Lighting Automation

Model: 8.1

Product Guidance
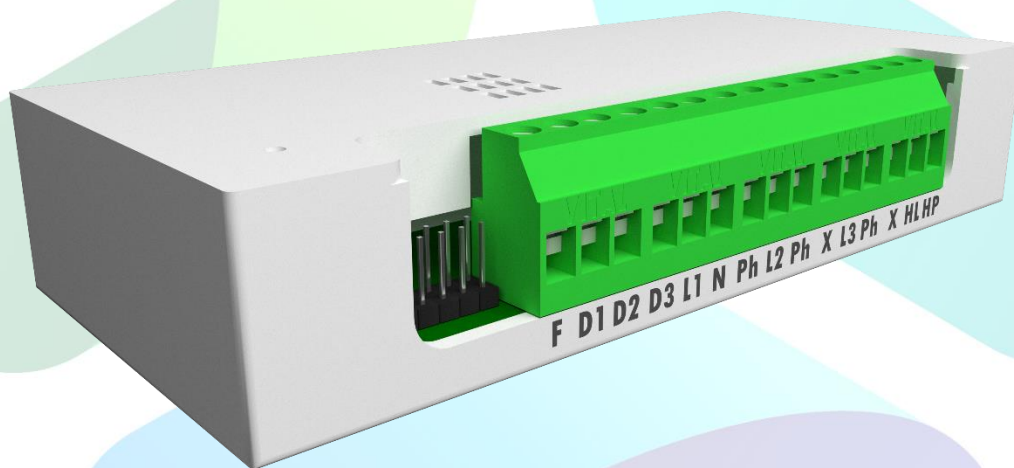
F D1 D2 D3 L1 N Ph L2 Ph X L3 Ph X HL HP

Table of Contents

1. <u>About Lighting Automation</u>

This section gives you a brief introduction to the Lighting Automation segment. Light Automation means to monitor, control and automate all the appliances which are operated using the traditional switch. Using Smart Node Lighting Automation modules, one can have access to all the lights, fans, device connected through the plug (AC, TV, phone charger and many more) from its Smart Node mobile application as well as supported third-party integrations like Alexa, Google Home and many more.

With Smart Node Lighting Automation installed, you can enjoy a multitude of features such as controlling appliances through mobile application, voice (such as Alexa, Google Home), mood-based scene settings, appliance scheduling and Geo-location based control. Smart Node has 6 different modules in Lighting segment: 8.1, 8.0, 4.1, 4.0, 2NL and 2HL.

2. Smart Node Lighting Module 8.1

Smart Node Lighting module 8.1 can automate eight different types of loads. Using LA-8.1, you can turn on/off, regulate (light intensity as well as fan speed), schedule and lock the appliances connected to it. The eight different types of load include support of one humming-free fan load, three dimmable light load, three regular load and a heavy load. The load combination in a single module is a major uniqueness of Smart Node. The combination of the load possible with 8.1 is described in the further sections.

Here, in 8.1 model:

8 indicates a total of 8 load support

1 indicates humming free fan speed regulation support

Note: *1 doesn't mean that only 1 fan can be connected with 8.1*

2.1 Mode of operations

The loads connected to LA-8.1 module can be operated by four different means at a time.

1) Traditional Switch/Smart Node Touch Interface

When traditional switches are connected with LA-8.1, then the loads connected with it can be operated with the manual switches as well as fan regulator.

When Smart Node Touch Interface is connected with LA-8.1, then the loads can be turned on/off as well as regulate (light intensity as well as fan speed) using the Touch Interface. The main advantage of installing Touch Interface is that even if loads are operated using the application then live reflection indicates on the touch interface. The Smart Node Touch Interface also adds elegant beauty to the interior of any house.

2) Smart Node application

All the loads connected to LA-8.1 can be operated using Smart Node application in Android as well as iOS phones. The application is available free of cost in the App Store as well as the Play Store. The loads can be operated from anywhere in the world provided internet is available on both sides. If the device and the phone are connected to the same Wi-Fi, then loads can be operated even without internet. Some of the features present in the Smart Node application are explained in short below:

- **Scene**

  Scenes for the lighting module can be created in Smart Node application. On a single click, multiple operations can be performed.

- **Schedule**

  We can individually set schedule to each load to turn on/off at any particular time at any particular days. We can also set the schedule in repeat mode or once mode. We can even dim the load using the schedule. A total of simultaneous 25 schedules can be set a time in one Lighting device. All schedules are executed independently of the internet.

- **Child Lock**

  We can lock the physical access of the switch in on/off mode using Smart Node application. By locking the switch, the load will not be operable by the connected mechanical switch or Smart Node Touch Switch.

- **Power State**

  We have a feature names Power state. When the feature is turned on, the state of the loads, as well as dimming, are saved on power-cut. The loads that were already on, will start as on and vice-versa.

  When the feature is turned off, the state of the loads, as well as dimming, are saved on power-cut and all the loads will start in off state.

- **Geo-Fencing**

   Using Geo-Fencing feature, automatic scenes can be executed as   per our entering or exiting a specific location.

- **Live Notification**

   A user gets instantly notified if there is any change in the appliance's state or when a schedule gets executed.

3) Voice control device

All the loads connected to LA-8.1 can be voice-controlled using voice enabling device like Amazon Alexa and Google Home. The loads can be turned on/off and regulate (light intensity as well as fan speed) using our voice.

In Android phone, if the email id used in the Play store is same as in Google Home, then one can control the load directly through Google Assistant. No need to have a Google speaker for that.

4) Third-Party Applications

Smart Node products are compatible with third-party applications like Smart Things.

3. Basic Hardware explanation

This section covers explanation about different types of load in 8.1. The front view of 8.1 is shown below:
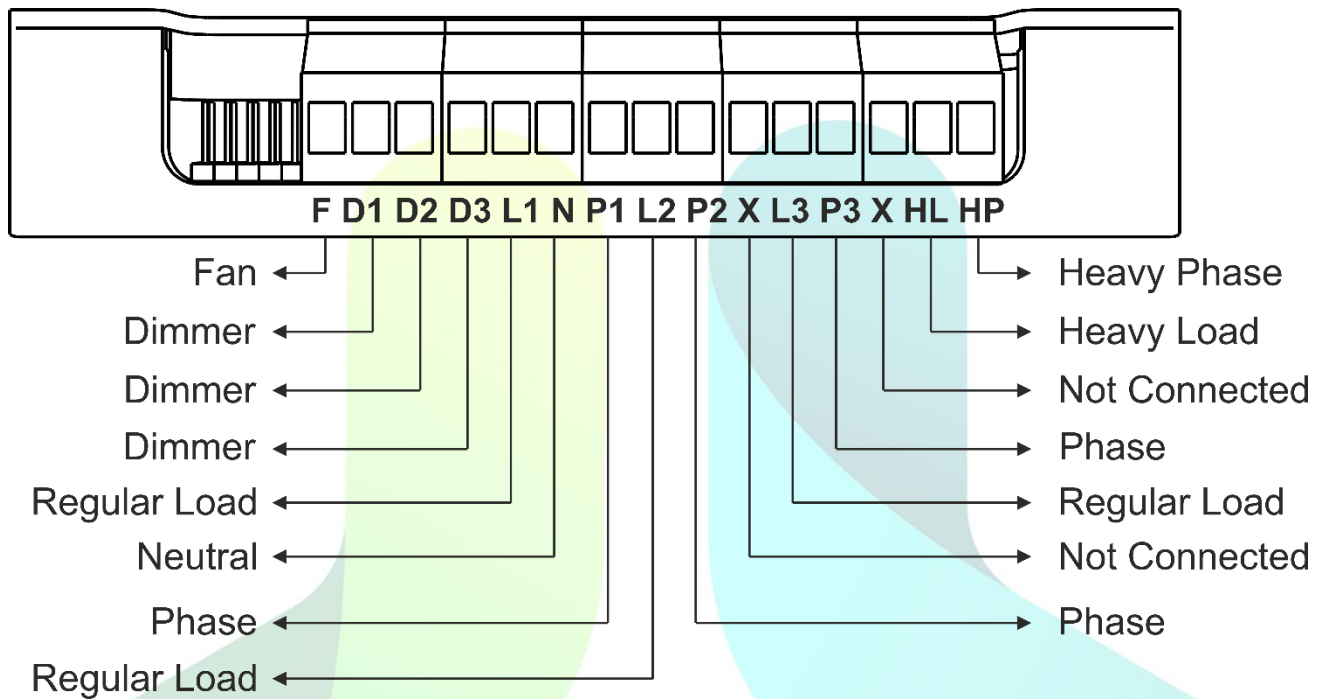
Here Ph indicates Phase (Live wire) input, N indicates Neutral input and HP indicates Heavy Phase input. The loads connected to the different output terminal are described in detail below:

> **F- Fan load**

Here, the load wire of the fan is connected. We can turn on/off the fan connected to this terminal. We can even change the speed of the fan through Smart Node when the fan load is connected to F. The regulation type being capacitive, there would be no humming sound even if we slow the fan speed through the Smart Node module. We do not suggest to connect any other load except fan to this terminal.

A fan with a maximum rating of 100 watts can be connected here.

A BLDC fax with a maximum rating of 75 watts can be connected here. A BLDC fan connected at F load cannot be speed regulated through Smart Node.

➢ **D- Dimmer Load**

Here, the preferable load connections are light or fan. Here, the total wattage of loads connected at D1, D2 and D3 should not exceed 300 watts.

• If a dimmable light or a LED with dimmable driver is connected to this terminal, we can turn on/off the light and even dim the intensity of the light using the mobile application or any third-party integration. The light dimming is done using phase-cut technology. The Light dimming is possible between 20-100% with a step of 4. A single dimmable LED or a group of dimmable LEDs with a maximum total rating of 150 watts can be connected. A manual dimmer should not be connected in series between the light and the terminal.

• If a fan is connected to this terminal, we can turn on/off the fan and even change the speed of the fan. The regulation type being phase-cut we do not guarantee humming-free fan speed change when we dim the load through the Smart Node module. The Fan regulation is possible with 5 steps. A fan with a maximum rating of 150 watts can be connected here.

• If a light with non-dimmable drivers is connected, then we can only turn on/off that particular light. A single non-dimmable LED or non-dimmable LEDs in series with a maximum total rating of 150 watts can be connected here.

• We do not recommend to connect plug here.

➢ . **L- Regular load**

Here, the possible connections of loads are light, fan, 6A plug and many others.

• If a 6A plug is connected to this terminal then the examples of appliances that can be connected via plug are TV, phone-charger, light lamp and many more. We can only turn on/off the load connected to this terminal. A single load with a maximum load capacity of 1500 watt can be connected here.

- If a light with dimmable or non-dimmable driver is connected to this terminal, we can only turn on/off that light. We cannot dim the intensity of the light through the Smart Node. If a physical dimmer is connected in series between L and the light load wire, then using the physical regular dimming is possible. A single light should not exceed 750 watts. We do not recommend to group more than 5 LED lights with this load.

- If a fan is connected to this terminal, we can only turn on/off the fan. We cannot change the fan speed through the Smart Node. If physical fan regulator is connected in series between L and the fan load wire, then changing the fan speed using that physical regular is possible. Multiple fans with a maximum rating of 1000 watts can be connected here.

➢ **HL- Heavy Load**

Here, the possible connections of loads are light, fan, 6A plug, 16 A plug and many others.

- If a 16A plug is connected to this terminal then the examples of appliances that can be connected via plug are AC, geyser, fridge, motor and many other. We can only turn on/off the load connected to this terminal. A single load with a maximum load capacity of 2500 watt can be connected here.

- If a 6A plug is connected to this terminal then the examples of appliances that can be connected via plug are TV, phone-charger, light lamp and many more. We can only turn on/off the load connected to this terminal. A single load with a maximum load capacity of 1500 watt can be connected here.

- If a light with dimmable or non-dimmable driver is connected to this terminal, we can only turn on/off that light. We cannot dim the intensity of the light through the Smart Node. If a physical dimmer is connected in series between L and the light load wire, then using the physical regular dimming is possible. A single light should not exceed 2000 watt. We do not recommend to group more than 8 LED lights with this load.

- If a fan is connected to this terminal, we can only turn on/off the fan. We cannot change the fan speed through the Smart Node. If physical fan regulator is connected in series between L and the fan load wire, then changing the fan speed using that physical regular is possible. Multiple fans with a maximum rating of 2000 watts can be connected here.

General Technical Specifications

Some general technical specifications of 8.1 module are given below

Input	100~240V 50/60Hz
Communication	Wi-Fi 2.4GHz 802.11b/g/n
Wi-Fi signal strength	-70 dBm (min)
Internet speed	512Kbps (min)
Data Consumption	<3MB/Month (100 operations/day)
Power Consumption	0.6W idle and <5W (On Full Load)
Operating Temperature	0° – 65°C Non-condense
Size (L x W x H)	128mm x 58mm x 25mm
Weight	150g

| Load-Wise Maximum Connection Capacity		
F	Resistive	100W
	Inductive	100W
	Capacitive	75W
D	Resistive	150W
	Inductive	150W
	Capacitive	150W
L	Resistive	1500W
	Inductive	1000W
	Capacitive	750W
HL	Resistive	2500W
	Inductive	2000W
	Capacitive	2000W
Examples of Resistive loads are: filament-based lamp, iron, hair dryer etc.		
Examples of Inductive loads are: blender, mixer, fan, old tube light, motor etc.		
Examples of capacitive loads are: LED lights, TV, set top box, charger, SMPS, computer etc		

4. Installation Guide

Smart Node Lighting Automation module 8.1 installation can be divided into two parts: first is the hardware connection with the actual loads and second is the configuration of the device with the Wi-Fi. We will go into deep into each section below

4.1 Hardware Installation

The LA- 8.1 box contains:

1. One 8.1 Device
2. One Switch Connector
3. A User Manual

Before going through the steps of installing the hardware, let us first have a look at the normal wiring behind a switch-board where switches are connected to the respective load to turn on or off that particular appliance.
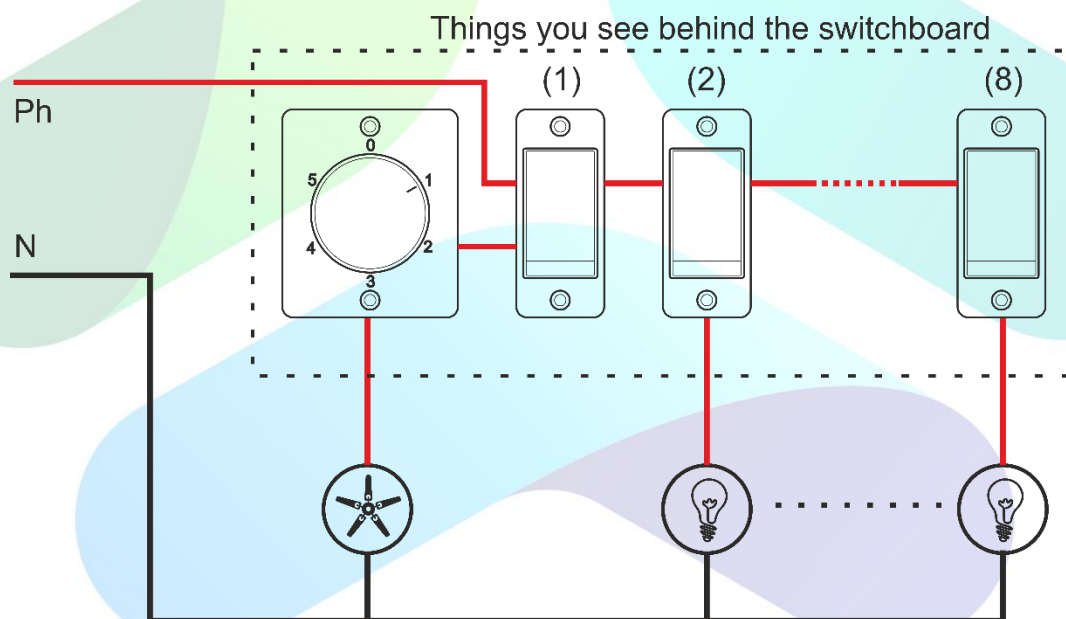
The next wiring diagram gives a basic explanation when a 8.1 device is connected behind a switchboard with 8 switches.
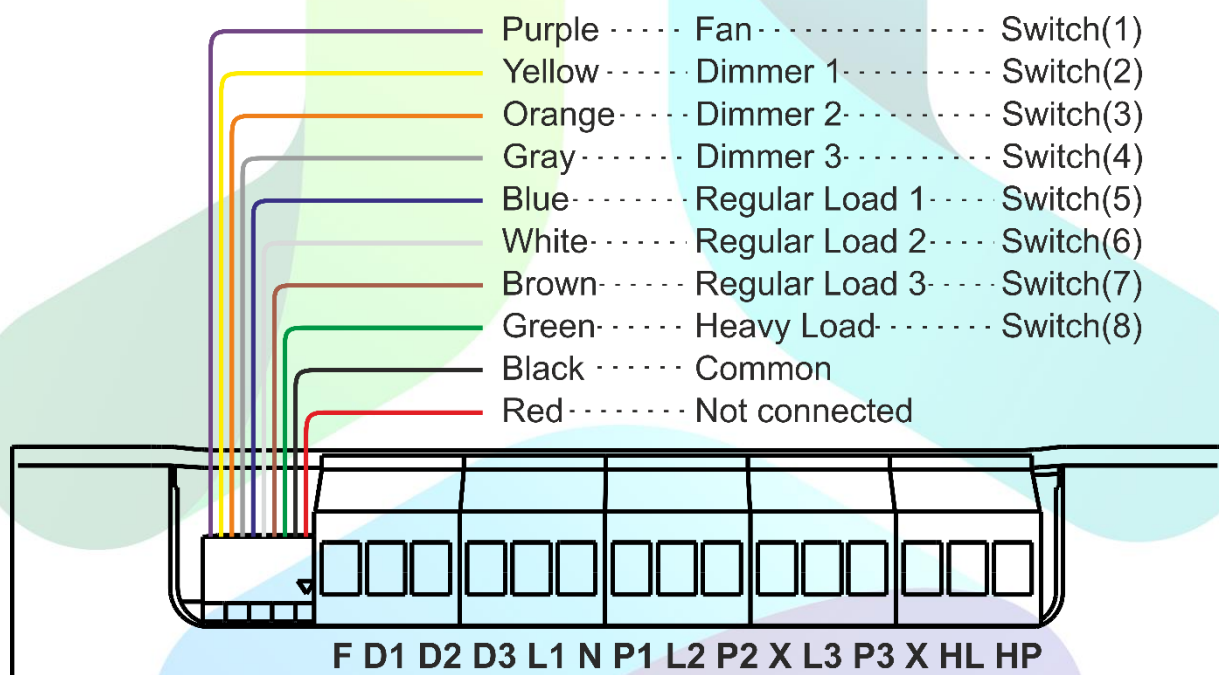
Installation Steps

1. Please turn off the power by switching off the MCB for safety purpose. Then remove the front panel of the respective switchboard and open the screws of the switch-plate
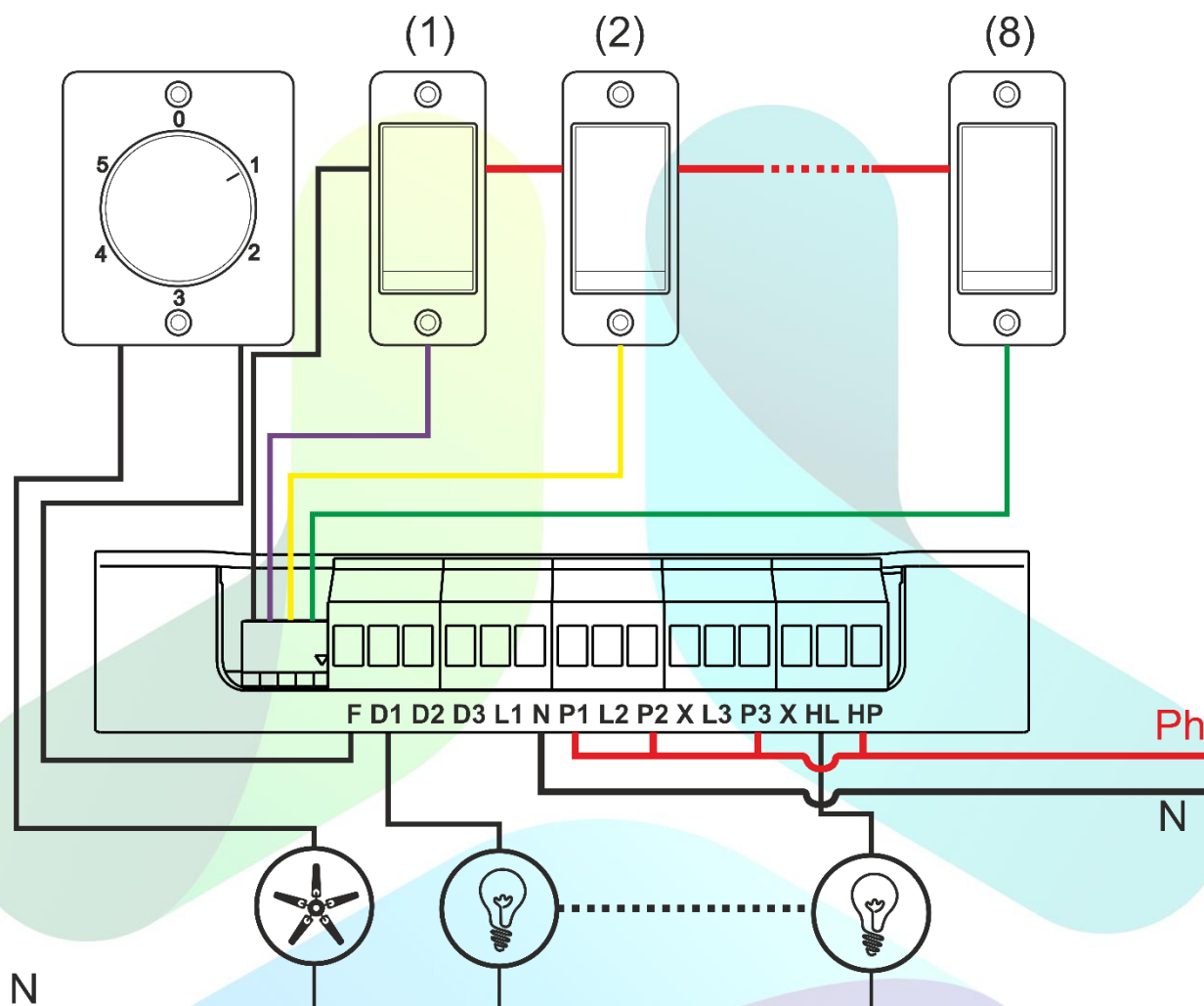
2. Identify the loads you wish to automate. Disconnect the load wires from the traditional switches and also, remove the phase (Live) wire from the switches. Now, label the load wires as per the load connected for further easy identification. The switchboard should be completely isolated from the main phase wire, neutral wire and load wires.

3. We need to connect the wire of each load (which were removed from the switches) to each node of the Smart Node module as per the load type. The detailed information about the load is explained above.

4. Insert the Heavy Phase to HP terminal, if any heavy load is connected to HL terminal or else insert regular phase wire to HP. Also, insert phase wire to two Ph terminals.
5. Insert the Neutral wire to N terminal.
6. Insert the switch connector in the male connector block on the left side of the green terminals with the small arrow indicated on the switch connector facing in the front.
7. Connect the black colour from the connector bunch to the common of the switches (where phase wire was connected previously) in the switchboard. Now, cross-check whether the phase wire is perfectly removed from the switchboard.
8. The colour code of the wires which needs to be connected to the other point of the switches which corresponds to the load as follows:

Purple · · · · ·	Fan · · · · · · · · · · · · · · ·	Switch(1)
Yellow · · · · · ·	Dimmer 1 · · · · · · · · · ·	Switch(2)
Orange · · · · ·	Dimmer 2 · · · · · · · · ·	Switch(3)
Gray · · · · · · ·	Dimmer 3 · · · · · · · · ·	Switch(4)
Blue · · · · · · · ·	Regular Load 1 · · · ·	Switch(5)
White · · · · · · ·	Regular Load 2 · · · ·	Switch(6)
Brown · · · · · ·	Regular Load 3 · · · ·	Switch(7)
Green · · · · · ·	Heavy Load · · · · · · ·	Switch(8)
Black · · · · · ·	Common	
Red · · · · · · · ·	Not connected	

F D1 D2 D3 L1 N P1 L2 P2 X L3 P3 X HL HP

Smart Node Colour Wires to Switch Connection

9. Now, insert the Switch Board back to its position and then, insert back all the screws and the outer plate.
10. Turn on the power by switching on the MCB.
11. Now, all the loads would be operable using physical switches. To operate the loads using

4.2 Wi-Fi Configuration

After successful wiring of the loads with the device, we now need to connect this hardware with the nearby Wi-Fi.

1. Press the Switch-1 On and Off at a rapid speed, you will hear 3 beeps from the device. It means the device is in *Configure* Mode.
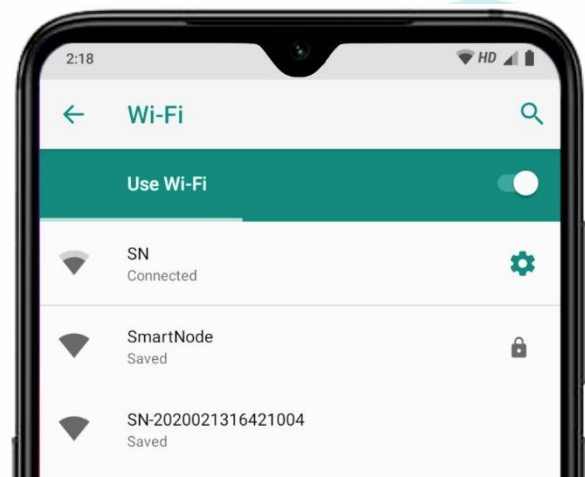

2. Now, on your mobile please go to Available Wi-Fi section. You will notice a new Wi-Fi name on the list with a name similar to "SN-XXXXXXXXXXXXX".
3. Connect to this Wi-Fi and wait for some time a webpage will open.
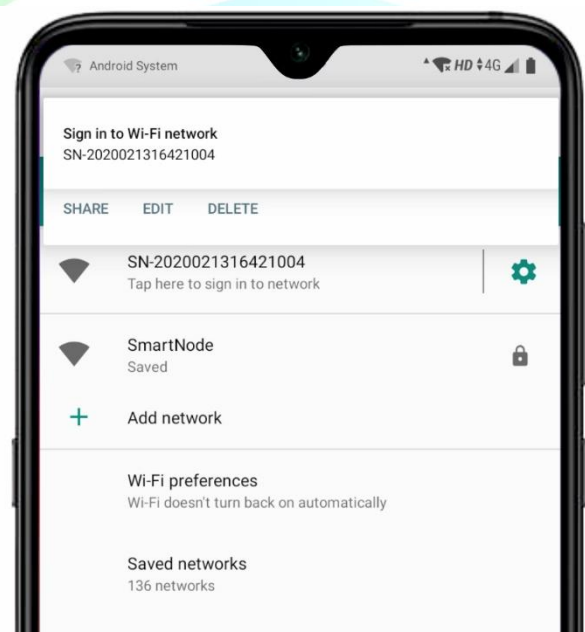

4. If the web page does not appear, then open any webpage and enter 192.168.4.1
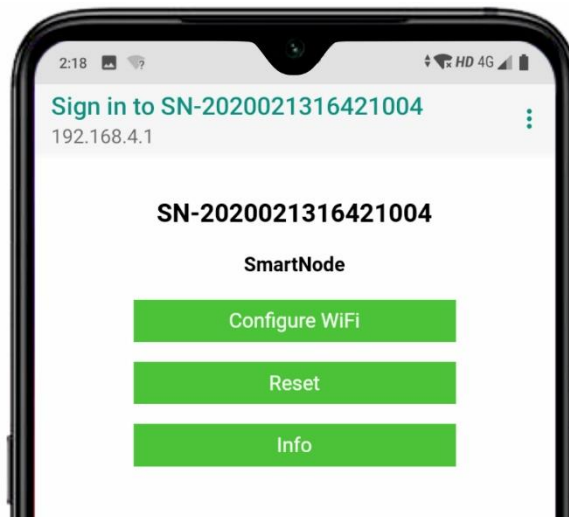
5. If you click on the "Reset" button, then the device will be back in the '*factory default*' mode and the pin of the device will set to default. All previously added device to any mobile will not work.

6. If you click on "Configure Wi-Fi" button, then you will be redirected to a page where a list of available Wi-Fi to the device will appear. For your reference, image is shown below.
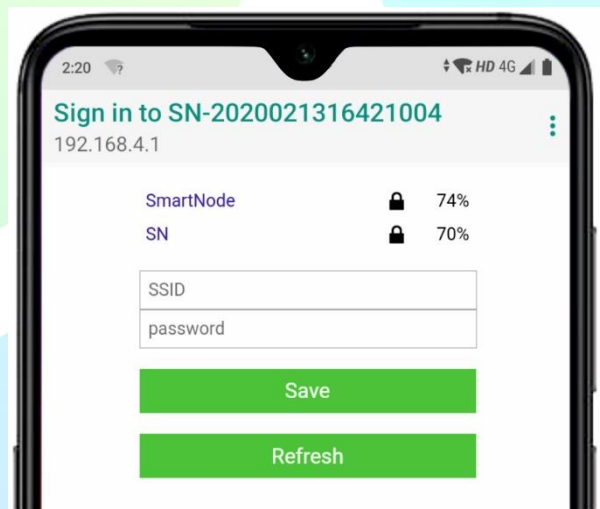
7. Select the preferable Wi-Fi of your network and then enter the password and press 'Save' button. We recommend that minimum Wi-Fi strength should be 50% for perfect operation.
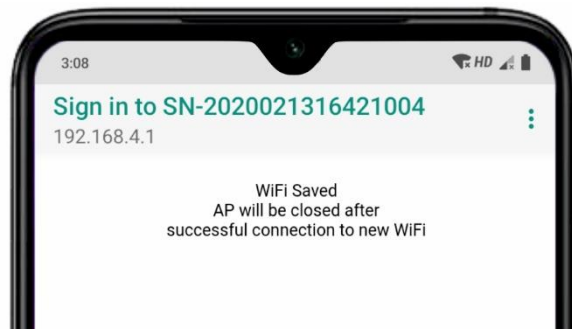
8. If the password is correct, then the device will get connected to your Wi-Fi network and the Wi-Fi created by the name of "SN-XXXXXXXXXXXXX" will disappear. If the password inserted is incorrect then the Wi-Fi "SN-XXXXXXXXXXXXX" will not get disappear and repeat the same process.

9. Install and open Smart Node application, go to 'Settings' -> 'Add New Device'. Click on 'Add Device' button. After 2 seconds, a list of devices in local will appear and the newly configured device would be there in the list with the name of its serial number.

10. Now click on this device from the list. You will be asked to enter the password of the device. Please type default password '1234' and press 'Login' button. If the password is entered correctly, then this new device will appear in the Lighting Automation section.

5. Installation – Special Cases

There are some special cases where the connection becomes a little bit complex. Some examples are:

5.1 Fan Regulator Connection

We recommend connecting a physical regulator in series between the Fan load and Smart Node respective terminal as shown in the figure below.
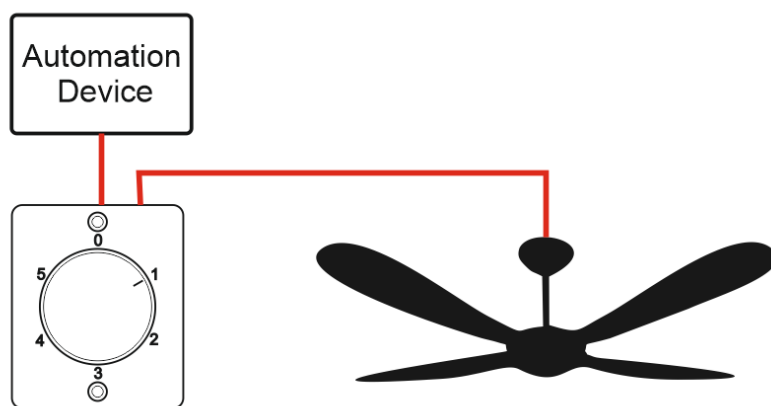
To understand the fan speed control, please refer the following chart.

Assuming a physical regulator with 5 speed control is connected in series on F, D1, D2 or D3 load as show above.

Case-1

Physical Regulator: 5
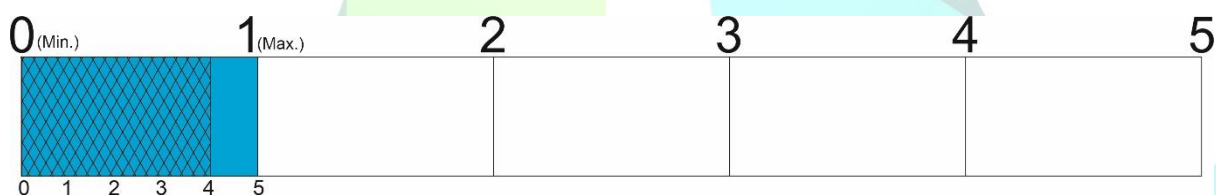
Smart Node Slider: 4

Case-2

Physical Regulator: 3

Smart Node Slider: 2

| 0(Min.) | 1 | 2 | 3(Max.) | 4 | 5 |

Case-3

Physical Regulator: 1

Smart Node Slider: 4

| 0(Min.) | 1(Max.) | 2 | 3 | 4 | 5 |

5.2 Invertor Connection

If you wish to connect the loads connected with 8.1 to work with invertor, then it is mandatory to insert the Invertor phase wire to Ph terminal (P1). By default, the loads connected to F, D1, D2, D3 and L1 will be connected with the Invertor. If we wish to connect other loads on 8.1 with invertor, we need to connect the inverter phase with the Ph terminal as follows.

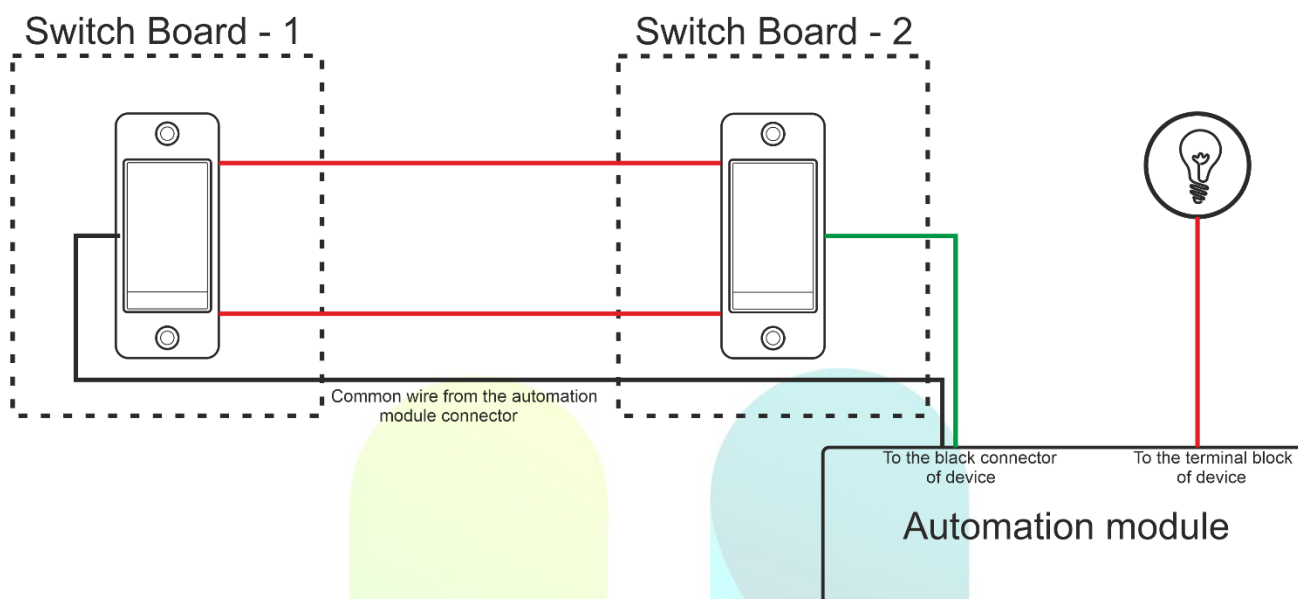| Loads	Ph Terminal
F, D1, D2, D3, L1	P1
L2	P2
L3	P3
HL	HP

5.3 Two- Way Connection

Two-way connection when using 8.1 depends whether we have connected traditional switches or Smart Node Touch Interface with the 8.1. If traditional switches are connected with 8.1, then two-way connection is possible provided an extra wire is present between the two switchboards. If Smart Node Touch Interface is connected with 8.1, then two-way connection is not possible.

When 8.1 is connected to Traditional switches, then it is possible to make a two-way connection of switches for loads connected on D1, D2, D3, L1, L2, L3 and HL terminal. It not possible to make a two-way connection for the load connected with F.

The following wiring diagram shows a basic two-way connection.
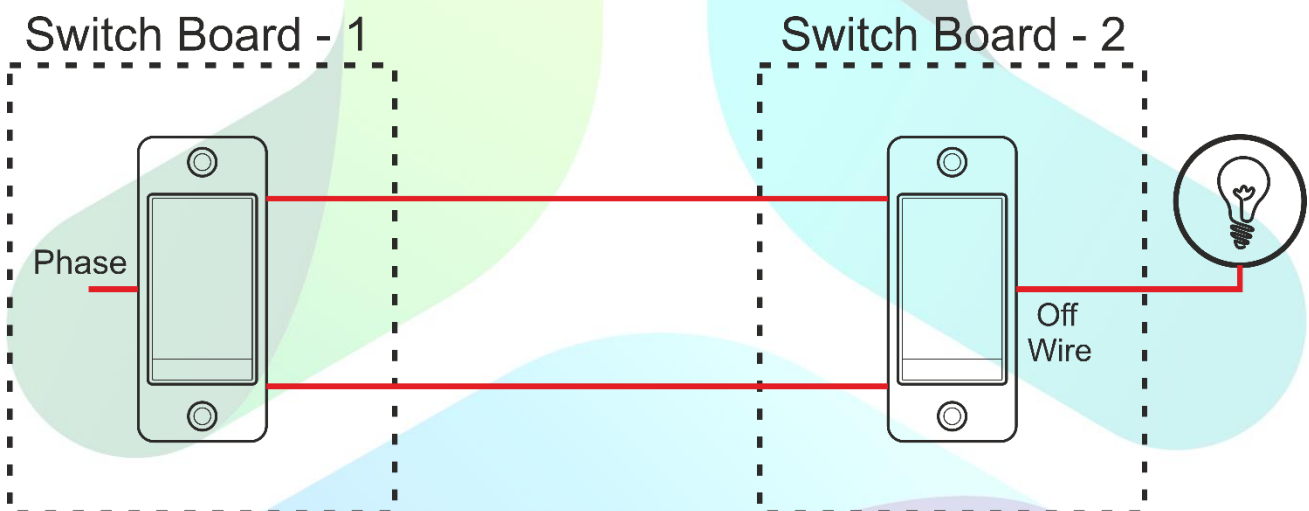
Now, if we install 8.1 with traditional switches and wish to make a two-way connection, then we need to insert an extra wire between the two switchboards. The common black wire from the connector provided should be connected as shown below. If no extra wire exists between the two switch boards, then it is not possible to make a two-way connection.

Switch Board - 1

Switch Board - 2

Common wire from the automation
module connector

To the black connector
of device

To the terminal block
of device

Automation module

6. Declaration

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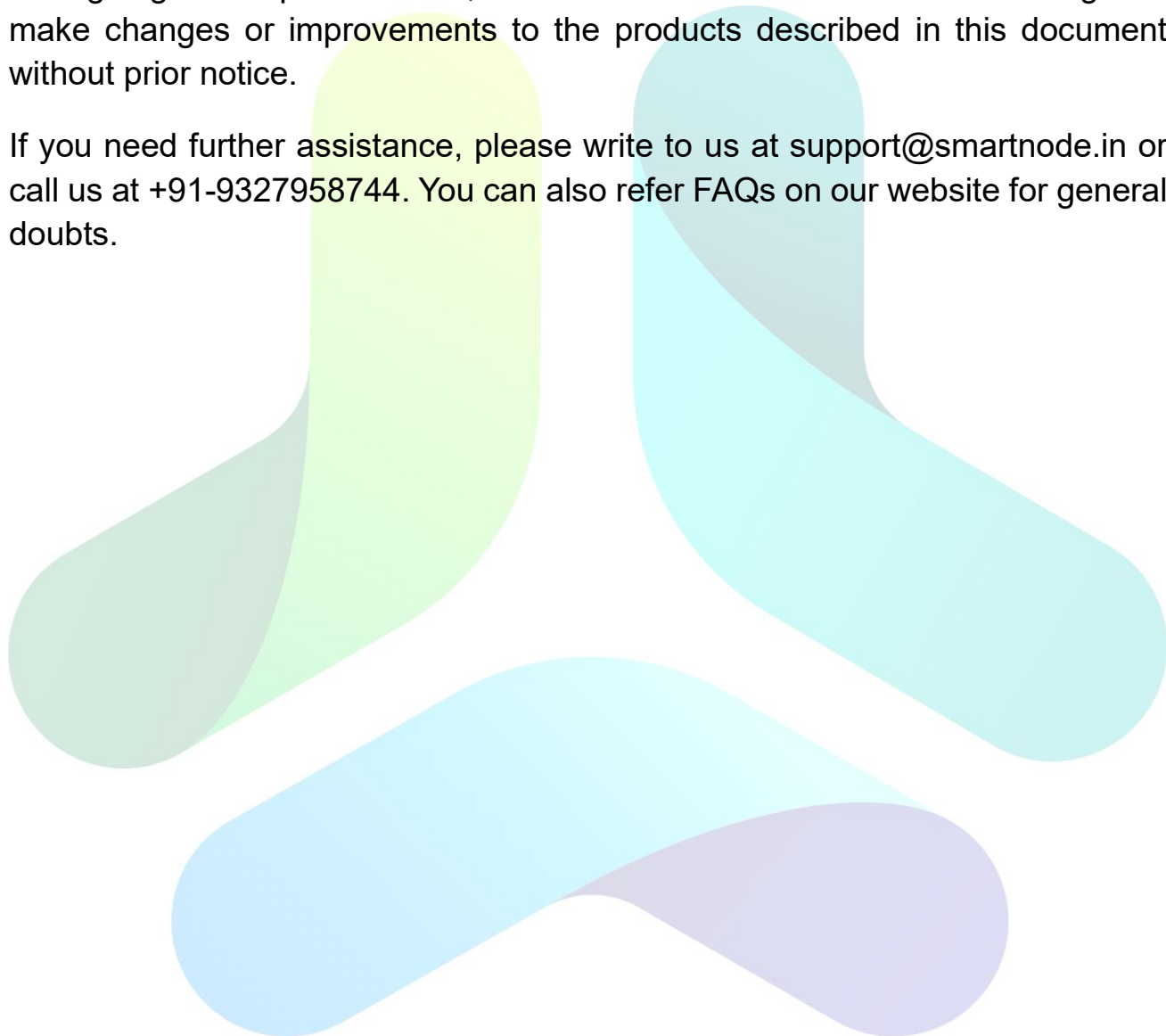
7. GUARANTEE and WARRANTY period

Smart Node offers one year of free replacement and another two years of free repairable warranty from the date of billing of the end client.

Smart Node will not be liable in any way towards damage caused to products by following:

a) The guarantee or warranty period is expired.
b) The serial number label is missing or unrecognizable.
c) The product has been modified or repaired by any unauthorised service centre or personnel during its guarantee or warranty period.
d) The defect was subject to abuse, improper use not conforming to product manual instructions, or environmental conditions more severe than those specified in the manual and specifications.
e) Damage caused by user (including but not limited to breakage of the module, wrong installation, no electrical earthing)
f) Spillages or moisture (including but not limited to exposure or contact with any liquid)
g) Neglect
h) Accidents including but not limited to improper voltage or power supply.
i) Unauthorised modifications including but not limited to the opening of the module, changing wiring;
j) Use of Smart Node products with incompatible or faulty equipment, using on higher loads;
k) The defect was subject to Force Majeure, such as acts of God, flood, lightning, earthquake, war, vandalism, theft, brownouts or sags (damage due to low voltage disturbances.

If the customer's product is not covered under guarantee or warranty, Smart Node may offer repair services at customer's own cost.