RLY+ wire to the positive terminal of the control coil on the external relay.

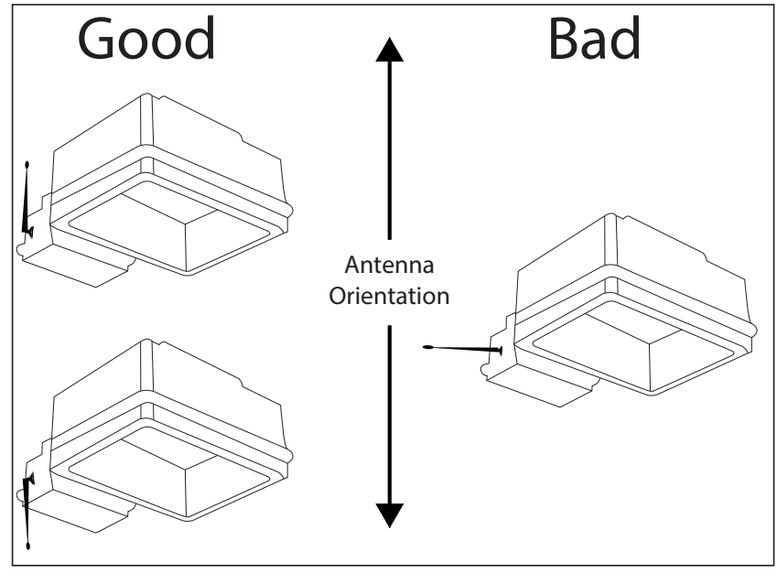

Figure 1 - Proper Antenna Installation

Note: Steps 7-9 are for Dimming Control

7. Connect the gray DIM- wire from the DIM10-283-20 to the DIM- input on the LED driver.
8. Connect the violet DIM+ wire from the DIM10-283-20 to the DIM+ input on the LED driver.
9. Switch power on to the fixture. The light should turn on.

Note: When power is applied before the DIM10-283-20 is added to the SimplySNAP system, lamps should turn on to full brightness. Approximately 10VDC should be present on the DIM+ wire using the DIM- wire as a reference when the lights are at full brightness.

Note: Steps 10-13 are for attaching sensors. An external 24V power supply is required to power any optional sensors.

10. Connect the DIM10-283-20 blue SNSA wire to the first sensor output and the orange SNSB wire to the second sensor output (if applicable).
11. Connect the DIM10-283-20 black SNSR wire to the Common (ground) connection on the external power supply and the sensor(s).
12. Connect the external power supply +24VDC power output to the power input on each sensor.
13. Connect the AC powered side of the external power supply by following the instructions provided by the external power supply manufacturer.

FOR 480VAC INSTALLATION (FIG. 3)

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

1. When using the DIM10-283-20 for 480VAC operation, a 2:1 step-down transformer must be used to convert 480VAC to 240VAC for powering the DIM10-283-20.
2. Connect one phase of the 480VAC electrical service to one input on the primary side of the step-down transformer..
3. Connect the other phase of the 480VAC electrical service to the other input on primary side of the step-down transformer.
4. Connect one output from the secondary side of the step-down transformer to the black LINE input on the DIM10-283-20.
5. Connect the other output from the secondary side of the step-down transformer to the white NEUTRAL input on the DIM10-283-20.
6. Connect the first phase of the 480VAC electrical service to the brown LINE_A input on the DIM10-283-20.
7. Connect the second phase of the 480VAC electrical service to the orange LINE_B input on the DIM10-283-20.
8. Connect the yellow LOAD_A output from the DIM10-283-20 to one pole of a dual-pole external relay.
9. Connect the other side of the pole of the external relay to the AC_LINE input on the 480VAC LED driver.
10. Connect the orange LOAD_B output from the DIM10-283-20 to the other pole of a dual-pole external relay.
11. Connect the other side of the pole of the external relay to the AC_NEUTRAL input on the 480VAC LED driver.
12. Connect the brown RLY+ wire to the positive terminal of the control coil on the external relay.
13. Connect the white RLY- wire to the negative terminal of the control coil on the external relay.

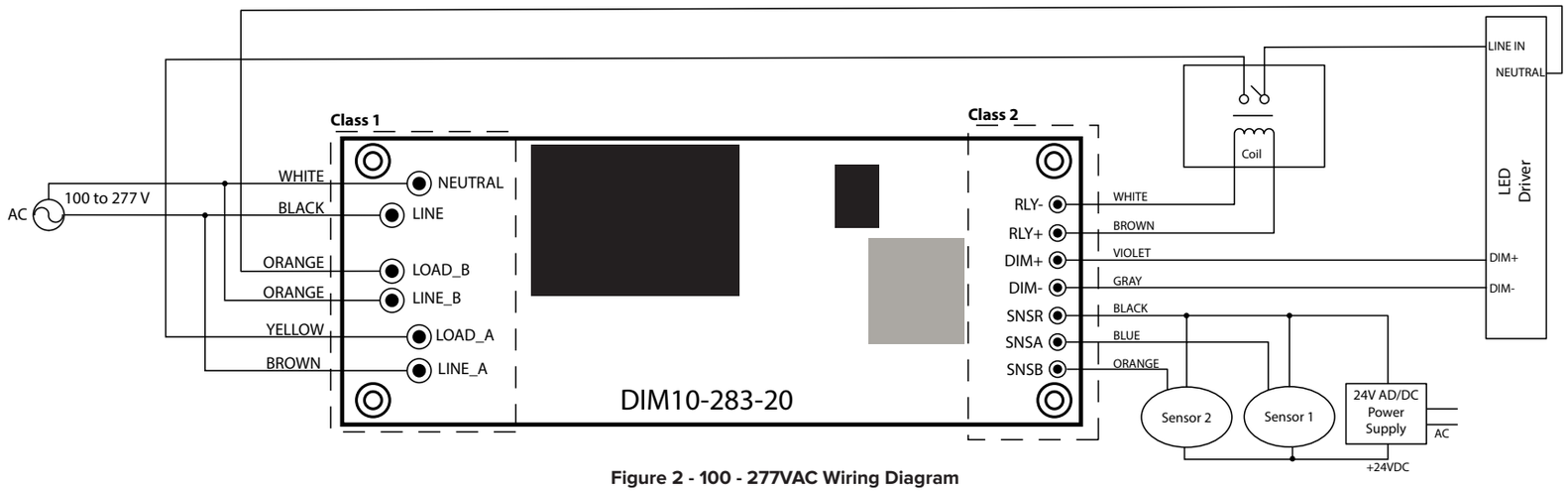

Figure 2 - 100 - 277VAC Wiring Diagram

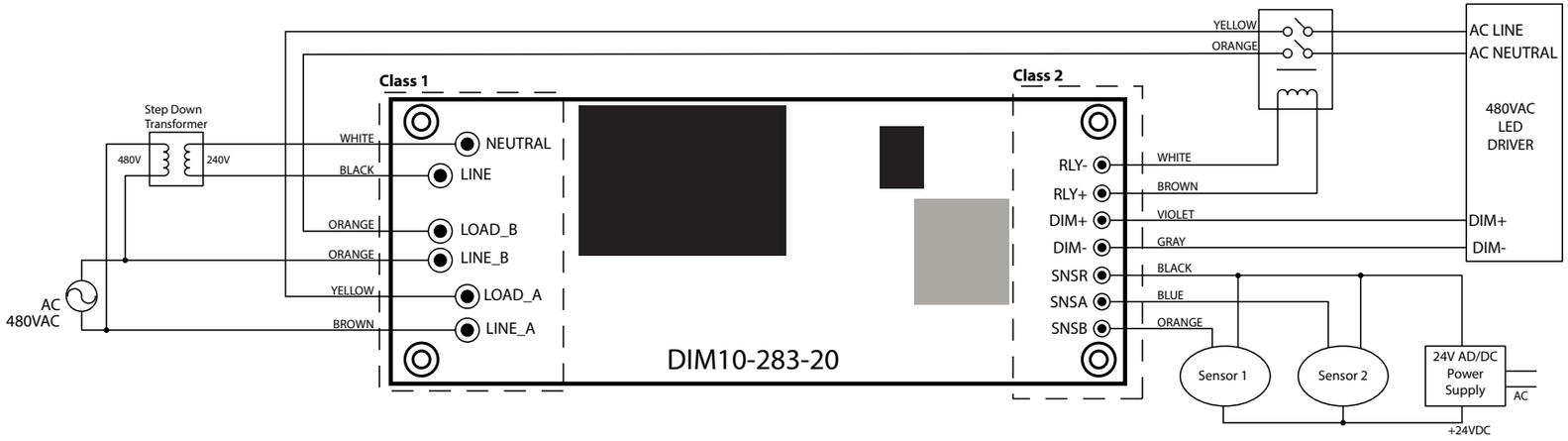

Figure 3 - 480VAC Wiring Diagram

Note: Steps 14-16 are for Dimming Control

14. Connect the gray DIM- wire from the DIM10-283-20 to the DIM- input on the LED driver.
15. Connect the violet DIM+ wire from the DIM10-283-20 to the DIM+ input on the LED driver.
16. Switch power on to the fixture. The light should turn on.

Note: When power is applied before the DIM10-283-20 is added to the SimplySNAP system, lamps should turn on to full brightness. Approximately 10VDC should be present on the DIM+ wire using the DIM- wire as a reference when the lights are at full brightness.

Note: Steps 17-20 are for attaching sensors. An external 24V power supply is required to power any optional sensors.

17. Connect the DIM10-283-20 blue SNSA wire to the first sensor output and the orange SNSB wire to the second sensor output (if applicable).
18. Connect the DIM10-283-20 black SNSR wire to the Common (ground) connection on the external power supply and the sensor(s).
19. Connect the external power supply +24VDC power output to the power input on each sensor.
20. Connect the AC powered side of the external power supply by following the instructions provided by the external power supply manufacturer.

CERTIFICATIONS

Model : 200365-01
Contains FCC ID : U9O-SM220
Contains IC : 7084A-SM220
UL File No : E346690

REGULATORY INFORMATION

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 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 "DIM10-283-20" 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.