User Manual
LANCOM Wireless ePaper Server

LANCOM
Systems

Contents

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1 Introduction

LANCOM Wireless ePaper Displays provide a variety of options for displaying information. You can automatically and remotely update the calendar schedule for your conference rooms, you can create dynamic notices and direction signs, or you can control the price labels of goods on your shelves from a central location in real time. The wide range of different settings allows you to set up your very own customized use case.

The Wireless ePaper Displays are battery powered and radio controlled, so they operate independent of any external power supply or physical network connection. This allows a highly flexible use. The graphical display offers a high-contrast image with a very wide viewing angle, while at the same time consuming an extremely low level of energy. Data transmission is protected by 128-bit encryption.

The associated LANCOM E-series access points provide not only the wireless connection to the Wireless ePaper Displays: They also support a full WLAN infrastructure and also the iBeacon technology. By integrating all of these technologies into a single device, they all operate in parallel without interfering with one another.

This User Manual helps you with the steps required to commission the Wireless ePaper Server for centralized management and monitoring of your Wireless ePaper infrastructure.

1.1 How it works

The LANCOM Wireless ePaper solution consists of four components:

- LANconfig allows the management and configuration of access points, includes the Wireless ePaper management feature, and facilitates the configuration of the Wireless ePaper Server
- The Wireless ePaper Server creates the graphics and transmits the information to the access point
- The access point connects to the Wireless ePaper Displays via radio
- The Wireless ePaper Display shows the desired content
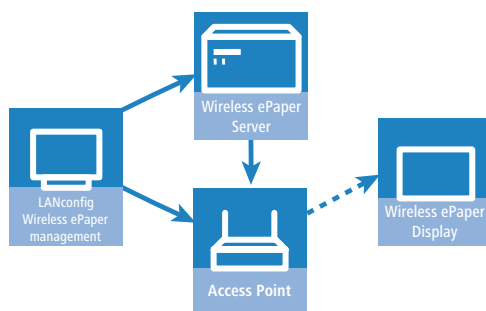
The software consists of LANconfig and the Wireless ePaper Server. LANconfig manages the access points, facilitates their configuration, and invokes the Wireless ePaper management. The Wireless ePaper Server receives the instructions from the Wireless ePaper Management, computes the content to be rendered, and transfers this to the access points. The access points forward the content to the Wireless ePaper Displays by radio.

Wireless ePaper Display

A Wireless ePaper Display is based on ePaper technology for the display of any information in the form of graphics and text. It can be used, for example, as room signage in the appropriate corporate design, or to display information about an article. The information on display is automatically updated via radio when the content changes, unlike any printed signs.

Wireless ePaper Displays, referred to as Displays in the following, are available in the sizes 7.4", 4.4" and 2.7".

LANCOM E-series access points

E-series access points communicate with Wireless ePaper Displays using radio frequencies in the 2.4-GHz ISM band and a proprietary protocol. They offer a choice of 11 radio channels.

Depending on the size of the area where the radio-controlled Wireless ePaper Displays are installed, more than one access point may be required to provide coverage over the entire area. If more than one access point is available, each Display automatically selects the access point with the best signal quality.

Further technical details on the LANCOM E-series access points can be taken from the data sheet.

LANCOM Wireless ePaper Server

The LANCOM Wireless ePaper Server is a software program required for the management of the LANCOM access points and Wireless ePaper Displays. The Wireless ePaper Server runs as a background service on an on-site Windows or Linux PC. It does not provide a graphical user interface.

The Wireless ePaper Server generates the graphics, which are transmitted to and shown on the Displays when there is a change of information.

LANconfig and Wireless ePaper management

The software LANconfig is required to operate the access points, with regard to both the WLAN and the Wireless ePaper solutions. Please use the appropriate User Manual for the installation and setup of LANconfig.

Monitoring and configuration of the Wireless ePaper infrastructure is available in LANconfig in the form of the Wireless ePaper management, which provides a graphical user interface. The Wireless ePaper management connects to the Wireless ePaper Server. The server can be installed on the same computer or on any other computer that is accessible on the network.

2 Installation and setup

Before you can access a Display, you first need to install and set up the various components. Go to the LANCOM website and download the latest version of LANconfig and the current installation packages for the Wireless ePaper Server. The Wireless ePaper management is integrated into LANconfig, so no separate installation is required.

The necessary steps are explained below:

- Install the Wireless ePaper Server software on a computer available locally in the network
- Set up the license for the Wireless ePaper Server
- Connect the access point to the local network and configure it
- Register the Displays with the Wireless ePaper Server

The Wireless ePaper management indicates whether the Wireless ePaper Server, access point and LANconfig are communicating correctly. It is accessible in LANconfig under **Tools** > **Start Wireless ePaper management**. The Wireless ePaper management opens in a new window in the system's default browser.

(i)   The Wireless ePaper management is a part of LANconfig and does not require separate installation.

2.1 Installing the Wireless ePaper Server

Install the Wireless ePaper Server on a central computer in the network with constant access to the Wireless ePaper Displays.

(!)   Only one Wireless ePaper Server should be installed on a network, otherwise conflicts could arise.

(!)   However, in the interests of system latency, the Wireless ePaper Server and the E-series access points should be connected over the same local network.

System requirements

The number of displays and their size directly affect the amount of RAM required. The required disk space may increase over time depending on the number of tasks and transmitted images.

- Intel dual core processor or equivalent
- 2 GB RAM (512 MB for the server)
- 100 MB hard disk space for the server installation
- Windows XP or later, Windows Server 2003 or later, Linux or OS X.
- Java Runtime Environment version 7 or later

Installation

On computers with the Windows operating system, the software is installed with the supplied installation routine. This directly installs and starts the Wireless ePaper Server as a service. In principle, the software runs outside of Windows on any computer with Java. You will find the corresponding ".jar" files in the download area of the LANCOM website.

To manage the Wireless ePaper Displays, the Wireless ePaper Server has to be started and running. To see whether the server is correctly installed and configured, look under the Wireless ePaper management for "Connected with server: [Server name] (IP: x.x.x.x)".
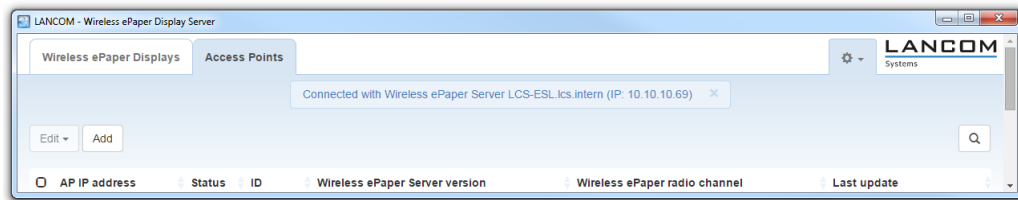
Files and folders of the Wireless ePaper Server installation:

config/	Contains files used for the configuration of the Wireless ePaper Server
data/	Contains runtime data such as templates
db/	Local mounted database (created when you first start)
lib/	External libraries required by your application
plugins/	Folder with user-specific plugins
derby.log	Database-related logging (created when you first start)
import.log	All logs of the import connections (created when you first start)
install_service.bat	Batch file for the installation of the server as a Windows service
level1.jar	Program code for operating the server on integration tier 1
prunsrv.exe	Required to run the Java application as a Windows service
server.jar	Main executable file to launch the application
server.log	All logs of the Wireless ePaper Server (created when you first start)
uninstall_service.bat	Batch file for the installation of the server as a Windows service

Updating the Wireless ePaper Server

In order to retain the database and configuration of your existing installation, simply copy the folder **db** and all modified files in the folders **config** and **data** to the new installation.

Starting the Wireless ePaper Server

You start the Wireless ePaper Server by double-clicking on the `server.jar` file. The Wireless ePaper Server requires a current Java Runtime Environment installed on the system. Furthermore, ".jar" files need to be associated with Java. When stated from the `server.jar`, the Wireless ePaper Server does not run as a service.

(!) By default, this server uses TCP connections on port 8000 (for Wireless ePaper management requests) and 8001 (for web services) and UDP connections on port 8000 (for detecting access points). Make sure that these ports are not blocked by a firewall or used by other applications.

When starting for the first time, the Wireless ePaper Server automatically creates a local database.

(!) It is not possible to start two instances of the Wireless ePaper Server at the same time on the same computer, because the database is locked and the TCP port is busy with the other instance. Additional configuration work is necessary in order to run multiple installations on the same computer.

Operating the Wireless ePaper Server as a background service

The Wireless ePaper Server can be run as a normal application, as described above. However, a productive system usually requires the application to start automatically and without a login user. To achieve this, the Wireless ePaper Server is registered as a Windows service. The Wireless ePaper Server then starts automatically.

The batch file `install_service.bat` is provided in order to start the Wireless ePaper Server as a Windows service. When this file is executed with administrator privileges, it installs the Wireless ePaper Server from the same directory but as a Windows service named *EPE_SERVICE*.

The file `uninstall_service.bat` removes the Windows service when it is executed with administrator privileges.

2.2 Setting up the license

In order to operate the Wireless ePaper Server, you first need to register it. On purchasing a Wireless ePaper Server license, you receive a license number that first has to be activated before use.

To activate your license, open your web browser and go to **http://lancom-systems.de/en/service-support/registrations/software/**. The option to activate your license is under **Wireless ePaper Servers**. Enter the serial number of your Wireless ePaper Server and the license number you purchased. If successful, you will receive an activation code for your license.

(!) This is how to find the serial number of your Wireless ePaper Server: Go to the Wireless ePaper management, open the menu in the top right-hand corner next to the LANCOM logo and click on **License**.

Registrations: LANCOM Wireless ePaper Server

Please use this form to activate your LANCOM Wireless ePaper Server license. When you send the registration, you will receive the activation code for your LANCOM Wireless ePaper Server.

Please note that the LANCOM Wireless ePaper Server license adheres strictly to the specified device after its activation. An activation of the same license for any other LANCOM Wireless ePaper Server installation is not possible. Therefore, take care to fill in the serial number without any mistake.

In case your registration was not successful or you have other problems during the registration you can trustfully turn to our **support »**.
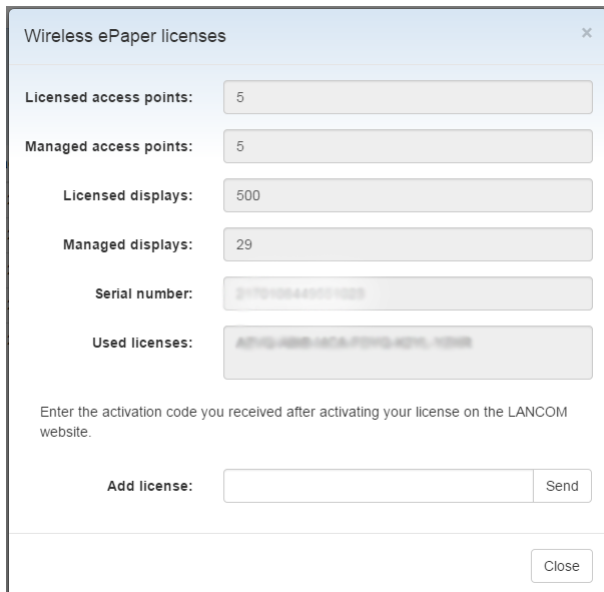
LANCOM Wireless ePaper Server serial number

Where will I find the LANCOM Wireless ePaper Server serial number?

LANCOM Wireless ePaper Server license number

Please verify your data before you continue.   Next »

To complete the registration of your license, you will find the option in the Wireless ePaper management in the menu in the top right-hand corner. Open the menu next to the LANCOM logo and click **License**.
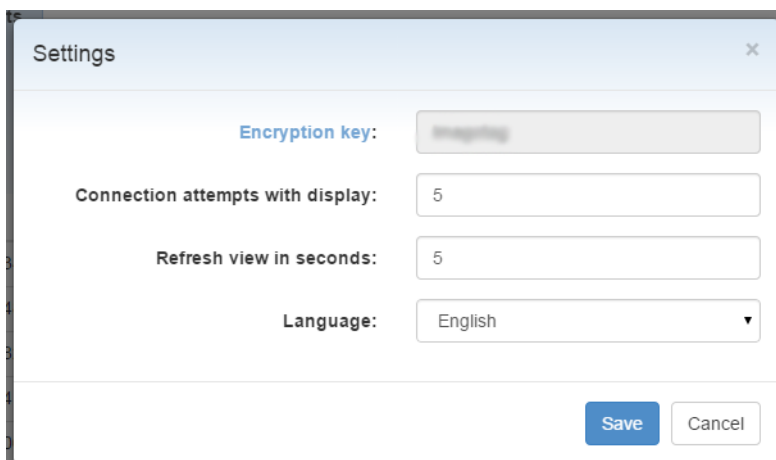

Once you have successfully registered your license on the LANCOM website and have received your activation code, enter this into the field **Add license** and then click **Send**. If your entries are correct, your license will be displayed. Under **Licensed access points** you can see the maximum number of access points that can be operated by the Wireless ePaper Server. To find the number of access points currently in operation, see **Managed access points**. The number of **Licensed Displays** and **Managed Displays** is shown in a similar manner. If you wish to operate more access points or displays than your current license allows, please contact LANCOM.

(!) If you have not set up a license, any commands sent to the display will be faulty and do not run.

2.3 General settings

In the upper-right corner of the Wireless ePaper management, click on the gear-wheel icon to access the general settings for the Wireless ePaper Server.

Under **Encryption key** you change the encryption passphrase used for the AES-128 encrypted communication between the Wireless ePaper Server and the managed Displays. You should change this for your installation first.

> (!) This key is stored to the Displays when they are registered. Should you want to change the key for a running installation, you need to reset all of the Displays to their factory settings beforehand (see *Reset Display* on page 19).

Under **Refresh view in seconds** you set the frequency with which the Wireless ePaper management updates the Displays. The preferred language for the Wireless ePaper management is set under **Language**. The **About** item contains the version number of the Wireless ePaper Server and a link to the LANCOM website.

2.4 Installing and configuring the access points

Access points of the E-series act as an interface between the Wireless ePaper Server and the Displays. Before content can be shown on the Display, you must have set up at least one access point on your network. For instructions on the basic installation and configuration of LANCOM access points, please refer to the relevant Quick Reference Guide.

Installing LANconfig

LANconfig is supplied with an automatic installation routine that is tailored to your access point. To install the application, execute the file with the extension `.exe` and select the folder of your choice.

Opening LANconfig

Start LANconfig either from the Start menu, the desktop shortcut, or by double-clicking on the file `lanconfig.exe`.

The settings for operating Wireless ePaper Displays are to be found in LANconfig under **Tools** > **Options** > **Wireless ePaper**. Under IP/Hostname you enter the IP address and the port of the Wireless ePaper Server. The recommended port number is 8001.
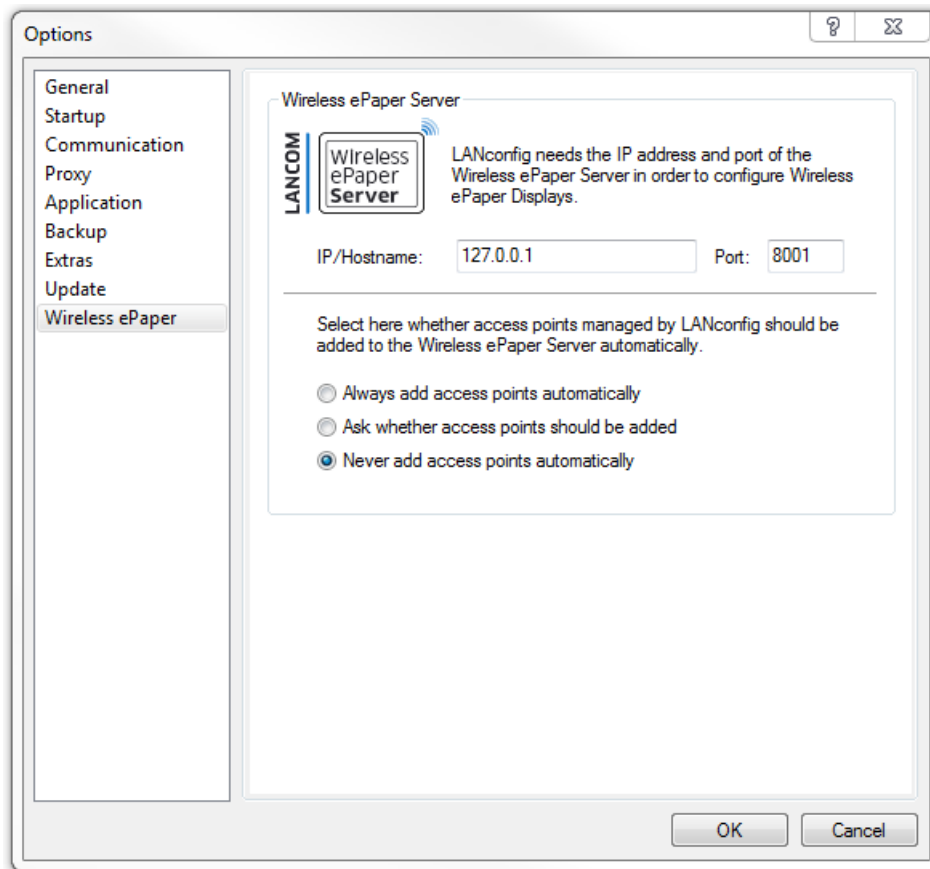
Opening WEBconfig
To access the WEBconfig user interface for the access point, open your web browser and enter the access point IP address into the address bar. You will find the settings and status information for the Wireless ePaper Displays in the menu items **LCOS menu tree** > **Setup** and **LCOS menu tree** > **Status** under **Wireless-ePaper**.

Opening the Wireless ePaper management
To start the Wireless ePaper management in LANconfig, click **Tools** > **Start Wireless ePaper management**.

Channel selection

For a functioning installation, a channel must be selected on each access point in the network. There are 11 non-overlapping channels, which are reserved for communication with the Displays. Five of these channels should be preferred because the Displays connect to the access points more quickly. If your WLAN installation operates on the channels 1, 6 and 11, then in all cases the channels 3, 5, 8, 9 and 10 should be selected. If there is another WLAN installation operating at 2.4 GHz (IEEE 802.11b/g/n), or another wireless technology operating on the 2.4-GHz ISM band, then you select the channels with the least overlap with the existing installation. The transmission continues to function even if the channels overlap, but this can result in loss of speed in the WLAN and for the communication with the Displays.

The radio channel is set using WEBconfig for the access point under **LCOS menu tree** > **Setup** > **Wireless-ePaper**. The channels 1 – 11 are available in the frequency range 2404 MHz to 2480 MHz. If possible, use the channels 3, 5, 8, 9 and 10, as these are scanned more frequently and do not cause interference with the usual WLAN channels (1, 6, and 11).
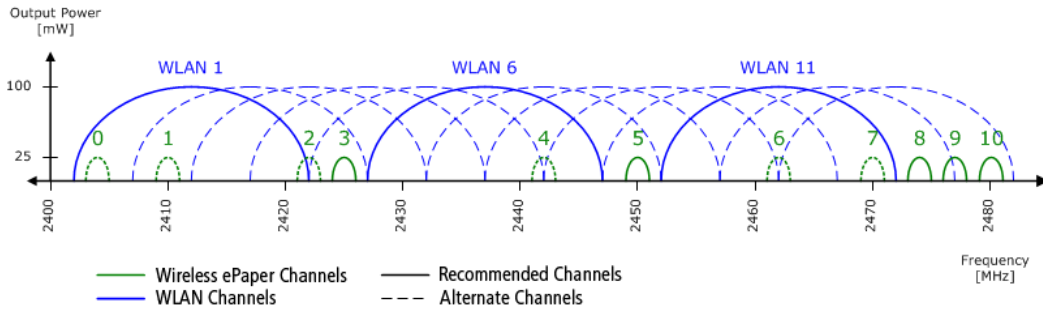
⚠ Do not select the same channel for two access points that are in the same area. This causes interference and prevents Displays from joining the network. It is possible to set the same channel on two access points if you are sure that each display is only within range of one of these access points.

2.4.1 Adding access points

To assign an access point to a Wireless ePaper Server, two options are available to you.

Option 1: Open the Wireless ePaper management under LANconfig. To do this, open the context menu of the desired access point in LANconfig and select **Add Wireless ePaper Server**.
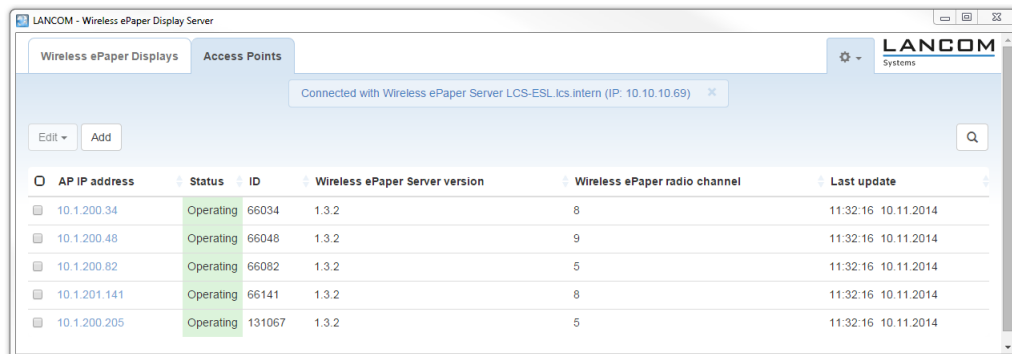
Option 2: In the Wireless ePaper management, go to the tab **Access points** and click the button **Add** to open the dialog for adding new access points.

Select the desired device from the list. The rest of the information is usually entered automatically. The IP address of the access point is displayed in LANconfig next to the discovered LANCOM devices. The access point ID is a unique ID that you will find either on the label of the access point or in LANmonitor. The port number is also to be found in the configuration settings of the access point. The default port is 4713, the setting is located in the configuration menu for the access point under **LCOS menu tree** > **Setup** > **Wireless ePaper**. A message informs you whether the action was a success. If an access point was added successfully but does not immediately show up in the list, you can refresh the display with F5.

If an access point was added correctly, it is displayed in the Wireless ePaper management list. The information displayed includes the IP address of the access point, its status, the ID, the version of the Wireless ePaper Server, the ePaper radio channel being used, and the time of the last update.

The list of access points contains the following values:

AP address

The IP address of the E-series access point

Status

The current connection status of the access point

ID

The unique ID of the access point

Wireless ePaper Server version

The version of the Wireless ePaper Server that the access point is connected to

Wireless ePaper radio channel
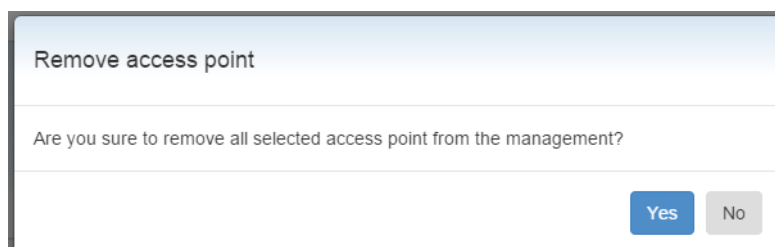
The Wireless ePaper radio channel selected for this access point

Last update

The time that the server last attempted to reach the access point

2.4.2 Removing access points

You can remove an access point from the Wireless ePaper management. In the **Access points** tab, select the relevant access point by placing a check mark in the appropriate selection box. Then click **Edit** > **Remove**, and confirm your selection with **Yes**.

2.5 Managing Wireless ePaper Displays

Opening the Wireless ePaper management

To invoke the Wireless ePaper management, start LANconfig and click on **Tools** > **Start Wireless ePaper management**. The tab **Wireless ePaper Displays** contains the setting options for the Displays.

Display ID

Displays are identified by their unique Display ID, which is an 8-digit hexadecimal number (e.g. B3010A4F) printed on the back of the display or shown on the Display itself (factory settings).

If a display is not registered, it does not join the network and any commands sent to it will fail with an error message. In order to register a display, a valid license must be installed first. Just how the licensing works is explained in *Setting up the license* on page 8. After registration, it may take some time until all registered displays join the network (up to two hours depending on the number of access points and channels used). A Display cannot be registered on multiple Wireless ePaper Server installations at the same time. It connects to one of these installations only.

ⓘ Displays that are not yet registered remain in sleep mode. Individual channels are scanned every 30 or 120 minutes and, depending on the choice of channel, it can take up to 2 hours for a device to be registered by the Wireless ePaper Server.

The list of Wireless ePaper Displays contains the following values:

Display ID

The unique identifier of the display

Display status

Current status of the Display. Communication with the Display is only possible when the status shows that this is secure.

Slot

The page that is currently shown in the Display

Tag

A marking used to group individual or multiple Displays or to indicate the location

Type

The Display type

AP address

The IP address of the selected access point

Signal strength

The signal strength of the last communication with the Display (from the perspective of the access point)

Battery

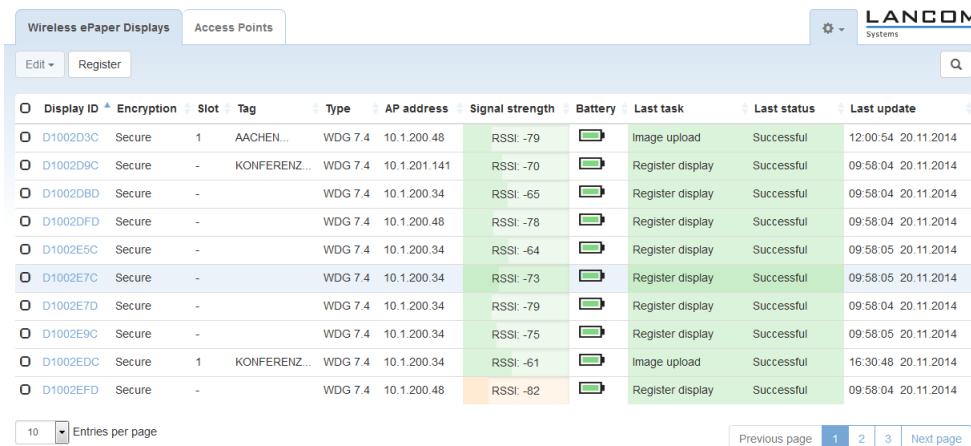The last reported charge of the internal batteries

Last task

The last task sent to the Display

Last status

Indicates whether the last command was completed or is still being processed

Last update

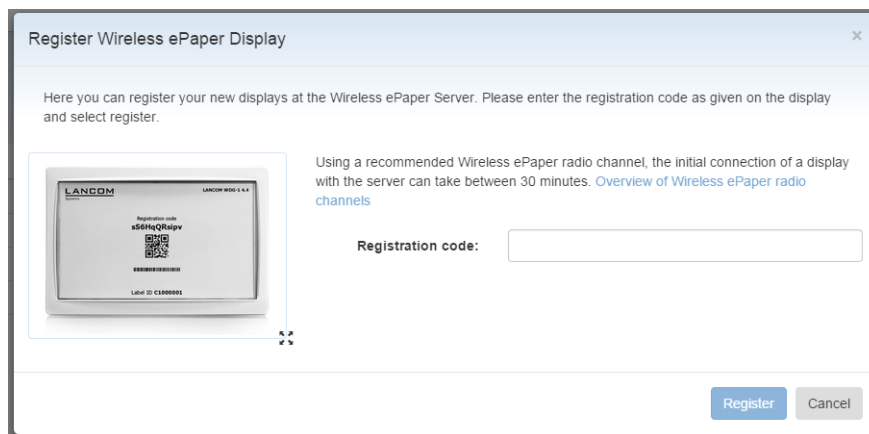Time and date of the last task sent to the Display

2.5.1 Add Wireless ePaper Display

The following prerequisites must be met in order to add a new Wireless ePaper Display:

- The Wireless ePaper Server software is installed and running.
- The access point is connected to the server.
- The display is within radio range of the access point.

In the Wireless ePaper management, the tab **Wireless ePaper Displays** features the button **Register**, which leads to the following dialog.

Enter the registration code shown on the Display.

(i) The registration code is not the same as the display ID. The registration code is only shown for Displays in their factory settings. The ID uniquely identifies the Display, also during normal operation. For more information about the ID, please see *Managing Wireless ePaper Displays* on page 14

2.5.2 Tasks and functions

A number of functions are available for managing the Wireless ePaper Displays, and these are explained in detail here.

These functions are invoked in the Wireless ePaper management under **Wireless ePaper Displays** > **Edit**.

Upload image

The easiest way to display content on the Display is to send it an image file.

To display an image file, go to the Wireless ePaper management, select the tab **Wireless ePaper Displays**, select the desired Display, click **Edit** and select **Upload image**. In the following menu, select **Add**.
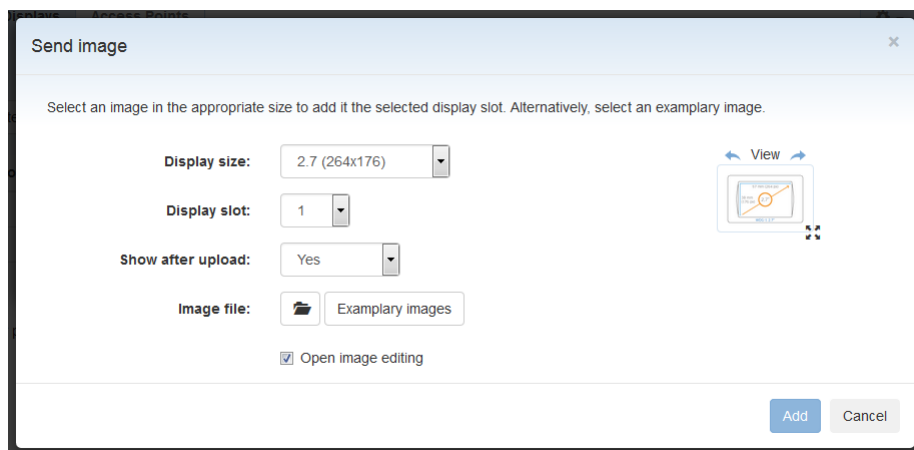
The display size is detected automatically. You select the desired image using "Image file (PNG, BMP)". LANCOM Wireless ePaper Displays support monochrome bitmaps in BMP or PNG format. The images need to have the same resolution as the Display. The image is displayed within approx. 10 seconds.

You can upload up to 12 images. Only the most recently added image appears on the display. You can enter different images into the various items under **Display slot**.

The function **Show after upload** sets which images are to be displayed subsequently. If this item is not selected, the image is transmitted to the Display but is not shown. The slot can be selected later with the option **Switch display slots**.

The item **Open image editing** allows you to select a portion of the image to be displayed. Select the area simply by moving the selection box. Click **Apply** to confirm your selection.
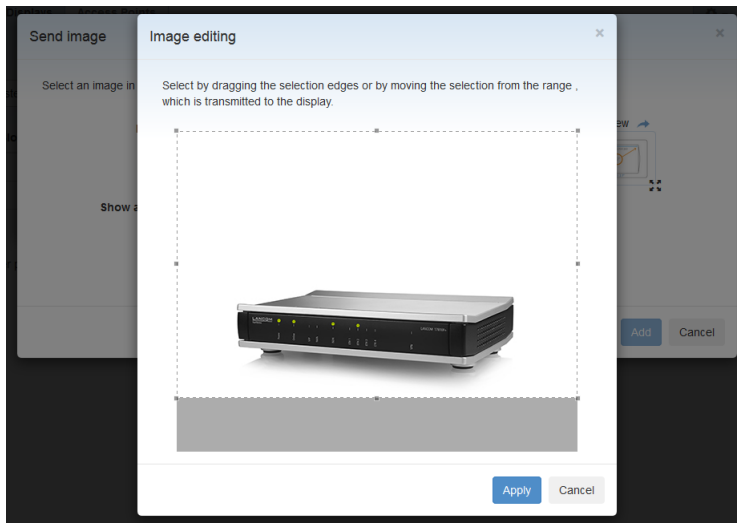
Display size	Image resolution
7.4"	400 x 800 pixels (portrait)
4.4"	400 x 300 pixels (landscape)
2.4"	264 x 176 pixels (landscape)

Switching slots
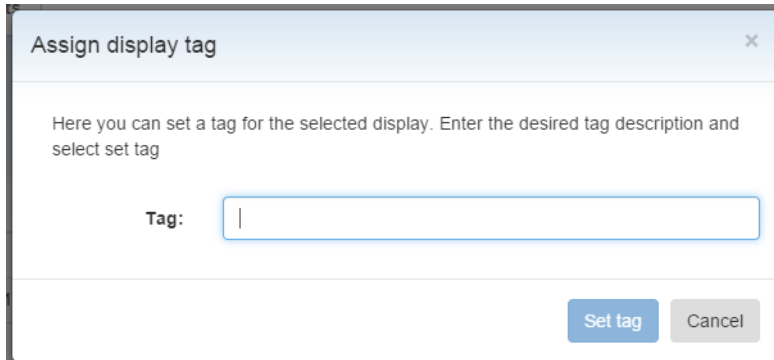
When you upload an image, you can tag it to be displayed immediately or at a later time with the option **Show after upload**. The slot to be displayed can be switched in the Wireless ePaper management with **Wireless ePaper Displays** > **Edit** > **Switch display slot**. You select the required slot from the list here.
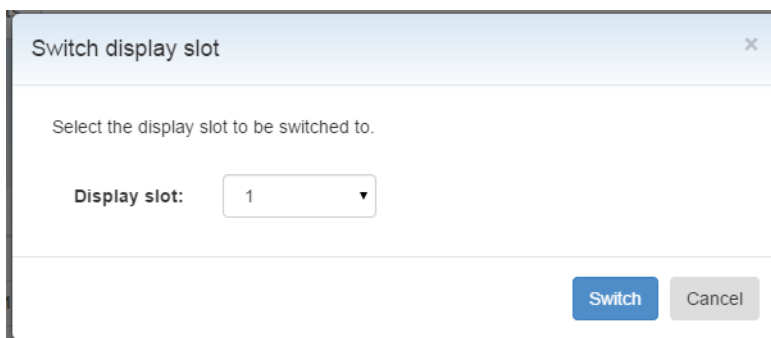
Set tag

Tags are useful markers for the individual Displays, e.g. to collect them into groups or to record their location.

To assign a particular tag to a Display, enter the Wireless ePaper management and click **Wireless ePaper Displays** > **Edit** > **Set tag** and enter the desired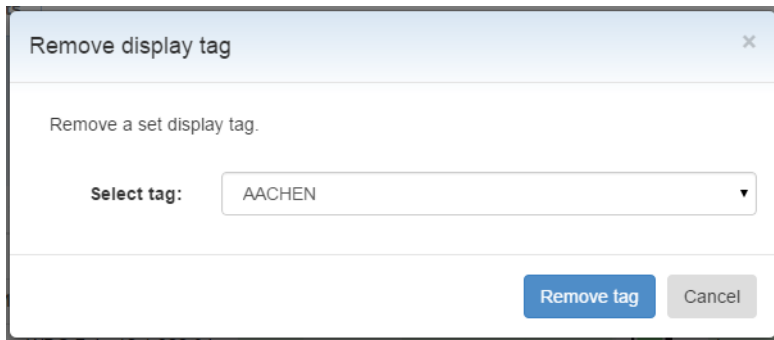 tag into the menu that appears. The QuickFinder offers a convenient way of finding individual or multiple displays by conducting a tag-based search in the Wireless ePaper management.

Removing tags

To remove an existing tag, go to **Wireless ePaper Displays** > **Edit** > **Remove tag** and select the appropriate tag from the drop-down menu.
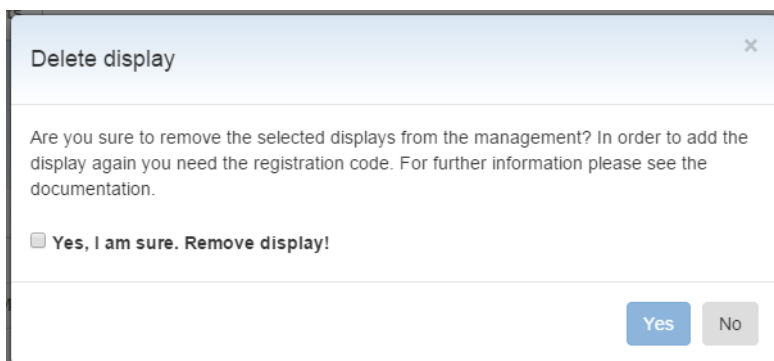
Remove

To remove a Wireless ePaper Display from the management program, go to **Wireless ePaper Displays** > **Edit** > **Remove**, confirm your selections by marking the check box and click **Yes**.

(!) Although this method removes the display from the management, it is still assigned to the corresponding Wireless ePaper Server. To assign the Display to another server, you need to reset the Display to its factory settings. Refer to section *Reset Display* on page 19 for information on this.

Show ID

The ID of a display is printed on the back of the device.

To display the ID on the Display itself, go to the Wireless ePaper management, click **Wireless ePaper Displays** > **Edit** > **Show ID** and confirm with **Yes**.
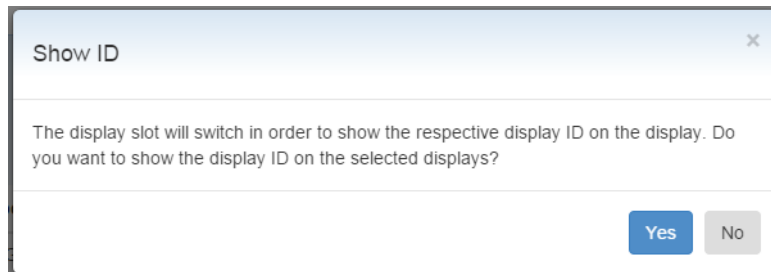
Refresh display

To refresh the Display, use the Wireless ePaper management function under **Wireless ePaper Displays** > **Edit** > **Refresh display** and click **Yes**.
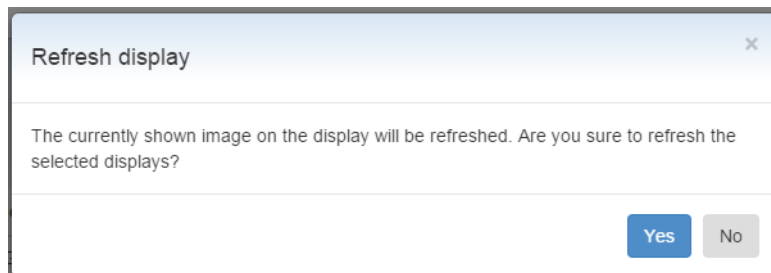
2.5.3 Reset Display

To reset a Display to its factory settings, click on the gear-wheel icon in the upper-right corner and select the item **Reset**. In this menu, enter the unlock code supplied with your Wireless ePaper Display. If you no longer have the unlock code, please contact LANCOM Support at + 49 (0) 2405 64597 77.

Restoring the factory settings is necessary if you wish to assign a Wireless ePaper Display to another Wireless ePaper Server.
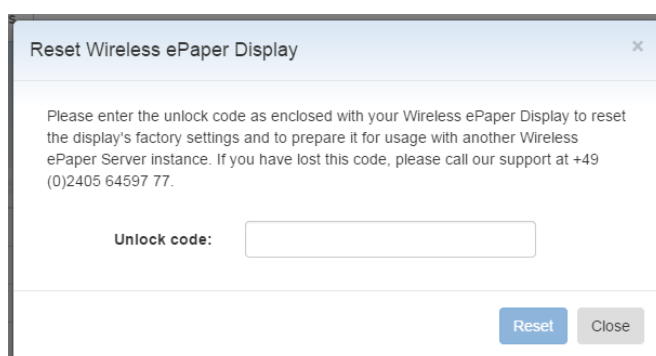
If a Display is reset after it was already associated with another Wireless ePaper Server, it must first be registered with the new server. Then it must be reset, deleted and registered again.

3 Rendered graphics: Creation and display

Compared to image files, rendered graphics provide better options for management and editing as the content and presentation can be handled independently of one another. The Wireless ePaper Server renders graphics by processing the content and formatting information as provided by XML and XSL files.

The content of a displayed graphic could be, for example, the calendar schedule for a conference room, or the name of a product and its price. It is stored in XML format, which makes it editable as text.

The Server reads a template for the formatting information of the graphic, such as the font style or size. The template is available as an XSL file. To make changes to the template, you will need knowledge of the programming language XSL (Extensible Stylesheet Language). Sample templates for your use are available under **\\<Installation-directory>\data\templates**.

There are a number of features that are available from a template:

- Various fonts and styles
- Tables, lines, and other graphic elements
- Barcodes (1D and 2D)
- All special characters (covered by UTF-8)
- Insertion of images or parts of images
- Loops and conditions
- Text transformation (e.g. transformation into capital letters)
- Automatic scaling and compression of the text to best make use of the available space.

In order to send the graphics to the Wireless ePaper Server, you need a command-line utility such as cURL. As an example, you send the command to the Server by entering the following into cURL: `curl -X POST -d @template_task_Wireless_ePaper_Solutions.xml http://ePaperServer:8001/service/task --header "Content-Type:application/xml"`. This recognizes the XML file and its reference to the XSL file with the formatting.

3.1 Example of a template

This XSL template is based on a potential meeting-room signage concept for the LANCOM Systems GmbH. This code can be used, for example, to access a calendar management system (such as IBM Notes, Microsoft Exchange, or Google iCalendar) to send automatic updates with the latest meeting information to the Wireless ePaper Displays. Line numbering is not a part of the code and is for purposes of clarity only.

```
001 <?xml version="1.0" encoding="UTF-8"?>
002 <!—The template is provided for 7.4" Displays mounted in the landscape orientation.-->
003 <xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
004
005 <xsl:template match="Record">
006
007  <!-- Rendering information for 7.4" Displays -->
008  <image height="480" width="800" rotation="90" font-family="Verdana">
009
010   <!-- Room -->
011   <field height="108" width="780" x="10" y="20">
012    <text align="center" font-size="40" font-weight="bold">
013     <utils method="toUpperCase">
014      <xsl:value-of select="room/@roomName"/>
```

```
015       </utils>
016      </text>
017
018      <!-- Date -->
019      <text align="center" font-size="35" font-weight="bold" padding-top="10">
020       <xsl:value-of select="room/field[@key='date']/@value"/>
021      </text>
022     </field>
023
024     <line thickness="2" x-from="0" x-to="800" y-from="130" y-to="130"/>
025
026     <!-- Time1 -->
027     <field height="50" width="780" x="20" y="150">
028      <text align="left" font-weight="bold" font-size="40">
029       <xsl:value-of select="room/field[@key='time1']/@value"/>
030      </text>
031     </field>
032
033     <!-- Purpose1 -->
034     <field height="50" width="780" x="20" y="200">
035      <text align="left" font-size="40" condense="1, 0.8, 0.6, 0.5">
036       <xsl:value-of select="room/field[@key='purpose1']/@value"/>
037      </text>
038     </field>
039
040     <!-- Chair1 -->
041     <field height="40" width="770" x="20" y="250">
042      <text align="left" font-weight="bold" font-size="30">
043       <xsl:value-of select="room/field[@key='chair1']/@value"/>
044      </text>
045     </field>
046
047      <!-- Time2 -->
048     <field height="35" width="780" x="20" y="320">
049      <text align="left" font-size="28">
050       <xsl:value-of select="room/field[@key='time2']/@value"/>
051      </text>
052     </field>
053
054     <!-- Purpose2 -->
055     <field height="35" width="780" x="20" y="355">
056      <text align="left" font-size="28" condense="1, 0.8, 0.6, 0.5">
057       <xsl:value-of select="room/field[@key='purpose2']/@value"/>
058      </text>
059     </field>
060
061      <!-- Chair2 -->
062     <field height="30" width="770" x="20" y="390">
063      <text align="left" font-size="20">
064       <xsl:value-of select="room/field[@key='chair2']/@value"/>
065      </text>
066     </field>
067
068     <!-- LANCOM Logo -->
069     <field align="right" height="60" width="780" x="10" y="410">
070      <img src="../images/LANCOM_Logo_200.png"></img>
071     </field>
072    </image>
073   </xsl:template>
074  </xsl:stylesheet>
```

3.2 Interaction between template, XML information and Wireless ePaper Displays

This chapter uses an example to describe the interaction between the template, XML information and the actual representation on the Wireless ePaper Display.

Step 1:

When an update is triggered by the Notes agent, the Wireless ePaper Server receives XML information with the following content: (Line numbering is not a part of the code and is for purposes of clarity only.)

```
001 <?xml version="1.0" encoding="UTF-8" standalone="yes"?>
002 <TaskOrder title="Refresh D1001BF6 for Aachen B2.100">
003 <TemplateTask labelId="D1001BF6" externalId="4711"
template="lcsconference_landscape.xsl">
004  <room roomName="Aachen B2.100">
005   <field key="date" value="16.09.2014"/>
006   <field key="time1" value="10:00 - 11:30"/>
007   <field key="purpose1" value="Marketing Project Coordination"/>
008   <field key="chair1" value="Alec Coad"/>
009   <field key="time2" value="11:30 - 13.00"/>
010   <field key="purpose2" value="Team Meeting Controlling"/>
011   <field key="chair2" value="Emily Kirby"/>
012  </room>
013 </TemplateTask>
014 </TaskOrder>
```

Step 2:

The Wireless ePaper Server processes the received information line by line. This sets the relevant label and the required template. Based on the template, the Server now creates the data set used to render the image. The layout is set according to the template and then the information from the XML is inserted.

Two content elements are described here for illustrative purposes: The chairperson of the next meeting and the company logo.

The chairperson for the subsequent meeting is formatted according to the template as follows:

```
061  <!-- Chair2 -->
062  <field height="30" width="770" x="20" y="390">
063   <text align="left" font-size="20">
064    <xsl:value-of select="room/field[@key='chair2']/@value"/>
065   </text>
066  </field>
```

The information necessary for the representation can be seen in the XML below:

```
011    <field key="chair2" value="Emily Kirby"/>
```

Access to the image specified in the template does not require access to the XML information. The path is evaluated instead.

```
068    <!-- LANCOM Logo -->
069    <field align="right" height="60" width="780" x="10" y="410">
070     <img src="../images/LANCOM_Logo_200.png"></img>
071    </field>
```

Step 3:

The image is rendered and sent to the Wireless ePaper Display. The Display appears as shown below. The chairperson of the subsequent meeting **(1)** and the image **(2)** are highlighted in color.