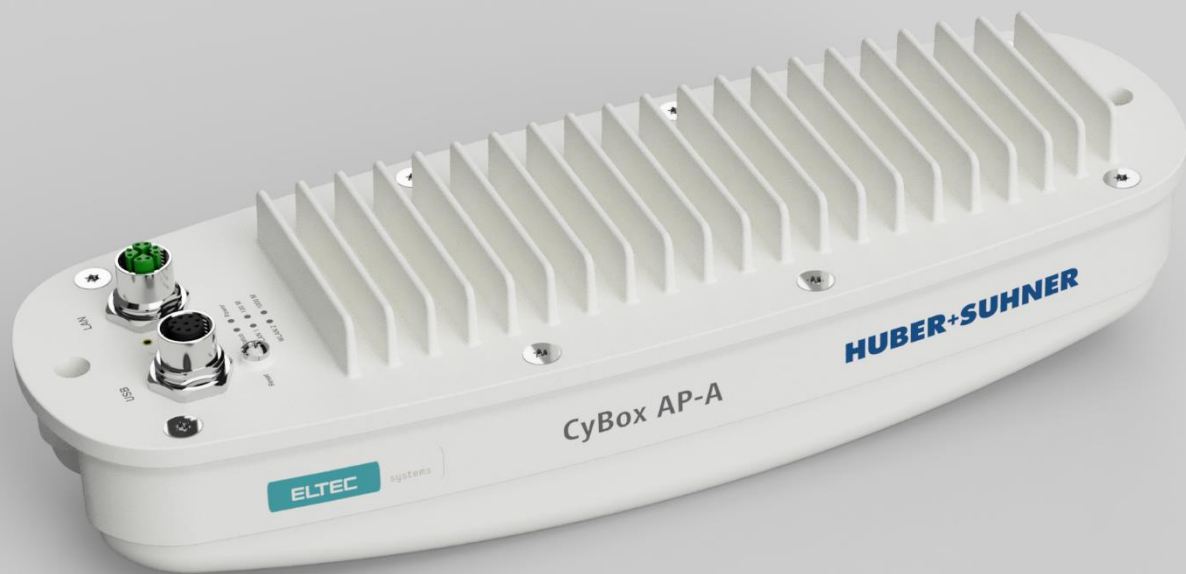


CYBOX AP-A | SENCITY® RAIL  
ACTIVE IN-CARRIAGE ANTENNA  
WIRELESS ACCESS POINT WITH INTEGRATED ANTENNA



# INSTALLATION MANUAL

## DISCLAIMER


### Copyright

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Our General Business, Delivery, Offer, and Payment Terms and Conditions shall otherwise apply.

## SAFETY INFORMATION


### Electrical safety

	<p><b>WARNING</b></p> <p>The device can be operated with voltages up to 56 V DC. Incorrect handling risks causing a fatal electrical shock.</p>
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### General advice

- Only qualified personnel is allowed to install, operate and maintain the devices.
- Please take safety precautions against electrostatic discharge (ESD).
- To prevent the risk of electric shock, turn off the external power supply and remove the power supply cable from the electrical outlet before handling or disassembling the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

## Operation safety

	<p><b>WARNING</b></p> <p>The device can become hot during operation (~ 60 °C).          Make sure it is protected from accidental contact.          The device must be installed so that it is not accessible to children.</p> <p>To prevent burns, switch off the device and allow to cool down for half an hour before disassembling or working on it.</p>
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- Before installing the device and connecting cables to it, carefully read the related manuals.
- Before using the device, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- Connect cables and use cable holder to avoid any tension forces on the connectors.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Please avoid any metallic material in front of the antenna or beside it.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

## Radio Frequency Exposure Statement

At least 20 cm separation distance between the antenna and the user's body must be maintained at all times.

## RECYCLING

Please recycle packaging environmentally friendly:



Packaging materials are recyclable. Please do not dispose packaging into domestic waste but recycle it.

Please recycle old or redundant devices environmentally friendly:



Old devices contain valuable recyclable materials that should be reutilized. Therefore, please dispose old devices at collection points which are suitable.

### EU DECLARATION OF CONFORMITY



ELTEC Elektronik AG herewith declares that the device is compliant to the basic requirements of the directive 2014/53/EU. The full text of the EU declaration of conformity is available in the Download Center at [www.eltec.com](http://www.eltec.com).

### UNITED STATES – FCC

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- this device may not cause harmful interference and
- this device must accept any interference received including interference that may cause undesired operation.

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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### CANADA – ISED

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

- this device may not cause interference and
- this device must accept any interference, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the Interference-Causing Equipment Standard ICES-003.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- l'appareil ne doit pas produire de brouillage.
- l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement a été testé et déclaré conforme aux limites d'un appareil numérique de classe A, conformément à la norme ICES-003 relative au matériel brouilleur.

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## 1 ABOUT THIS DOCUMENT

This installation manual is intended only for system developers and integrators; it is not intended for end users.

It describes the hardware functions of the product, connection of peripheral devices and integration into a system. Additional information on special applications and the configuration of the product is available in a separate configuration manual which can be downloaded from the Download Center at [www.eltec.com](http://www.eltec.com).

## 2 OVERVIEW

### 2.1 PRODUCTS

This installation manual comprises all information to set-up the following product.

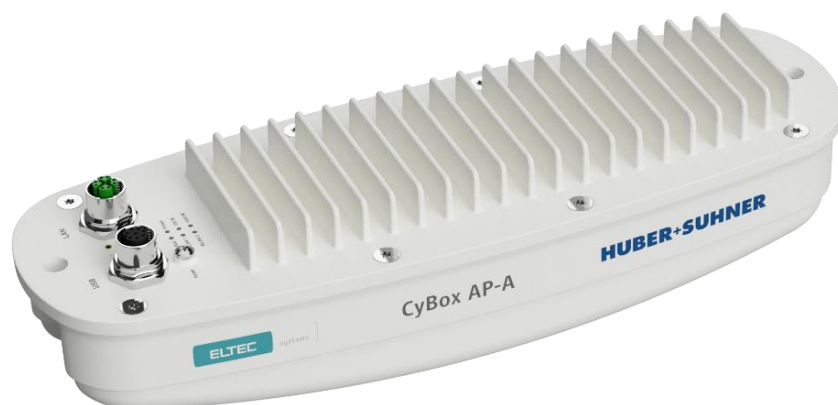


Figure 1 Picture of CyBox AP-A

## 3 HARDWARE

### 3.1 DEVICE CONNECTORS

#### 3.1.1 POWER OVER ETHERNET (POE+)

The CyBox AP-A is designed to be supplied via the Ethernet uplink, as class 4 powered device, according to IEEE 802.3at. In this case the supply voltage is provided remotely over the injector.

#### 3.1.2 ETHERNET INTERFACES

The LAN port of the CyBox AP-A is utilizing a M12 X-coded connector (CAT-6A) with the pin assignment as shown in Table 1. Mating connectors are available from several manufacturers.

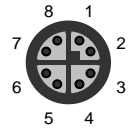
	PIN	SIGNAL NAME	DESCRIPTION
	1	D1+	First data line plus
	2	D1-	First data line minus
	3	D2+	Second data line plus
	4	D2-	Second data line minus
	5	D4+	Fourth data line plus
	6	D4-	Fourth data line minus
	7	D3-	Third data line minus
	8	D3+	Third data line plus

Table 1 Pin Assignment of M12 Ethernet Connector (LAN 1)

### 3.2 ANTENNAS

The CyBox AP-A consists of a single housing with integrated antennas which are located behind the plastic cover of the device. There is no need for external RF cable installation because each of the two radio modules is connected internally to the antennas via pigtailed.

### 3.3 M12 SERVICE INTERFACE (USB AND SERIAL PORT)

The CyBox AP-A is equipped with a USB and serial port. The USB port can be used to attach a memory device to update the firmware or to configure the device.

Note that the USB port is a dedicated maintenance port. It is not designed to be used while the device is in operation inside rolling stock equipment.

Table 2 shows the pin assignment of the power supply connector.

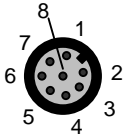
	PIN	SIGNAL NAME	DESCRIPTION
	1	USB-VCC	USB positive power supply voltage
	2	USB-D-	USB negative data line
	3	USB-D+	USB positive data line
	4	USB-GND	USB negative power supply voltage
	5	DNC	Do not connect
	6	RS232-TX	Console port transmit data
	7	RS232-RX	Console port receive data
	8	RS232-GND	Console port ground

Table 2 Pin Assignment of M12 Service Connector

### 3.4 COVER PLATE WITH INTERFACES

The figure below provides an overview of the cover plate.

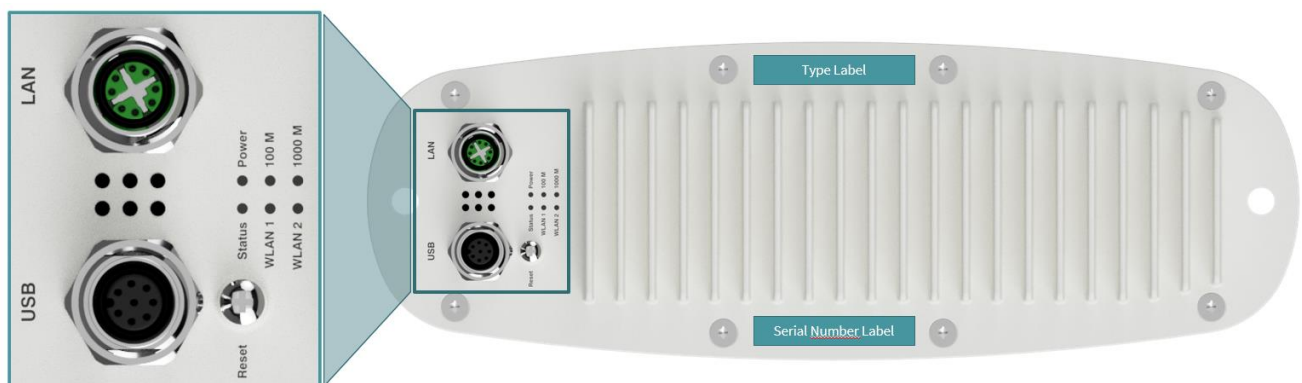


Figure 2 Cover Plate Overview

### 3.5 LED INDICATORS

The LEDs on the cover plate of CyBox AP-A provide quick indication of the device status.

#### 3.5.1 POWER LED STATUS

LED COLOR	STATE	DESCRIPTION
Green	On	Device is receiving correct input power
Green	Off	Device is not powered

Table 3 **Power LED Status**

#### 3.5.2 STATUS LED STATUS

LED COLOR	STATE	DESCRIPTION
Green	On	Normal operation
Green	Off	Device is booting   self-testing
Green	Blinking	Device is resetting to factory settings
Green/Red	Toggle Green/Red	Emergency system booted
Red	On	Software   Configuration error
Red	Off	Normal operation

Table 4 **Status LED Status**

#### 3.5.3 WLAN 1 LED STATUS

LED COLOR	STATE	DESCRIPTION
Green	On	Indicates module 1 is in use
Green	Blinking	Indicates data transfer on module 1
Green	Off	Indicates module 1 is inactive

Table 5 **WLAN 1 LED Status**

#### 3.5.4 WLAN 2 LED STATUS

LED COLOR	STATE	DESCRIPTION
Green	On	Indicates module 2 is in use
Green	Blinking	Indicates data transfer on module 2
Green	Off	Indicates module 2 is inactive

Table 6 **WLAN 2 LED Status**

### 3.5.5 LAN LED (100 M) STATUS

LED COLOR	STATE	DESCRIPTION
Green	On	100 Mbit/s link established
Green	Blinking	Indicates 100 Mbit/s data transfer
Green	Off	No 100 Mbit/s link

Table 7 **LAN LED (100 M) Status**

### 3.5.6 LAN LED (1000 M) STATUS

LED COLOR	STATE	DESCRIPTION
Green	On	1000 Mbit/s link established
Green	Blinking	Indicates 1000 Mbit/s data transfer
Green	Off	No 1000 Mbit/s link

Table 8 **LAN LED (1000 M) Status**

## 3.6 RESET SWITCH

The CyBox AP-A is equipped with a hidden reset switch behind the cover plate, close to the service connector. The button is accessible with a straightened paper clip pushed through the little hole behind the sealing screw on the cover plate. The sealing screw must be tightened with a torque of 1.2 Nm.

The effect of pressing the reset switch depends on the duration of its activation, as indicated in Table 9 below. The timing behavior is only valid if the device has completely booted (after approx. 1 min). While the device is booting or executing U-Boot, pushing the button will always reset the device.

The following table describes the functions of the reset switch.

HOLD TIME	STATUS LED BEHAVIOR	ACTION
< 2 seconds	Off	Reset after release
2-5 seconds	Off	No action
> 5 seconds	Green blinking	Remove custom configuration then reset

Table 9 **Reset Switch Behavior**

## 4 MOUNTING

When mounting the CyBox AP-A please consider the following aspects:

- Do not install the device close to any sources of heat such as radiators or heat registers.
- Keep the device away from any liquids. The protection class of the housing is IP54.
- Keep a free space of at least 150 mm around the cooling fins to ensure adequate heat dissipation capabilities.
- The housing provides two mounting holes to install the device in horizontal or vertical orientation on a planar, flat and stable surface with a cutout for the connectors and cooling fins.
- For fixation use two M8 screws of sufficient length (ISO 4762) with the included M8 washers.

The drawings in Figure 3 to Figure 5 show the outer dimensions of the housing and installation process for the access point, including the position of the mounting holes.

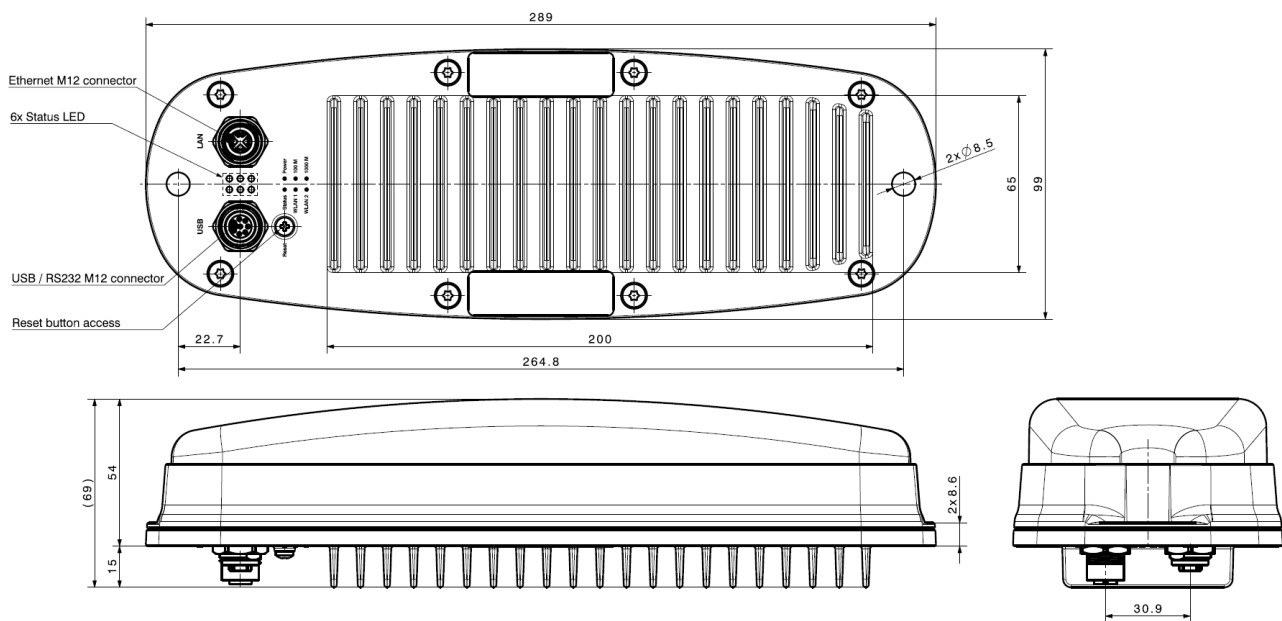
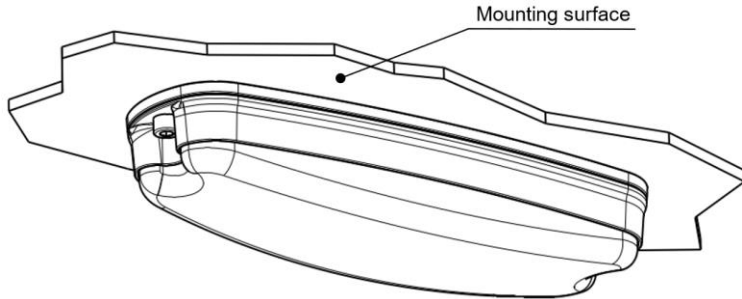
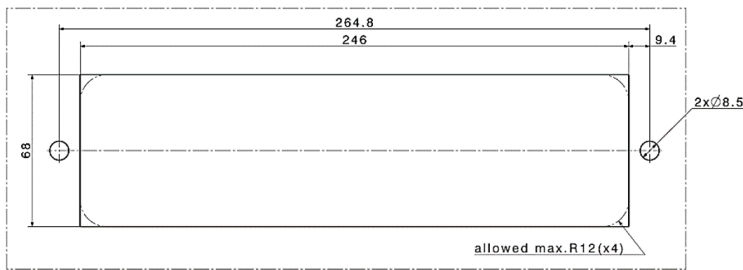


Figure 3 Dimensions of the access point housing



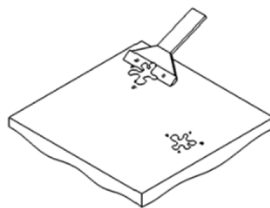
Antenna shall be mounted indoor.

The surface where the antenna is mounted shall be stable



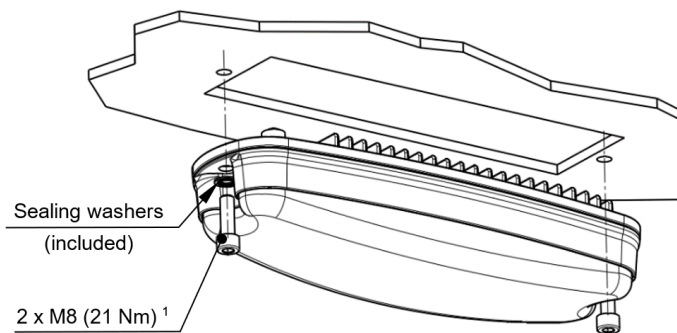
Cut out the rectangular shape according to the template.

Drill two holes for the M8 mounting screws.



Clear the area where the antenna is mounted from paint, corrosion, anodized layer, dust, cutting chip, burrs, oil and grease.

Figure 4 Recommended cutout for the installation of the access point



Product shall be mounted with two M8 screws.

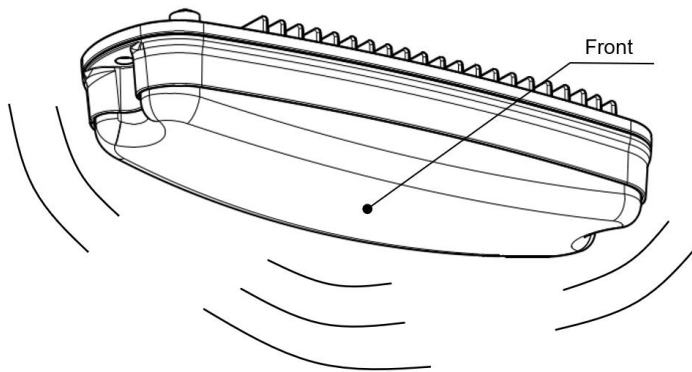
1) Use mounting screws according to ISO 4762. Screws are not included.

Figure 5 Mounting of the access point

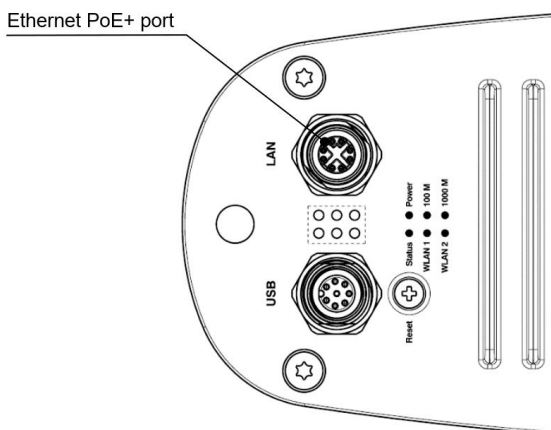


### 4.1 ELECTRICAL CONNECTION

1. Establish a connection to the network by plugging a M12 patch cable to M12 ethernet connector on the cover plate which is shown in Figure 6.
2. Make sure to use a PoE+ injector for correct operation.
3. Ensure that the ethernet cable is intact and undamaged. Do not switch on the system if there are damages on the ethernet cable or plug.
4. Use power cables which are approved for the power supply in your country.
5. The device itself has no on/off switch It starts as soon as it is supplied with power.



Please avoid any metallic material in front of the antenna or beside it.



Connect Ethernet cable to the correct port as shown.

Use cable holder to avoid any tension forces on the connectors.

Figure 6 Cable connection of the access point