



## LEP-401M-KIT

Industrial IP30 Ethernet Extender, 800 meters, 10/100Mbps Ethernet PoE Extender (1 Pair: LEP-401M-L and LEP-401M-R)



## Hardware Manual

Version 1.0.1  
(March 2024)



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## FCC Warning

This equipment has been tested and found to comply with the limits for a Class-A 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. It may cause harmful interference to radio communications if the equipment is not installed and used in accordance with the instructions. 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.

**Caution:** Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

## **Avertissement FCC**

Cet équipement a été testé et déclaré conforme aux limites d'un appareil numérique de classe A, conformément à la partie 15 des règles de la FCC. Ces limites sont conçues pour fournir une protection raisonnable contre les interférences nuisibles dans une installation résidentielle. Cet équipement génère, utilise et peut émettre de l'énergie radiofréquence. Cela peut provoquer des interférences nuisibles aux communications radio si l'équipement n'est pas installé et utilisé conformément aux instructions. Cependant, il n'y a aucune garantie qu'aucune interférence ne se produira dans une installation particulière. Si cet équipement provoque des interférences nuisibles à la réception radio ou télévision, ce qui peut être déterminé en éteignant puis en rallumant l'équipement, l'utilisateur est encouragé à essayer de corriger les interférences par une ou plusieurs des mesures suivantes:

- Réorientez ou déplacez l'antenne de réception.
- Augmentez la distance entre l'équipement et le récepteur.
- Connectez l'équipement à une prise sur un circuit différent de celui auquel le récepteur est connecté.
- Consultez le revendeur ou un technicien radio / TV expérimenté pour obtenir de l'aide.

## **CE Mark Warning**

This is a Class-A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

## **Avertissement de marque CE**

Ceci est un produit de classe A. Dans un environnement domestique, ce produit peut provoquer des interférences radio, auquel cas l'utilisateur peut être amené à prendre des mesures adéquates.

## **Industrial Ethernet Extender**

Industrial Grade Ethernet PoE Extender

Hardware Manual

Version 1.0.1 (March 2024)

The manual supports the following models:

- LEP-401M-L
- LEP-401M-R

*Antaira Technologies - Industrial Ethernet Switches*  
**LEP-401M-KIT - Hardware Manual - v1.0.1**

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This document is the current official release hardware manual. Please check our website ([www.antaيرا.com](http://www.antaيرا.com)) for any updated manual or contact us by e-mail ([support@antaيرا.com](mailto:support@antaيرا.com)).

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# 1 Overview

LEP-401M-L (Local Unit) & LEP-401M-R (Remote Unit) are a pair of Industrial Grade LAN extenders which are designed to extend power (IEEE 802.3at) and data over 100 meters. Traditionally, standard Ethernet supports Ethernet transmission distance up to 100 meters. However, by using paired LAN extenders, they can extend transmission distance up to 800 meters over 2 or 4-pair UTP cable in point-to-point topology.

The local unit of LEP-401M-L supports 55-57VDC power inputs and feeds both power and data to the remote unit. The remote unit then provides 10/100Base-TX Ethernet and power over Ethernet (IEEE 802.3at standard or non-standard 'passive PoE') to the connected standard or non-standard powered devices (PD).

LEP-401M-L (Local Unit) & LEP-401M-R (Remote Unit) are the best choice when there is no power available at the remote side or when providing power at the remote is difficult or expensive. Moreover, these extenders are particularly designed for harsh environments, such as industrial networking, traffic surveillance, security automation applications, IP surveillance, city security, intelligent transportation systems (ITS) and are also suitable for many military or utility market applications where environmental conditions exceed commercial product specifications.

## 1.1 Product Hardware Features

### System Interface and Performance

- Long distance power feeding and data transmission up to 800 meters on 2 or 4 pair UTP cable
- Supports standard IEEE 802.3af/at or passive PoE devices
- Eliminates the need for any power supply at the remote side
- Quick deployment and easy maintenance

### Power Input & Connection (For LEP-401M-L)

- DC 55~57V redundant, with a 2-pin removal terminal block
- It is recommended to use a UL listed Industrial Power Supply

### Operating Temperature

- Standard Operating Temperature model: -40°C to 75°C

### Case / Installation

- IP30 protection metal housing
- Wall mounting design

## 1.2 Package Contents

- LEP-401M-L

- 1 - LEP-401M-L
- 1 - Two-pin terminal block
- 1 - Wall mounting bracket set with screws
- LEP-401M-R
  - 1 - LEP-401M-R
  - 1 - Wall mounting bracket set with screws

## 1.3 Safety Precaution

**Attention:** If the DC voltage is supplied by an external circuit, please use a protection device on the power supply input. The industrial Ethernet switch's hardware specs, ports, cabling information, and wiring installation will be described within this hardware manual.

**Attention:** Si la tension CC est fournie par un circuit externe, veuillez utiliser un dispositif de protection sur l'entrée d'alimentation. Les spécifications matérielles, les ports, les informations de câblage et l'installation du câblage du commutateur Ethernet industriel seront décrits dans ce manuel d'utilisation.

### C1D2 Installation and Operating Instructions

These devices are open-type devices that are to be installed in an enclosure only accessible with the use of a tool, suitable for the environment.

"This equipment is suitable for use in Class I, Division 2, Groups A, B, C, and D or non-hazardous locations only."

**WARNING:** EXPLOSION HAZARD - Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous."

**WARNING:** EXPLOSION HAZARD - Substitution of any components may impair suitability for Class I, Division 2."

### Instructions d'installation et d'utilisation du C1D2

Ces appareils sont des appareils de type ouvert qui doivent être installés dans un boîtier accessible uniquement à l'aide d'un outil adapté à l'environnement.

«Cet équipement est conçu pour être utilisé uniquement dans les zones de classe I, division 2, groupes A, B, C et D ou non dangereuses.»

**ATTENTION:** RISQUE D'EXPLOSION - Ne débranchez pas l'équipement à moins que l'alimentation ait été coupée ou que la zone ne soit pas dangereuse. »

**ATTENTION:** RISQUE D'EXPLOSION - La substitution de tout composant peut nuire à la compatibilité avec la classe I, division 2.

### Warning Labels

The caution label means that you should check certain information on the user manual when working with the device.  
(Shown in *Figure 1.1*)

### Étiquettes d'avertissement

L'étiquette d'avertissement signifie que vous devez vérifier certaines informations du manuel d'utilisation lorsque vous travaillez avec l'appareil. (Illustré à la *figure 1.1*)



*Figure 1.1 - Caution Label*  
*Figure 1.1 - Étiquette de mise en garde*



*Figure 1.2 - Hot Surface Warning Label*  
*Figure 1.2 - Étiquette d'avertissement de surface chaude*



## 2 Hardware Description

### 2.1 Physical Dimensions

Figure 2.1, below, shows the physical dimensions of this product series:

(W x D x H) is 52mm x 102.5mm x 25mm

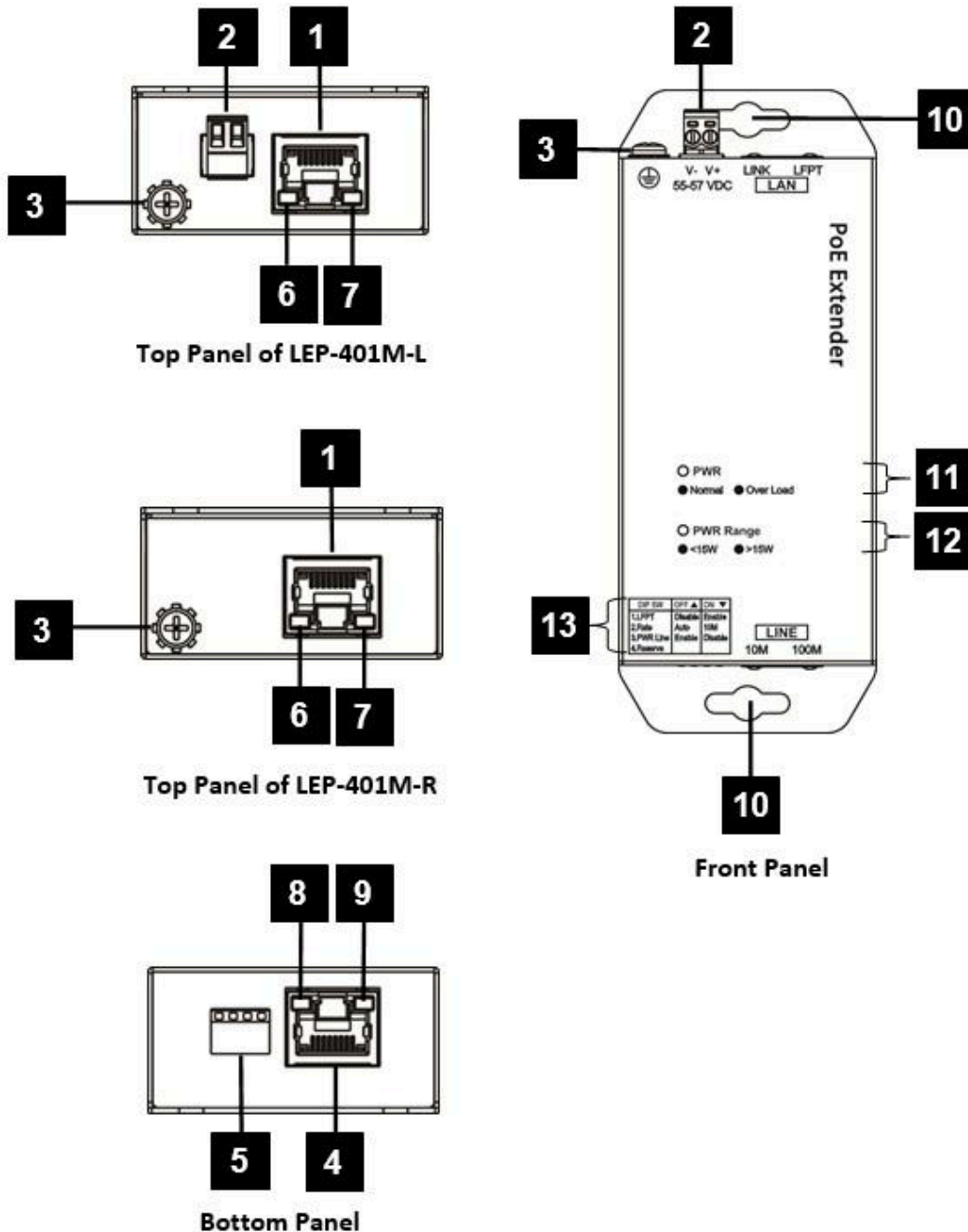


Figure 2.1 - Physical Dimensions

No.	Description	No.	Description
1	LAN RJ45 connector	8	Line speed is in 10Mbps
2	Power input connectors (For LEP-401M-L)	9	Line speed is in 100Mbps
3	Grounding connector	10	Wall mounting holes
4	LINE RJ45 connector	11	Power LED indicator
5	DIP Switch	12	Power range LED indicator
6	LAN link LED indicator	13	Function table of DIP Switch
7	LFPT LED indicator	-	-

## 2.2 Extension Distance vs Link Speed / PoE Power Budget

### Cat. 5e UTP Cable

Extension Distance (Meters)	Link Speed (Mbps)	PoE Power Budget (Maximum Watt)	
		4-Pair UTP	2-Pair UTP
100	100	31.4	28
200	100	29.6	22.4
300	100	27.6	15.2
400	100	24.7	12.2
500	100	20.3	9.8
600	100	17.2	7.9
700	10	15	7.1
800	10	13.2	6.1

### Cat. 6 UTP Cable

Extension Distance (Meters)	Link Speed (Mbps)	PoE Power Budget (Maximum Watt)	
		4-Pair UTP	2-Pair UTP
100	100	32.2	28.8
200	100	30.5	25.5
300	100	28.7	16.7

400	100	27	14.7
500	100	24.1	11.8
600	100	20.5	9.9
700	10	17.7	8.7
800	10	16	7.5

**Note:** Please note that the tables above are for your reference. The actual result will vary depending on your actual cable quality and networking conditions.

## 2.3 LED Indicators

LED	Color	Description	
PWR	Green	On	Power is on
		Off	No Power
	Amber	On	If the following PoE overloading conditions occur, the PWR LED indicator will be lit in Amber. <ul style="list-style-type: none"> <li>LEP-401M-L: PoE output &gt;30W or PoE output errors</li> <li>LEP-401M-R: PoE output &gt;29W or PoE output errors</li> </ul>
		Off	Normal conditions
PWR Range (LEP-401M-L)	Green	On	PoE output <15W
	Amber	On	PoE output ≥15W
PWR Range (LEP-401M-R)	Green	On	PoE output <15W
		Blinking	Passive PoE mode
	Amber	Off	PoE function is disabled or there is no PoE output under Active PoE mode
		On	PoE output ≥15W
LAN LINK	Green	On	LAN side link is up
		Blinking	LAN side link is up and active
		Off	LAN side link is down
LAN LFPT	Amber	On	Link fault pass through function is activated and link loss conditions occur

		Off	LFPT function is off or link operates normally
LINE 10M	Amber	On	LINE side link is up and operates at 10Mbps
		Off	LINE side link is down and operates at 100Mbps
LINE 100M	Green	On	LINE side link is up and operates at 100Mbps
		Off	LINE side link is down and operates at 10Mbps

Table 2.1 - LED Indicators

## 2.4 Connectors

LEP-401M-L has two standard shielded RJ-45 connectors for Ethernet cable connections. The connector labeled LAN will connect to the Ethernet switch, while the connector labeled LINE will connect to LEP-401M-R LINE side for distance extension. The connector of LEP-401M-R labeled LAN will connect to PD devices such as IP Camera, Access Point, IP Phone, Digital Signage or any other PoE powered devices.

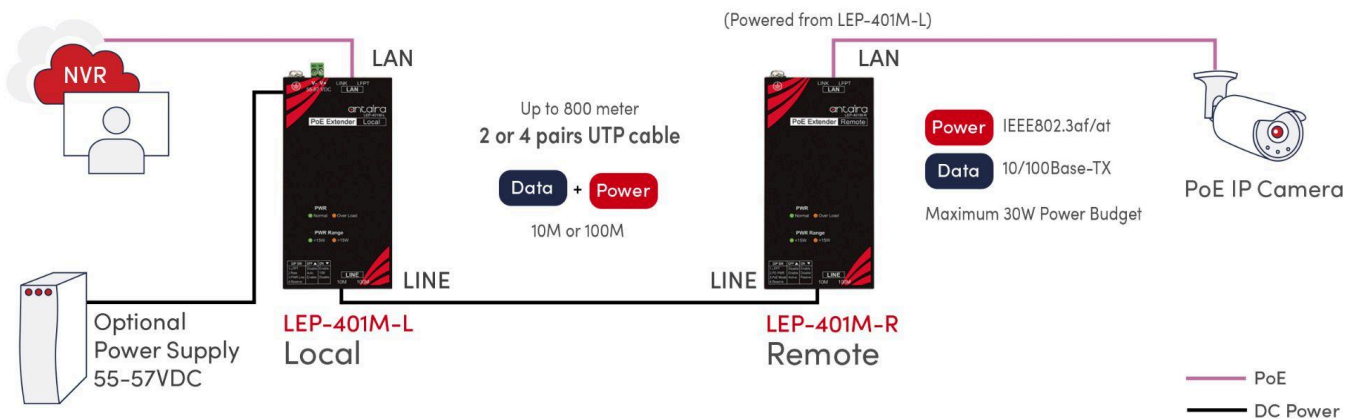


Figure 2.2 - Connector Diagram

### RJ-45 Ethernet Port Pinouts

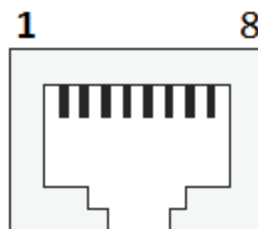


Figure 2.3 - RJ-45 Ethernet Port Pinouts

**RJ-45 Ethernet & PoE Pin Assignments**

Pin No.	RJ-45 Ethernet 100Base-TX	PoE Output (2 Pair)
1	RX+	V+
2	RX-	V+
3	TX+	V-
4	-	
5	-	
6	TX-	V-
7	-	
8	-	

## 2.5 DIP Switch (LEP-401M-L)

DIP No.	DIP 1	DIP 2	DIP 3	DIP 4
<b>Position</b>	LFPT	Rate	PWR Line	Reserved
<b>OFF</b>	LFPT Off	Auto	Enable	-
<b>ON</b>	LFPT On	10M	Disable	-

**DIP 1**

**OFF:** Disable LFPT function.

**ON:** LFPT function is enabled. When the remote device is link down, the link of the local device will be forced down.

**DIP 2**

**OFF:** The device automatically learns the link speed rate. The link speed can be either 10Mbps or 100Mbps.

**ON:** This setting forces port speed rate to 10Mbps.

**Note 1:** The LAN speed is determined by LINE speed which means that if LINE speed is forced to 10Mbps, the LAN speed will be set to 10Mbps as well. When the speed rate is set to Auto, the LINE speed will be determined by the extension distance. For detailed "Extension Distance vs. Link Speed/PoE Power Budget" information, please refer to page 8.

**Note 2:** Please note that the "Extension Distance vs. Link Speed/PoE Power Budget" tables in page 8 are for your reference. The actual result will vary depending on your actual cable quality and networking conditions.

### DIP 3

**OFF:** Provide power to LINE side.

**ON:** Do not provide power to LINE side.

**Note:** The remotely connected PD device will perform a power reset when this DIP switch is turned ON (Disable) and then turned OFF (Enable).

### DIP 4

This DIP switch is reserved for future use. Please place this DIP Switch in the original OFF position.

## 2.6 DIP Switch (LEP-401M-R)

DIP No.	DIP 1	DIP 2	DIP 3	DIP 4
Position	LFPT	PD PWR	PoE Mode	Reserved
OFF	LFPT Off	Enable	Active	-
ON	LFPT On	Disable	Passive	-

### DIP 1

**OFF:** Disable LFPT function.

**ON:** LFPT function is enabled. When the remote device is link down, the link of the local device will be forced down.

### DIP 2

**OFF:** Provide power to the PD device.

**ON:** Do not provide power to the PD device.

**Note:** The remotely connected PD device will perform a power reset when this DIP switch is turned ON (Disable) and then turned OFF (Enable).

### DIP 3

**OFF:** This sets the device to Active mode which negotiates with the remote powered device via IEEE802.3at/af standard.

**ON:** This forces the device to passive mode. In this mode, the device continuously feeds power to the powered device without negotiation.

### DIP 4

This DIP switch is reserved for future use. Please place this DIP Switch in the original OFF position.

## 2.7 Recommended Power & Ground Wiring Scheme

### DC Power Connection

The fault alarm contact is in the middle of the terminal block connector as the picture shows below in *Figure 2.8*. By inserting the wires, it will detect the fault status including power failure or port link failure (managed industrial switch only), and form a normal open circuit. An example is shown below in *Figure 2.8*.

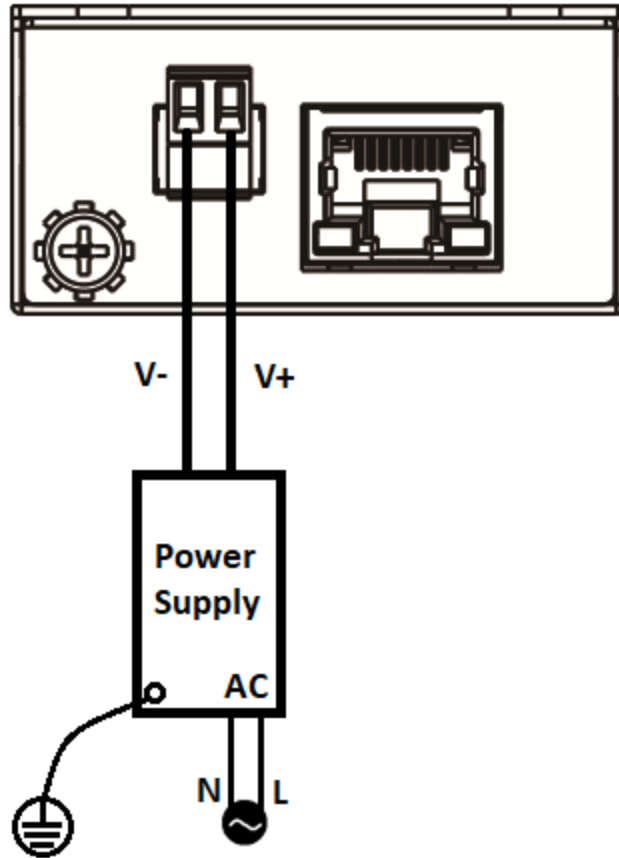


Figure 2.4 - DC Power Connection

### Earth Ground Connection

An earth ground connector is provided on the top panel with an earth ground sign next to it. Grounding the device properly can help to release leakage of electricity to the earth safely so as to reduce unexpected influences from electromagnetic interference (EMI) and electromagnetic susceptibility (EMS).

Prior to connecting to the power, it is important to connect the ground wire to the earth. Follow steps below to install ground wire:

1. Loosen or remove the grounding screw.
2. Attach the grounding screw to the ring-type or fork-type terminal of the grounding cable. Make sure that the grounding cable is long enough to reach the earth.
3. Use a screwdriver to fasten the grounding screw.

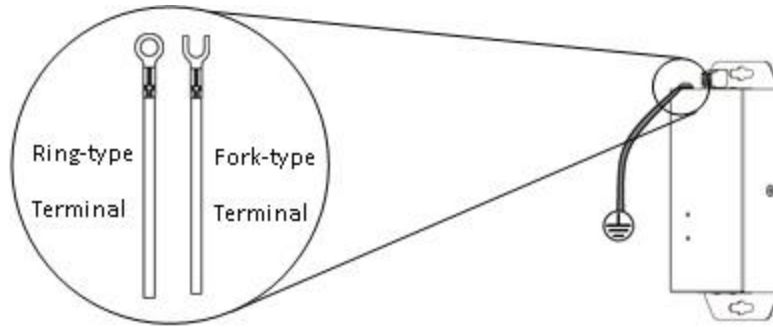


Figure 2.5 - Grounding Cable Type

Figure 2.6 - Grounding Connection



## 3 Mounting Installation

### 3.1 Wall Mounting

Each Ethernet extender comes with a pair of wall-mounting hardware brackets. When installing the wall-mounting brackets, be sure to correctly align the screw holes. Use the screws provided in the wall-mounting kit to securely fasten the brackets.

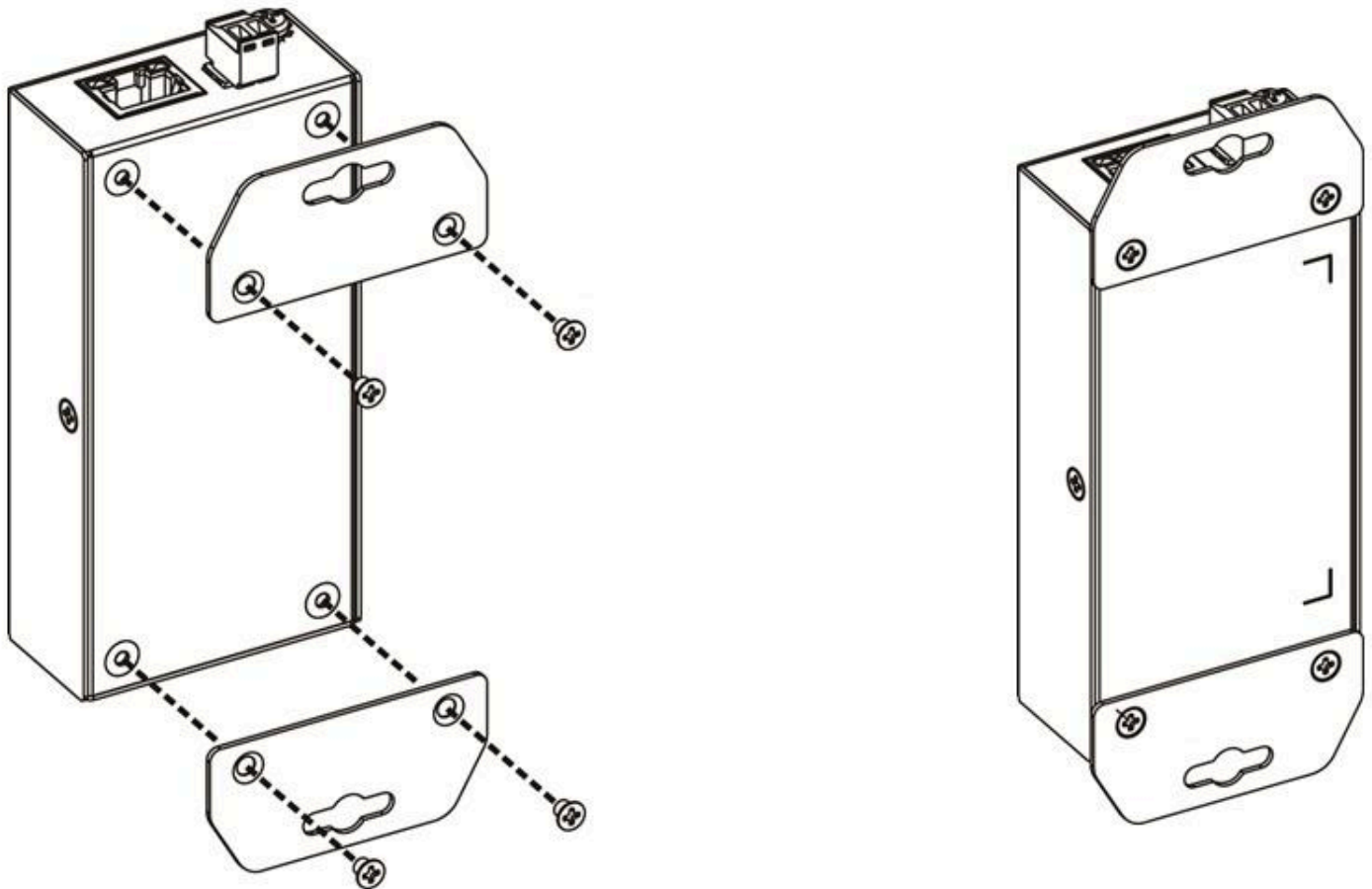


Figure 3.1 - Attaching Wall-Mounting Brackets to the Device

Once two wall-mounting brackets are securely attached to the device, prepare two appropriate screws for wall-mounting installation.

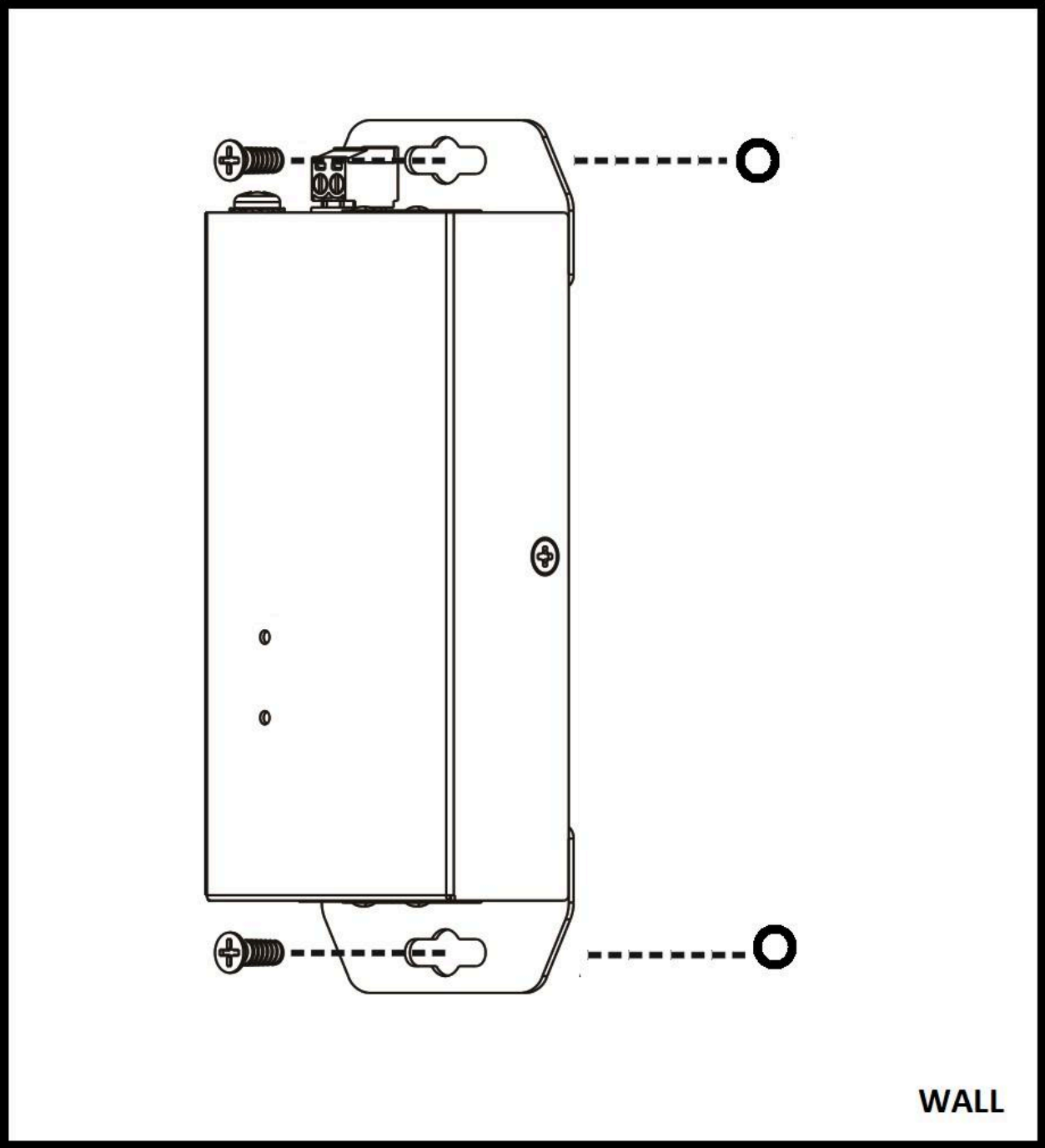


Figure 3.2 - Wall-Mounting Installation

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