Appendix 6.

User manual

SPEAKS Z-WAVE®

FDN Series INSTALLATION GUIDE

With nanogrid™ FDN series light switches, you can create custom, ambient lighting throughout any home or building while conserving energy and cutting costs.

FDN series switches offer a range of intuitive features to help users make their homes more energy efficient. Utilizing Z-Wave technology, the standard in home control, your switches are easily incorporated into a total home control or energy management solution.

nanogrid

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WARNING, CAUTIONS & NOTES

WARNING! To avoid fire, shock, or death, turn off power at circuit breaker or fuse and ensure that power is off before beginning installation.

CAUTION! Electrical Safety
This unit is equipped with three wire power cords. Under no circumstances should the ground wire be disconnected.
To prevent possibility of hazard do not expose the unit to moisture.

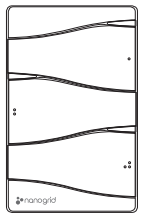
NOTES! Observe the following points.
This product is to be installed in accordance with any and all applicable electrical codes and regulations.
If any part of this installation guide is unclear to you, consult a qualified electrician.

NOTES! This product requires a NEUTRAL CONNECTION.

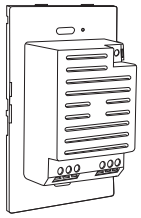
NOTES! This product is for residential/office use only.

What's in the box

*In order to provide our customers with the highest quality product, the contents are subject to change with or without prior notice.



1 Face Plate



1 Main unit

1 User manual

3 Screws

Introduction

Frostdale's FDN Series (1000, 21XX, 22XX, 23XX, 24XX) wireless, wall-mounted light switches offer truly outstanding features and functionality, enabling users to control, monitor, and reduce energy consumption.

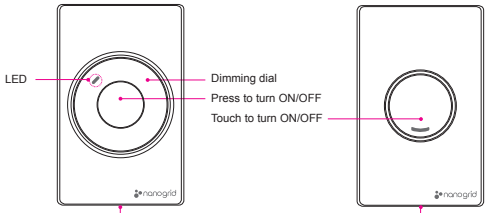
With select Z-Wave Alliance certified controllers, the switches are easily accessed via custom applications for the World Wide Web and smartphones such as the iPhone, ensuring complete control over each unit as well as the ability to view detailed usage logs.

All FDN Series switches are designed to provide complete home automation with seamless short range wireless connectivity. With nanogrid™ products homeowners can create fully functional home networks that are affordable, easy to install, and easier still to use.

The maximum supported load for these switches is 600W with 110~240AC, 50~60Hz, suitable for high voltage fixtures including LED, halogen, fluorescent*, normal incandescent and dimmable CFLs.

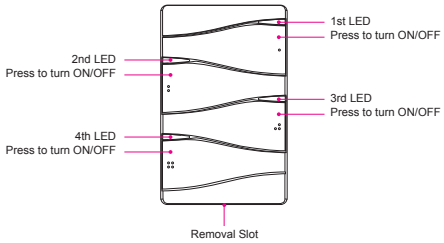
NOTES! FDN1000 DIMMER IS NOT compatible with fluorescent lighting

Operation



FDN1000 Face Plate

FDN21XX Face Plate



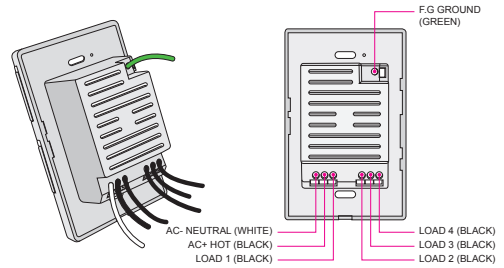
FDN24XX Face Plate

Models & Dimension

FDN1000 Wireless Dimmer Switch
FDN21XX Wireless Light Switch.1-way
FDN22XX Wireless Light Switch.2-way
FDN23XX Wireless Light Switch.3-way
FDN24XX Wireless Light Switch.4-way

Model No.	Description	Face plate Dimension (mm)	Back case Dimension (mm)
FDN1000	Wireless Dimmer Light Switch	72.6 (W) x 114.5 (H) x 14.3 (D)	50.6 (W) x 71.7 (H) x 31.5 (D)
FDN21XX	Wireless Light Switch 1-way	72.6 (W) x 114.5 (H) x 10.8 (D)	50.6 (W) x 71.7 (H) x 31.5 (D)
FDN22XX	Wireless Light Switch 2-way	72.6 (W) x 114.5 (H) x 10.8 (D)	50.6 (W) x 71.7 (H) x 31.5 (D)
FDN23XX	Wireless Light Switch 3-way	72.6 (W) x 114.5 (H) x 10.8 (D)	50.6 (W) x 71.7 (H) x 31.5 (D)
FDN24XX	Wireless Light Switch 4-way	72.6 (W) x 114.5 (H) x 10.8 (D)	50.6 (W) x 71.7 (H) x 31.5 (D)

Wiring Configuration



Before you start

The range and performance of each unit are highly dependent on the following. Before installation, it is strongly recommended that you plan each device's location with these criteria in mind.

(1) Distance between units: Up to 30 meters line of sight
(2) Layout of the house: Walls and obstacles separating the units
(3) Electrical equipment located near the units

Before starting any installation, please also be advised of the following safety precautions.

(1) Improper use or installation can cause serious injury, death, or loss/damage to property.
(2) Install in accordance with all federal, state, and local electrical codes.
(3) This unit generates heat. It must be operated within specified operating temperature limits.
(4) If you are not sure which wires are hot, neutral, load, or ground, have a trained electrician perform the installation.

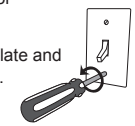
Installation Procedures

WARNING! When installing this product, please take all necessary precautions for electrical safety. Electrical accidents can have a profound impact on life and property. If in doubt, enlist the help of a trained professional.

1 Turn off local electrical power by either switching off the circuit breaker or removing the fuse from the fuse box.

2 If you need to remove an existing dimmer or switch from the wall:

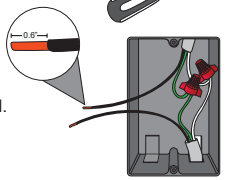
A. Use a screwdriver to remove the wall plate and existing dimmer or switch from the wall.



WARNING! When installing this product, please take all necessary precautions for electrical safety. Electrical accidents can have a profound impact on life and property. If in doubt, enlist the help of a trained professional.

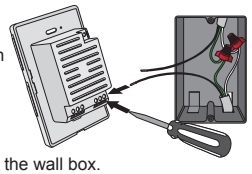
B. Detach the existing dimmer or switch, leaving the wall box wiring intact.

3 Prepare each wire. Wire insulation should be stripped back 0.6 inch from the wire end.



WARNING! When installing this product, please take all necessary precautions for electrical safety. Electrical accidents can have a profound impact on life and property. If in doubt, enlist the help of a trained professional.

4 Identify and connect the wires to the switch wire-clip terminal. Wall box wiring can differ depending upon how the box was wired by the electrician and where the power source is located – either at the light fixture or the wall box.



NOTES! When connecting wires to the back of the FDN switch case, press and hold orange-colored button with a flat-tip screw driver to open wire clip terminal, insert 0.6 inches of wire into terminal and release.

WARNING! When installing this product, please take all necessary precautions for electrical safety. Electrical accidents can have a profound impact on life and property. If in doubt, enlist the help of a trained professional.

5 Fit wires back into the wall box forming a zigzag pattern so that they easily fold into the wall box.

6 Align the switch unit to the wall box and fasten with screws. Tighten the screws until the back side of the unit is even with the wall surface.

NOTES! When inserting the face plate, align it with the switch unit and press until it clicks into place.

7  Turn power back ON at circuit breaker.

8 Test the unit to see if it is working properly.

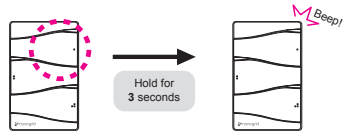
Troubleshooting

LED lights are not on after the switch is wired.

- Make sure the circuit breaker is switched on and not tripped.
- Make sure the light bulb is not burned out and is screwed in tightly.
- Check for proper installation.

How to connect your switches to Z-wave network

To join an existing Z-Wave network, press and hold the top button on your nanogrid switch for (3) seconds. Release when the beep confirms your switch has been added.



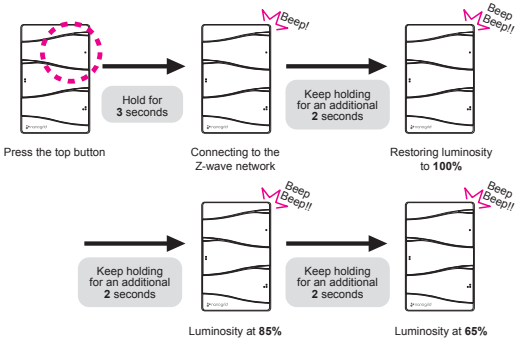
How to activate your switch's **ESM** (Energy Saving Mode)

ESM is a built-in feature that helps users instantly reduce energy consumption and cut down on monthly utility costs.

In order to activate the ESM feature, press and hold the top button on your nanogrid switch for between (5) and (7) seconds. During this time, you will hear a single beep followed by a series of two double beeps. The second double beep will indicate that luminosity is at 85%.

For maximum energy savings, press and hold the top button on your nanogrid switch for between (7) and (9) seconds. During this time, you will hear a single beep followed by a series of three double beeps. The third double beep will indicate that luminosity is at 65%.

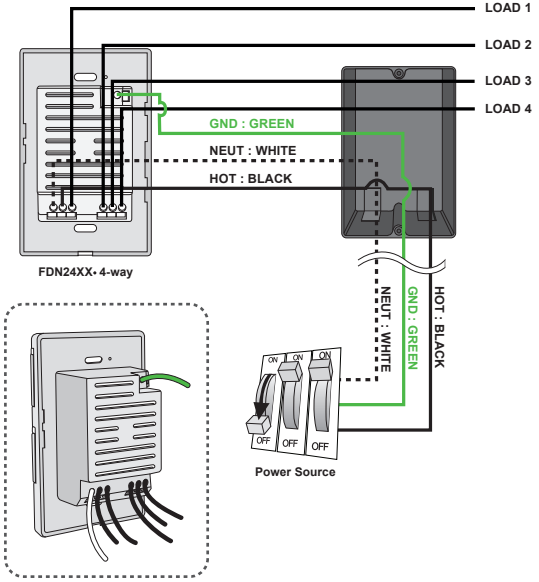
In order to deactivate the ESM feature, hold the top button on your nanogrid switch for between (3) and (5) seconds. The first double beep will indicate that ESM has been deactivated and luminosity is back to 100%.



NOTES! This feature works only with dimmable CFLs, incandescent light bulbs, and LED light bulbs. DO NOT USE this feature with fluorescent lighting.

Sample wiring configuration

	Wire clip terminal	Switch wall box
COMMON	GND	GND : GREEN
	NEUTRAL	NEUTRAL : WHITE
	HOT	HOT : BLACK
FDN1000 (Dimmer) & FDN21XX (1-way)	LOAD 1	LIGHT FIXTURE #1
FDN22XX (2-way)	LOAD 1	LIGHTING FIXTURE #1
	LOAD 2	LIGHTING FIXTURE #2
FDN23XX (3-way)	LOAD 1	LIGHTING FIXTURE #1
	LOAD 2	LIGHTING FIXTURE #2
	LOAD 3	LIGHTING FIXTURE #3
FDN24XX (4-way)	LOAD 1	LIGHTING FIXTURE #1
	LOAD 2	LIGHTING FIXTURE #2
	LOAD 3	LIGHTING FIXTURE #3
	LOAD 4	LIGHTING FIXTURE #4



WARRANTY POLICIES

The Frostdale™ wireless, wall-mounted light switch has a limited one (1) year warranty on parts from the date of purchase. During the warranty period, Frostdale™ will replace or repair any defective products or parts. If the exact product is not available, one of comparable value will be substituted at the manufacturer's discretion.

For any damages incurred, the warranty will never exceed the purchase price of the device. This warranty does not cover installation, removal, or reinstallation cost. The warranty is not valid in cases where damage was incurred due to misuse, abuse, incorrect repair, or improper wiring or installation. This warranty gives customers specific legal rights and customers might also be entitled to additional rights which vary by country.

REGULATORY COMPLIANCE

FCC ID: _____

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference that may cause undesired operation.

CE ID: _____

Registered ISO 9001:2008 / ISO 14001:2004

reddot design award winner 2011