

Quick Start Guide

Applies to software version 1.4.0 or higher

Last change: 07.09.2015

Author: Kurt Haller-Walzl

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[Introduction]

1 Electronic Shelf Labeling – A brief introduction

An electronic shelf label is a device that shows article data and price information on its display. In comparison to printed labels the information is automatically updated if price or article data changes.

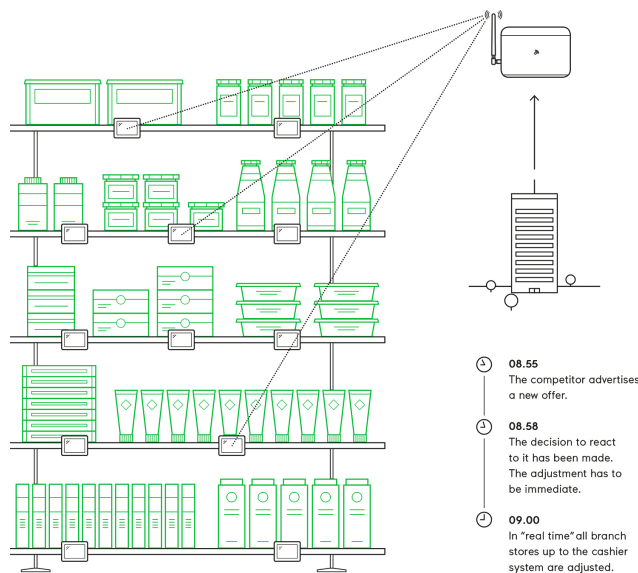


FIGURE 1-1: Electronic Shelf Labeling

- Cost reduction through elimination of manual price changes
- Fully automatic price updates from the headquarters to the branch stores within seconds
- Process security and price integrity – 100% correlation between cash point and shelf
- Increased flexibility in price design and immediate reaction to market situation Image gain due to use of highly modern technology
- Simplified processes for store personnel
- Enhanced sales & price profitability maximize price performance and profit opportunities

2 The G1 label family

The imago G1 electronic shelf label family offers high-quality display options, operating with a replaceable battery and thus working with any external power supply. The G1 red family is capable of changing all pixels to black, white or red.

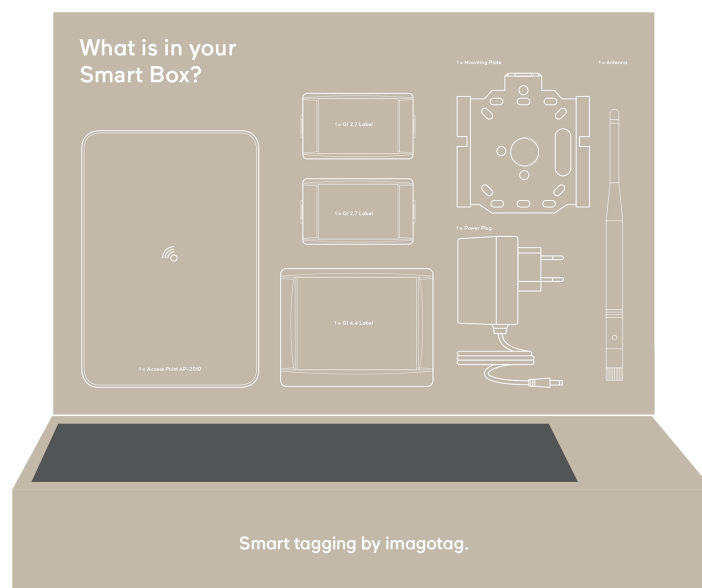
The current line-up has display sizes from 2 inch to 7.4 inch. They may be used in landscape and portrait mode and can be customized with changeable front covers.
(missing or bad snippet)

2.1 Key Features

- 2.4 GHz bi-directional MSK proprietary radio
- Radio coverage: up to 25 meters
- Return Signal: yes
- 11 available communication channels
- Ultra-low power consumption
- Customer-replaceable battery
- Full graphical e-Ink display with paper-like readability
- Changeable and customizable front covers
- Super wide viewing angle (nearly 180 degrees)
- Flexible mounting options available
- May be used in landscape and portrait mode
- Fast response time (less than 15 seconds)
- Water resistant
- 128-bit AES encryption with secure key exchange
- Multiple pages support with preloading and fast page switching
- Integrated NFC tag as an option

3 What's in your Smart Box?

- **2x G1 2.7 Labels / 1x G1 4.4 Label**
 - The G1 electronic shelf label family offers high-quality display options, operating with a replaceable battery and thus working with any external power supply. Thanks to the perfect readability of the e-ink displays and our outstanding wireless data transmission technology you can implement all your sales, marketing, and logistic strategies.
- **1x Access Point AP-2010 incl. Antenna**
 - The AP-2010 by imago tag is the communication center in the store that 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. It supports 11 selectable ESL channels.
- **1x Installation Guide with USB Stick**
 - *ESL Server*: The ESL Server is a Java software that is required to manage the imago tag access points and electronic shelf labels.
 - *ESL Client*: The ESL Client is also Java based software. It's a graphical user interface (GUI) for monitoring and for the configuration of the ESL Server. The ESL Client connects to the ESL Client. The server may be installed on the same machine or any other machine that is accessible over the network.
 - *Template Editor*: To render images from article records on the ESL Server, the layout must be predefined in a template file. Therefore an editor to create and edit template files with live preview based on example records is also on the imago tag USB stick.
 - *Other documentation*: Developer Reference, Image Rendering Reference and CSV/XML Import Plugin
- **1x Mounting Plate**
 - Metal Mounting Plate for Mounting the AP-2010 on Walls, Ceilings or other Mounting-Rails.
- **2x Caddy Clips**
 - With our system you're able to mount your labels almost wherever you want.
- **1x Power Plug**
 - Power Plug to supply power for the AP-2010 (Power over Ethernet is also available).



[Getting Started]

1 Latest Software and Documentation

At the Customer Portal <https://portal.imagotag.com> you can view all your shipments, get access to registration- and unlock codes, check the warranty status of your labels, download your license files and access the latest software releases and documentation from this site.

2 Install software

There's several software you'll have to install in order to configure and setup your ESL system. You'll just have to extract the following 3 archives in a location of your choice:

1. ESL Server <server.zip>
2. ESL Client <client.zip>
3. Template Editor <template.zip>

2.1 System requirements

- Server hardware: Pentium 4 (2 GHz or higher), 2 GB RAM
- Java Runtime Environment Version 6, Update 36
- Windows XP, Windows 7, Windows Server 2008 (R2), Suse Enterprise Linux 11, Ubuntu 12 (all 32/64-bit versions)
- imagotag Server/Client applications (2x .zip archives)
- imagotag AP-2010
- imagotag Labels and license files

2.2 Installation process

Please unpack the zip-archives <server.zip>, <client.zip> and <template.zip> on your machine - e.g. under C:\imagotag\.

Note: To unpack the zip-files you can either use the windows internal archive-unpacker (see screenshots) or an unpack tool of your choice (e.g. the free tool 7zip - www.7zip.org).

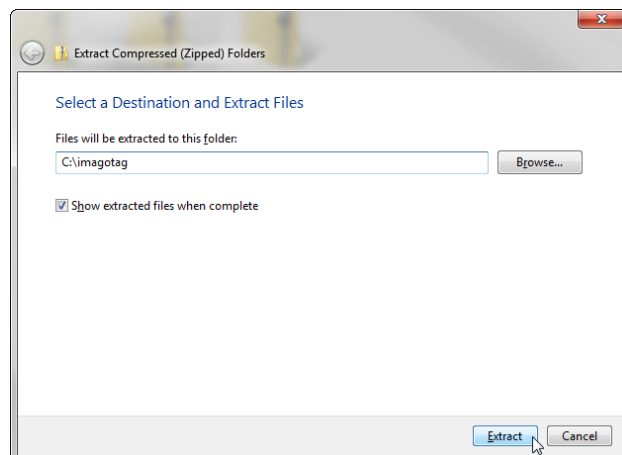
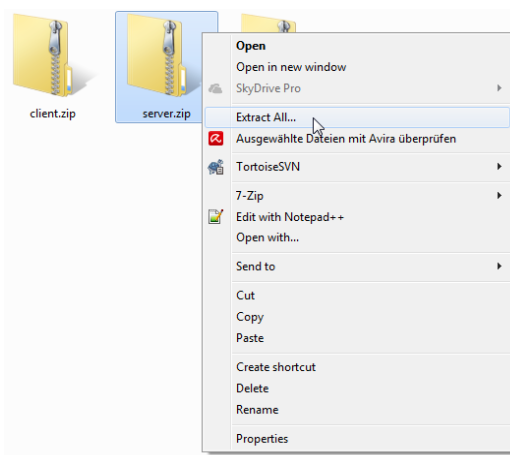


FIGURE 1-2: Unpack/Install imagotag Software

FIGURE 1-3: Unpack/Install imagotag Software #2

#1

After unpacking all 3 archives, your folder should look something like this:

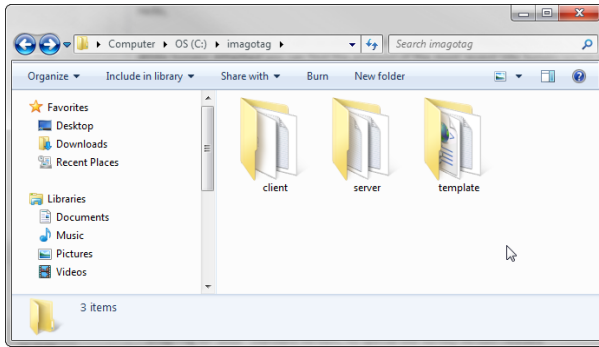


FIGURE 1-4: Unpacked imagotag software folder

The imagotag software is now installed and you can step forward to point *Start Server and Client - Start Server and Client*.

2.3 Customer Portal

At the Customer Portal you can view all your shipments, get access to registration- and unlock codes, check the warranty status of your labels, download your license files and access the latest software releases and documentation from this site.

After user registration and activation you will have access to documentation and you can activate, manage and download your imagotag software licenses see *Activating License* on page 12. Your user account will not be assigned to a customer account yet. If assigned, you have access to all shipments here including lists of label IDs, registration codes and unlock codes. To get access there must be a completed order and your account needs to be verified (existing customer account required).

3 Start Server and Client

3.1 Starting ESL Server

In order to start the ESL Service with the default configuration, just execute the jar file "server.jar" as described in [\[Troubleshooting\]](#) and wait for the small service GUI to show up (if the window doesn't show up after all, make sure your Java installation and configuration is correct).

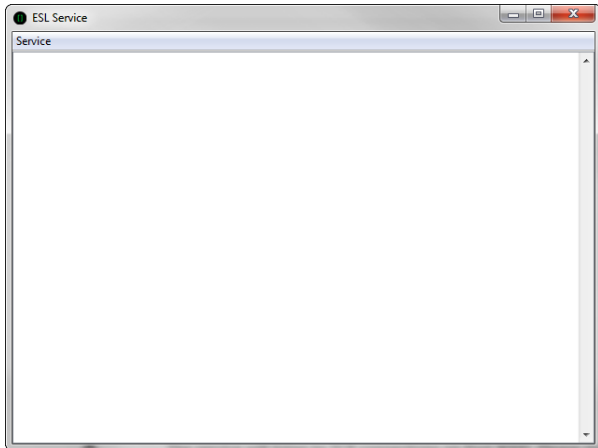


FIGURE 1-5: ESL Server web management interface



The service will listen to TCP connections on Port 8000 and 8001 and UDP connections on Port 8000. Please make sure that there is no firewall issue and/or interference with other systems.

After start of the service you can check the web-GUI of the server:

URL: `http://<host|ip>:8000`
Login: admin/admin

During the first start the ESL Server will automatically create a Derby¹ database. If another database connection is needed or preferred, the connection parameters should be validated by imagotag.

Note: As you can see there are several level numbers, by default the server instance will start in level 3. You can find the description of the different levels in the Developer Reference (which is also available at the Customer Portal) under "Integration Levels".

3.1.1 Example articles

For easier usage some example articles can be preloaded at the time you start the ESL Server. You can find the corresponding XML article data here: `C:\imagotag\server\data\fixtures\`.

To enable and disable the preloading of these fixtures go to the system configuration and set the corresponding property "importFixtures" true or false.

Note: The article records are based on the XML-standard.

¹Apache Derby, an Apache DB subproject, is an open source relational database implemented entirely in Java

3.2 Starting ESL Client

Go to the extracted client directory and execute the "client.jar" file.

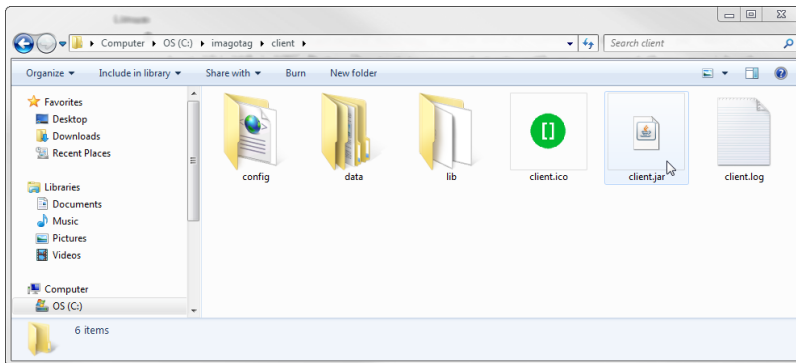


FIGURE 1-6: Starting ESL Client

The client is configured to connect to a server on the local machine per default. In order to change this to a remote machine in a network you have to start the client with an additional parameter:

Windows

- Create a shortcut/Edit existing short cut
- Append " --host hostnameOrIPAddress" at the end of the "Target" field. (Note: The text to append starts with a space and there are 2 hyphens to add!)

Linux

- Append " --host hostnameOrIPAddress" at the end of command (e.g. "java -jar client.jar -host 192.168.1.100" Note: The text to append starts with a space and there are 2 hyphens to add!)

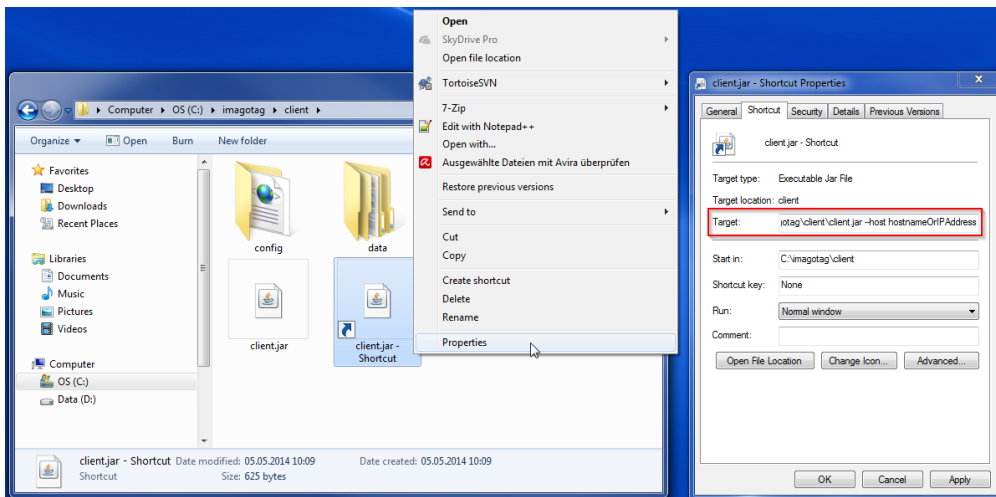


FIGURE 1-7: Starting ESL Client with parameter

3.2.1 ESL Client Login

- Username: admin
- Password: admin

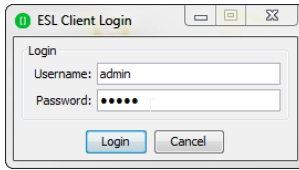


FIGURE 1-8: ESL Client Login

3.3 Activating License

After starting the ESL Server and Client it's necessary to activate the license which is included in the "Software License Document". To view your current license status there's a License status dialog. You can find it in the ESL Client under "Help - License status". Since no license is activated/imported yet the window should look similar to this:

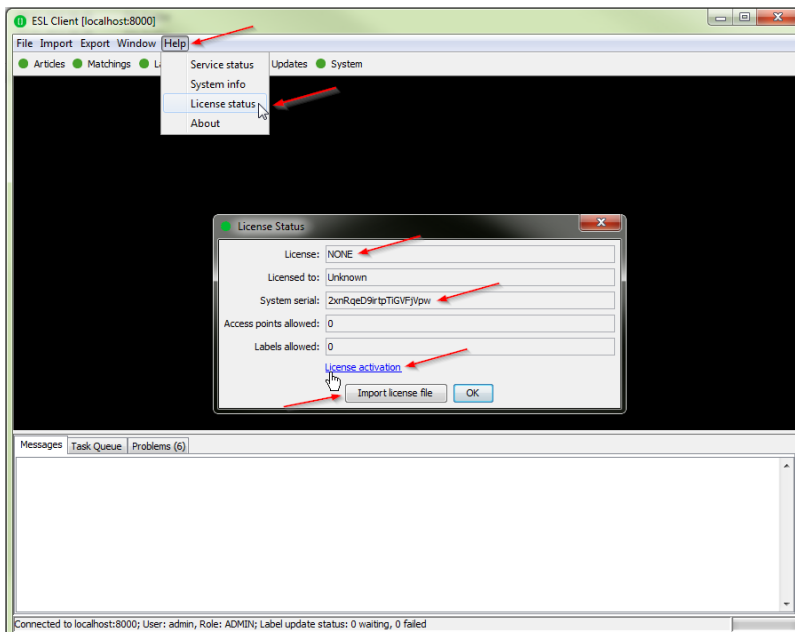


FIGURE 1-9: License Status Dialog

Copy the "System serial" to the clipboard and then click the "License activation". You'll be automatically redirected to the imagotag Customer Portal <https://portal.imagotag.com>.

Please **log in** (or register a new user). After log in, you can see a summary of already activated licenses and / or activate a new license. Click "**activate new license**".

Fill in "**License key**", copy/paste the "**System serial**" (from the "License Status" dialog), add a **Comment** (optional) and click the "**Activate**" button.

FIGURE 1-10: Activate License (imagotag Customer Center)

Download the generated license file and complete the licensing process by importing the license file to your ESL system. With the successful activation of your SmartBox demo license you're now able to register and use up to five labels and one access point.

FIGURE 1-11: Import of license file downloaded before

Note: Press "F5" (after 15 seconds) to update the license status after license file import.

4 Connect and configure Access Point AP-2010

The AP-2010 by imagotag is the communication center in the store that transmits price information to the labels. In order to ensure the communication between ESL Server, access point AP-2010 and the labels the access point has to be configured at the start of the ESL Server.

One way to configure the access point is on the client.

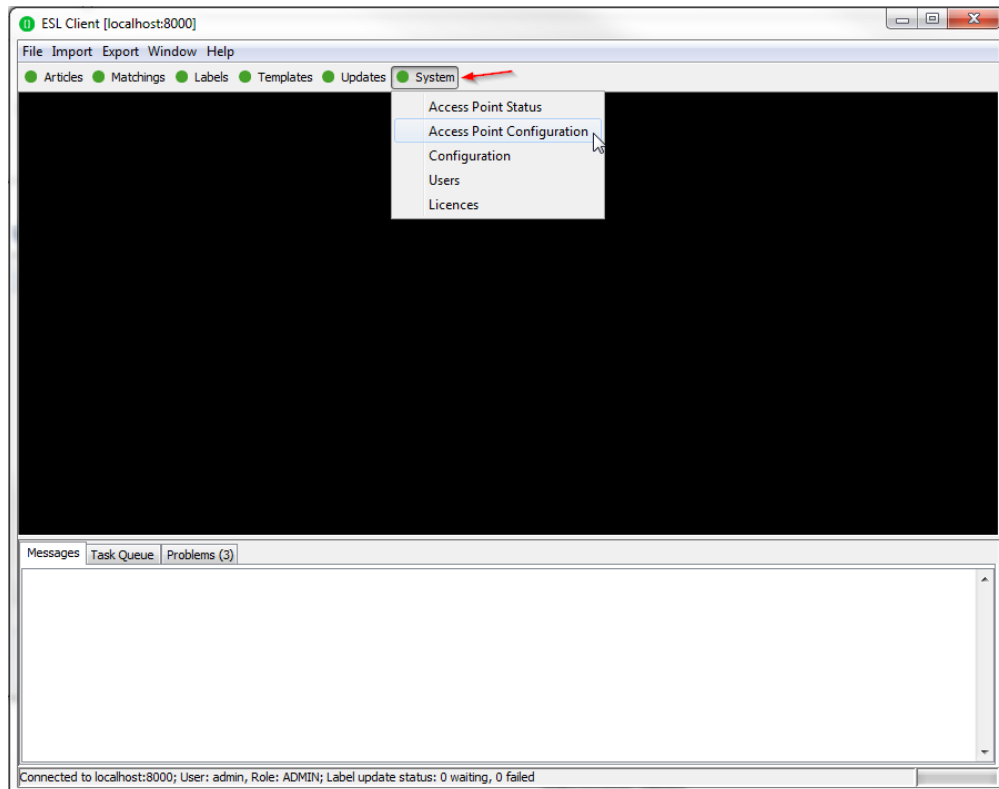


FIGURE 1-12: ESL Client Access Point Configuration

4.1 Connect and configure

Before labels are able to communicate with the server at least one access point needs to be configured. In standard configuration the AP-2010 should get an IP-address via DHCP (recommended) and is accessible via imagotag AP-2010 web management interface:

URL: `http://<host|ip>:8080`

Login: `admin/admin`

Important Note: In this part of the Quick Start Guide it is assumed that a DHCP server is present (you can find the steps to discover the access point without DHCP in the Troubleshooting section at points *Establish a network configuration when no DHCP is available – Step by step* and *AP discovering with Bonjour Services*).

4.1.1 Discover the Access Point

Before you can configure the access point it's necessary that the server will discover it.

The following points have to be observed:

- Connect your machine to the same network as the AP
- Plug in the power supply of the access point
- During the boot process of the access point, start the ESL Server software on the computer
- When the access point is booted up, the server will discovery it with an IP address (Note: The discovering process may take up to 2 minutes)
- Use the ESL Client to connect to your ESL Server
- Under System – Access Point Status – the AP should be listed as discovered (after successful boot sequence)
- One Column of the AP should show now the IP address
- Now you're able to configure the access point via AP-2010 web management interface under <http://<DHCP-IP-address>> or a right click on the discovered AP -> Open in browser...

In the status overview you get some details about the AP-2010:

Access Point Status	
Device Status	
AP ID:	1806
Device:	IMAGOTAG Access Point AP-2010
Serial Number:	1806
Software Version:	1.0.3
Firmware Version:	2.0.7
Hardware Revision:	1
Build:	2308
Service Status	
Status:	ONLINE
Uptime:	12 days, 51 minutes and 49 seconds
Time:	2012-12-03T10:47:47.990
Labels:	623
Waiting Tasks:	0
Total Tasks:	0
Total Task Size:	0 KB
Network Status	
Hostname:	ap1806
IP Address:	192.168.1.208
MAC Address:	80:02:8E:00:07:0E
Wireless Channel:	0
Roaming Status	
ESL Server:	192.168.1.76 [192.168.1.76]
Last Update:	2012-12-03T10:47:41.366
Valid Time:	10 minutes
Registered Labels:	623
Ping Interval:	15 minutes
Used Channels:	[0]

FIGURE 1-13: AP-2010 Status overview

It's recommended for the demo installation not to use the "Auto-Config" feature and configure the AP manually.

4.2 Necessary configuration over the AP-2010 web management interface

The following actions need to be performed over the web-GUI

1. Deactivate Auto-Config: Administration -> Auto-Config
2. Set up network details (or leave DHCP): Administration -> Network
3. Set up a wireless channel: Administration -> Wireless



The AP-2010 supports 11 wireless channels. It's recommended to choose one of the recommended channels: 3, 5, 8, 9 or 10. These channels do not interfere with standard Wi-Fi channels 1, 6, 11 and are scanned by the labels more often. For further information about selecting channels see point *Connect and configure Access Point AP-2010*.

4.3 Necessary configuration at the ESL Client

After the configuration in the AP-2010 web management interface it's necessary to add this AP via the ESL Client: System – Access Point Configuration – New ...

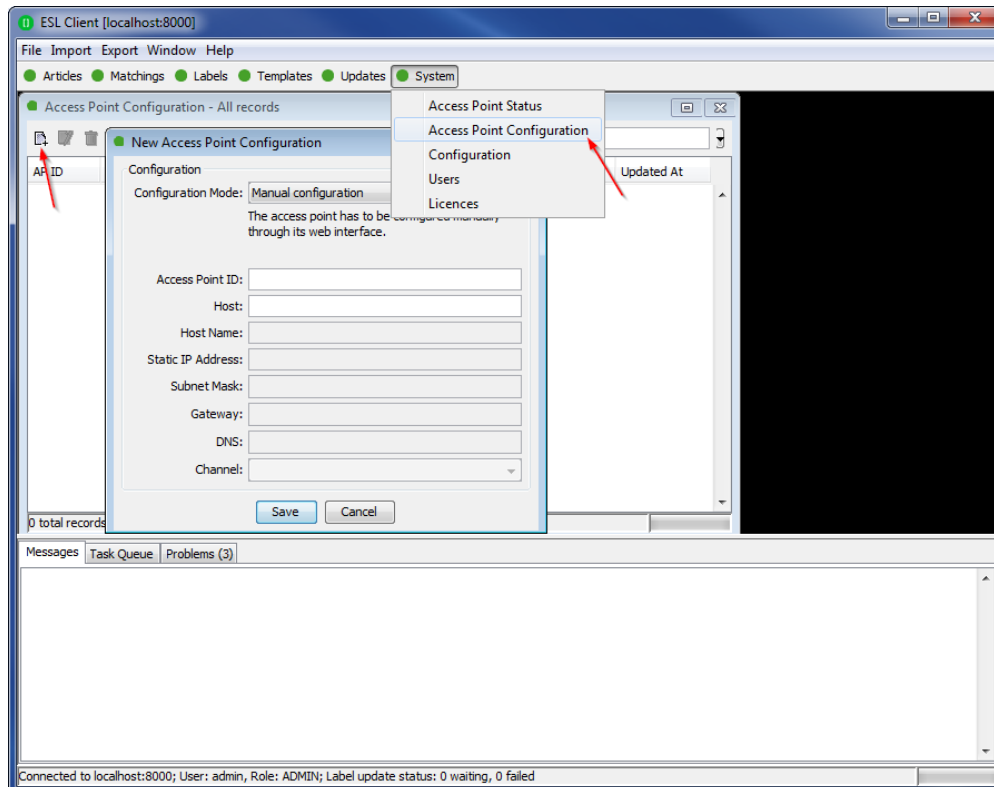


FIGURE 1-14: ESL Client AP configuration - System -> Access Pont Configuration -> New

Choose "Manual Configuration" if you don't use Auto-Config and enter Access Point ID (AP ID) and IP address (Host).

Note: After the basic configuration in the AP-2010 web management interface, it is also possible to fill in AP-ID and AP-IP-Address automatically. For this choose "Create Configuration..." under System – Access Point Status - Right click on the discovered and configured Access Point.

After saving the AP configuration you should see the AP under System – Access Point Status as ONLINE. In addition the AP status LED should turn **BLUE**.

4.4 Selecting channels

For a working installation a channel must be selected on each access point in the network. There are 11 non overlapping ESL channels reserved for the communication with the labels. Five of these channels do not interfere with typical Wi-Fi installations and should therefore be favored. These are the **ESL channels 3, 5, 8, 9 and 10** and they **should be selected if there is a Wi-Fi installation on the Wi-Fi channels 1, 6 and 11**.

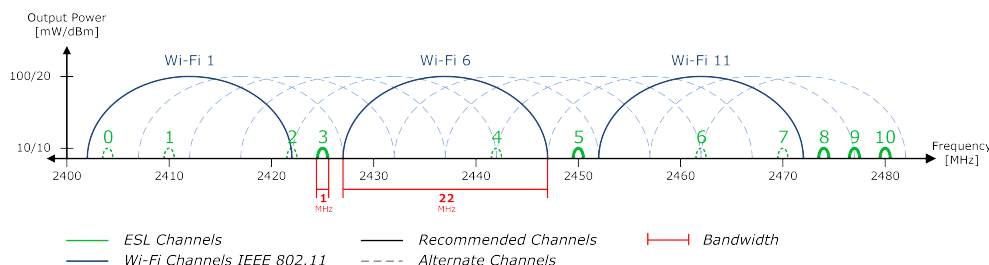


FIGURE 1-15: Comparison between common used Wi-Fi and ESL channels

If there is a Wi-Fi installation operating at 2.4 GHz (IEEE 802.11b/g/n) or any other radio frequency (RF) technology that uses the 2.4 GHz ISM band make sure to select the ESL channels that are least overlapping with the existing installation. If there is no ESL channel without any overlapping both the ESL and existing installation should still work but there might be a reduced overall speed in both installations.

Warning: Do not select the same channel on two access points within one area. This will cause interferences and avoids labels from joining the network. The same channel may only be selected on two access points if it can be guaranteed that every label is within the range of only one of these access points.

4.5 The Status LED

There are several LED colors that indicates the main status of the access point.

Color	Description	Note
Red	Boot process	Can take about 2 minutes, if it takes much longer, the device is defective and there is a need for service.
Blue	Normal mode	---
Yellow	Operational, but not connected to any server or no channel selected	---
Red (blinking)	Running Firmware Update	During this time there is no connection to the electronic label

If there are any problems regarding the access point please see chapter *[Troubleshooting]*.

5 Setup Security

The security concept is based on individual registration codes for each label. Not only that the new concept simplifies installations, it also provides stronger encryption and a secure key exchange with individual communication key derived from a user defined network key.

5.1 General encryption features and how does it work

- Solid improved safety
- Encrypted data type AES128 (Advanced Encryption Standard)
- User defined 128 bit network key for each installation
- Key is distributed to labels automatically

The new system requires a user defined 128 bit network key for each installation. The key is derived from a passphrase that is defined by the customer and stored in the ESL Server and used by all access points connected to that server to encrypt data communication to the labels. A per-label communication key is transmitted to the labels during the registration of them. Each label is assigned an individual registration code (it combines label ID and PIN code and it's an alphanumeric case-sensitive code with 11 characters). The ESL Server will then automatically start the key exchange with the label secured by the PIN extracted from the registration code.

5.2 Set the encryption key

First step is to set the parameter "encryptionPassphrase" under System – Configuration (you can choose the encryption Passphrase on your own).

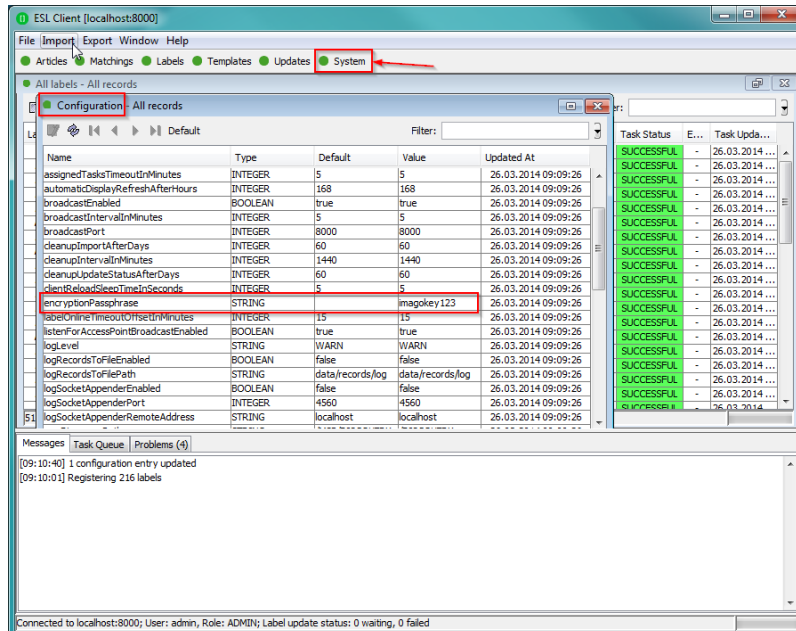


FIGURE 1-16: Set encryption key

Note: Do not change encryption passphrase if labels are already connected and encrypted (if you want to change the encryption passphrase you'll first have to unlock all labels – see [Troubleshooting] on page 32).

6 Register labels

In order that labels can join the network it is necessary to register them first.

6.1 General procedure

Via the ESL Client under File – Register Labels it's possible to register your labels manually with the registration code shown on each single label or you could import a CSV file with your registration codes. In order to refresh the entries press the refresh button shown in the next figure.

Important Note: After the registration it could last a certain time until all registered labels are joined to the network (from 30 minutes up to two hours, depending on configured access point channels). After this you can send images to each label (see *Start tagging* on page 23).

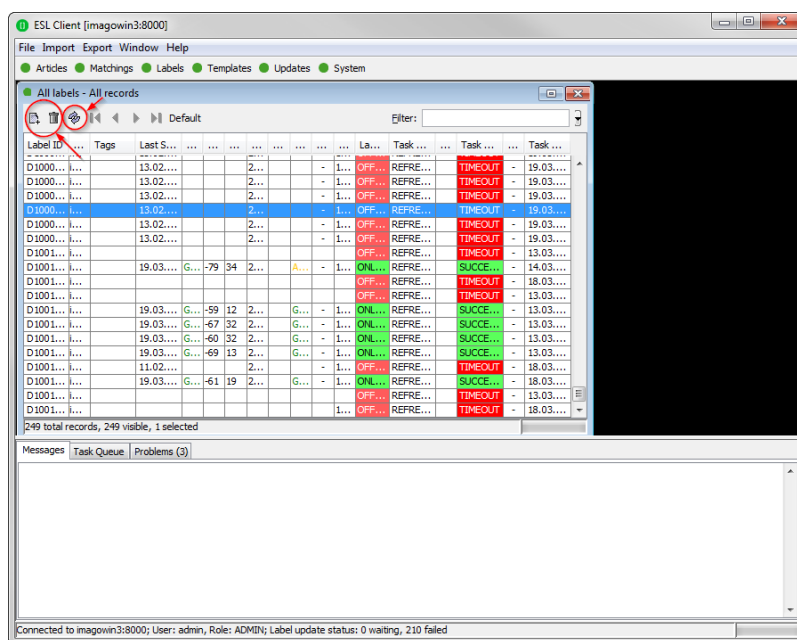


FIGURE 1-17: Add/Delete Label and refresh entries

6.2 What's on the label?

All labels will arrive with its registration code (11-digit alphanumeric) shown on the display of the label. The code is printed as a 2D QR code, as a 1D Code128 barcode and as human readable text. The registration process for the customer is easy – he has only to scan one of this barcodes. The ESL Server will then automatically start the key exchange with the label secured by the PIN extracted from the registration code.

The two relevant codes:

1. The **label ID (8-digit hexadecimal)** to identify the label (it's also the radio address which is similar to a MAC address).
2. The **registration code (11-digit alphanumeric)** is required to activate the encryption. This code also contains the label ID and a random PIN code.

6.2.1 Labels before and after registration

Page Layouts
G1 4.4

Layout when shipped

Registration Page Layout

Note: The label ID can only be read and will not be displayed as barcode in this layout.

Layout after successful registration

Reset Page Layout

Note: After successful registration, the AES key is exchanged for encryption and the label switch to a page where only the label ID is displayed as 1D Code128 barcode.

The sticker (on the bottom and on the back) always contain only the label ID and therefore should not be used for registration. They are only intended for the later article assignment (matching process).

Here you can see the registration dialog in the ESL Client where one single label has been entered with the registration code and the other one with the label ID (for old label versions < 3.0.0).

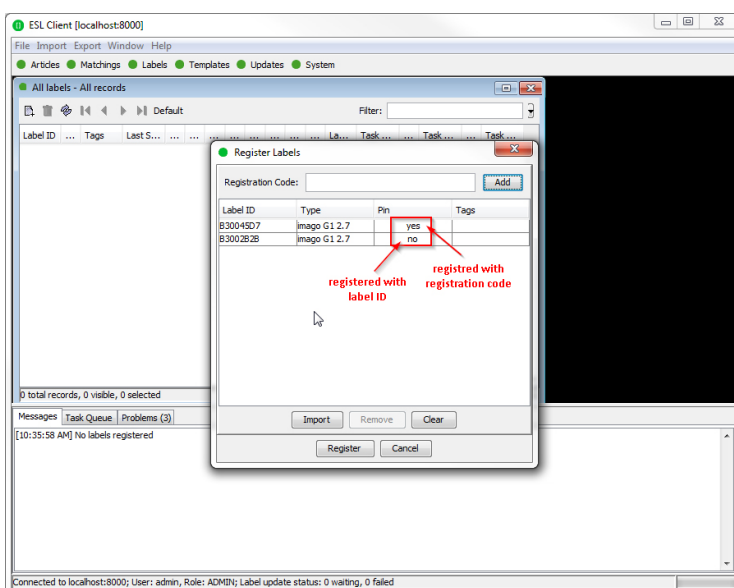


FIGURE 1-18: Register labels dialog (registered with registration code and label ID)

Note: New versions of the ESL Server, ESL Client and AP-2010 ($\geq 1.3.0$) will also support old labels that do not come with a pre-programmed PIN code. New labels ($\geq 3.0.0$) will also work in old installations together with old labels but the ESL Server will not accept registration codes during the registration process. To register the labels it is required to scan the barcode with the label ID from the backside or the bottom edge of the label. As the server will not start the key exchange all data is transmitted unencrypted to the labels.

6.3 Handheld terminals, USB barcode scanner and iOS-App

It's also possible to register labels with a commercial USB barcode scanner (2D/1D). You can also use our iOS-App (for iPhone and iPod touch, only available on request).

Handheld terminals are mobile devices that are used to manage the ESL installation. If the handheld provides a barcode scanner, it may be used easily to link articles and labels by scanning the article barcode (usually EAN, UPC or GTIN) and the unique ID of the label.

Here you can see some screenshots of our iOS-App:

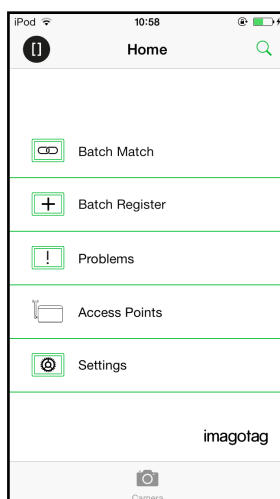


FIGURE 1-19: ESL-App Home-Screen

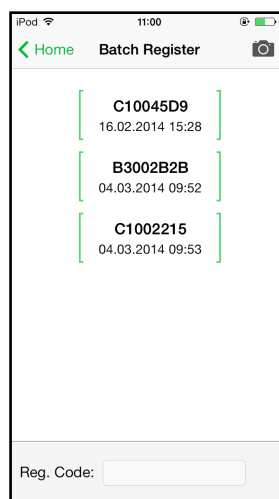


FIGURE 1-20: ESL-App Registration Page

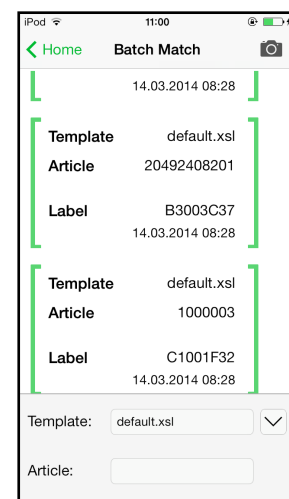


FIGURE 1-21: ESL-App Matching Page

6.4 Encryption status

Here are the encryption status a label could have:

- **AES:** Communication with label is encrypted with 128 bit AES
- **No PIN:** Could not set encryption key as no PIN (registration code) was provided
 - Solution: Re-register label with registration code
- **Key unset:** Communication is NOT yet encrypted
 - Solution: Set encryption key as described in section *Setup Security - Setup Security*
- **Unsupported:** Encryption is not supported by label firmware
- **Unknown:** Security status is not determined yet

The screenshot shows the ESL Client software interface. At the top, there are menu options: File, Import, Export, Window, Help. Below the menu is a status bar with indicators for Articles, Matchings, Labels, Templates, Updates, and System. The main area displays a table of label records. The 'Encryption' column is highlighted with a red box, and a red arrow points to it. The table columns include Label ID, Type, Tags, Last Seen, Power, R..., LQT, Firmware, Encryption, Sync-Qua..., Label Status, Task Status, and Task... The table contains 216 total records, with 216 visible and 0 selected. The status bar at the bottom indicates: Connected to localhost:8000; User: admin, Role: ADMIN; Label update status: 0 waiting, 1 failed.

Label ID	Type	Tags	Last Seen	Power	R...	LQT	Firmware	Encryption	Sync-Qua...	Label Status	Task Status	Task...
C10038E9	imago G1 4.4	CRYPTOJ	26.03.20...	GOOD	-52	35	3.0.0	AES	PERFECT	ONLINE	SUCCESSFUL	- 25.03...
C10038EA	imago G1 4.4	CRYPTOJ	26.03.20...	GOOD	-39	19	3.0.0	AES	PERFECT	ONLINE	SUCCESSFUL	- 25.03...
C10038EB	imago G1 4.4	CRYPTOJ	26.03.20...	GOOD	-42	8	3.0.0	AES	PERFECT	ONLINE	SUCCESSFUL	- 25.03...
C1003C58	imago G1 4.4	CRYPTOJ	26.03.20...	GOOD	-51	16	3.0.0	AES	PERFECT	ONLINE	SUCCESSFUL	- 25.03...
C300011C	imago G1 4...							UNKNOWN		OFFLINE	SUCCESSFUL	- 25.03...
D1001962	imago G1 7.4	CRYPTOJ	26.03.20...	GOOD	-43	35	3.0.0	AES	PERFECT	ONLINE	SUCCESSFUL	- 25.03...
D1001964	imago G1 7.4	CRYPTOJ	26.03.20...	GOOD	-41	19	3.0.0	AES	PERFECT	ONLINE	SUCCESSFUL	- 25.03...
D1001965	imago G1 7.4	CRYPTOJ	26.03.20...	GOOD	-52	31	3.0.0	AES	GOOD	ONLINE	SUCCESSFUL	- 25.03...
D100196D	imago G1 7.4	CRYPTOJ	26.03.20...	GOOD	-37	12	3.0.0	AES	PERFECT	ONLINE	SUCCESSFUL	- 25.03...
D100197E	imago G1 7.4	CRYPTOJ	26.03.20...	GOOD	-37	19	3.0.0	No PIN	PERFECT	ONLINE	SUCCESSFUL	- 25.03...
D1001984	imago G1 7.4	CRYPTOJ	26.03.20...	GOOD	-59	21	3.0.0	AES	GOOD	ONLINE	SUCCESSFUL	- 25.03...
D1001985	imago G1 7.4		26.03.20...	GOOD	-58	33	2.3.2	AES	GOOD	ONLINE	SUCCESSFUL	- 25.03...
D1001986	imago G1 7.4	CRYPTOJ	26.03.20...	GOOD	-55	24	3.0.0	Unsupported		ONLINE	SUCCESSFUL	- 25.03...
D100198A	imago G1 7.4	CRYPTOJ	26.03.20...	GOOD	-43	12	3.0.0	AES	PERFECT	ONLINE	SUCCESSFUL	- 25.03...
D100198C	imago G1 7.4	CRYPTOJ	26.03.20...	GOOD	-43	33	3.0.0	AES	PERFECT	ONLINE	SUCCESSFUL	- 25.03...
D100198D	imago G1 7.4	CRYPTOJ	26.03.20...	GOOD	-53	29	3.0.0	AES	GOOD	ONLINE	SUCCESSFUL	- 25.03...
D1001990	imago G1 7.4	CRYPTOJ	26.03.20...	GOOD	-47	39	3.0.0	AES	PERFECT	ONLINE	SUCCESSFUL	- 25.03...
D1001992	imago G1 7.4	CRYPTOJ	26.03.20...	LOW	-41	13	3.0.0	No PIN	PERFECT	ONLINE	TIMEOUT	- 25.03...
D1001993	imago G1 7.4	CRYPTOJ	26.03.20...	GOOD	-43	30	3.0.0	AES	PERFECT	ONLINE	SUCCESSFUL	- 25.03...

FIGURE 1-22: Encryption status

6.5 Unlocking labels

If the label was registered and a communication key was set it will no longer work in other networks using a different network key passphrase. To unlock this labels for other networks an unlock code is required. The unlock code is similar to the registration code - it is a combination of the label ID and a 128 bit PUK code.

Via ESL Clientselect **File – Unlock labels** and enter the unlock key.

The screenshot shows the 'Unlock Labels' dialog box. It has a title bar with a green dot and a close button. The dialog contains an 'Unlock Code:' text box with an 'Add' button to its right. Below this is a table with columns 'Label ID', 'Type', and 'Puk'. At the bottom of the dialog are buttons for 'Import', 'Remove', 'Clear', 'Unlock', and 'Cancel'.

FIGURE 1-23: Unlock Labels Dialog

Note: The unlock-code for the specific labels is enclosed in the Smart Box (in an envelope).

7 Start tagging

7.1 What can I do now?

As soon as labels are online you can do several things:

- Send image to label
- Assign tags
- Show the current image
- Ping label
- Reset label (reset display to show label ID and label ID barcode)
- Refresh display
- Switch to a preloaded page
- Create a new matching
- Set filters
- ...

7.2 Sending pictures to labels

1. Right click on one or more labels -> Send image...
2. Select a picture (Note: Display size must match the resolution of the image)
 - A. In the right pane, a priority (currently not relevant) could be set for the task, as well as the Page to which the image should be sent and whether the image is preloaded.
 - B. When preloading, the image is placed in the memory of the label, but not yet displayed. The image change will only be performed after the change to the relevant page. This allows for each label that images are cached on the various pages and be accessed quickly by switching to the relevant page.
3. By clicking on "open" the corresponding task(s) for the label(s) will be created and the transfer begins.

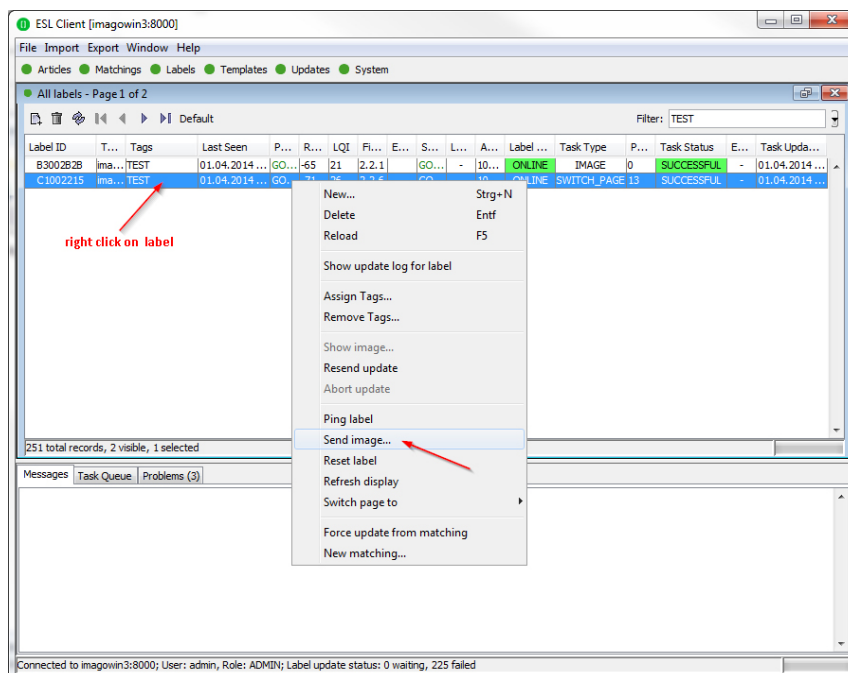


FIGURE 1-24: Send image to label

7.3 Article management

For complete management of your articles select **Articles – All Articles** in the ESL Client. Here you're able to create/delete and edit your articles.

The Smart Box comes with 4 predefined articles which you can see here. You can add some more demo articles, edit the existing ones or just step further to the next point Matchings.

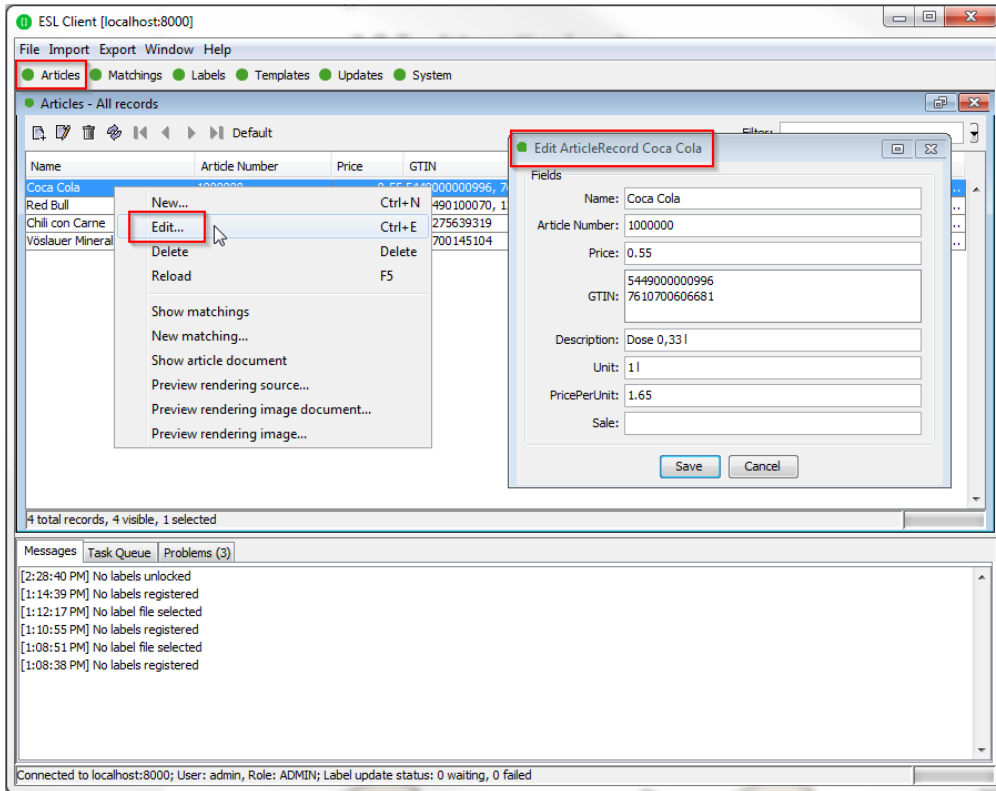


FIGURE 1-25: Article management

7.4 Matchings

The logical link between an article and the label that shows the article information and price of this article is called matching. With a matching the layout of the image rendered for the label is also defined by specifying the name of a template.

In a more technical way a matching is the triple of:

- Label ID
- Article number or GTIN
- Name of the template file

Note: Only one matching per label is allowed but a single article may be matched to more than one label.

Select File – New matchings to open the dialog where you can select the desired data records and create a number of matchings at the same time.

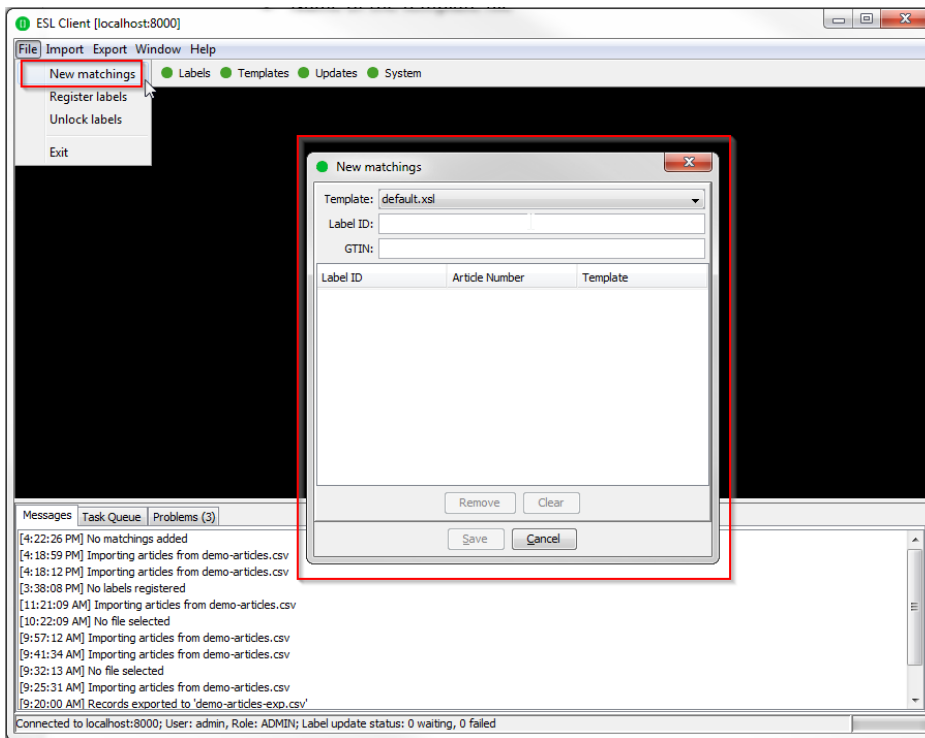


FIGURE 1-26: New matchings dialog

Another way to create/edit matchings is under “*Matchings – All Matchings*”:

- Select the desired data records (Label ID, Article Number) in the following window “*New Matching Record*” (either manually or with the magnifying glass symbol). Select an appropriate template via “*Template*” that should be used to generate the image.
- Confirm your choice by clicking Save. After that, the generated image is sent to the selected label.

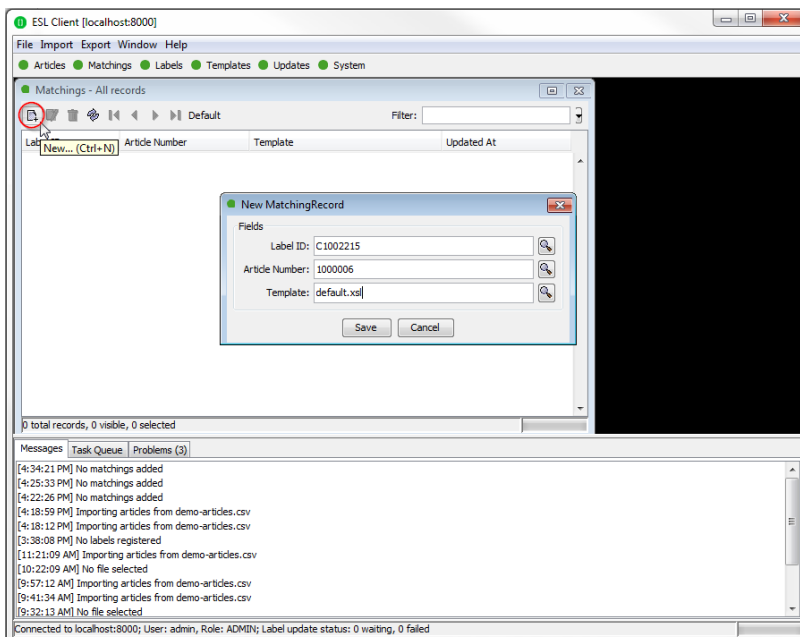


FIGURE 1-27: Create a matching

It's also possible to create Matchings with ESL Client under Labels and Articles, for this just select the desired article or label, right-click on it and select "New matching..." (the new matching dialog will be pre-filled with the article or label information).

7.5 Set filters for enums

It's possible to set and combine several filters. Click on the drop down menu to see the different choices.

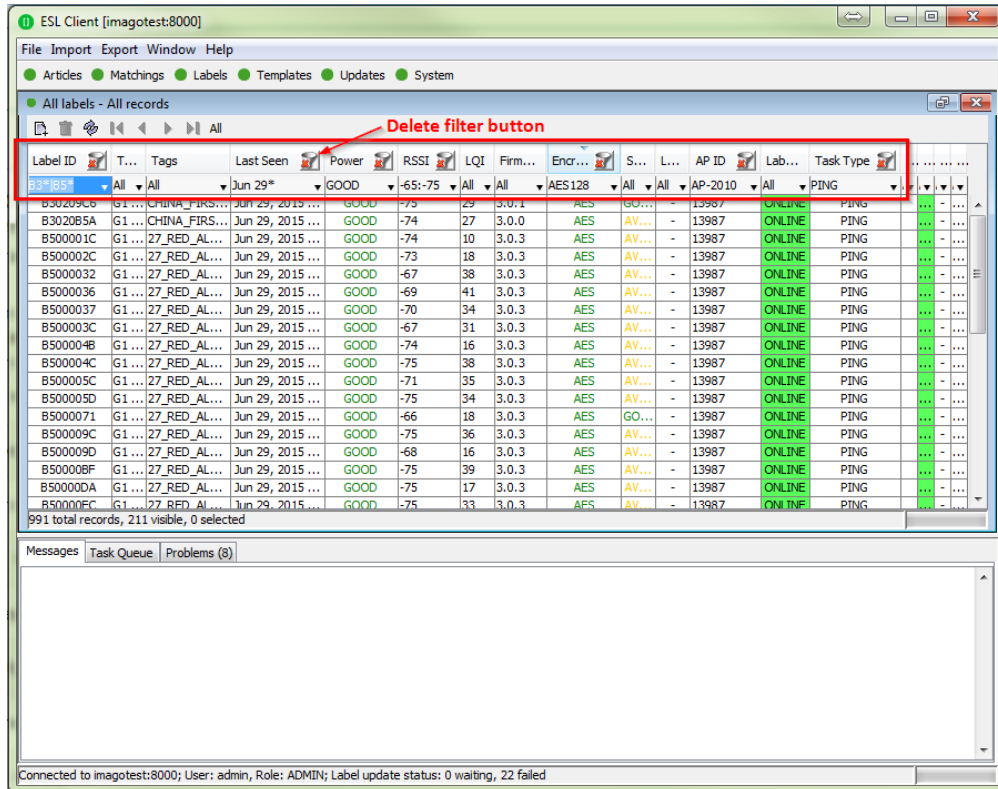


FIGURE 1-28: ESL Client filter options

7.5.1 Filter options

The following operators are available:

Operator	Description
<	Less than
>	Greater than
<=	Less than and equal
>=	Greater than and equal
!	Negation (Not)
=	Equals
:	Defines a range (e.g. RSSI filter -65:-75 shows all labels with current RSSI value within -65 and -75) Doesn't apply to date and text.

7.5 Templates

The template is used to specify the fields, which should be rendered into the image. The ESL Server can handle multiple templates.

7.5.1 General information about templates

The image rendering process is based on XSL (EXtensible Stylesheet Language) templates. The individual image for the label is then generated by applying the template to a XML, which is based on the properties of the label and is expanded by a custom XML from the user.

The following steps are executed when processing a template:

- Generating a record XML based on the label/task information and custom information provided by the user
- Applying the template (XSL) on the generated record XML. This results in a document containing the fields, specified in this reference and values referenced from the XML
- Rendering the image (*.PNG) based on the previous output



FIGURE 1-29: Input and result of the rendering process

7.5.2 Template Editor

In order to use our rendering engine you must know our template language which is basically XSL. We do also have a Template Editor with live preview, but you need a little bit time to setup everything and get familiar with it. Therefore we suggest to send pre-rendered images to labels (right-click on a label -> send image) which you can create with every image manipulation software you want (e.g. Gimp, Photoshop, Paint, ...). You can even take some pre-rendered images from us for each label type with the correct resolution as a template – you'll find some in the client's directory under data/images.

7.5.2.1 Starting Template Editor

Navigate to the unpacked template directory (see point *Installation process* on how to unpack the software package) and execute the “template.jar” file (see [*Troubleshooting*] on page 32).

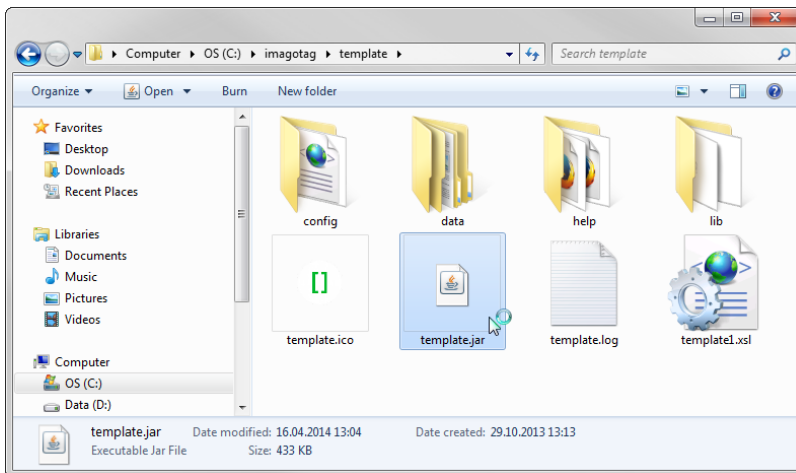


FIGURE 1-30: Starting the Template Editor

7.5.2.2 Open default template-file and load records from server:

- Open the Template Editor by clicking the “template.jar” file located in the template-directory (In our example it should be C:\imagotag\teemplate\).
- Next step is to create a new template file or to open an existing one (The default.xml template file is located in the server-directory under C:\imagotag\server\data\teemplate\).
- To get a live preview you’ll have to load some records, in our case we load the demo article records from our running server, see the following figure.

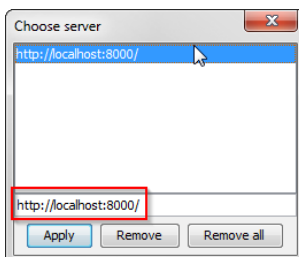


FIGURE 1-31: Load Records from Server

After these steps your Template Editor window should look something like this:

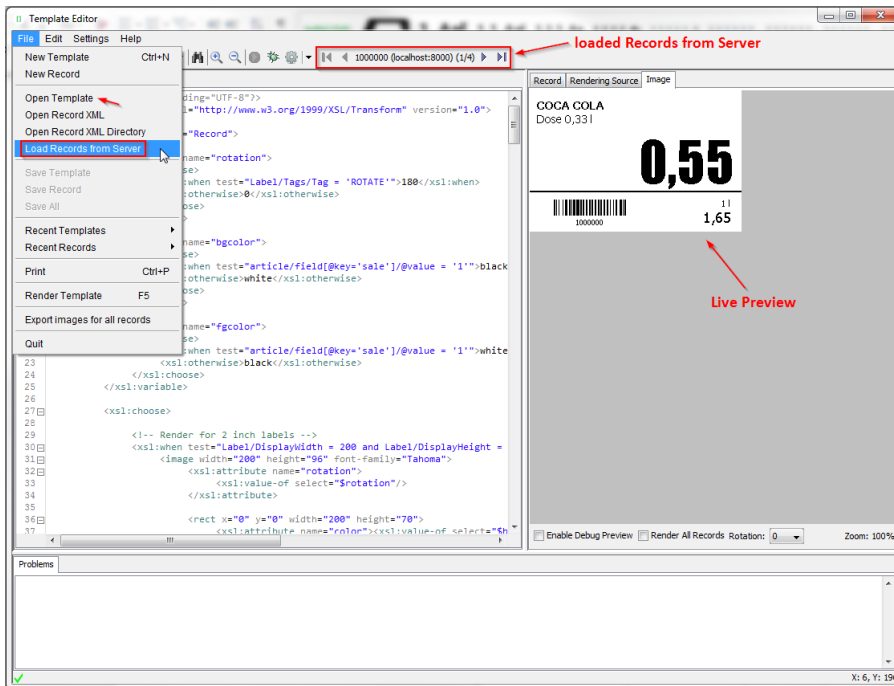


FIGURE 1-32: Template Editor with loaded records from server and default.xsl template file

7.5.2.3 Design Mode

You can enable the graphical Template Editor by selecting **Settings – Configuration** – tick **Enable Design Mode** and finally the Save-button.

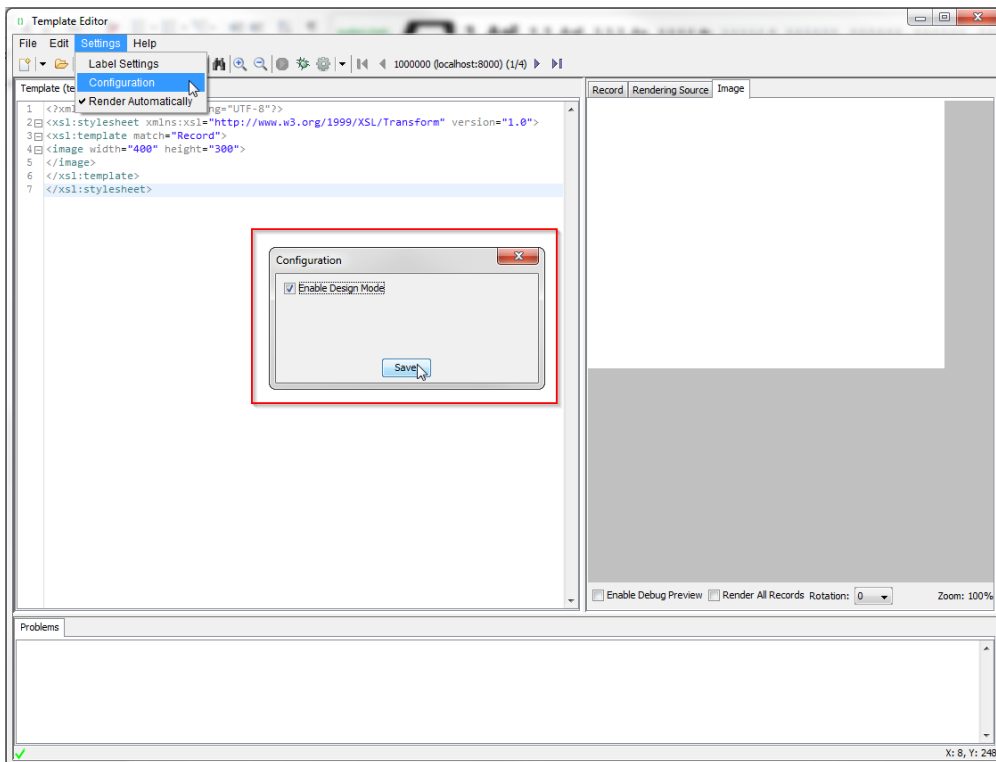


FIGURE 1-33: Enable Design Mode in Template Editor

After enabling the Design Mode a new tab will show up.

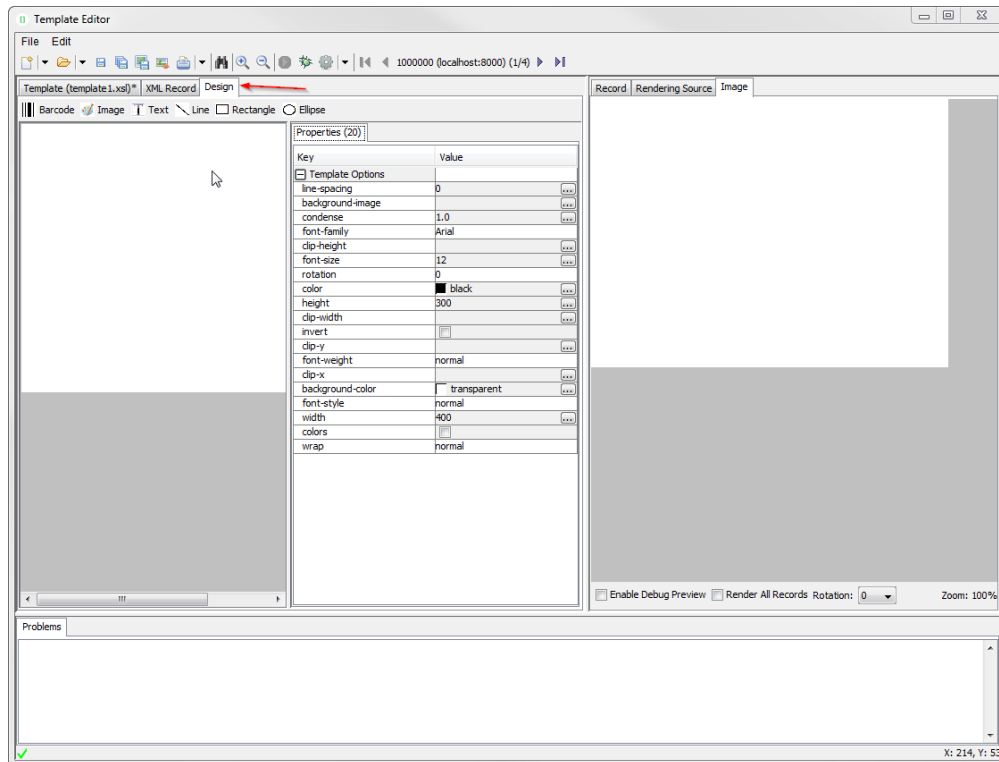


FIGURE 1-34: Template Editor Design Tab

7.5.2.4 Enable and show color red

As there are new label types which are capable of showing the color "red" there's a short description how to enable this inside the xsl template file.

- *Optional: Query whether it is a "red" label*
 - `<xsl:when test="Label/DisplayWidth = XXX and Label/DisplayHeight = XXX and Label/DisplayColors = 'BLACK_WHITE_RED'">`
- Add colors option to image tag:
 - `<image width="XXX" height="XXX" colors="true" font-family="XXX">`
- Show something in color red, e.g. text:
 - `<text font-size="XXX" condense="XXX" font-weight="XXX" color="red">`

7.5.2.5 Help Content

There's a link to the Help content for the Template Editor, open it by clicking Help – Help Content in the Template Editor or open the file *index.html* located in `C:\imagotag\template\help\`.

Also you can find further information on the USB Stick under **Documentation - Image Rendering Reference**.

8 Integration

8.1 Webservice integration

The ESL server provides access to its interfaces methods through a RESTful web service API. The web service is designed according to the "Representational State Transfer" (REST) architectural pattern.

The ESL server listens for incoming HTTP web service requests on the TCP port 8001 by default.

You can find further information and documentation about the webservice integration online under <https://portal.imagotag.com/get/documentation>

8.2 Plugins

We provide several plug ins which are used for importing article information into the ESL Server.

You can find further information and documentation about our integration plug ins online under <https://portal.imagotag.com/get/documentation>

8.3 Custom integration

For custom integration we provide a Plugin-Interface. Software development service is available from imagotag software development team or third-party integration partners.

For pricing get in touch with our sales agents (sales@imagotag.com).

[Troubleshooting]

1 FAQ

If you run into any errors during connecting or sending images to labels, please refer to the documentation included in the server. This documentation can be found in the AP-2010 web management interface of the server under "Documentation".

- For problems updating the labels (error code column in labels window) refer to "Update Error Codes" or (task status column in labels window) refer to "Task Status"
- For connection status problems refer to "Connection Status"
- For label hardware errors (label error column in labels window) refer to "Label Error Codes"

Code	Problem	Solution
1	Label not licensed	The label is not licensed. Import the proper license file for the label or check for typos in the label id.
3	Label not registered	The label may have been deleted or has never been registered at all. Register label.
10	Image does not match display size	The size of the image does not match the label's display size. Please check the width and height of your image and look up the display size in pixels for the label. These sizes have to be equal.
11	Error during image rendering	Check template (wrong or faulty)
12	Error during image conversion	Change format of the image to standard format (e.g. PNG or BMP)
13	Invalid page	Page not supported by label type, choose a different page
14	Could not process task because there are unfinished tasks waiting for this label	Abort task or wait until unfinished tasks are finished
20	Template not found	Check template directory for missing template file
21	Error during template parsing	Correct template file (Invalid content found)
22	Error during content document creation	Check server and article record configuration
30	Could not send update because label has insufficient power to perform the update	The power status of the label is "Bad", which means it is very low on battery that in may not accomplish the display update. Replace the battery of the label.
62	HTTP communication error with the access point	The server was not able to send the task to the Access Point. Please make sure that the Access Point is not offline (System -> Access Point Status) and there is an established network connection between Access Point and Server.
80	Error while writing task to database	Check database connection
92	Task type not supported	Upgrade AP software to process this kind of task

1.1 Running the ESL Server as a background service

The ESL server may be started as a normal application, but on a productive system it is usually required to have it automatically started without a user logged in. To achieve this the ESL server can be registered as a Windows service. It is then started automatically without any graphics user interface.

To install the ESL server as a Windows service the batch file **install_service.bat** is provided. If this file is executed with administrator privileges (Right click – Run as Administrator) it will install the ESL server installation from the same directory as a Windows service with the name ESL_SERVICE.

The file `uninstall_service.bat` will remove the Windows service if executed with administrator privileges.

If you have any problems regarding the background service:

- Check if you have installed the correct JAVA version corresponding to your system (x86/x64)
- If the ESL Server is already installed as a Windows service you have to uninstall it first (`uninstall_service.bat`) and reinstall it again (`install_service.bat`).

1.2 Where can I find the license file for my SmartBox?

You find the license file (which has to be activated at the imagotag Customer Portal enclosed in the SmartBox in a "License Envelope".

1.3 Deleting the demo articles

In order to prevent the example articles from being re-added to the server, go to "System - Configuration" and set the "importFixtures" variable to false.

1.4 Establish a network configuration when no DHCP is available – Step by step

1. Set a laptops Ethernet adapter to DHCP
2. Turn off all other network adapters (Wi-Fi)
3. Connect to the same network as the AP-2010 (use a common Ethernet cable to connect your device directly with the AP-2010)
4. Start local ESL Server on laptop
5. Use the ESL client to connect to your local server
6. Under System – Access Point Status – the AP should be listed as discovered (after successful boot sequence – may take up to 2 minutes)
 - Press F5 on your keyboard or the refresh button in the ESL client to refresh the access point status (the Client doesn't refresh the status automatically!)
7. One Column of the AP should now show the IP address
8. Open a browser, type in <http://<discovered-ip>:8080> or
 - at the ESL client perform a right click on the discovered access point – Open in browser – Maintenance – Status

Note: Restart your access point if discovering process takes more than 2 minutes.

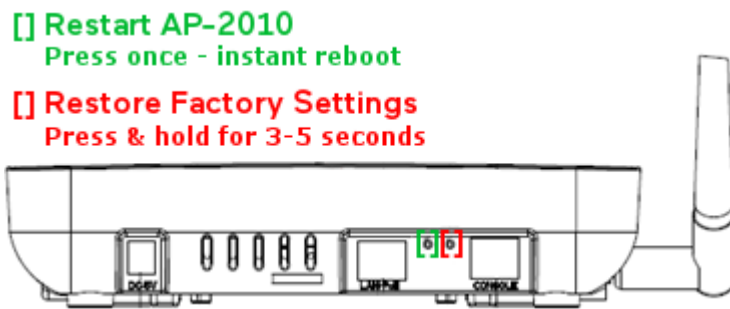


FIGURE 1-35: Restart and Factory Defaults button

1.5 AP discovering with Bonjour Services

You still got problems to find your AP in your network? There's another workaround: You can use Apple's "Bonjour Print Services".

Download and install "Bonjour Print Services" for Windows (pre-installed under OSX):

<http://support.apple.com/kb/DL999>

Note: After installation there's no reboot required.

If the access point is connected directly to the system where the "Bonjour Service" is installed (or on a network with running "Bonjour Service") you can find the access point by typing the following in the browser of your choice:

<http://ap-<ID>.local:8080> (e.g. <http://ap-12724.local:8080>)

Note: You can reach older versions of the AP with <http://imagotag-ap.local:8080> (custom hostnames are only available on newer versions of the access point)

1.6 What can I do if the Status LED of the AP-2010 access point doesn't turn blue?

- Check the AP status
- Check AP configuration
 - No Channel set
- Check network reachability of AP
- AP registered to Server?
- Reboot AP

1.7 Labels don't come online

After the registration it could last a certain time until all registered labels are joined to the network (up to two hours, depending on number of access points and the channels used.

- Up to 30 minutes with channels 3, 5, 8, 9 and 10
- Up to 2 hours with channels 0, 1, 2, 4, 6 and 7

Warning: A label must not be registered to multiple ESL server installations at the same time. It will only connect to one of this installations.

1.8 The encryption does not work

Check the encryption passphrase in Server Configuration (System – Configuration).

If label was already registered with a different passphrase you'll have to unlock the label first in order to register it on the server.

1.9 Unlocking labels

If the label was registered and a communication key was set it will no longer work in other networks using a different network key passphrase. To unlock this labels for other networks an unlock code is required.

Select **File – Unlock labels** and enter the unlock key.

The unlock-code for the specific labels is enclosed in the Smart Box (in an envelope).

If you have any problems (the unlock code wasn't included or you can't find it) please contact the imagotag support (support@imagotag.com).

1.10 Starting Java applications

Before starting a Java application, make sure you have Java Runtime Environment Version 6 or higher installed and you have set the necessary environment variables.

If the .jar file extension is known and associated with Java, just double-click the jar file to start the application. Otherwise if the extension is not recognized:

Windows:

Create a shortcut of the jar file, right-click on it and open properties. Prepend "javaw.exe -jar" to the path in the "Target" field. Double-click the shortcut.

Linux:

Navigate via command line to the directory where the jar file lies and execute "java -jar <filename>.jar"

In case your environment variables are not set properly (e.g. javaw.exe/java command could not be found) do the following steps:

1. Locate your installation directory of your Java Runtime Environment
2. Set JAVA_HOME Variable

Under Windows:

- Right-click on "**My Computer**" and select "**Properties**"
- Click the **advanced** tab
- Click the "**EnvironmentVariables**" button
- Under "**SystemVariables**", click **New**.
- Enter the variable name as **JAVA_HOME**
- Enter the variable value as the installation directory of your Java Runtime Environment
- Click **OK**
- Look for the Path variable in "**SystemVariables**" and edit it
- Append a semicolon (;) and %JAVA_HOME%\bin to it

- Click **OK**
- **ApplyChanges**

Under Linux:

- Use the “export” command to set your variables
- **export JAVA_HOME=<pathToJRE>**
- **export PATH=\$PATH:<pathToJRE>/bin**
- In order to make these changes persistent, write them into your **.bash_profile** file and use “source ~/.bash_profile” to apply the changes

1.11 Encoding problems

Per default, UTF-8 encoding is used. If you have any problems regarding encoding you can force any java application to use UTF-8. By setting the (Windows) environment variable **JAVA_TOOL_OPTIONS** to **-Dfile.encoding=UTF8**, the (Java) System property will be set automatically every time a JVM is started.

1.12 Further documentation

Please contact the support for further documentation:

- Developer Reference (Web Service)
- Image Rendering Reference
- CSV/XML Import Plugin
- FAQ