AP400 - All Types

Installation Manual

A publication of

NEC Nederland B.V.

HILVERSUM, THE NETHERLANDS

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Great care has been taken to ensure that the information contained in this handbook is accurate and complete. Should any errors or omissions be discovered or should any user wish to make a suggestion for improving this handbook, he is invited to send the relevant details to:

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Regulatory information European Union

Declaration of Conformity

Hereby, "NEC Unified Solutions", declares that this "AP400" is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

 http://www.nec-unified.com/doc

PRODUCT DISPOSAL INFORMATION (EN)

For countries in the European Union

The symbol depicted here has been affixed to your product in order to inform you that electrical and electronic products should not be disposed of as municipal waste.

Electrical and electronic products including the cables, plugs and accessories should be disposed of separately in order to allow proper treatment, recovery and recycling. These products should be brought to a designated facility where the best available treatment, recovery and recycling techniques is available. Separate disposal has significant advantages: valuable materials can be re-used and it prevents the dispersion of unwanted substances into the municipal waste stream. This contributes to the protection of human health and the environment.

Please be informed that a fine may be imposed for illegal disposal of electrical and electronic products via the general municipal waste stream.

In order to facilitate separate disposal and environmentally sound recycling arrangements have been made for local collection and recycling. In case your electrical and electronic products need to be disposed of please refer to your supplier or the contractual agreements that your company has made upon acquisition of these products.

At www.nec-unified.com/weee you can find information about separate disposal and environmentally sound recycling.

For countries outside the European Union

Disposal of electrical and electronic products in countries outside the European Union should be done in line with the local regulations. If no arrangement has been made with your supplier, please contact the local authorities for further information.

Exposure to Radio Frequency (RF) Signals - All Countries:

This device with internal antennas must provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Regulatory information United States

This device contains functions which are not operational in US territories

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.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

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 equipment.
- Increase the separation between the equipment and receiver.
- Consult the dealer or an experienced radio/TV technician for help."

Privacy of communications may not be ensured when using this equipment.

Note:	*Please note that the AP400E is not available in USA/Canada.*

Exposure to Radio Frequency (RF) Signals:

This base station is a radio transmitter and receiver. It is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the OET Bulletin 65 Supplement C. These limits are part of comprehensive guidelines and establish permitted levels of RF energy for the general population. The guidelines are based on the safety standards previously set by international standards bodies. These standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

This device with internal antennas must provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

<u>Regulatory information Canada</u>

This device complies with Industry Canada licence-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.

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 : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Exposure to Radio Frequency (RF) Signals:

This wireless device is a radio transmitter and receiver. It is designed and manufactured not to exceed the emission limit for exposure to radio frequency (RF) energy set by the Ministry of Health (Canada), Safety Code 6. These limits are part of comprehensive guidelines and established permitted levels of RF energy for the general population. These guidelines are based on the safety standards previously set by international standards bodies. These standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

This device with internal antennas must provide a separation distance of at least 20 cm from all persons.

This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

Privacy of communications may not be ensured when using this equipment.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Note: *Please note that the AP400E is not available in USA/Canada.*

Contents:

PREFACE

This manual is applicable for the AP400, DECT Transceiver.

Please note that some product models or features described in this manual may not be available in all world regions."

No legal rights can be obtained from information in this manual.

Important:

The equipment described in this manual should be installed and maintained only by professional and qualified engineers in accordance with the procedures and instructions described in this manual.

1 AP400 GENERAL

1.1 GENERAL

This installation Manual is valid for installing a DECT transceiver (AP400) to a wall in horizontal or vertical position. The AP400 is designed for indoor use. When installing an AP400 outdoors, please use the dedicated Outdoor Cabinet and appropriate outdoor cabling

Note that there are two types of DECT Transceivers:

- **AP400** (with internal antennas).
- **AP400E** with directional antenna.

Note: *The AP400**E** must always be installed/used in the outdoor cabinet! For more information consult the manual for the Outdoor Cabinet for AP400.*

Note: *Please note that the AP400E is not available in USA/Canada.*

1.2 COUNTRY SELECTION

Country settings are pre-determined by the DAP Controller and this ensures that the AP400 only operates according to local country regulations. It is not possible for any 3rd party or end user to alter these settings or download software that controls the RF parameters.

The variant sold in each country can only operate in the frequency band allowed in that country. This is ensured by only delivering the correct DAP controller version for each country.

There are three types of DAP Controllers available for the AP400:

- **DAP Controller – International.**
  This version is used in EMEA countries and countries that use the European frequencies and power levels. In these countries, only the DAP Controller - International will be delivered, so no other frequencies than the European frequencies and power levels are possible in this region.

- **DAP Controller - North America**
  This version is used in North America and can only use the North American frequencies and power levels. In these countries, only the DAP Controller – North America will be delivered, so no other frequencies than the North American frequencies and power levels are possible in this region..

- **DAP Controller - Selective Countries.**
  This version is used in countries with frequency ranges other than EMEA or North America.

Note: *In North America, only the "DAP Controller - North America" will be delivered, so no other frequencies than the North America frequencies and power levels are possible in North America.*

Note: *In Europe, only the "DAP Controller - International" will be delivered, so no other frequencies than the European frequencies and power levels are possible in Europe.*

1.3   SITE REQUIREMENTS

Usually the Cabinets will be fixed to existing walls in the positions determined by the Site Survey.

Do not mount the AP400 to a metal wall!

1.4   TEMPERATURE RANGES

The temperature ranges of the AP400:

– Temperature range AP400: -5° to 45° C.

The AP400 should not be exposed to sunlight!

The outside temperature range for the AP400 (all types) mounted in the Outdoor Cabinet is as follows:

– Minimum outside temperature: -20° C
– Maximum outside temperature: 45° C

The Outdoor Cabinet should not be exposed to sunlight!

1.5   CABLE SPECIFICATIONS FOR AP400 Types

The cabling to the AP400(E) should be "Category 5" or "Category 6" Ethernet cabling. The interface is defined as an SELV interface according EN60950-1. For this reason the safety restriction as given in the next chapter should be respected:

The power for the AP400(E) must be supplied via the Ethernet cable, PoE (IEEE 802.3af). There is no room for a Mains Power adaptor inside the Outdoor Cabinet.

Note: *"Category 7" cabling is not supported!*

Note: *PoE source must comply with clause 2.5 (Limited Power Source) per EN 60950-1*

1.6 CABLING <u>SAFETY</u> REGULATIONs

<u>*Please read the following notes carefully:*</u>

Note: *When you are going to install an AP400(E) outdoors, it should always be installed in an Outdoor Box.*

Note: *The cabling and/or the AP400(E) may never be exposed to over-voltages (e.g. lightning) without proper protection.*

Therefore mind the following notes:

Note: *When the AP400 is installed in the Outdoor Cabinet, and the Outdoor Cabinet is mounted against a wall, lead the cable directly indoors. This avoids that the cable becomes sensitive to over-voltage. In that case, no lightning protection is needed. It is strongly recommended to use shielded Cat 5 cable. Make sure that the shield of the cable is connected to a proper "ground".*

Note: *When the AP400 is installed in the Outdoors and cabling runs outdoors, the cabling will be exposed to lightning and over-voltage. You must use lightning arrestors/protectors which comply with the local regulations and legislation. Furthermore, the cabling outdoors, must be shielded Cat. 5 cabling. Make sure that the shield of the cable is connected to a proper "ground".*

1.7 INTERNAL ELECTRICAL ISOLATION

The AP400(E) provides internal isolation (1,5 kV) between the Ethernet connection and the internal electrical components, including the antenna's and antenna connector in the AP400E in the AP400.

1.8 G.729 DAUGHTER BOARD

The AP400 does support the G.729 codec, but only if the G.729 Daughter Board is installed.

If the G.729 Daughter Board is not installed, the AP400 supports only G.711u law or G.711a law.

Installation of the Daughter Board is described in chapter 3. MOUNTING THE G.729 DAUGHTERBOARD.

1.9 VISUAL CHECK

The equipment must be carefully unpacked and examined for any visible sign of damage.

Anything not in order should be reported back to the supplier, as soon as possible, to avoid delays during installing due to missing equipment.

1.10 HORIZONTAL OR VERTICAL MOUNTING

The AP400 can be mounted horizontally or vertically. When mounting vertically, you don't need to change the antenna position.

Figure 1. AP400 in vertical position.

When the AP400 is mounted horizontally, the antenna position must be changed (see chapter 2).

Figure 2. AP400 mounted horizontally

1.11   INSTALLATION PROCEDURES

The installation of an Outdoor Cabinet comprises the installation of:

- Adjusting the Antenna position (if necessary).
- Mounting the G.729 Daughter Board (if applicable)
- Mounting the AP400 against the wall.
- Connecting directional antennas, if necessary.

Note: *The minimum distance between AP400s (DECT Access Points) must be more than 1 meter. (However, it is strongly recommended to respect a minimum distance of 5 meters between the AP400s.)*

1.12   UNPACKING

PROCEDURE: "Unpacking".

Actions

1.   Open the card board box and take the AP400 out.

2.   Check the AP400 for any damage.

3.   Continue with one of the following Chapters:

   – When you mount the AP400 vertically, the antenna position will normally be OK,
     and when you do not need to install the G.729 Daughter Board, continue with
     Chapter 4 MOUNTING THE AP400 AGAINST A WALL.
   – When you mount the AP400 horizontally, you must change the antenna position.
     Consult Chapter 2. ADJUSTING THE ANTENNA POSITION.
   – When you require G.729 codec support, you will have to install the G.729
     Daughter Board. Consult Chapter 3. MOUNTING THE G.729
     DAUGHTERBOARD.

2   ADJUSTING THE ANTENNA POSITION

This chapter is not applicable for the AP400E.

Note: *You only need to change the antenna position when you mount the AP400 horizontally! In all other cases you don't need to change the antenna position.*

Figure 3. AP400 mounted horizontally

PROCEDURE: "Adjusting the Antenna position".

Note: *Antenna position can be changed once. You should not change it back!*

Actions

1.   Remove the two screws from the rear side of the cabinet.
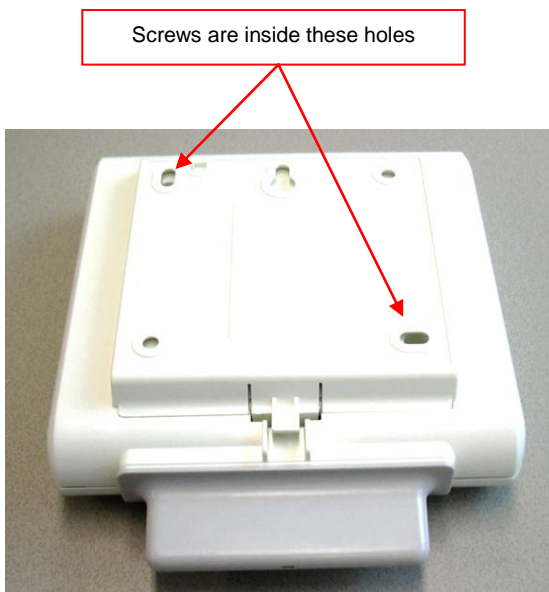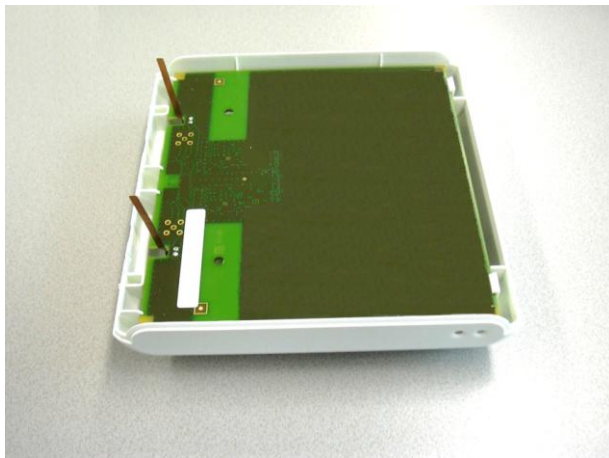
Screws are inside these holes

Figure 4. Rear side of Cabinet.

2. Open the cabinet CAREFULLY! Make sure that you shift the cover of the antenna's carefully from the antenna's.

3. Take the antenna cover from the AP400 cover.

4. To put the antennas in vertical position, bend them **_carefully_** as shown in Figure 5. Bend Antennas carefully into vertical position.

5. After the antennas are put in the vertical position, close the AP400 cabinet again. In other words, put the AP400 cover back into position and secure the screws at the rear side of the cabinet. See Figure 6. Antennas locked into Cover.
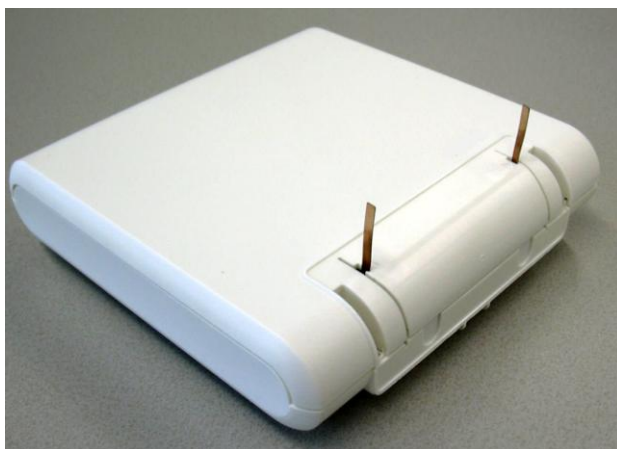

Figure 6. Antennas locked into Cover.

6.   Make sure that the antennas are properly locked into the locks in the AP400 cover.
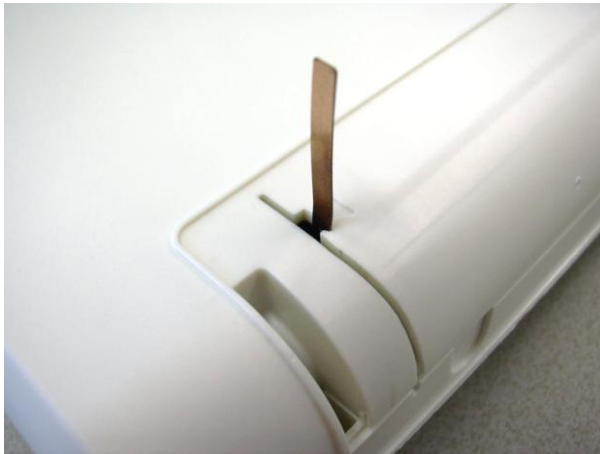

Figure 7. Detail of Antenna in lock.

7.   Move the antenna cover carefully over the antennas in the vertical position and make sure that the antennas do not bend. When the antenna cover is in its position, push it further into its position in the AP400 cabinet to fix it.

Figure 8. Cover installed.

8.   Now your AP400 is ready to be installed.

3   MOUNTING THE G.729 DAUGHTERBOARD

Follow the step-by-step procedure below, to install the G.729 daughter board.

PROCEDURE: "Installing the G.729 Daughter Board".

Actions

1.   Make sure that you have the G.729 Daughter board.

2.   Open the cabinet. Use steps 1 and 2 in Chapter 2.

3.   Take the PCB out of the cabinet.

Note: Mind the light conductor for the LEDs. It can drop off!

LED Light conductor
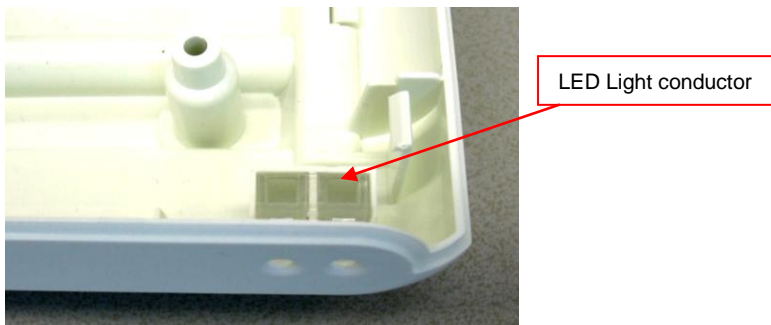
Figure 9. Light conductor for LEDs

4.   Now you should have the AP400 PWB and the G.729 Daughter Board as separate
        items.

5.   Remove the protection foil from the sticky part on the G.729 Daughter Board.
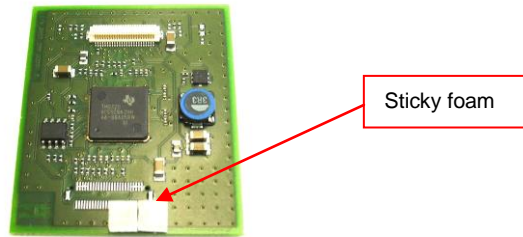
Figure 10. G.729 Daughter Board with sticky foam

6. Mount the G.729 Daughter Board onto the main PWB. Push the Daughter Board carefully onto the main board. The white connector should fit well. Make sure that the sticky part sticks to the Main Board.
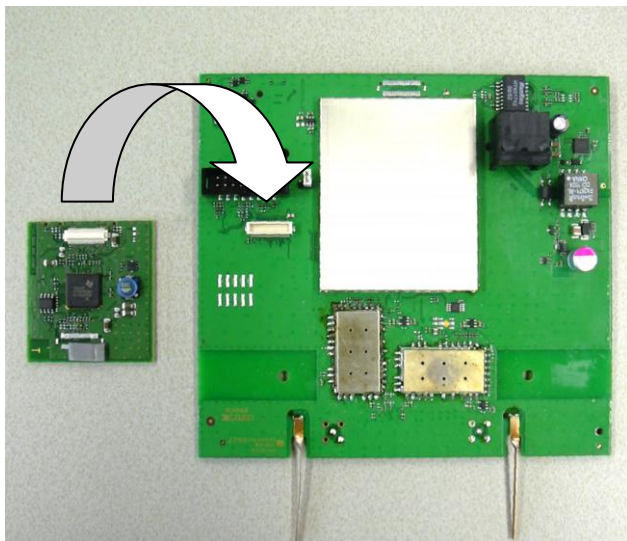
Figure 11. Mounting the G.729 Daughter Board onto the Main board.

7. Put the AP400 together in the reverse order as it was disassembled, mounting the PCB into the cabinet and assembling the cabinet. Do not forget to mount the two screws back into the rear side of the cabinet.

4   MOUNTING THE AP400 AGAINST A WALL/CEILING

PROCEDURE: "Procedure for mounting the AP400 to the wall".

Actions

1.   Remove the mounting plate from the AP400 cabinet.

Push clip up, to take mounting plate off.
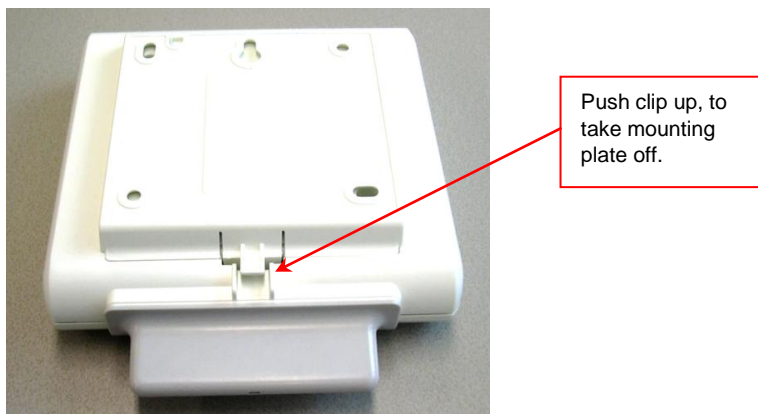
Figure 12. How to take the mounting plate off.

2. Mount the mounting plate to the wall or ceiling, using appropriate fitings.

Figure 13. Mounting plate..

3. Make sure that the Ethernet cable to the cabinet has the correct length.

4. If necessary, mount the RJ45 connector to the cable using the tool for mounting an RJ45 connector plug to a Category 5 or Category 6 cable.

5.   Lead the cable to the AP400 cabinet and connect the RJ45 connector. Push the
cable into the groove.

Figure 14. Cable at rear side of the cabinet.

6.   Push the cabinet onto the mounting plate.

Note: *When pushing the AP400 on to the mounting plate, make sure that you hear/feel
a distinct click. This indicates that the AP400 is firmly mounted to the mounting
plate.*
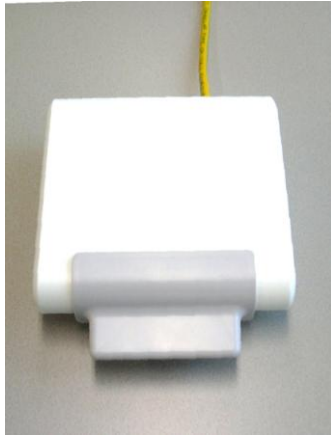
Figure 15. AP400 mounted against the wall.

5   LEDs

5.1   LED Status

The AP400 is equipped with two LEDs.

Top LED – Yellow

This LED represents the status of the AP400.

LED Status (Top LED, Yellow)	Meaning
Off	No power
0,5 seconds On - 0,5 seconds Off	Loading software/firmware
Short flash every 0,25 seconds	IP Network error (not connected, no DHCP/TFTP server, no DAP Controller
Fast blink	DAP operational, but trying to synchronize to another DAP
Continuous fast blink	Hardware error
Steady On	DAP operational (and synchronized to other DAP or is the synchronization master).

Table 1. AP400 LED Status on top LED

Lower LED – Red/Green

This LED is used to indicate the start-up and network status.

LED Status (lower LED, Red/Green)	Meaning
RED Steady on	Power but FPGA starting up
RED flashing	Trying to connect to the network
Green flashing	Network status display and showing network activity
Off	AP400 operational

Table 2. Lower LED status on the AP400.

5.2   LED Colours

The colour of the *top* LED might be different depending on the operational mode. The following operational modes are distinguished:

- **Normal (single band) mode**
  In the normal single band mode, the top LED will be Yellow.

- **Dual Band Mode**
  In Dual Band mode, the LED colour shows the operational frequency:
  – Green   :   Europe/International
  – Red   :   North America / USA

A   SPECIFICATIONS

Dimensions / Environment:

–	Dimensions (W x D x H) ....:	145 x 43 x 174
–	Outside temperature range...........................:	-5° C . . . 45° C
		The AP400 should not be exposed to sunlight. .
–	IP Specification ....:	In Outdoor Box = IP66
–	Relative Humidity ....:	5 . . . 95 %

PoE Specifications:

–	Voltage at AP400 via PoE ....:	36 . . . . 57 V. DC
–	PoE Class ....:	Class 2
–	Power Consumption.....................................:	6 Watt maximum

Note: *PoE source must comply with clause 2.5 (Limited Power Source) per EN 60950-1*

IP Specifications:

–	IP Network ....:	10/100Base-T IEEE802.3
–	Connector: ....:	RJ45
–	Cable ....:	Cat 5 / Cat 6 UTP.
		Cat 7 is not supported.
–	IP Version ....:	IPv4
–	DHCP/TFTP support ....:	Yes
–	Quality of Service ....:	IEEE802.1Q, IEEE802.1P

Audio CODEC:

–	AP400:..:	G.711
–	AP400 with Daughter Board ....:	G.711 and G.729

Country/Region support:

–	EMEA..:	1880 – 1900 Mhz
–	Latin America ....:	1910 – 1930 MHz
–	Brazil..:	1910 – 1920 MHz (< 20 dBm)

− North America ....:   1920 – 1930 MHz (< 21 dBm) power)

Note: *Country selection is determined by the DAP Controller Type! See section 1.2 COUNTRY SELECTION.*