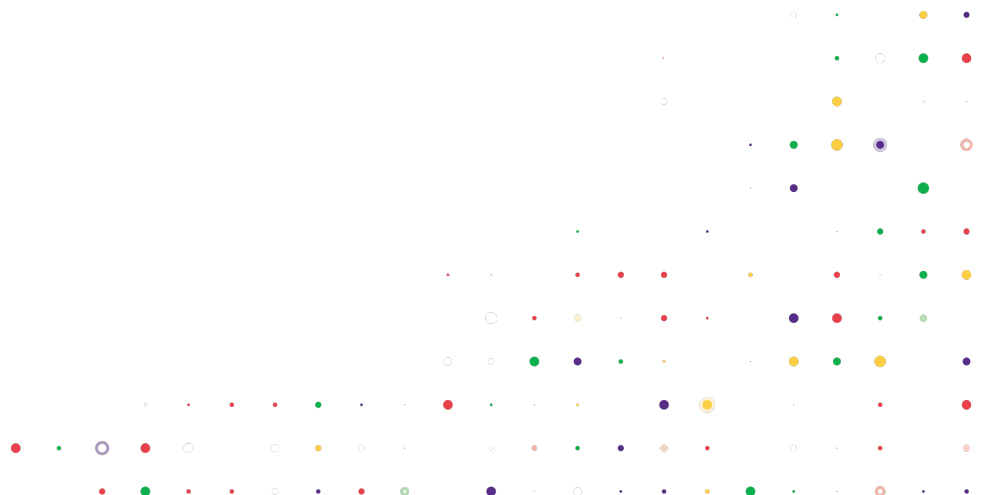


# Product Specification AP-2010

Last change: 27.03.2017



|          |                                                                |           |
|----------|----------------------------------------------------------------|-----------|
| <b>1</b> | <b>Introduction</b>                                            | <b>4</b>  |
| 1.1      | Key Features                                                   | 4         |
| 1.2      | Destination countries                                          | 4         |
| 1.3      | Scope of delivery                                              | 4         |
| <b>2</b> | <b>Barcode Information</b>                                     | <b>5</b>  |
| 2.1      | Serial Number                                                  | 5         |
| <b>3</b> | <b>Mechanical Characteristics</b>                              | <b>7</b>  |
| 3.1      | Mechanical Dimensions                                          | 7         |
| 3.2      | Front, Side and Top View                                       | 7         |
| 3.3      | Upper Surface                                                  | 8         |
| 3.4      | Side View                                                      | 8         |
| 3.5      | Rear View                                                      | 9         |
| <b>4</b> | <b>Mounting</b>                                                | <b>10</b> |
| 4.1      | Audience                                                       | 10        |
| 4.2      | General Instructions                                           | 10        |
| 4.3      | Instructions for the Mounting Location                         | 10        |
| 4.4      | Approachability                                                | 11        |
| 4.5      | Screw of the Antenna                                           | 11        |
| 4.6      | Metal Bracket for Mounting on Wall, Ceiling or T-Mounting Rail | 12        |
| 4.7      | Mounting on Wall or Ceiling                                    | 12        |
| <b>5</b> | <b>Electrical Specifications</b>                               | <b>15</b> |
| 5.1      | Used Channels                                                  | 15        |
| 5.2      | Difference WiFi and ESL protocol                               | 15        |
| 5.3      | Cabel Specifications                                           | 15        |
| 5.4      | Power Supply Specifications                                    | 16        |
| 5.5      | Pinout RJ45 Ethernet                                           | 16        |
| <b>6</b> | <b>Electrical &amp; RF Characteristics</b>                     | <b>17</b> |
| 6.1      | General Technical characteristics                              | 17        |
| 6.2      | Power and Current Consumption                                  | 17        |
| 6.3      | General Specifications                                         | 17        |
| <b>7</b> | <b>Environmental</b>                                           | <b>19</b> |
| 7.1      | Humidity and Operating Conditions                              | 19        |

7.2 Storage Conditions .....19

7.3 Cleaning Instructions .....19

**8 Packing ..... 20**

8.1 Packing Dimensions .....20

8.2 Illustrations .....20

8.3 Palletization .....21

**9 Certifications ..... 22**

9.1 Types .....22

9.2 Overview .....22

9.3 Applied Standards .....22

9.4 Declaration .....22

**10 Problems which requiring maintenance or replacement of the AP-2010 ..... 24**

**11 Intended Use ..... 25**

**12 Improper Use ..... 26**

**13 Warranty ..... 27**

# 1 Introduction

The Access Point AP-2010 by imagotag is a network device similar to WLAN access points that is required for communication with the imagotag electronic shelf labels (transmits price information to the labels).

Up to 10 000 labels can be managed per access point and the self-organizing network allows automatic roaming of labels without manual handling. The high transmission rate of the 2.4 GHz wireless technology and the intelligent task scheduling enables fast and secure updates on imago G1 labels of all sizes.

This document is the technical specification of the Access Point AP-2010.

In the USA and Canada the AP-2010 usa/canada bundle incl. antenna with limited data efficiency is required according to the FCC/IC regulations. This bundle has a reduced data efficiency for label/updates/hour, for more details see label product specification.

## 1.1 Key Features

- Manages up to 10 000 imago G1 labels of all sizes
- Covers up to 1 950 m<sup>2</sup> (depending on shop layout)
- Low power consumption – powered by PoE (Power over Ethernet) or with low power plug
- Easy configuration and monitoring
- Optimized scheduling of tasks and self-managed roaming of labels

## 1.2 Destination countries

The imagotag AP-2010 is currently intended for use in Europe, Canada and USA. More countries will follow.

## 1.3 Scope of delivery

- 1 pcs imagotag AP-2010
- 1 pcs 2.4-2.5GHz 5dBi antenna
- 1 pcs metal mounting
- 1 pcs "caddy® clips 4G16M11" from Erico®
- 2 pcs self-locking nuts M6



May vary depending on configuration

## 2 Barcode Information

The AP-2010 comes with an AP-ID, P/N, MAC and S/N. The AP-ID consists of 5 decimal digits (0-9).

**Product Code:** A1A001xxx

### 2.1 Serial Number

Depends on Producer (A)

#### 2.1.1 Producer is 01

| Part | Description      | Format  | Example | Comment                                              | Source                                                      |
|------|------------------|---------|---------|------------------------------------------------------|-------------------------------------------------------------|
| A    | Producer         | 2 alpha | 01      |                                                      | Specified by imagotag once for each fab                     |
| B    | Product family   | 3 alpha | G1B     |                                                      | Specified by imagotag in the product specification document |
| C    | Product version  | 3 alpha | 301     |                                                      |                                                             |
| D    | Product revision | 3 alpha | 001     | Incremented on every change of product specification |                                                             |
| -    | Separator        | "-"     | -       |                                                      | Fixed                                                       |
| E    | Internal         | 1 alpha | B       | Internal                                             | Calculated during production                                |
| F    | Year             | 1 dec   | 4       | 4=2014, 5=2015,...                                   |                                                             |
| G    | Week             | 2 dec   | 10      | Calendar week in current year (01-53)                |                                                             |
| H    | Weekday          | 1 dec   | 3       |                                                      |                                                             |
| I    | Internal         | 5 dec   | 00060   | Continuous Serial Number (Counter)                   |                                                             |

## 2.1.2 Producer is not 01

| Part | Description      | Format  | Example | Comment                                              | Source                                                      |
|------|------------------|---------|---------|------------------------------------------------------|-------------------------------------------------------------|
| A    | Producer         | 2 alpha | 02      |                                                      | Specified by imagotag once for each fab                     |
| B    | Product family   | 3 alpha | R22     |                                                      | Specified by imagotag in the product specification document |
| C    | Product version  | 3 alpha | N01     | N = with NFC                                         |                                                             |
| D    | Product revision | 3 alpha | 001     | Incremented on every change of product specification |                                                             |
| -    | Separator        | "-"     | -       |                                                      | Fixed                                                       |
| E    | Year             | 1 alpha | E       | E=2014, A=2010, B=2011,..                            | Calculated during production                                |
| F    | Week             | 2 dec   | 13      |                                                      |                                                             |
| G    | Internal         | 6 dec   | 000065  | Continuous Serial Number (Counter)                   |                                                             |

**Format:** AABBBCCDDDD-EFFGGGGGG

**Example:** 02G1B302001-E13000065

**Note:**

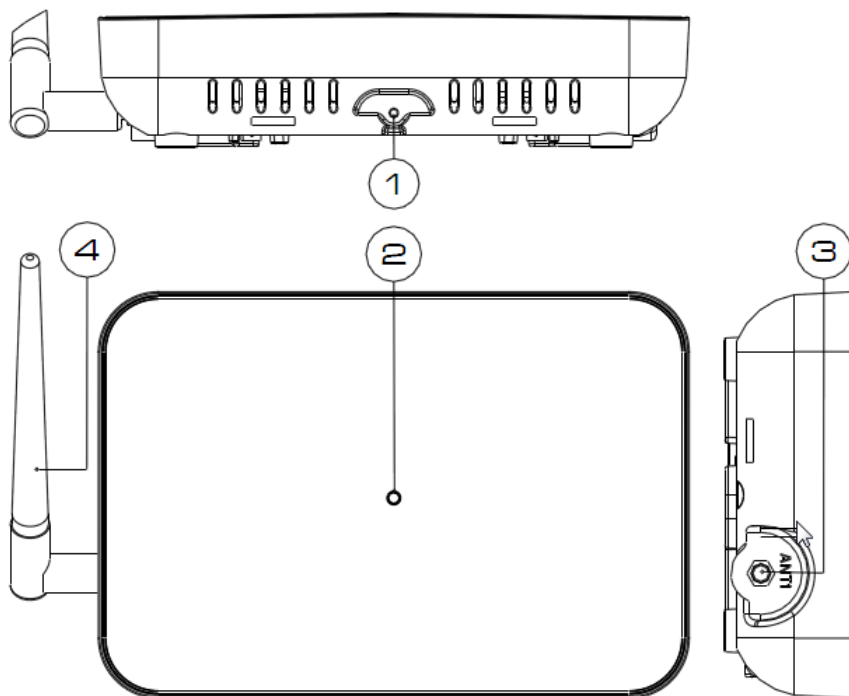
- Calendar week date is calculated according to ISO 8601 (see [http://en.wikipedia.org/wiki/ISO\\_week\\_date](http://en.wikipedia.org/wiki/ISO_week_date))

### 3 Mechanical Characteristics

#### 3.1 Mechanical Dimensions

- With antenna:
  - Outline (mm): 226 x 135 x 45
  - Weight: 350 g
- Without antenna:
  - Outline (mm): 196 x 135 x 45
  - Weight: 320 g

#### 3.2 Front, Side and Top View



**FIGURE 1-1: Front, side and top view of the AP-2010**

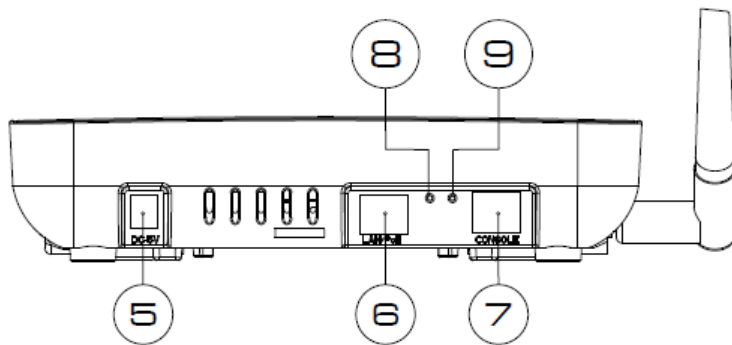
**1** Mounting plate fixation screw-hole

**2** LED

**3** Antenna socket

**4** Antenna

### 3.3 Upper Surface



**FIGURE 1-2: Top view of the imagotag AP-2010**

**5** Connection for the Power Supply

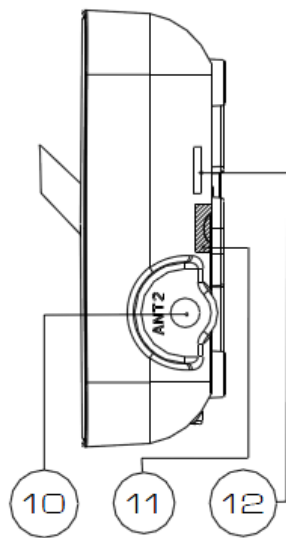
**6** LAN/PoE

**7** Console

**8** Restart

**9** Reset to Factory Settings

### 3.4 Side View



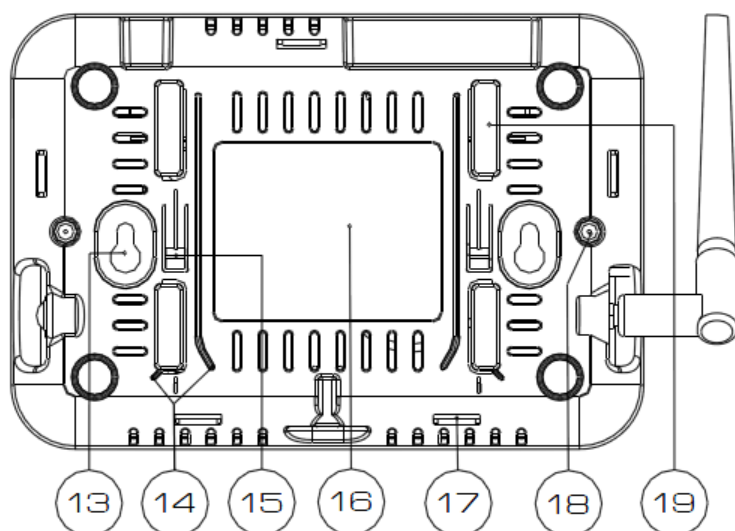
**FIGURE 1-3: Side view of the imagotag AP-2010**

**10** Antenna Connector (unused)

**11** Warranty Seal

**12** Snap Connector Housing

### 3.5 Rear View



**FIGURE 1-4: Rear view of the imagotag AP-2010**

**13** Mounting Tab

**14** Mounting Rail

**15** Locking Tab

**16** Label

**17** Snap Connector Housing

**18** Housing Screw

**19** Mounting Profile

## 4 Mounting

### 4.1 Audience

The installation instructions are intended for trained electricians who can exhibit the following qualifications:

- Knowledge of the use of tools and work instructions.
- Knowledge of the usable condition of the tool.
- Knowledge of the electrical safety instructions.
- Knowledge of the electrical building regulations.
- Knowledge of the relevant standards.
- Knowledge of assembly schedule.

### 4.2 General Instructions

- Read these installation instruction carefully before you connect the access point to the power source.
- The company imagotag GmbH assumes no liability for injury to persons or damage to the Access Point or damage to the environment caused by improper installation or mis-application.
- Remove jewellery such as rings, necklaces, and watches before working on the device.
- Make sure that the access point is not connected to the power source during assembly.
- Don't work on the access point during a thunderstorm and don't connect a cable at this time.
- Use appropriate and tested climbing aid if you work above body height.



Complete the installation and use the ERICO products just according the ERICO® instruction. If necessary, you will find the desired data sheets at [www.erico.com](http://www.erico.com) and at every ERICO customer service.

### 4.3 Instructions for the Mounting Location

The Access Point could be mounted on a:

- Concrete wall
- Mortar wall
- T-Mounting Rail

Select the installation location for the access point carefully. Pay particular attention to the following requirements:

- Install the access point only in areas where the permissible environmental conditions (see ) can be observed.
- Don't install the access point in environmental with direct sunlight or heat source.
- Mount the metal bracket for the access point on dry surfaces only.

- Don't mount the access point on any flammable material.
- The minimum bearing capacity of the substrate should be 5 kg.
- The LAN cable manufacturer must be complied with the default specifications (e.g. minimum bend radius)

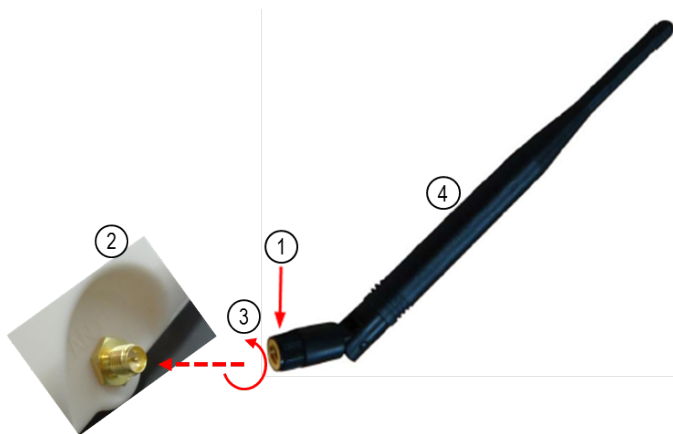
#### 4.4 Approachability

- Mount the metal bracket that the access point can easily be pushed into the metal bracket
- Make sure that the LAN socket is easily accessible after installation.
- After installation the LED should be clearly visible.
- It is important that the inner surface of the access point have sufficient air circulation. The vents must be free to ensure good ventilation and prevent overheating.



The mounting material (e.g. screws or pegs) for securing the metal bracket on concrete wall is not part of the scope of delivery. It must be selected by the installer depending on the substrate itself.

#### 4.5 Screw of the Antenna



**FIGURE 1-5: Figure 3 - Screw of the Antenna**

**1** Front Part

**2** Connection Socket

**3** Direction of Rotation

**4** Rear Part (Swivelling)

Note: Screw the antenna with only the front part (1)

## 4.6 Metal Bracket for Mounting on Wall, Ceiling or T-Mounting Rail

Once the metal bracket is mounted, the AP-2010 will be mechanical connected and fixed with a fixing screw.

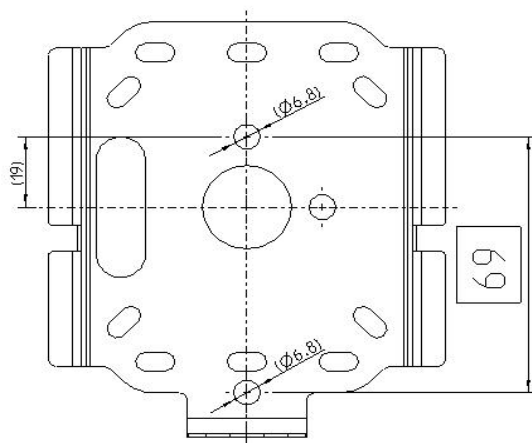


FIGURE 1-6: Figure 4 - Metal Bracket for imagotag AP-2010

## 4.7 Mounting on Wall or Ceiling

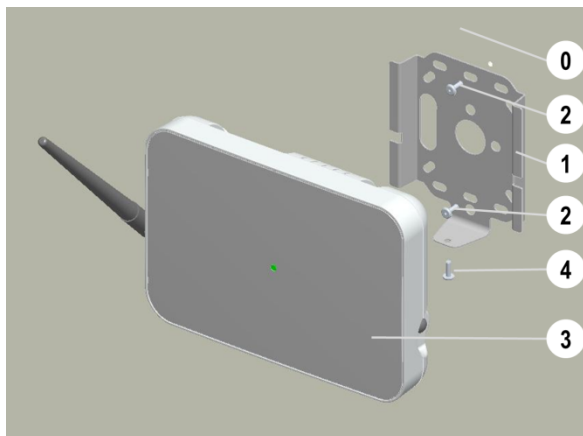


FIGURE 1-7: Figure 5 - Wall or Ceiling Mounting (Scheme)

0 Mounting Surface

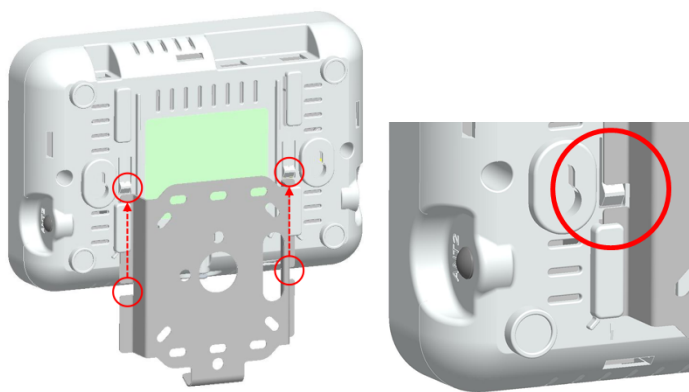
1 Metal Bracket

2 Mounting Screw

3 sesimagotag AP-2010

4 Fixation Screw

- a. Install the metal bracket to the wall or ceiling with the help of dowels and mounting screws.

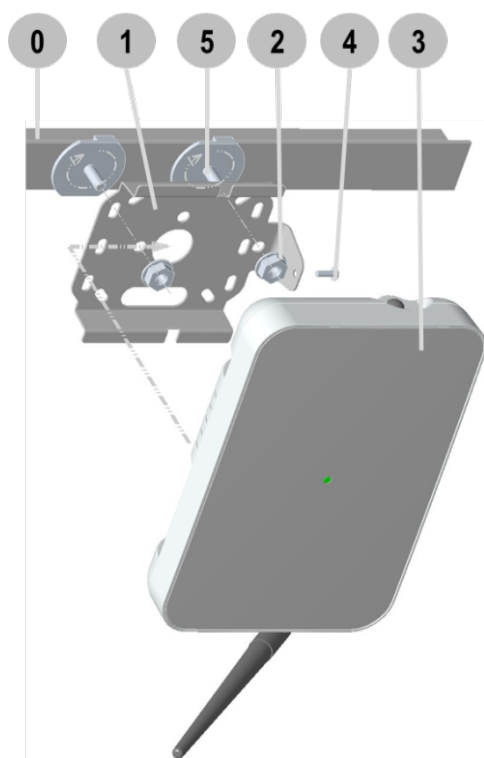


**FIGURE 1-8: Figure 6 - imagotag AP-2010 Locking Tabs**

- b. Slide the access point to the mechanical lock of the locking tabs
- c. Attach the AP-2010 with the enclosed fixation screw to the metal bracket

#### 4.7.1 Mounting on a T-Mounting Rail

Attach the metal bracket using the included “caddy® clips” from Erico® and the enclosed, self-locking screw nuts M6.



**FIGURE 1-9: Figure 7 - Mounting an AP-2010 on a T-Mounting Rail**

- |                                     |                                |
|-------------------------------------|--------------------------------|
| <b>0</b> T-Mounting Rail            | <b>3</b> imagotag AP-2010      |
| <b>1</b> Metal Bracket              | <b>4</b> Fixation Screw        |
| <b>2</b> Self-locking Screw Nuts M6 | <b>5</b> ERICO® „caddy® clips“ |

- a. Place 2 pieces of “caddy® clips” with the right distance on the T-Mounting Rail and fix it (twist)

- b. Place the metal bracket
- c. Fix the Metal Bracket with 2 pieces of the self-locking screw nuts M6
- d. Slide the access point to the mechanical lock of the locking tabs
- e. Attach the AP-2010 with the enclosed fixation screw to the metal bracket

## 5 Electrical Specifications

### 5.1 Used Channels

Although WIFI and ESL use the same frequency band (**2.4 Ghz ISM Band**), there are channels that do not overlap (not interfering - recommended channels).

| Kanal | Frequenz | WLAN Kanal (802.11b/g)    |
|-------|----------|---------------------------|
| 0     | 2404 MHz |                           |
| 1     | 2010 MHz | WLAN 1 (2402 – 2422 MHz)  |
| 2     | 2422 MHz |                           |
| 3     | 2425 MHz | not interfering           |
| 4     | 2442 MHz | WLAN 6 (2427 – 2447 MHz)  |
| 5     | 2445 MHz | not interfering           |
| 6     | 2462 MHz |                           |
| 7     | 2470 MHz | WLAN 11 (2452 – 2472 MHz) |
| 8     | 2474 MHz | not interfering           |
| 9     | 2477 MHz | not interfering           |
| 10    | 2480 MHz | not interfering           |

FIGURE 1-10: Overview of used channels of the imagotag AP-2010

### 5.2 Difference WiFi and ESL protocol

In contrast to the proprietary developed time based imagotag ESL protocol the WiFi protocol applies to the IEEE 802.11 standard.

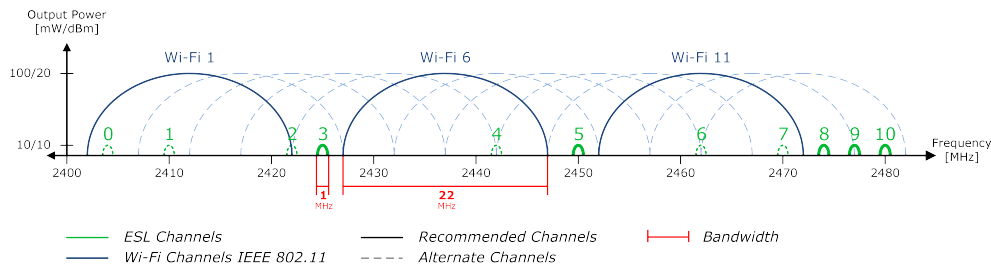


FIGURE 1-11: WiFi and ESL frequencies and channels (22 Mhz bandwidth)

### 5.3 Cabel Specifications

You can use a commercially available LAN cable (CAT-5 or higher) for data connection and the power supply (if PoE is used) of the imagotag AP-2010.

## 5.4 Power Supply Specifications

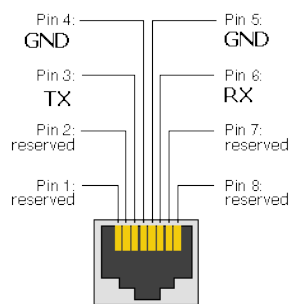
Sunny Computer Technology Europe s.r.o.

- Model: SYS1541-1505-Wxx
- Input: 100-240 V ~ 1.0 A MAX, 50-60Hz
- Output: 5V 3A
- Output Power: 15W MAX
- Operating Temperature: 0° C to + 40° C
- MTBF: 50.000 hours full rated load operation at 40 °C, according to the MIL-HDBK-217F

## 5.5 Pinout RJ45 Ethernet

- Pin 3 – TX (AP to PC)
- Pin 6 – RX (PC to AP)
- Pin 4/5 – Ground

### 5.5.1 Pinout



## 6 Electrical & RF Characteristics

### 6.1 General Technical characteristics

#### Power:

- External Power Supply: 5 VDC / 3A
- Power Supply via PoE: IEEE 802.3af, IEEE 802.3at
- Power consumption: 15W MAX, typical 3W

#### Technology:

- Radio technology: proprietary
- Operating frequency: 2.4 GHz (ISM-Band) – 2.4835 GHz
- Transmitted power:  $\leq 10$  dBm
- Number of Channels: 11
- Access protocol: proprietary

#### Other:

- MTBF: >300.000h at 40°C according to SN29500

### 6.2 Power and Current Consumption

Power consumption measurements indicate that the AP-2010 has the following patterns:

- Operating Current:  $\leq 60$  mA (max. current)
- Operating Power:  $\leq 280$  mW
- Supply Voltage:  $5V \pm 10\%$

### 6.3 General Specifications

#### 6.3.1 Hardware

- 600 MHz ARM Cortex-A8
- Memory - 512MB DDR2 memory
- SD/MMC card connector
  - 512 MB card with imagotag software preinstalled
- Power over Ethernet (PoE IEEE 802.3af / IEEE 802.3at)
  - The original IEEE 802.3af-2003 PoE standard provides up to 15.4 W of DC power (minimum 44 V DC and 350 mA to each device). Only 12.95 W is assured to be available at the powered device as some power is dissipated in the cable.
- Other Interfaces
  - Serial RS232 Interface
  - 10/100 Ethernet Interface
- Power
  - Power source options (DC, PoE)
  - 3.3 V I/O operation
  - DC supply  $5V \pm 10\%$ , 3A Max

### 6.3.2 Software Package

- OS: Embedded Linux
- AP-2010 application software
- RF Firmware

## 7 Environmental

### 7.1 Humidity and Operating Conditions

- Temperature: 0° C to + 40° C
- Humidity: 10% to 80% (non-condensing)

### 7.2 Storage Conditions

- Temperature: -20 °C to + 70 °C
- Humidity: 10% to 85% (non-condensing)

### 7.3 Cleaning Instructions

Steps:

1. Shutdown Access Point
2. Plug Out Power Supply (AC or PoE)
3. Clean the Access Point with the help of a damp cloth

**Note:** Do not use liquid or aerosol cleaners.

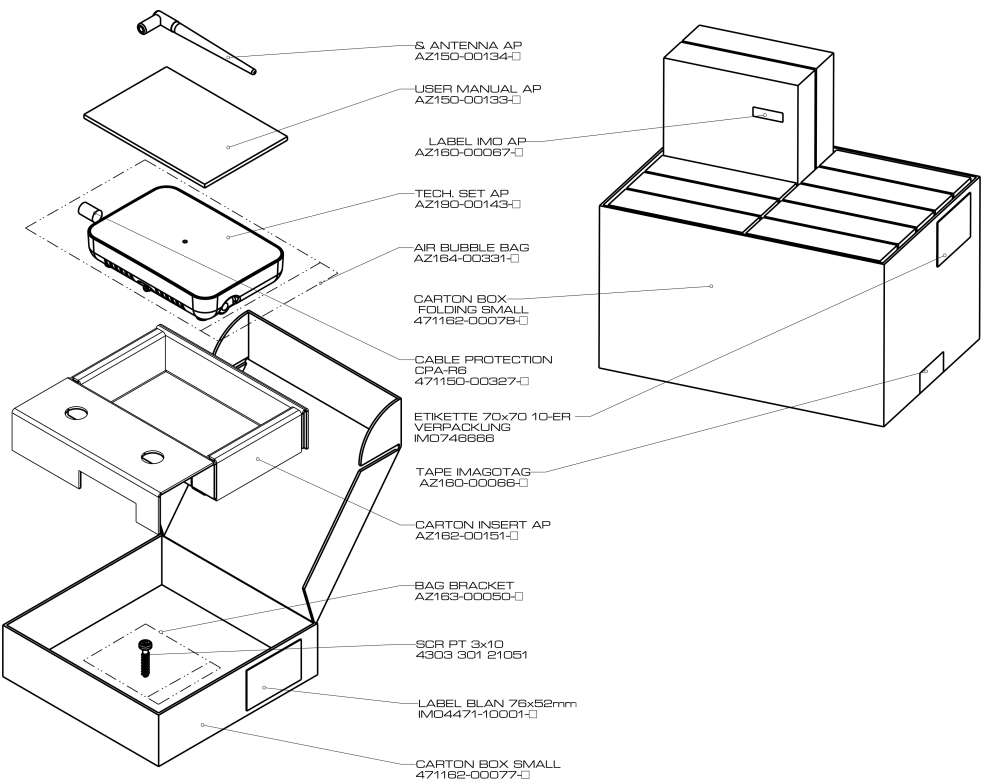
8 Packing

8.1 Packing Dimensions

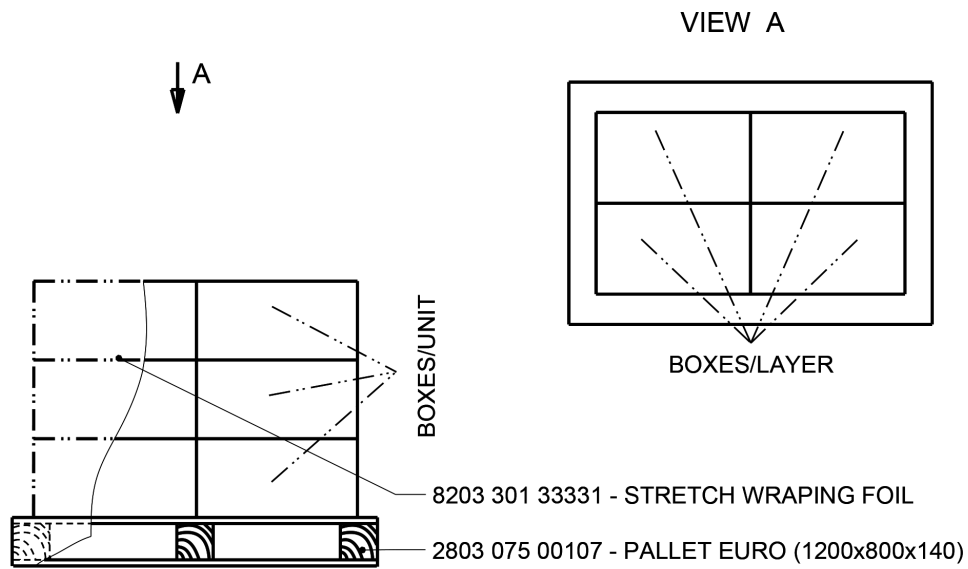
| DIMENSIONS |        |       |        | STACKING      |    | QUANTITY     |     |
|------------|--------|-------|--------|---------------|----|--------------|-----|
|            | LENGTH | WIDTH | HEIGHT |               |    |              |     |
| BOX        | 520    | 350   | 260    | LAYER / UNIT  | 3  | SETS / BOX   | 10  |
| PALLET     | 1200   | 800   | 140    | BOXES / LAYER | 4  | SETS / LAYER | 40  |
| UNIT       | 1200   | 800   | 960    | BOXES / UNIT  | 12 | SETS / UNIT  | 120 |

Imagotag AP-2010 / Box: 10

8.2 Illustrations



### 8.3 Palletization



#### PROCEDURE

1. Stack BOXES on PALLET
2. Fix stacked BOXES with STRETCH WRAPPING FOIL

## 9 Certifications

### 9.1 Types



Housing, board and the display are conform with the ROHS Directive



The product meets the EU safety, health and environmental protection requirements and has the approval of CE marking



This device complies with part 15 of the FCC Rules.

### 9.2 Overview

| Caption | RoHS | Food Contact | CE | FCC/IC |
|---------|------|--------------|----|--------|
| AP-2010 | •    |              | .2 | .5     |

<sup>1</sup>FCC/IC certified since calendar week 9 / year 2015 (the FCC logo must be printed on the nameplate)

<sup>2</sup>R&TTE EN 300328 V1.8.1

<sup>3</sup>R&TTE EN 300328 V1.9.1

<sup>5</sup>There are two different versions of the AP available. One CE and one FCC version.

### 9.3 Applied Standards

#### Information Technology Equipment

EN 60950-1/A2:2013

UL 60950-1/A2:2014

CSA CAN/CSA-C22.2 NO.60950-1-07

#### EMV

EN 301489-17 V2.2.1

#### R&TTE

EN 300328 V1.8.1 / EN 300328 V1.9.1

#### Human Exposure to Electromagnetic Fields

EN 62479:2010

#### Radio international

FCC: 47 CFR Part 15 (USA)

RSS-210 Issue 8 (Canada)

### 9.4 Declaration

The company imagotag GmbH declares on his own responsibility that the AP-2010 corresponds to the standards mentioned above.

#### 9.4.1 FCC

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.

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

#### 9.4.2 IC

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'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

#### 9.4.3 NCC 警語：

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

## 10 Problems which requiring maintenance or replacement of the AP-2010

Plug out the power supply and contact the imagotag GmbH when it comes to the following cases:

- The AP-2010 was strewn with liquid.
- The AP-2010 has been dropped or damaged.
- The LAN port of the AP-2010 is damaged.
- The antenna connection thread is damaged.
- The LED of the AP-2010 no longer lights up.

Contact the manufacturer if despite intended purpose the device is not working and none of the mentioned cases occurred.

## 11 Intended Use

The imagotag AP 2010 is exclusively designed to connect to electronic labels of the company imagotag GmbH via radio.

The device may only be used in areas where the environmental conditions be the same as described in the chapter (see *Environmental* on page 19).

Intended use includes the observance of all information in this system manual.

## 12 Improper Use

Any use that is not mentioned in Section Intended Use, shall be deemed to be improper. Any damage which result from improper use, the operator will assumes liability.

The following usage is not allowed:



- Never dismantle the electronic device because except battery there is no component which could be changed by someone who is not qualified.
- Don't drop it.
- Keep it away from water.
- Strictly avoid direct contact with groceries.
- Don't use the electronic device with defective parts.
- Don't use the electronic device with spare parts and accessories which are not examined and approved by the imagotag GmbH.
- Unauthorized changes or modifications to the electronic device and their components without the consent of imagotag GmbH are not allowed.
- Don't heat, recharge or bend battery.
- We take no responsibility for stolen ESLs without encryption.
- Keep away batteries from children.
- Don't throw defective batteries into the dustbin. Give them to a reprocessing company.
- Don't throw electronic device into the dustbin. Give them to a reprocessing company.
- Contact imagotag GmbH for more details about this process.

## 13 Warranty

The device is provided with a warranty seal. Is this warranty seal destroyed, expire at the same time, all warranty claims.