COMMSCOPE UH17P2 ION-U Remote Unit for Cellular System Instruction Manual

Installation Instruction
The Remote Unit, Extension Unit or Master Unit must be mounted by professionel/special trained installer.

MECHANICAL INSTALLATION
Health and Safety for Mechanical Installation

Read and observe chapter /.3 Health and Safety.

Contents

General Installation Safety Requirements

Wet conditions increase the potential for receiving an electrical shock when installing or using electrically powered equipment. To prevent electrical shock, never install or use electrical equipment in


cation or during a lightning storm.


Do not remove caps from any of the connectors until instructed to do so.


Read and observe all the warning labels attached to the unit. Make sure that all warning labels are kept in a legible condition. Replace any missing or damaged labels.

Installation Cautions


Read and observe all cautions listed in **"Safely Working with a CAP H" on page 18.**


Do not install the unit in a way or at a place where the specifications outlined in the Environmental and Safety Specifications leaflet of the supplier are not met.


Due to power dissipation, the CAP H may reach a very high temperature. Ensure sufficient airflow for ventilation. Do not operate this equipment on or close to flammable materials. Use caution when servicing the CAP H.


Exceeding the specified load limits may cause the loss of warranty.


When connecting and mounting the CAP H cables, ensure that no water can penetrate the unit chassis through these cables.

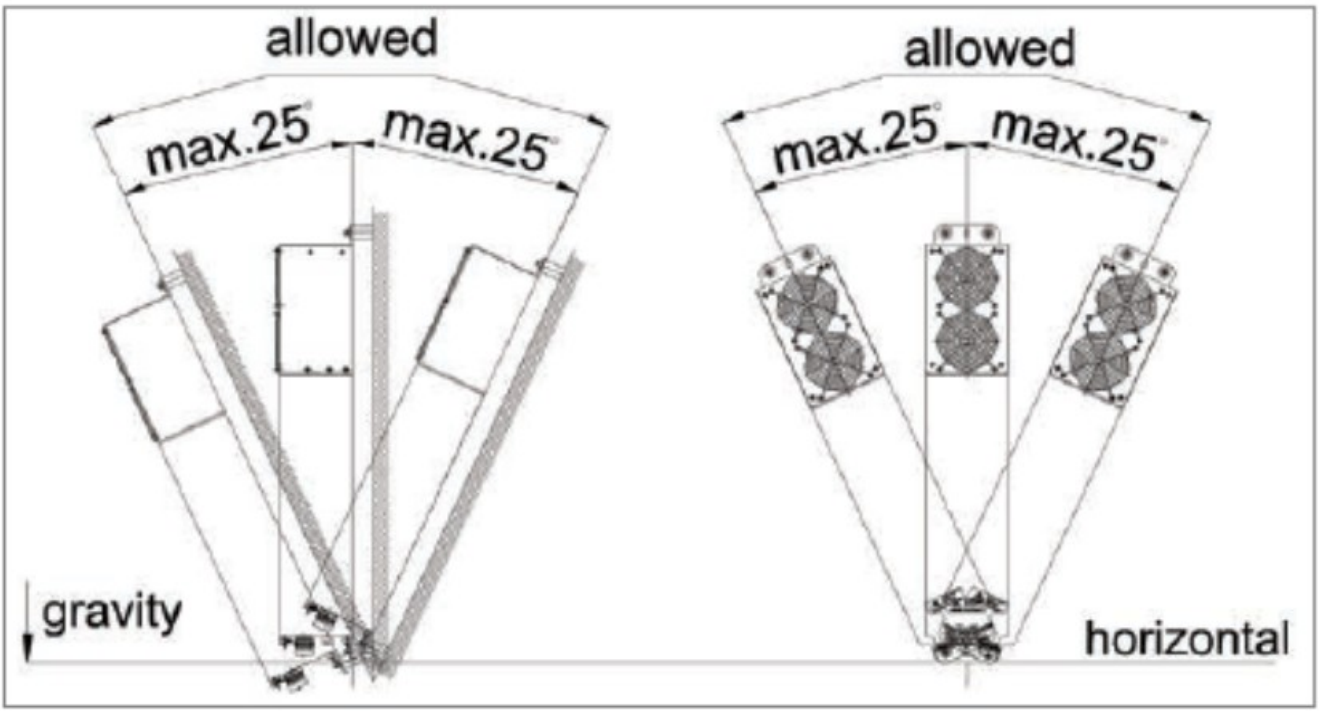

Ensure that there is free access to the electrical connections as well as to the cabinet. The approved bending radius of the connected cables ust not be exceeded. See **'Determine the Mounting Site" on page 28.**


If any different or additional mounting material is used, ensure that the mounting remains as safe as the mounting designed by the manufacturer. The specifications for stationary use of the CAP H must not be exceeded. Ensure that the static and dynamic strengths are adequate for the environmental conditions of the site. The mounting itself must not vibrate, swing or move in any way that might cause damage to the CAP H.


A spacing of 50 mm (1.97 inch) around the unit is required.


To ensure sufficient airflow when mounting the CAP H in enclosed spaces, two lid openings (one for the air inlet and the other for the air outlet) must be provided. Do not block these air inlets and outlets when mounting the CAP H. The size of each opening must equal at least 18 x 18 cm (> 300 cm2). Ensure that there is no thermal short circuit between the air inlet and air outlet. Make sure free airflow is not deflected or otherwise obstructed.


Observe all additional rules or restrictions regarding mounting that apply to specific CAP H types. For details refer to the mechanical specifications in the data sheet for the unit. Install the unit vertically with the Fan Unit at the top. A maximum tilt angle of 25° from a vertical position must be maintained, as shown in the following illustration.



ELECTRICAL INSTALLATION
Health and Safety for Electrical Installation
Read and observe chapter /.3 Health and Safety.

Working Safely with MAINS Power

Read and observe all cautions listed in “Safely Working with a CAP H” on page 18.
Electrical hazard. Danger of death or fatal injury from electrical current. Obey all general and regional installation and safety regulations relating to work on high voltage installations, as well as regulations covering correct use of tools and personal protective equipment.

Ground (earth) the unit before connecting the power supply. Grounding bolts are provided on the CAP H connector panel to connect the ground-bonding cable. See “Ground the CAP H” on page 37.

If the CAP H MAINS connector is not easily accessible, a disconnect device in the mains power circuit must be provided within easy reach.

A connection of the mains supply to a power socket requires the power socket to be near the CAP H. Before connecting or disconnecting the CAP H MAINS connector, ensure that the mains power supply is disconnected.

Make sure that an appropriate circuit breaker is acting as a disconnect device (as required by IIEC/EN62368-1 annex L) and an overcurrent limiting device are connected between mains power and the CAP H.

Incorrectly wired connections can destroy electrical and electronic components.

To avoid corrosion at the connectors caused by electrochemical processes, the material of the cable connectors must not cause a higher potential difference than 0.6 V (see electrochemical contact series).

For destabilized electric networks, which frequently generate spikes, the use of a voltage limiting device

is advised.

Unused connectors must be closed with their protective covers to ensure water tightness.

For the AC power supply connection, a minimum cross section of 1.5 mm2 is required. Each wire must observe the applicable national regulations regarding loop impedance, voltage drop, and methods of installation. Make sure to connect the correct voltage to the CAP H.

CAP H APs require a minimum 120 Volt / 15 Amp or 240 Volt / 13 Amp, single-phase, 50 / 60 Hz AC service. MAINS power must be interruptible with an external delay-actions mains breaker.
CommScope recommends external AC breakers capable of at least 15 Amps max. for 120-Volt service or at least 13 Amps for 240-Volt service.

Do not connect or disconnect the power cord at the mains connector while power is on. Turn off mains power before connecting the power cord at the CAP H, then engage mains again.

Do the following to connect the MAINS power to the CAP H.

1. Follow the steps in **"Ground the CAP H" on page 37.**
2. Locate the MAINS power cable that was delivered with the CAP H (shown in **Figure 11 on page 47).**
3. Locate or install a suitable power junction box or receptacle near the CAP H, and then route the power cable from the power source to the CAP H./h

   Do not connect the cable to the CAP H MAINS connector at this time. The power source must be interruptible.
4. Secure the MAINS cable per local regulations and electrical codes. Allow enough slack in the cable at the CAP H to plug or unplug the cable into the CAP H MAINS connector.
5. Wire the power cable to the junction box or receptacle. Refer to the color code and pin numbers shown in **Figure 11 on page 47.**
6. With the cable's MAINS plug disconnected from the CAP H, turn the circuit breaker on, unscrew the plug's protective cover, and carefully test the plug with a voltmeter to ensure that the voltage and polarity are correct.
7. Once the testing has been completed, turn off the circuit breaker.
8. Unscrew the protective cover from the MAINS connector of the CAP H (see Figure 11 on page 47).
9. Insert the plug into the MAINS connector and tighten the clamping ring until it is hand-tight. Do not over-tighten the clamping ring.
10. Turn on the circuit breaker.

The CAP H is powered on as soon as power is connected to it.

HEALTH AND SAFETY

RF Safety Cautions

This system is a RF Transmitter and continuously emits RF energy. Maintain a minimum clearance from

the antenna as specified in Table 7 while the system is operating. Whenever possible, power down the CAP H before servicing the antenna.

 Only license holders for the respective frequency range are allowed to operate this unit.

 Do not operate the CAP H without terminating the antenna connectors. The antenna connectors may be terminated by connecting them to their respective antennas or to a dummy load.

Health and Safety Precautions

 Electrical hazard. Danger of death or fatal injury from electrical current. Obey all general and regional installation and safety regulations relating to work on high voltage installations, as well as regulations covering correct use of tools and personal protective equipment.

 Laser radiation. Risk of eye injury in operation. Do not stare into the laser beam; do not view the laser beam directly or with optical instruments.

 High-frequency radiation in operation. Risk of health hazards associated with radiation from the antenna(s) connected to the unit. Implement prevention measures to avoid the possibility of close proximity to the antenna(s) while in operation.

 Risk of injury by the considerable weight of the unit falling. Ensure there is adequate manpower to handle the weight of the system.

 Risk of serious personal injury by equipment falling due to improper installation. The installer must verify the following.

- There is adequate manpower to handle the weight of the system during installation.
- That the supporting surface will safely support the combined load of the electronic equipment and all attached hardware and components.
- When wall mounting a CAP H, the wall anchors (screws and anchors) used to mount the CAP H should be appropriate for the wall structure/material.

Property Damage Warnings

 Only suitably qualified personnel are allowed to work on this unit and only after becoming familiar with all safety notices, installation, operation and maintenance procedures contained in this installation guide.

 Keep operating instructions within easy reach and make them available to all users.

 When opening the CAP H, do not damage the warranty labels on the internal devices. The warranty is void if the seals are broken.

 Make sure the repeater settings are correct for the intended use (refer to the manufacturer product information) and regulatory requirements are met. Do not carry out any modifications or fit any spare parts, which are not sold or recommended by the manufacturer.

 Due to power dissipation, the CAP H may reach a very high temperature. Ensure sufficient airflow for ventilation. Do not operate this equipment on or close to flammable materials. Use caution when servicing the CAP H.

 Although the CAP H is internally protected against overvoltage, it is strongly recommended to ground (earth) the antenna cables close to the antenna connectors of the unit for protection against atmospheric discharge. In areas with strong lightning, it is strongly recommended to install additional lightning protection.

 Guard Against Damage from Electro-Static Discharge
Electro-Static Discharge (ESD) can damage electronic components. To prevent ESD damage, always wear A an ESD wrist strap when working with ERA hardware components. Not all ERA hardware requires grounding. For those hardware components for which grounding is required, connect the ground wire on the ESD wrist strap to an earth ground source before touching the component. Wear the wrist strap the entire time that you work with the hardware.

Compliance

1. Notice: For installations, which have to comply with FCC RF exposure requirements, the antenna selection and installation must be completed in a way to ensure compliance with those FCC requirements. Depending on the RF frequency, rated output power, antenna gain, and the loss between the repeater and antenna, the minimum distance D to be maintained between the antenna location and human beings is calculated according to this formula:

$$D_{[cm]} = \sqrt{\frac{P_{[mW]}}{4 * \pi * PD_{[mW/cm^2]}}}$$

   where

   • P(mW) is the radiated power at the antenna, i-e. the max. rated repeater output power in addition to the antenna gain minus the loss between the repeater and the antenna.

   • PD (mW/cm') is the allowed Power Density limit acc. to 47 CFR 1.1310 (B) for general population /uncontrolled exposures which is – f(MHz) / 1500 for frequencies from 300MHz to 1500MHz – 1 for frequencies from 1500MHz to 100,000MHz RF exposure compliance may need to be addressed at the time of licensing, as required by the responsible FCC Bureau(s), including antenna co-location requirements of 1.1307(b)(3).
2. **Notice:** For installations which have to comply with European EN50385 exposure compliance requirements, the following Power Density limits/guidelines (mW/cm7*) according to ICNIRP are valid:

   • 0.2 for frequencies from 10 MHz to 400 MHz e f(MHz) / 2000 for frequencies from 400 MHz to 2 GHz

   • 1 for frequencies from 2 GHz to 300 GHz
3. **Notice:** Installation of this equipment is in full responsibility of the installer, who has also the responsibility, that cables and couplers are calculated into the maximum gain of the antennas, so that this value, which is filed in the FCC Grant and can be requested from the FCC data base, is not exceeded. The industrial boosters are shipped only as a naked booster without any installation devices or antennas as it needs for professional installation.
4. **Notice:** For installations which have to comply with FCC/ISED requirements: English: This device complies with FCC Part 15. 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. This device complies with Health Canada's Safety Code. The installer of this device should ensure that RF adiation is not emitted in excess of the Health Canada's requirement. Information can be obtained at **http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radio_guide-lignes_direct-eng.php.**

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Antenna Stmt for ISED:

This device has been designated to operate with the antennas having a maximum gain of 9 dBi. Antennas having a gain greater than 9 dBi are prohibited for use with this device without consent by ISED regulators. The required antenna impedance is 50 0. The antenna(s) used for this transmitter must be installed to provide a minimum separation distance (as specified in Table 7) from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

5. **Notice:** The unit complies with Overvoltage Category II. It also complies with the surge requirement according to EN 61000-4-5 (fine protection); however, installation of an additional medium (via local supply connection) and/or coarse protection (external surge protection) is recommended depending on the individual application in order to avoid damage caused by overcurrent. For Canada and US, components used to reduce the Overvoltage Category shall comply with the requirements of IEC 61643-series. As an alternative, components used to reduce the Overvoltage Category may comply with ANSI/IEEE C62.11, CSA Certification Notice No. 516, CSA C22.2 No. 1, or UL 1449. Suitability of the component for the application shall be determined for the intended installation.
6. Notice: Corresponding local particularities and regulations must be observed. For national deviations, please refer to the respective documents, which are available from CommScope.
7. Note: For a Class B digital device or peripheral:

   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 RF technician for help
8. **Notice:** For a Class A digital device or peripheral. 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.
9. **Note:** This unit complies with European standard EN60950-1 / EN62368-1.
10. **Note:** The output power at the antenna connector of the CAP H can be up to 43 dBm (20 W) in the 758 – 768

MHz band. This output power of 20 W at the unit's antenna connector can be reduced to 5 W per channel ERP (maximum allowed) by using appropriate antenna equipment. For example: feeder cable loss + antenna gain: – 10 dBd 43 dBm (20 W) + (- 10 dBd) = 33 dBm (2 W) ERP

Equipment Symbols Used Compliance

Please observe the meanings of the following symbols used in our equipment and the compliance warnings listed in Table 6.

Table 6. Compliance Labels

Symbol	Compliance	Meaning
—	FCC	For industrial (Part 20) signal booster: WARNING: 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 Licensee to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of $100,000 for each continuing violation.
		For (Part 90) signal booster: WARNING: 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 Licensee to operate this device. You MUST register Class B signal boosters (as defined in 47 CFR 90.219) online at **www.fcc.gov/signal-boosters/registration**. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of $100,000 for each continuing violation.
—	ISED	WARNING: 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. AVERTISSEMENT: Ce produit N'EST PAS un appareil de CONSOMMATION. Il est concu pour 6tre installs par un installateur approuve par un titulaire de licence d'ISDE. Pour utiliser cet appareil, vous DEVEZ detenir une LICENCE d'ISDE ou avoir obtenu le consentement expnas d'un titulaire de licence autorise par ISDE.
CE	CE	To be sold exclusively to mobile operators or authorized installers – no harmonized frequency bands, operation requires license. Intended use: EU and EFTA countries.
		Indicates conformity with the RED directive 2014/53/EU and/or RoHS directive 2011/65/EU.
CE 0700	CE	Indicates conformity with the RED directive 2014/53/EU and RoHS directive 2011/65/EU certified by the notified body no. 0700.

Required Antenna Distances

Table 7. Required Antenna Distances

CAP H Model	Antenna gain without cable loss [dBi]	Minimum Distance			
		FCC		ISE D	
		m	inches	m	inches
CAP H 17E/17E/19/19	9	2.	88.	3.	128.
CAP H 7E/80-85/17E/19	9	3.	107.	4.	154.
CAP H 23/23/25T/25T	9	2.	78.70	3.	107.
CAP H 80-85/17E/19/26	9	2.	100.	3.	131.

Documents / Resources

	COMMSCOPE UH17P2 ION-U Remote Unit for Cellular System [pdf] Instruction Manual CAPH8171926, XS5-CAPH8171926, XS5CAPH8171926, UH17P2 ION-U Remote Unit for Cellular System, UH17P2, ION-U Remote Unit for Cellular System