



BOSCH

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Installation Manual



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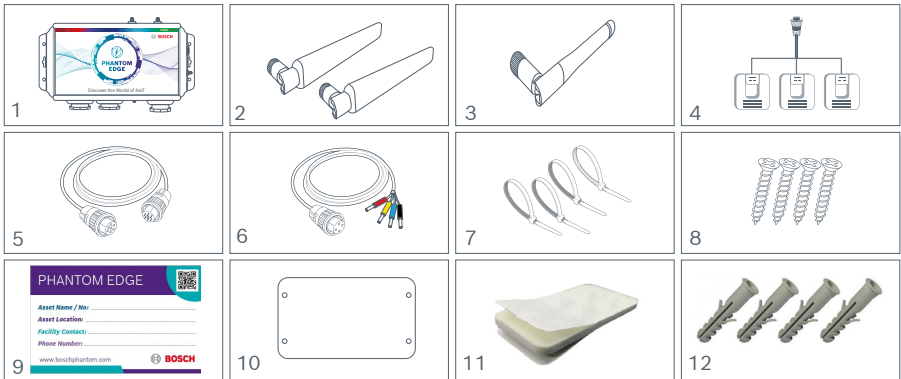
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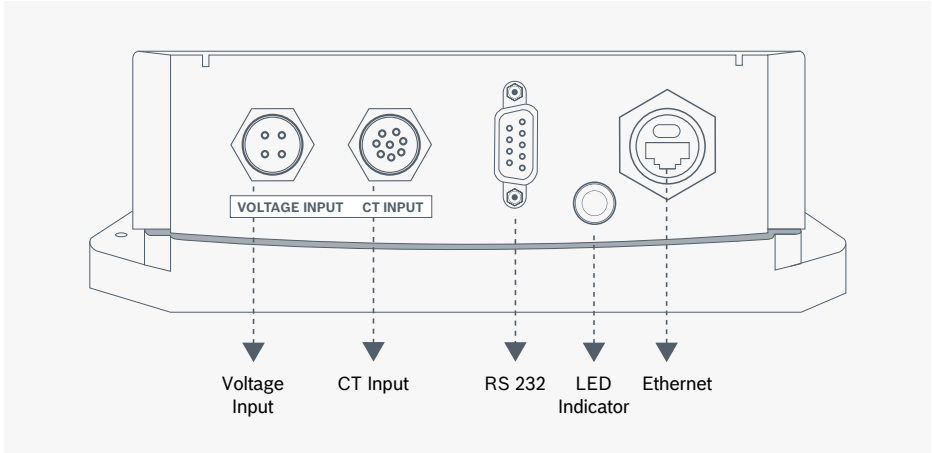
List of components

Sl No.	Item	Quantity
1	Phantom Edge Sensor Device	1
2	LTE Antennas	2
3	Wi-Fi Antenna	1
4	Current Transformer (CT) with Connector	set of 3
5	CT Cable Extender (Optional)	1
6	Voltage Connection Cable with Connector	1
7	Cable Ties	4
8	Mounting Screws	4
9	Contact and Warranty Card	1
10	Drill Paper Guide	1
11	Double Sided Tape	1
12	Wall Plugs	4

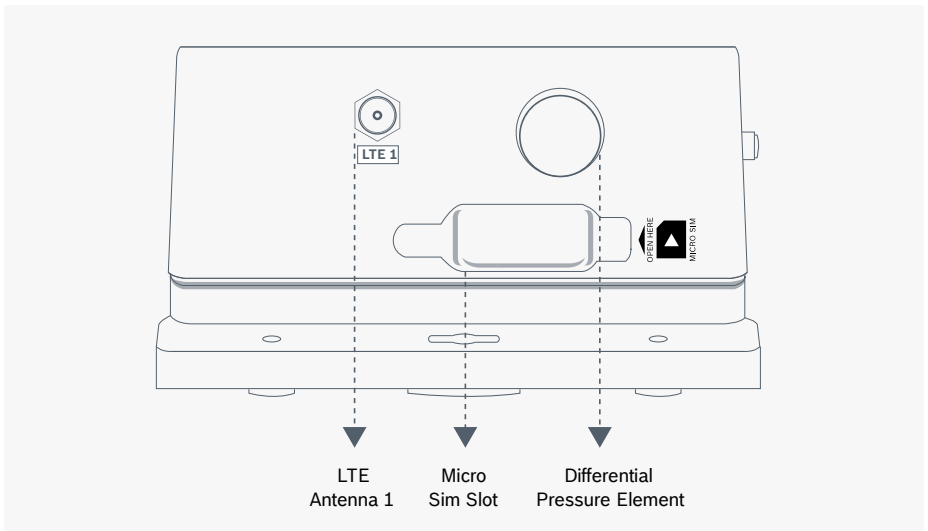


Phantom EDGE View

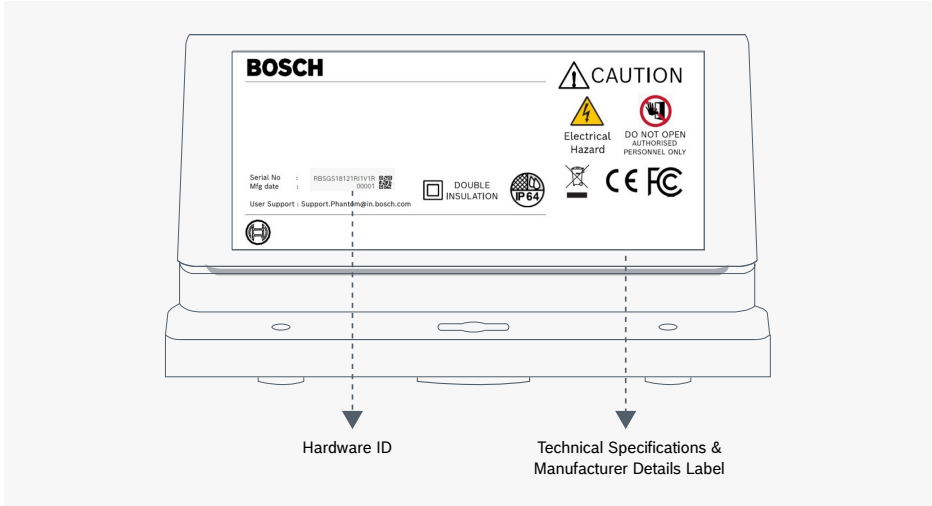
2.1 Front View



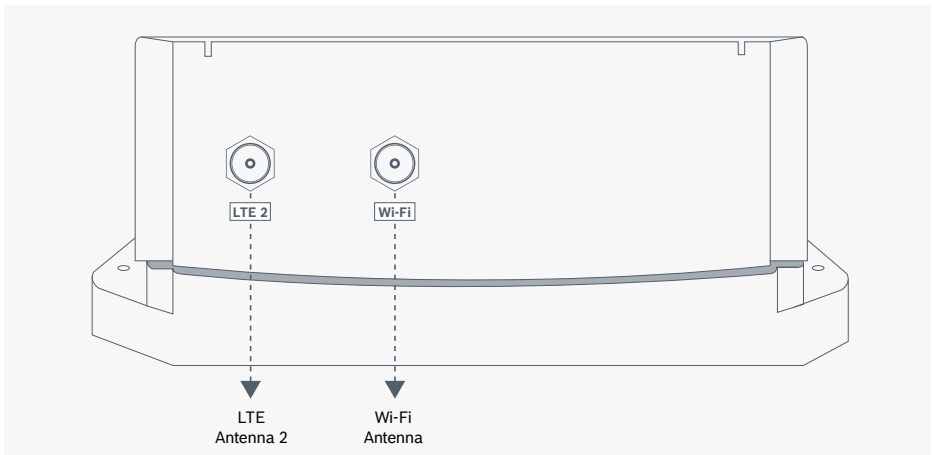
2.2 Right View



2.3 Left View



2.4 Back View

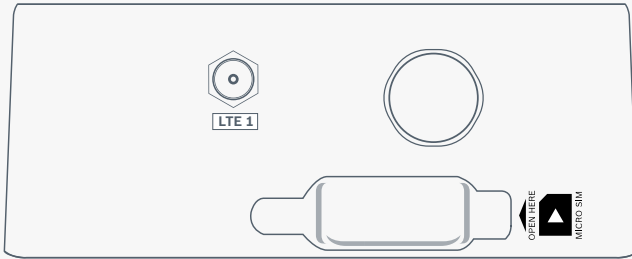


Installation Steps

3.1 SIM Card Insertion (Optional)

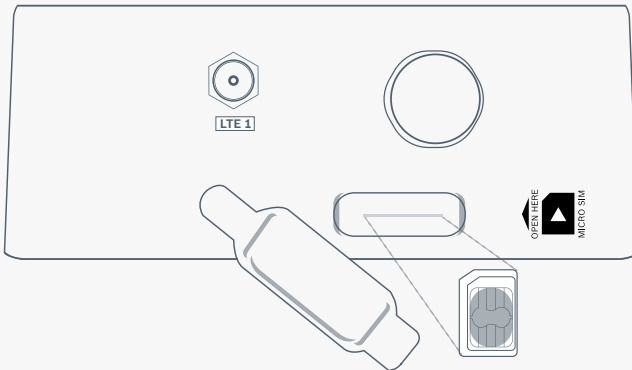
If Wi-Fi connection is not available, use SIM card for it

a.



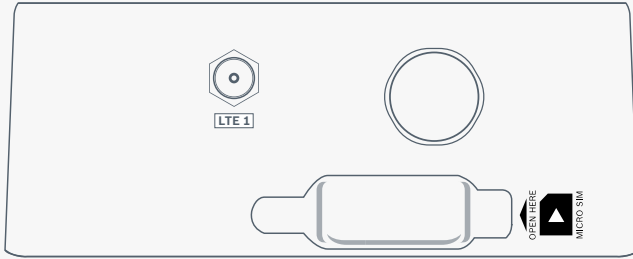
Gently pull the flap on its right side to reveal the Micro SIM card slot

b.



Insert Micro SIM into Phantom Edge as per the marking sticker

C.

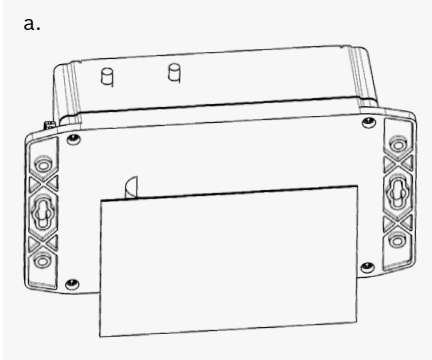


Close the Micro SIM cap and fasten it firmly without any bulge

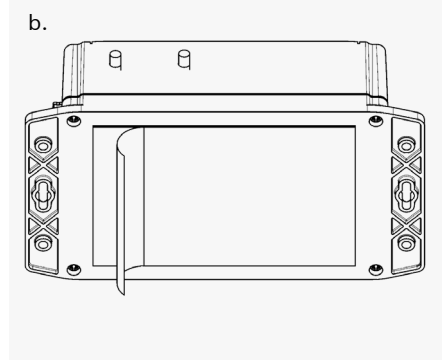
3.2 Mounting

Identify a flat painted wall or metallic surface to mount Phantom Edge. Ensure that Phantom Edge is mounted within 1 meter of radius from the point of CT installation. Phantom Edge can be mounted in the following options:

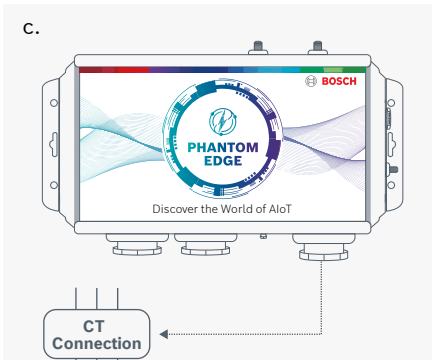
Option A: Mount Phantom Edge in a horizontal direction using sticker



Clean the backside of the device using Iso-Propyl alcohol, peel off the liner from one side of double sided tape and stick it to the backside of Phantom Edge as shown above. Ensure there are no air bubbles while sticking.

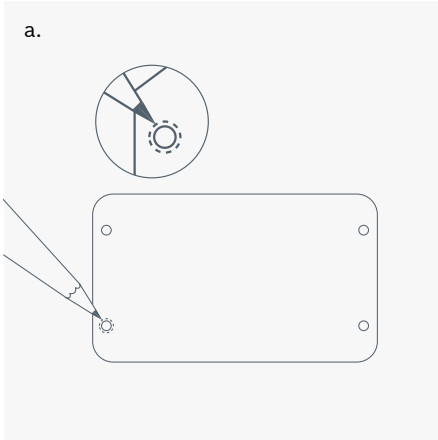


Peel off the other liner of double sided tape from the backside of Phantom Edge

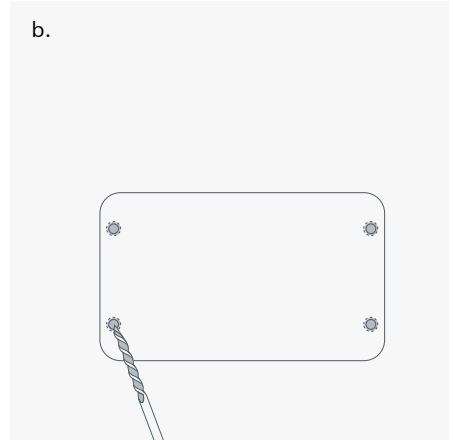


Mount Phantom Edge in a horizontal direction by using adhesive surface of the stickers. Ensure mounting surface is cleaned using Iso-Propyl alcohol before sticking the device.

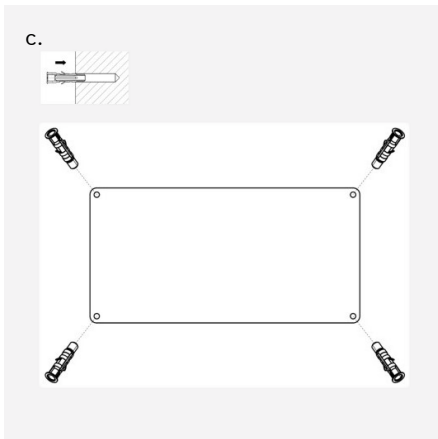
Option B: Mount Phantom Edge on a vertical surface using screws



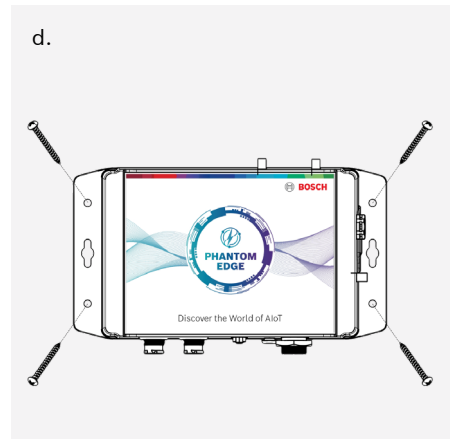
Use the Drill Paper Guide and mark the four locations to drill on the target wall



Drill holes of sufficient depth to accommodate wall plugs provided in the installation kit

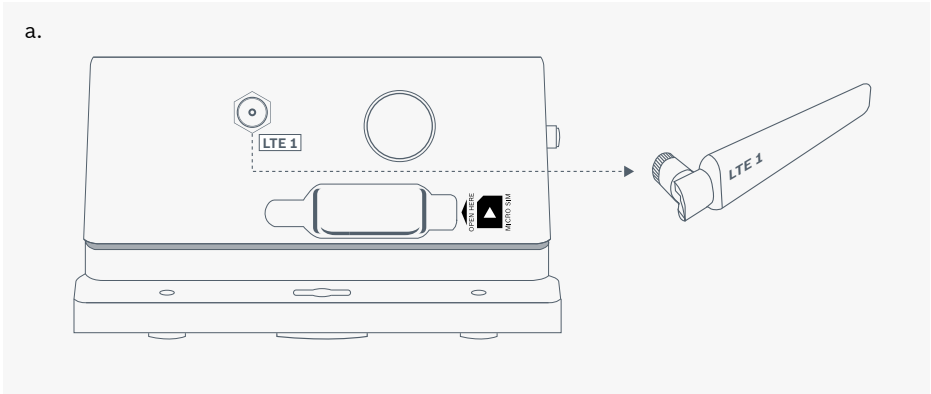


Insert four wall plugs into the drill holes with the help of hammer

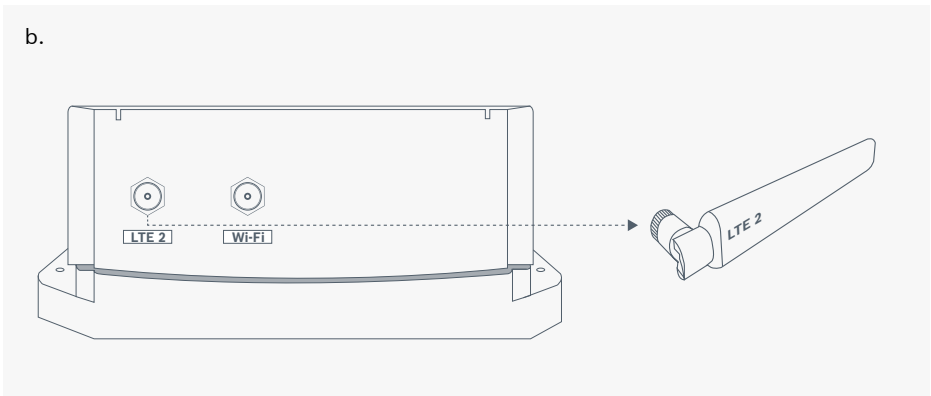


Mount the Phantom Edge on the wall using the four screws provided in the kit

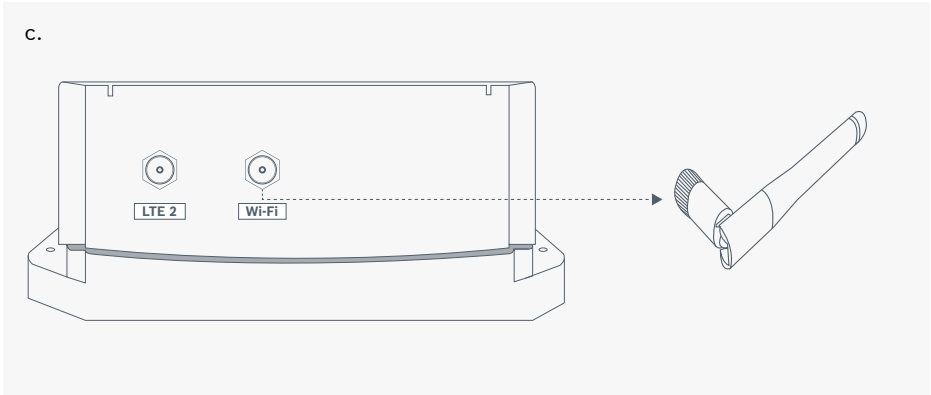
3.3 Antenna Connection



Insert LTE antenna 1 into LTE antenna 1 port and rotate the antenna nut in a clockwise direction until it is firm. Ensure not to overtighten.

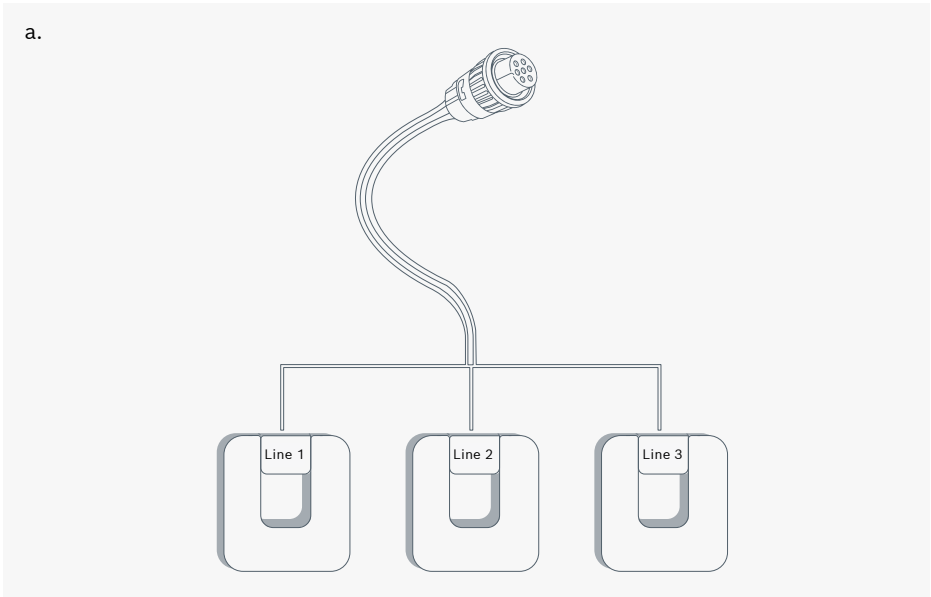


Insert LTE antenna 2 into LTE antenna 2 port and rotate the antenna nut in a clockwise direction until it is firm. Ensure not to overtighten.

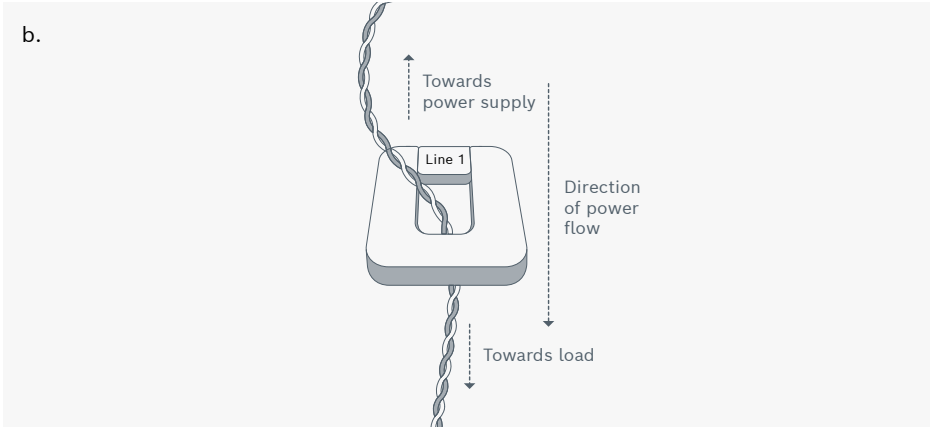


Insert Wi-Fi antenna into Wi-Fi antenna port and rotate antenna nut in a clockwise direction until it is firm. Ensure not to overtighten.

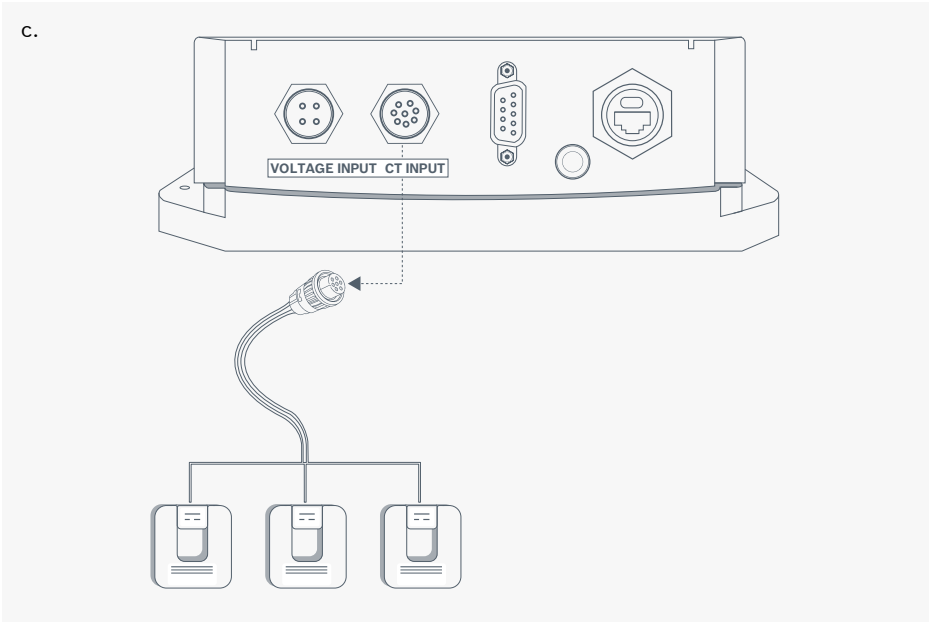
3.4 CT Connection



Identify each CT by line 1, 2 & 3 label behind the CT



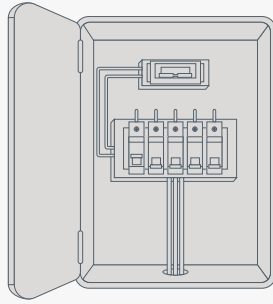
Clamp CT around the individual power cable for each phase. Ensure that the front surface of the CT and line label, is oriented in the direction of power source. Ensure color code of the power cable and line label matches. (Refer Exhibit 1)



Connect the CT female connector to the male connector on Phantom Edge, which is labelled as Current Input

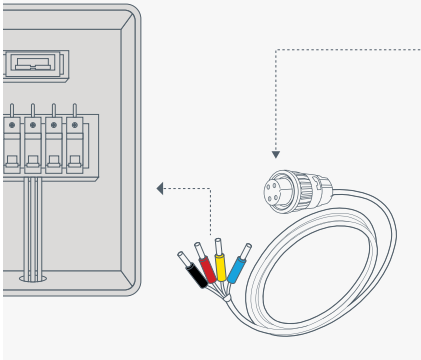
3.5 Voltage Connection

a.



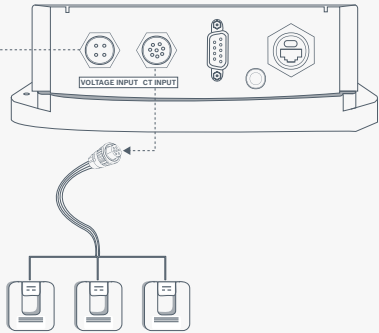
Identify the MCB switch associated with relevant electrical load/machine

b.



c.

Voltage Connection



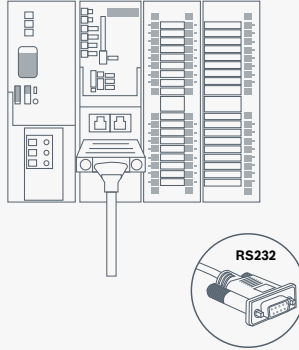
Remove approx. 50mm of insulation from wires. Connect the four-individual wire strands in the voltage connector cable to the appropriate points of the four-pole MCB. Follow color coding of the wire strands to ensure correct connection (*Refer exhibit 1*).

Connect the female connector of this cable to the male connector on Phantom Edge, which is labelled as Voltage Input

3.6 RS232 Connection (Optional)

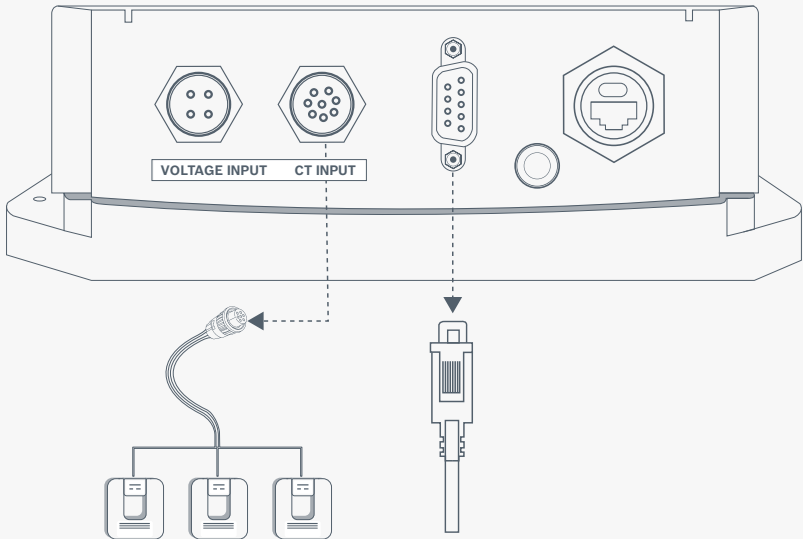
Use this option only if you need to collect the data from a device using RS232 port

a.



Identify RS232 female connector connected to machine PLC

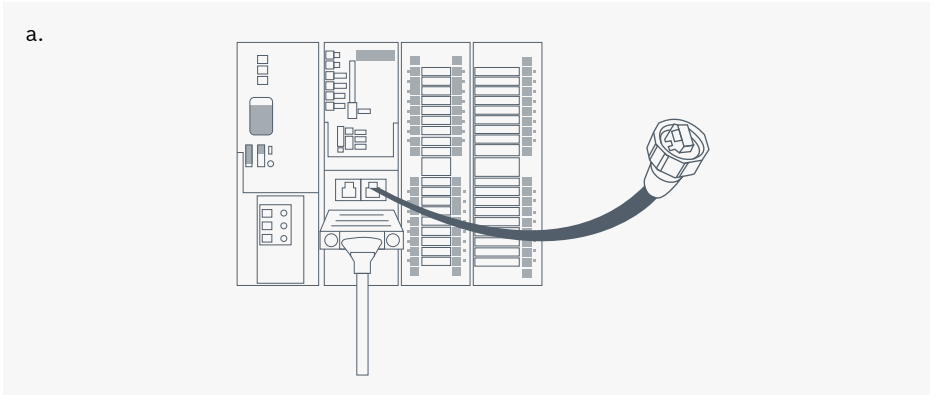
b.



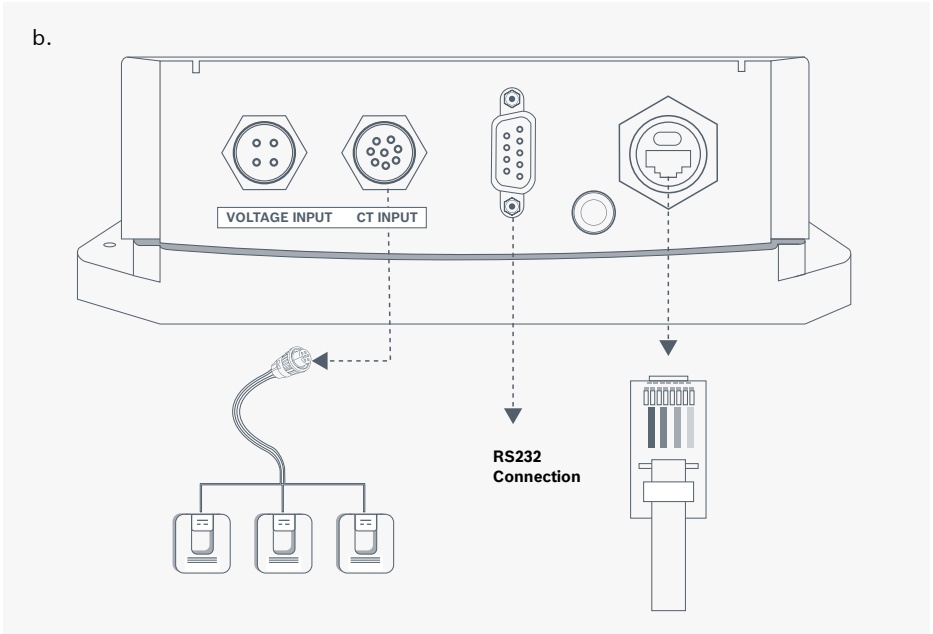
Connect machine PLC RS232 female connector to the male connector of Phantom Edge and tighten the screws

3.7 Ethernet Connection (Optional)

Use this option only if you need to collect the data from a device using ethernet port

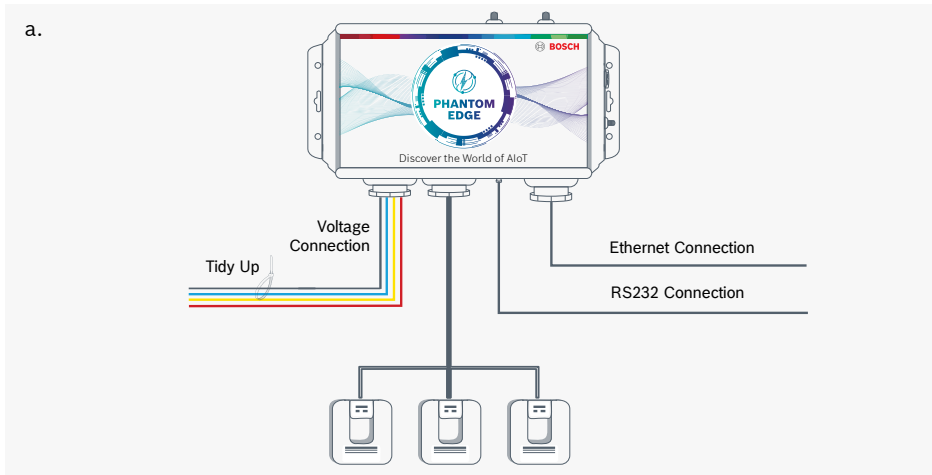


Identify the recommended Amphenol RJ45 Cable RCP-5SAMMM-SLM7Bxx male connector connected to machine PLC

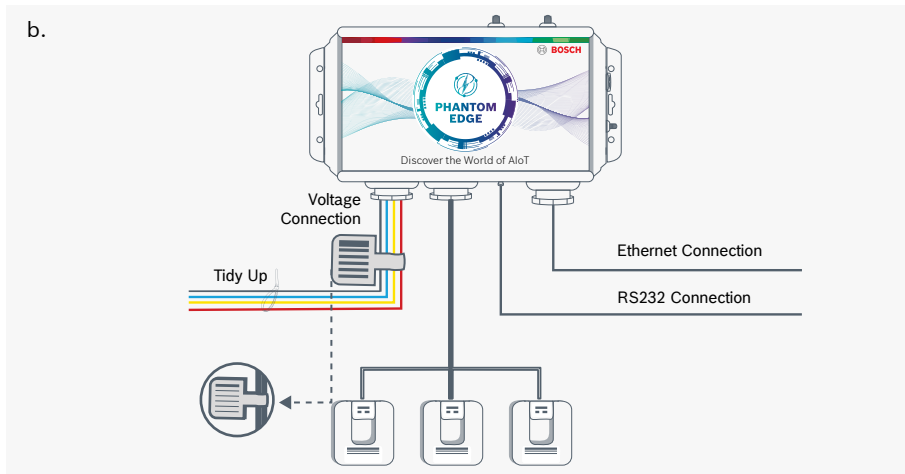


Connect machine's RJ45 ethernet male connector to the RJ45 female port of Phantom Edge and rotate connector nut in a clockwise direction to tighten it

3.8 Tidy Up



Use the cable ties to secure and bundle the cables



Fill in the contact details of local technician and tag it on the voltage cable. Ensure all details are correctly filled for emergency response.

3.9 Connection Diagram

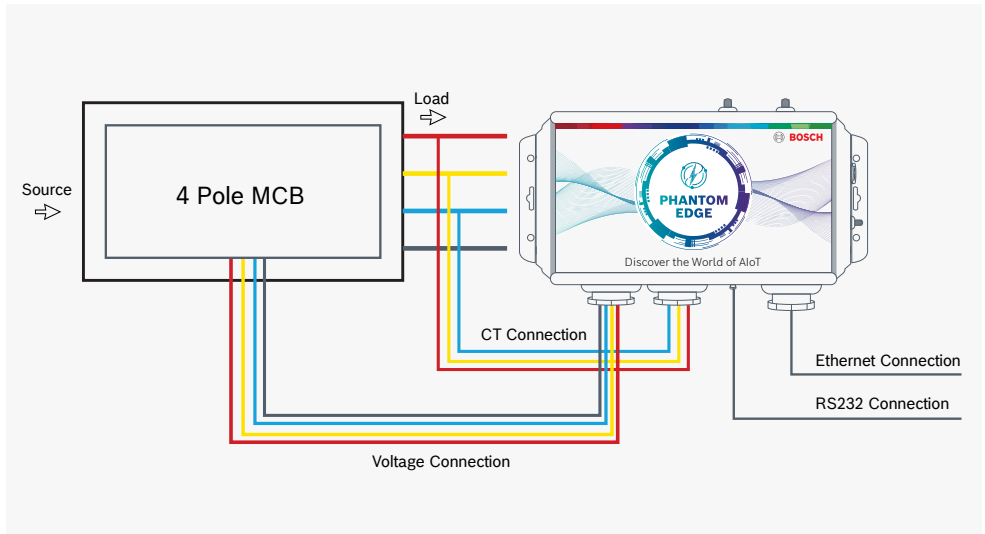


Exhibit 1

Color code used with components in the kit	Green or Black	Red	Yellow	Blue
Region	Neutral (N)	Line 1 (L1)	Line 2 (L2)	Line 3 (L3)
Europe & UK	 Blue	 Brown	 Black	 Grey
UK (Old)	 Black	 Red	 Yellow	 Blue
Australia	 Black	 Red	 White	 Blue
USA	 White	 Black	 Red	 Blue
Singapore	 Blue	 Brown	 Black	 Grey

Technical Specification (1/2)

Features & Benefits

Phantom runs patented AI algorithms on the edge to analyze, interpret and measure asset performance in real time

High resolution, granular and real time data available for analytical decision making and actionable insights

Introduces digitalization for legacy and modern machines

Multiple real-time monitoring use cases across residential, retail, commercial, utility distribution and electrical machines in discrete manufacturing areas.

Non-Intrusive installations assist in quick enablement without disturbing existing electrical layouts and infrastructure

Processing Core

Processor Type Dual Core 1.6GHz

RAM 2 GB

Main Memory ¹ 8 GB

Connectivity & Interfaces

Wi-Fi 802.11 /b/g/n/ (2.4 GHz @ 20 MHz)

GSM (Global) 850/900/1800/1900 MHz

4G LTE Bands USA/Canada: B2,B4,B5,B12,B13
Global: B1,B3,B7,B8,B28, B40,B41

Bluetooth Bluetooth EDR, BLE 4.2

Ethernet RJ 45: 10/100 Mbps

Serial Protocol RS232 Protocol (Max Baud Rate 115 kbps)

Operating System

Operating System Linux

Electrical Characteristics

Measurement Accuracy ² Class 1

Measurement Category CAT III

Voltage Measurement Range 90 to 280 VAC (L-N)

Current Measurement Range Upto 1000 A

Input Supply 1 Phase, 3 Phase Star Connection ³, AC Only

Power Consumption <10 W

Frequency 50/60 Hz +/- 2 Hz

¹ Upto 7 days of data backup, in case of connectivity loss

² Phantom Edge device is rated for 0.1% accuracy, but overall accuracy is limited due to CT's 1% accuracy

³ In case of delta connection, reach out to manufacturer



Technical Specification (2/2)

Environmental Conditions	
Operating Temperature	-10 °C to +50 °C
Storage Temperature	-10 °C to +50 °C
Altitude	Max 2500 m
Relative Humidity	10% to 95%
IEC Protection	Class II (Double Insulation)
IP Degree of Protection	IP 64
Pollution Degree	2
IEC Over Voltage Category	CAT III
Indoor/Out Door Use	Both
General Features ⁴	
Device Mounting	Wall Mount or Flat Surface Mount
Weight	~ 0.876 kg
Dimensions (mm)	220.8 X 156.7 X 62.5 (L X B X H)

Regulatory Compliance	
EMC Standards	EN 301 489-1, EN 301 489-17, EN 301 489-52, IEC 61326-1
RF Standards	EN 300 328, EN 301 511, EN 301 908 -1, EN 301 908-13
Safety Construction	IEC 61010-1 (CB)
USA	FCC
EU	CE
Canada	ISED
Accessories	
Current Transformer	Standard 100 A, 200 A, 400 A & 1000 A
Voltage Cable	4 Core; 0.5 mm ² wire
Voltage Cable Color Code	Customized to US, EU and APAC regions

⁴ Considered for Phantom Edge device only



Safety instructions for installation

1. The product must be used by skilled and trained personnel only. Personnel scheduled to be trained, familiarized, instructed, or participating in a general training course may only work with the product under the supervision of an experienced person.
2. Note the ESD handling instructions and handle components with care.
3. Turn off the power supply before connecting Phantom Edge to the LT panel.
4. Always make sure that the LT panel is de-energized by using a tester. When an electric tester touches a live or hot wire, the bulb inside the tester lights up showing that the respective wire is live. Check all the wires, the outer metallic covering of the LT panel, and any other hanging wires with an electrical tester before proceeding with your work.
5. Be sure your hands are dry and wear non-conductive gloves, protective clothing and shoes with insulated soles.
6. Never use equipment with frayed cords, damaged insulation, or broken plugs.
7. Always use insulated tools while working.
8. Know the wire color code of your country. Refer to exhibit 1 in the installation steps.
9. Do not drop Phantom Edge. It may lead to its damage or malfunctioning.
10. If the phantom edge unit is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Service & Support

Robert Bosch Engineering And Business Solutions Private Limited

123, Industrial Layout, Hosur Road, Koramangala, Bangalore 560 095, India

Mail ID: Support.Pantom@in.bosch.com

Uninstallation & End-of-Life disposal instructions

1. Be sure your hands are dry and wear non-conductive gloves, protective clothing, and shoes with insulated soles
2. Turn off the electrical supply before disconnecting Phantom Edge from LT panel
3. Make sure, LT panel is de-energized, by using a tester. When an electric tester touches a live or hot wire, the bulb inside the tester lights up showing that the respective wire is live. Check all the wires, the outer metallic covering of the LT panel, and any other hanging wires with an electrical tester before proceeding with your work.
4. Uninstall the device in the following sequence:
If the device is mounted using double sided tape, dismantle the device by spraying solvents such as Acetone or MEK (Methyl-Ethyl-Ketone) on the adhesive interface and clean the residual adhesive present on the enclosure or metal part using above mentioned solvents after dismantling the device.
 - i) Remove voltage connections
 - ii) Remove cable ties used to tie up loose wires
 - iii) Remove ethernet connections (Optional)
 - iv) Remove RS232 connections (Optional)
 - v) Remove CT connections (Optional)
 - vi) Remove antennas from the device
 - vii) Remove the SIM from device
5. Customer is responsible for proper disposal of the device at its end-of-life. Bosch, as a component manufacturer shall adhere to meet regional and local requirements in the design considerations of the component.
6. This component shall not be disposed of in a normal way but via separate collection of electronic waste disposal system provided by your local authority. The life cycle of device with supported IMEI number and ICC ID is the responsibility of the customer. The customer shall ensure that necessary procedure is followed to manage IMEI of the device at the end-of-life, according to the mandatory local regulations.



Regulatory Information

FCC Regulatory Conformance:

FCC Compliance Notification to User:

Phantom Edge device comply 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 undesired operation.

Co-Location Warning Statement:

These devices and their antennas must not be co-located or operating in conjunction with any other antenna or transmitter.

Exposure Compliance:

Do not touch the Primary antennas, which are transmitting RF signals. Always disconnect power to the CCU before installation or maintenance service. The Primary antennas should always be separated from the operator or nearby person by a minimum distance of 20 cm.

Information to User:

These devices must be operated as supplied by RBEI. Any changes or modifications made to these devices without the express written approval of RBEI may void the user's authority to operate these devices

EU Regulatory Conformance:

CE Statement:

Hereby RBEI Pvt. Ltd. declares that the radio equipment type Phantom EDGE is in compliance with Directive 2014/53/EU. The full text of conformity (DoC) is available in the following internet address: www.boschphantom.com



WEEE mark - The product should not be discarded as unsorted waste



CAUTION Caution/Warning



Do Not Open ,
Authorized personnel only



DOUBLE INSULATION Double Insulation



Electric Shock /Danger from electricity



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For more information, send your enquiries to **Support.Phantom@in.bosch.com**

