



User Manual

N2

NANO POWER

Octa Band Digital Radios
Integrated Antennas
Integrated Bluetooth

Copyright © Mavenir 2020. All rights reserved. This document is protected by international copyright law and may not be reprinted, reproduced, copied or utilized in whole or in part by any means including electronic, mechanical, or other means without the prior written consent of Mavenir.

Whilst reasonable care has been taken by Mavenir to ensure the information contained herein is reasonably accurate, Mavenir shall not, under any circumstances be liable for any loss or damage (direct or consequential) suffered by any party because of the contents of this publication or the reliance of any party thereon or any inaccuracy or omission therein. The information in this document is therefore provided on an “as is” basis without warranty and is subject to change without further notice and cannot be construed as a commitment by Mavenir.

The products mentioned in this document are identified by the names, trademarks, service marks and logos of their respective companies or organizations and may not be used in any advertising or publicity or in any other way whatsoever without the prior written consent of those companies or organizations and Mavenir.

Content

General.....	5
Warnings.....	5
Site Considerations	6
Environmental.....	6
Preparation.....	7
Unpacking and Inspection.....	7
Tools	7
Clearance	7
Installation of the A2	9
Mount the A2 in the Rack.....	9
A2 Accessories.....	9
Attach A2 Handle.....	10
Attach Sliding Rails and A2 to Rack	10
Connect Power and Ground Cable to A2.....	11
Mount the A2 on the Wall.....	12
Attach Handle to A2	12
Mount A2 to Wall	13
Connect Power and Ground Cable to A2.....	14
Installation of the N2RU.....	15
N2RU Ceiling Installation (with the suspended ceiling).....	15
N2RU Accessories	15
Assemble Bracket I&II	16
Place the Bracket.....	16
Assemble Bracket II.....	17
Buckle Up and Connect Wire	18
To Perform Maintenance on the N2RU	19
N2RU Ceiling Installation (without suspended ceiling)	20

Draw Circles for Plastic Expansion Nails	20
Assemble Mounting Bracket.....	21
Buckle Up and Connect Wire	22
To Perform Maintenance on the N2RU	23

General

The N2 system components are designed for maximum safety and reliability when they are installed, used, and maintained by trained and qualified technicians in accordance with the procedures and instructions contained in this manual. To ensure the safe operation of your system, always follow the safety and operational recommendations in this manual.

Warnings

- N2 system is not a consumer product. Please install and use N2 system in accordance with the instructions.
- Before installing or modifying any N2 system equipment, read and fully understand the entire instructions in this guide.
- Only qualified personnel are authorized to install and maintain the N2 system.
- Changes or modifications to the N2 system equipment not expressly approved by the manufacturer could void the product warranty and the user's authority to operate the equipment.
- Follow Electro Static Discharge precautions to avoid any damage to PCB, PSU, etc.
- Keep equipment powered-off during installing or modifying.
- Low path loss cables connected to antennas are highly recommended.
- This is NOT a CONSUMER device. It is designed for installation by FCC LICENSEES and QUALIFIED INSTALLERS. You MUST have an FCC LICENSE or express consent of an FCC License to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.
- This is NOT a CONSUMER device. It is designed for installation by an installer approved by an ISED licensee. You MUST have an ISED LICENCE or the express consent of an ISED licensee to operate this device.
- To comply with FCC RF exposure compliance requirements, each individual antenna used for this transmitter must be installed to provide a separation distance greater than 20cm or more from all persons during normal operation and must not be co-located with any other antenna for meeting RF exposure requirements.
- To comply with RSS-102 RF exposure compliance requirements, each individual antenna used for this transmitter must be installed to provide a separation distance greater than 20cm or more from all persons during normal operation and must not be co-located with any other antenna for meeting RF exposure requirements.
- Antenna gain should not exceed 4 dBi.

Note: 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 received, including interference that may cause undesired operation.

NOTE: 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:

-
- Reorient or relocate the receiving antenna.
 - Increase the separation between the equipment and receiver.
 - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
 - Consult the dealer or an experienced radio/TV technician for help.

Note: Only authorized person can enter the area where the antenna is installed. And the person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means. Awareness of the potential for RF exposure in a workplace or similar environment can be provided through specific training as part of a RF safety program

NOTE: This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Site Considerations

- N2 complies with FCC RF exposure limits for an uncontrolled environment.
- The system delay should be taken into consideration when there are neighboring BTS sites with overlapping in coverage.
- Pick an ideal easy-to-reach location for installation convenience.
- Verify that there is a minimum of a 50cm radius of space around N2 equipment for the convenience of maintenance and on-site inspection.
- Install Master A2 close to the service area for monitor and debugging.

Environmental

Humidity and temperature have adverse effects on the reliability of the N2 system. Therefore, it is highly recommended to install the equipment in locations with stable humidity, temperature, and ventilating.

The equipment has to operate within the following humidity level and temperature range:

Maximum humidity: 85%

Temperature range: -10 to 40°C

Preparation

Unpacking and Inspection

Unpack and inspect the packages as follows:

1. Open the shipping packages carefully for each unit from the protective packing sponge.
2. Ensure that all equipment and accessories have been delivered.
3. Ensure that all equipment and accessories have no damage. If there is any damage, contact your Sunwave service agent.

Tools

Electric drill, cross head screwdriver, side cutters, ladder, and other tools are needed for N2RU installation which is not offered from Sunwave for now. Customers to provide these tools themselves.



Philips Screwdriver
M6 and M3



Drilling Machine



Pen



Allen Wrench T5



Combination
Spanner 17mm

Clearance

The minimum spacing of N2RU to other objects like wall is 0.5m.

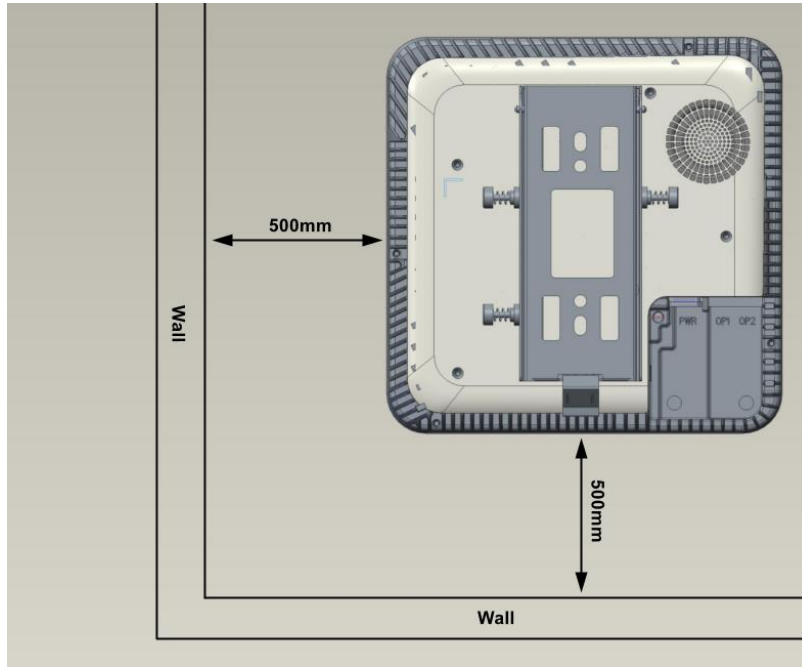


Figure 1. N2RU Spacing to Wall

The minimum spacing of 2 N2RU is 24mm.

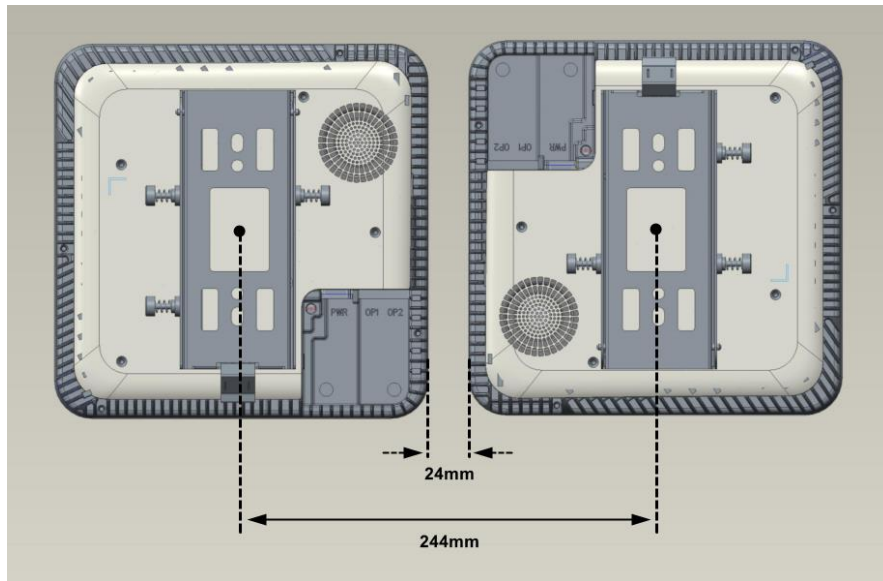


Figure 2. Minimum Spacing of 2 N2RU

Note: 2 N2RU installed in one spot are directional for case installation and cooling. (Details in Installation of the N2RU)

Installation of the A2

Mount the A2 in the Rack

A2 Accessories







	① Screw M6*16	② Screw M3*6
		
③ Suspension Loop	④ AC Power Lead 2.5m	
		
⑤ CAT-5 Cable 1.5m	⑥ Ground Wire 2m	
		

Figure 3. A2 Accessories

Note: the ground wire of A2 is 12AWG and 2 meter in Accessories package.

Attach A2 Handle

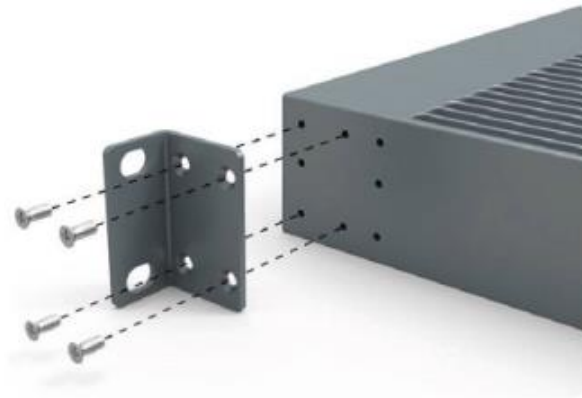


Figure 4. Attaching a 19" Mounting Bracket

1. Attach the 19" mounting brackets at the front of the A2, using 4 screws M3×16 per bracket and the Phillips screwdriver. Observe the orientation of the brackets.

Attach Sliding Rails and A2 to Rack

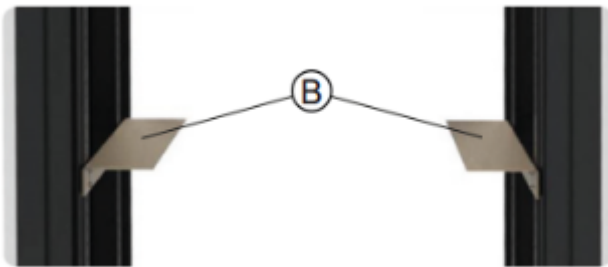


Figure 5. Attached Sliding Rails

1. Attach the sliding rails **B** to the rack.

Note: the sliding rails are not included in the delivery.



Figure 6. Place A2 in Rack

2. Place the A2 in the rack.



Figure 7. Fix A2 with Screws



Figure 8. Separation of Adjacent A2

3. Secure the A2 using 2 screws M6×16 on both sides and the Phillips screwdriver.

For rack installation, it is highly recommended to use a fan tray in the middle of 2 adjacent A2 for cooling.

Note: It will reduce service life if A2 is continuously working in environment of high temperature.

Connect Power and Ground Cable to A2



Figure 9. Connect Power Cable at Rear Side

1. Connect and lock the power cable at the rear of the A2.



Figure 10. Connect Ground Cable at Rear Side

2. Connect and screw the ground wire at the rear of the A2.

Mount the A2 on the Wall

Attach Handle to A2

Attach the 19" mounting brackets to the rear of the A2 unit, using 4 screws M3×16 per bracket and the Phillips screwdriver. Observe the orientation of the brackets shown in Figure 11.

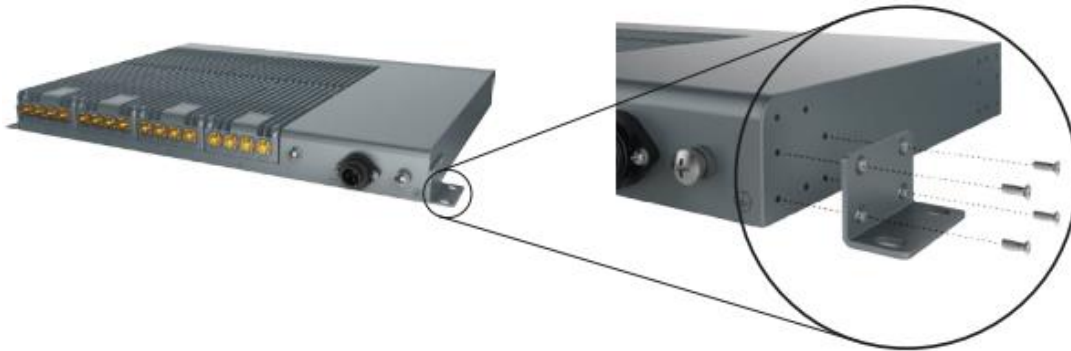


Figure 11. Attaching a 19" Mounting Bracket

Mount A2 to Wall

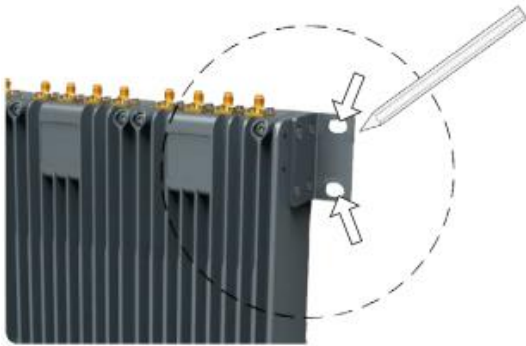


Figure 12. Marking the position of mounting holes

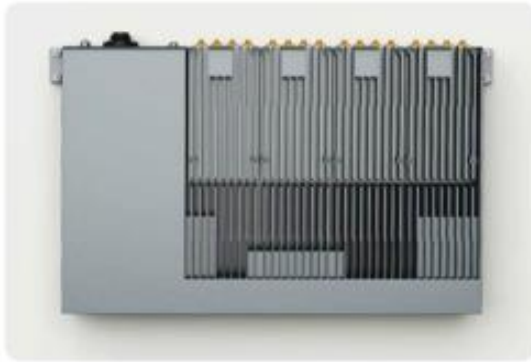


Figure 13. Mounting completed

1. Hold the A2 to the installation location and mark the position of the 4 mounting holes in the mounting brackets.
2. Drill the mounting holes according to the chosen mounting accessories.
3. Attach the dowels, expansion screws, or the similar and fasten the A2 to the wall.

Connect Power and Ground Cable to A2



Figure 14. Connect power cable at the rear of the unit



Figure 15. Connect ground cable at the rear of the unit

1. Connect and lock the power cable at the rear of the A2.

1. Connect and screw the ground wire at the rear of the A2.

Installation of the N2RU

N2RU Ceiling Installation (with the suspended ceiling)

N2RU Accessories

① Screw M3×6	② Screw M6×70	③ Flat Washer M6
④ Spring Washer M6	⑤ DC Power Lead 2m	⑥ Waterproof Connector
⑦ Optical Transceiver FTLX1370W4BTL	⑧ Nylon Cable Ties	⑨ Plastic Expansion Nail
⑩ Screw ST6.3×50	⑪ Mounting Bracket I	
⑫ Mounting Bracket II	⑬ Mounting Bracket IV	

Figure 16. N2 Accessories

Assemble Bracket I&II

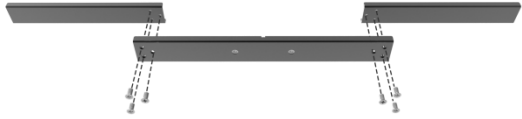


Figure 17. Assembling Bracket I & IV



Figure 18. Attaching Cable Tie to Mounting Bracket

1. Assemble Mounting Bracket I & IV with 6 x M3 x 6 screws.
2. Attach Nylon Cable Tie to the Bracket I & IV combination

Place the Bracket

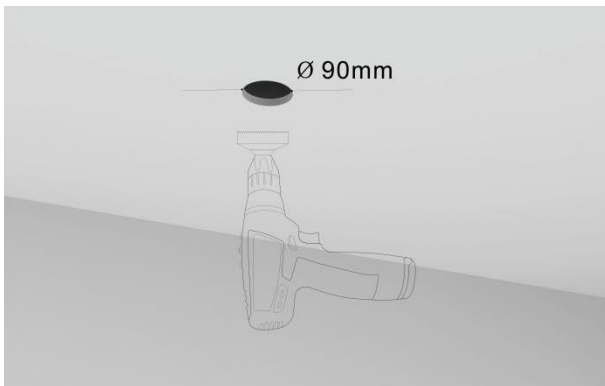


Figure 19. Drilling a Hole

1. Drill a hole with a diameter of 90mm for putting Mounting Bracket I & IV.

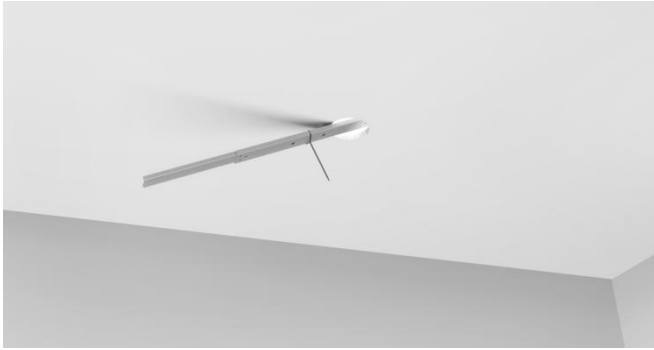


Figure 20. Placing Bracket I & IV



Figure 21. Placing Bracket 2

2. Place the Mounting Bracket I & IV on to which the N2RU will be attached to the reverse of the Ceiling Tiles.

3. Ensure the nylon tie hangs down through the hole.

Assemble Bracket II



Figure 22. Assemble Bracket II

1. Attach Mounting Bracket II to Mounting Bracket I using 2 x M6 x 70 screws, Flat Washer M6, and Spring Washer M6.

Note: Paired Mounting Bracket III is already assembled into N2RU in factory

Buckle Up and Connect Wire

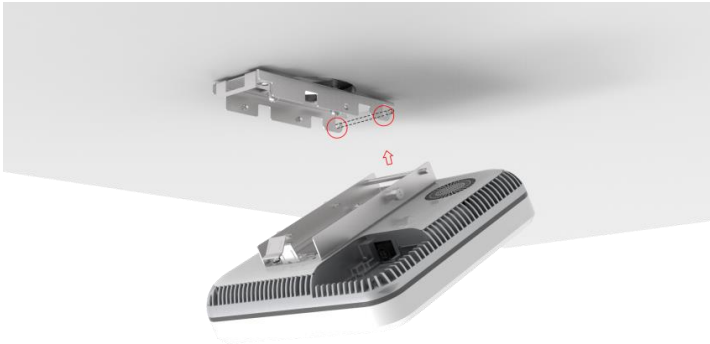


Figure 23. Connecting Bar over Hooks on Bracket II

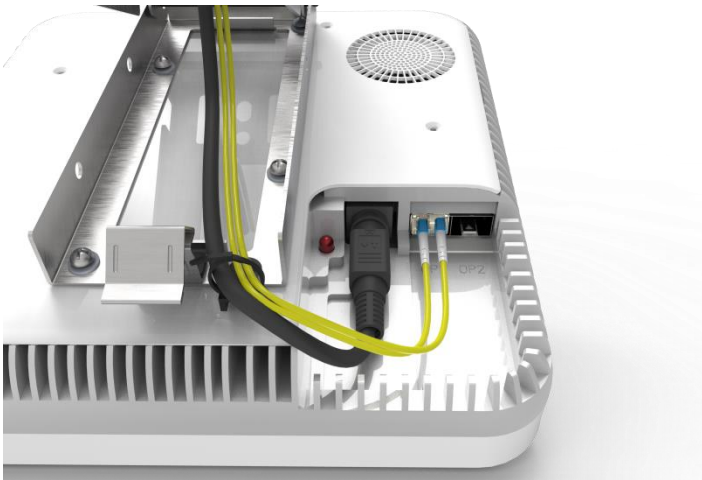
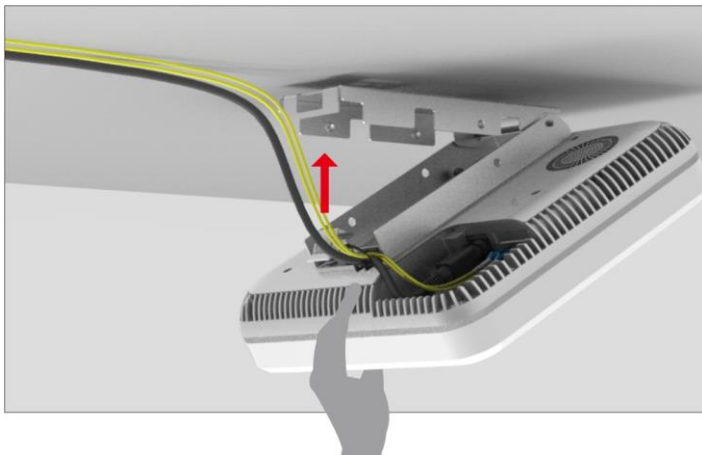


Figure 24. Wire Connection Diagram



1. Clip the bar on paired Bracket III over the hooks on Bracket II.

2. Connect the power cable and fiber cable to N2RU

Note: Connect power cable first and then power it on. Do NOT connect the powered cable to the N2RU in case of excessive current impulse.

3. Engage the rotary hook on Bracket IV into Bracket II

Figure 25. Installation Completed Diagram



4. Tighten the M3 x 3 screws

Figure 26. Tighten N2RU

To Perform Maintenance on the N2RU



1. Depress the hook on the front of the N2RU to expose top panel of N2RU for debugging and maintenance

Figure 27. Unlock Rotary Hook Diagram 1

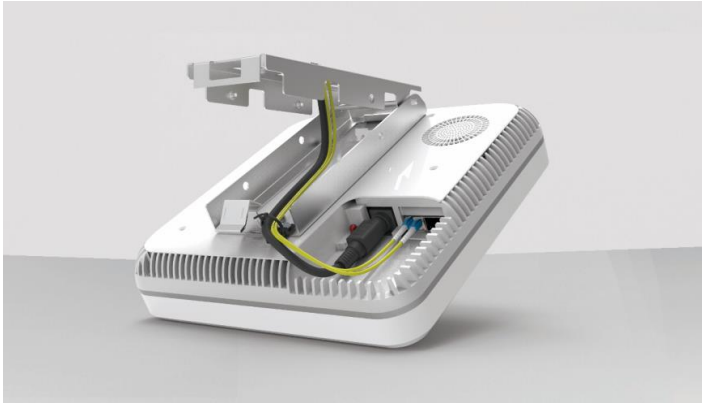


Figure 28. Unlock Rotary Hook Diagram 2

N2RU Ceiling Installation (without suspended ceiling)

Draw Circles for Plastic Expansion Nails

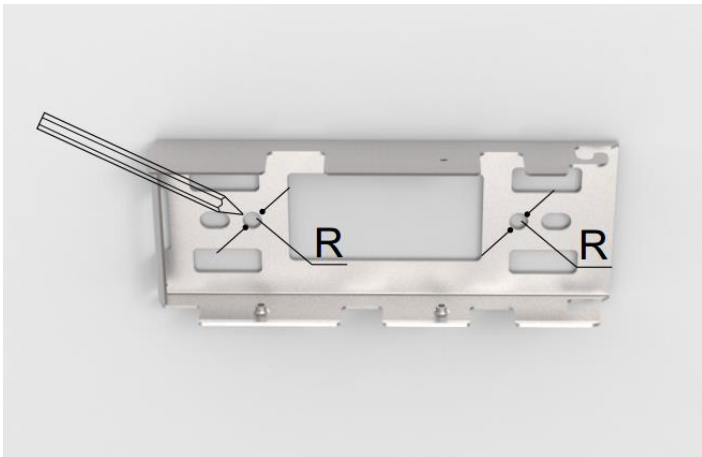


Figure 29. Drawing Circles Diagram 1

1. Using the Mounting Bracket III keyholes as guides, mark the position of the 2 holes to be drilled into the ceiling.

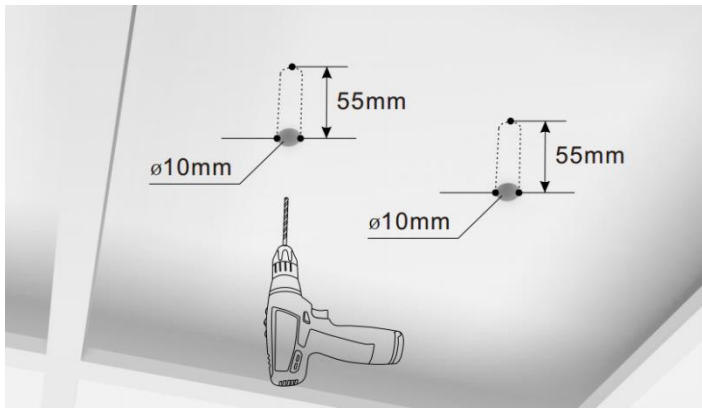


Figure 30. Drilling Holes Diagram 1

2. Drill 2 holes with a diameter of 10mm and depth of 55mm at the positions in step 1



Figure 31. Insert Plastic Wall Plugs

3. Insert plastic wall plugs into holes by hammer

Assemble Mounting Bracket



Figure 32. Assembling Bracket III Diagram 1

1. Assemble Mounting Bracket III to the ceiling using ST6.3 X 50 screws.



Figure 33. Assembling Bracket III Diagram 2

Buckle Up and Connect Wire

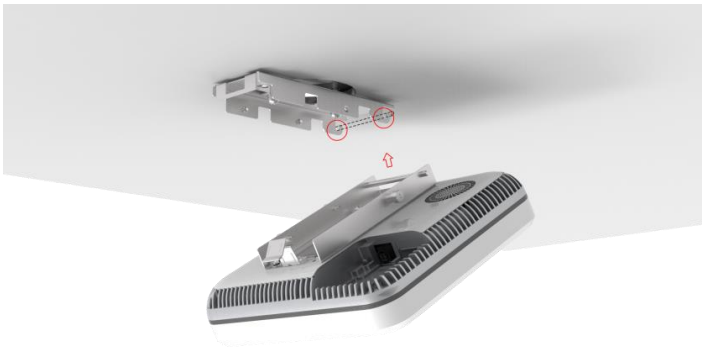
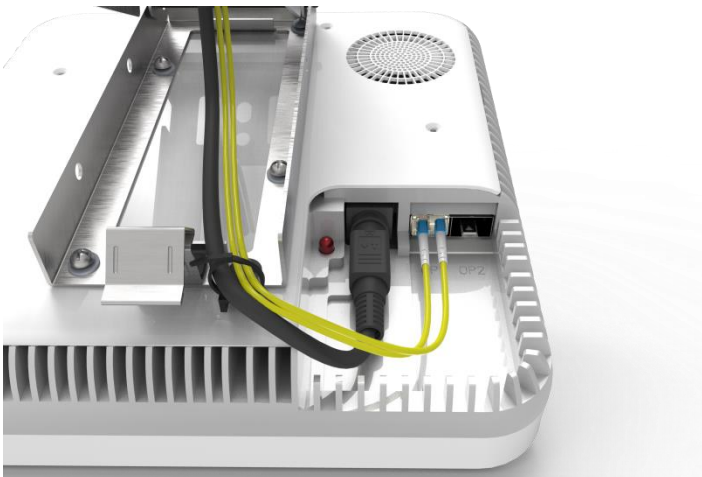


Figure 34. Connecting Bar over Hooks on Bracket II



1. Clip the bar on paired Bracket III over the hooks on Bracket II.

2. Connect the power cable and fiber cable to N2RU

Note: Connect power cable first and then power it on. Do NOT connect the powered cable to the N2RU in case of excessive current impulse.

Figure 35. Wire Connection Diagram

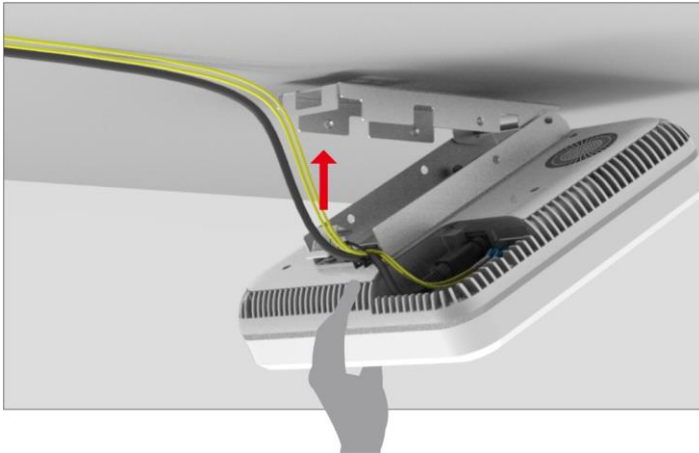


Figure 36. Installation Completed Diagram

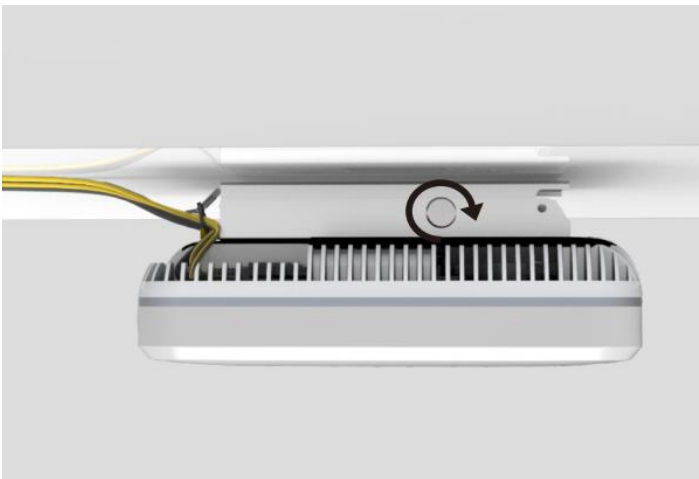


Figure 37. Tighten N2RU

3. Engage the rotary hook on Bracket IV into Bracket II

4. Tighten the M3 x 3 screws

To Perform Maintenance on the N2RU



Figure 38. Unlock Rotary Hook Diagram 1

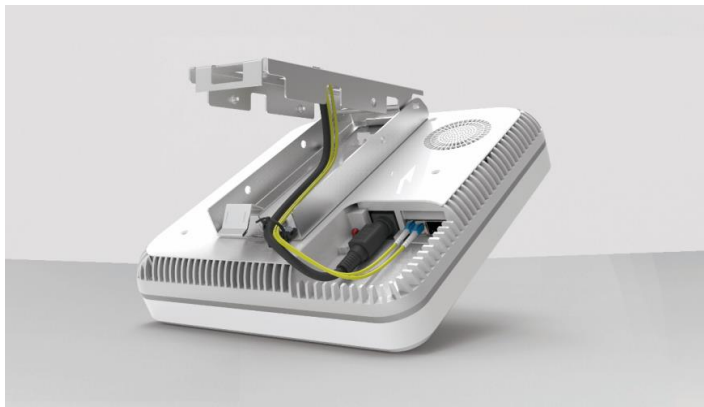


Figure 39. Top Panel of N2RU Exposed

1. Depress the hook on the front of the N2RU to expose the top panel of N2RU for debugging and maintenance.