



Libshelf manual

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Table of Contents

| | |
|--|----|
| About..... | 6 |
| Important information..... | 7 |
| Do not overfill | 7 |
| Tag placement | 7 |
| SIP connection | 7 |
| Getting started..... | 8 |
| Set up connection to SIP server | 8 |
| Start the software | 8 |
| Test the system | 8 |
| Configuring settings..... | 9 |
| Maintenance mode | 9 |
| Changing the on-screen and receipt texts and languages | 9 |
| Shutting down..... | 10 |
| Modes of operation..... | 11 |
| Patron mode | 11 |
| Maintenance mode | 11 |
| Entering maintenance mode | 11 |
| Inventory | 12 |
| Statistics | 12 |
| Out of use mode | 12 |
| Settings reference..... | 13 |
| Global settings | 13 |
| Admin | 13 |
| Admin cards..... | 13 |
| Shutdown cards | 13 |
| Data models | 13 |
| AFI activate value..... | 13 |
| AFI deactivate value..... | 13 |
| Danish: Check CRC..... | 14 |
| Empty block byte..... | 14 |
| Empty block count..... | 14 |
| Empty tag mask..... | 14 |
| ISO 28560-2: Maximum item id length..... | 14 |
| ISO 28560-2: Minimum item id length..... | 14 |
| Models to use | 14 |

| | |
|--|----|
| Device: Shelf | 14 |
| Block count | 14 |
| Email connection info | 15 |
| Port | 15 |
| Server | 15 |
| SMTP password..... | 15 |
| SMTP user..... | 15 |
| Use authentication..... | 15 |
| Use SSL | 15 |
| Functions | 15 |
| Remind patron to take the receipt..... | 15 |
| Show farewell at end of session..... | 15 |
| Languages | 15 |
| Default culture..... | 15 |
| Language list..... | 16 |
| Log | 16 |
| Server name for logging..... | 16 |
| Offline | 16 |
| Allow checkin when offline..... | 16 |
| Receipt | 16 |
| Check in print mode | 16 |
| Footer print font..... | 16 |
| Footer print font size..... | 16 |
| Header print font | 17 |
| Header print font size..... | 17 |
| Hold slip print data | 17 |
| Print data | 17 |
| Text print font..... | 18 |
| Text print font size..... | 18 |
| Use email receipt..... | 18 |
| Scripting | 18 |
| Use script for item identifiers..... | 18 |
| SIP | 18 |
| Code page for receiving..... | 18 |
| Code page for sending..... | 18 |
| Due date culture..... | 18 |
| Ignore supported messages..... | 19 |
| Library service supports item information (17)..... | 19 |
| Library type..... | 19 |
| Max print line width..... | 19 |
| Protocol version..... | 19 |
| Starting sequence number..... | 19 |
| Use BL and CQ fields for patron authentication | 19 |
| Use error handling..... | 19 |
| Use Fee Acknowledge in Checkout..... | 20 |
| Use sip message 63..... | 20 |
| Statistics | 20 |
| Interval (in days) for the statistics report..... | 20 |
| Timers | 20 |
| AC refresh time in minutes..... | 20 |
| Error show time in seconds | 20 |
| Idle timeout for offline sync (sec)..... | 20 |
| Info show time in seconds..... | 20 |
| Receipt reminder show time in seconds | 20 |

| | |
|--|-----------|
| Reset to default language (seconds)..... | 21 |
| Session end info show time in seconds..... | 21 |
| Session timeout in seconds..... | 21 |
| Sip received timeout in seconds..... | 21 |
| User interface | 21 |
| AF message type in UI..... | 21 |
| Default currency..... | 21 |
| Hide flag in language selection..... | 21 |
| Maximum number of maintenance messages..... | 21 |
| Show item ID before item title..... | 21 |
| Use current language in maintenance mode..... | 22 |
| Local settings | 22 |
| Admin | 22 |
| Admin password..... | 22 |
| Admin password timeout..... | 22 |
| Device: Shelf | 22 |
| Antennas to use..... | 23 |
| Auto reconnect..... | 23 |
| COM port | 23 |
| Ignore security errors..... | 23 |
| Reader IP address..... | 23 |
| Reader IP port..... | 23 |
| Set tag security..... | 23 |
| Shelf reader type..... | 23 |
| Use reader over network..... | 23 |
| Inventory | 23 |
| Number of milliseconds to wait between inventories | 23 |
| Removed item is discarded from added (seconds)..... | 24 |
| Timeout for full inventory (seconds)..... | 24 |
| Language files | 24 |
| Language texts..... | 24 |
| Log | 24 |
| Hide sensitive info | 24 |
| Number of hours to run debug logging..... | 24 |
| Save log | 24 |
| Notifications | 24 |
| Recipients of email notifications..... | 24 |
| Send email notifications about..... | 25 |
| Send message board notifications about..... | 25 |
| Sender address for email notifications..... | 25 |
| Pictures | 26 |
| Company logo..... | 26 |
| Email receipt image..... | 26 |
| Farewell image..... | 26 |
| Library logo..... | 26 |
| Receipt image..... | 26 |
| Receipt | 26 |
| Hold slip printer name | 26 |
| Print hold slips for hold items..... | 26 |
| Print transfer slips for transfer items..... | 26 |
| Receipt printer mode..... | 27 |
| Receipt printer name..... | 27 |
| Transfer slip printer name..... | 27 |

| | |
|---------------------------------------|-----------|
| SIP | 27 |
| Login location code..... | 27 |
| Login user id..... | 27 |
| Login user password..... | 27 |
| Server ip address | 27 |
| Server port..... | 27 |
| Terminal password | 27 |
| Use ACS login..... | 28 |
| Sorting rules | 28 |
| Rule | 28 |
| User interface | 28 |
| Mouse cursor visible..... | 28 |
| Troubleshooting | 29 |
| Tag read errors in Messageboard | 29 |
| Language codes..... | 30 |

About

Libshelf is a self-contained, automatic unit for returning items. It consists of a shelf unit, a terminal and software. This manual contains information mainly for the use of the software.

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Libshelf version: **2.0.5813**



Libshelf - blue unit

Important information

There are some important things to understand before using Libshelf, to ensure it works as designed.

Do not overfill

The RFID reading shelves can read books from shelves only if placed correctly. If you fill the shelves up all the way, patrons returning books may place them creatively, which can lead to items not being recognized.

Tag placement

As with any RFID tagged material, items in Libshelf should have tags secured to books in different positions. If all tags are placed in exactly the same position in each book, they will interfere with each other, causing incorrect reading.

We recommend tags to be placed in at least three different positions on the inside of the back cover of each item.

SIP connection

The unit needs a SIP connection to work. It is possible to operate the unit in offline mode, but it is meant to be used only temporarily should the connection break.

The device will only be able to display item identifiers on screen and on receipts, during offline situations. After it gets a connection again, it will then send those item identifiers as check in messages to the library system automatically.

Getting started

To start using the system, you need to set up some basic settings. This chapter has a short introduction on getting started with Libshelf.

Set up connection to SIP server

The device must be connected to your SIP server before it can be used. All item names are retrieved using the SIP connection.

A network cable connector can be found from the bottom of the rear panel of the terminal. SIP connection settings can be found from Management Utility section SIP under device settings.

Start the software

Start the Libshelf software by double-clicking the icon on the screen. The software should also be configured to start automatically, in which case you do not need to start it up separately.

Test the system

Test the system simply by placing some items on the shelves. It takes a few seconds for the device to scan everything, after which the item identifiers should appear on screen. As soon as the identifiers are available, SIP check in messages are sent, and item names are retrieved from the return messages and shown on screen.

Configuring settings

All settings for Libshelf are configured using **Management Utility**, a software from P.V. Supa. Management Utility is delivered with the unit and can be used directly on the terminal computer, or from another computer connected to the same network.

There is a separate user manual available from Management Utility. This document explains what the Libshelf settings do, not how to use Management Utility.

Maintenance mode

The device contains a specific Maintenance mode. It allows access to some information, such as inventory and statistics, but not to any settings.

Changing the on-screen and receipt texts and languages

All on-screen texts and receipt texts can be altered freely, and languages can be configured as needed. Texts are modified with a specific tool, **Language Editor**, which is supplied with the Libshelf.

Language Editor is used to modify language files, which are stored in the database. Both Language Editor and Libshelf software use Master Controller service to access these files. A single file of translations can be used by multiple cabinets.

Any changes made to the texts will only take effect after the next restart of the Libshelf software.

A separate manual on how to use Language editor is available.

Shutting down

To shut down the system, the software and the computer must be shut down first – never just unplug the device when the computer is running, as it may cause damage to the computer!

Shut down by entering the Maintenance mode first. Then, from the maintenance view, select Power down to shut the device down.

Alternatively you can use **Management Utility** from another computer to shut down the Libshelf software or computer, and also start it up again. Starting the computer remotely requires that the network supports Wake On Lan packets.

Modes of operation

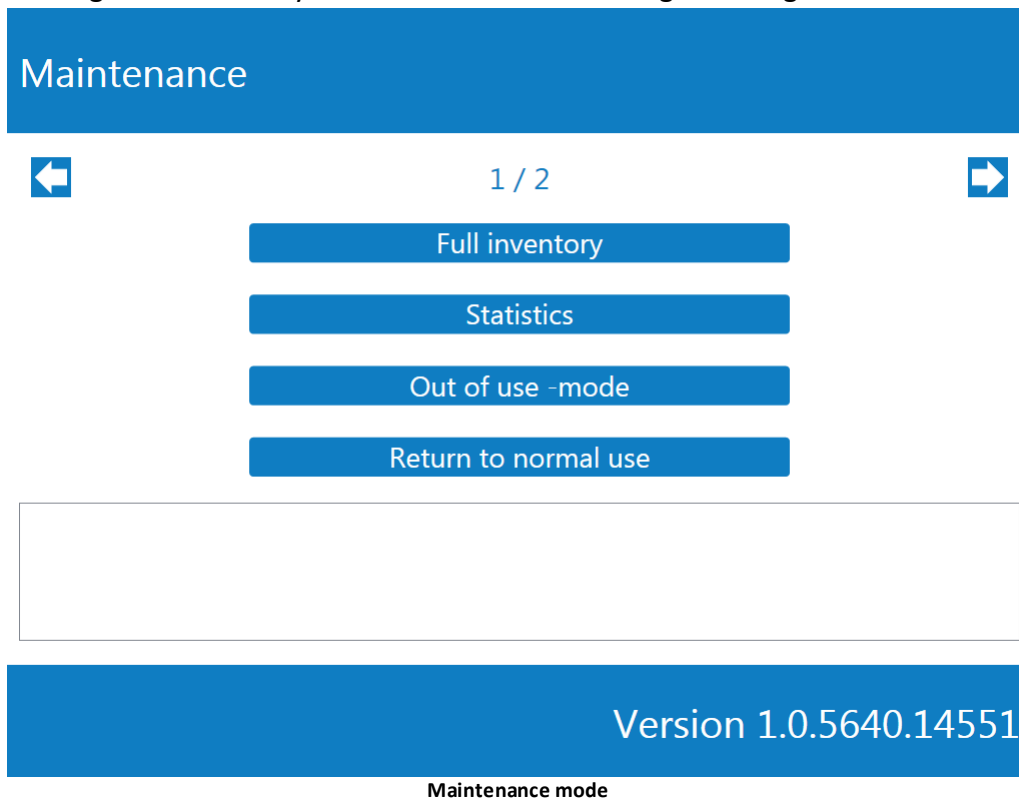
The software has two modes of operation: Patron mode and Maintenance mode. In normal use, the software remains always in Patron mode. Maintenance mode is used to carry out specific tasks, such as enabling or disabling the alarm on tags, or shutting down the software.

Patron mode

Patron mode is the default mode in which the device is normally used. In Patron mode, the device can be used to return items by patrons. The device is constantly scanning the shelves looking for new items, and when it finds any they are displayed on the screen. Once the patron has completed returning books, he can either just walk away and the session will be terminated after a few seconds, or press a button on screen to get a receipt.

Maintenance mode

In Maintenance mode, librarians can control the system and perform various options, such as running a full inventory of items on the shelves or generating a brief statistics report.



Entering maintenance mode

When the software is running in normal patron mode, you can enter the Maintenance mode by touching the four corners of the screen in configured order. The default configuration is 1234 which means a "U" shape: start by touching the top left corner first, then bottom left, then bottom

right and last the top right corner. This should now enable the maintenance mode; if it doesn't, please wait a few seconds before attempting again, so that the device will clear its internal buffer from the previous attempt.

Inventory

You can run a full inventory on all items on the shelves. This can be done for example before leaving the shelf for patrons to use, or to verify that all items can be correctly recognised by the readers.

Note that the inventory takes some time to complete, as it requires that for each item, the SIP server is queried for the item information.

Statistics

From the maintenance menu, a simple statistics report can be printed out. This report only has the number of items checked in and out per day, over a configured number of days.

More comprehensive reports can be created with the **Supa Reporter** tool.

Out of use mode

This option allows the device to be placed in "Out of use" mode. It will display a message on screen, and not allow patrons to use it. This can be used for example if there is a problem with the SIP server connection, or the printer has run out of paper.

Settings reference

This section contains information about all settings related to Libshelf software, as found through Management Utility.

Global settings

These settings apply to all Libshelf units connected to the same Master Controller, in the same settings group.

Admin

Settings related to administration tasks on the unit.

Admin cards

Admin cards are used to enter [Maintenance mode](#) in the software. These can be any patron cards or special cards with any ID. Store the ID in this setting - when the device reads a card with this ID, the software goes to Maintenance mode.

Multiple cards can be used, separate the values with comma (,) character, for example

12345,23456,34567

Shutdown cards

Shutdown cards are used to shut down the system. These can be any patron cards or special cards with any ID. Store the ID in this setting - when the device reads a card with this ID, the shuts down.

Multiple cards can be used, separate the values with comma (,) character, for example

12345,23456,34567

Data models

RFID tag data model settings. These settings replace all earlier INI-file based settings; those are no longer used by Libshelf software.

AFI activate value

Value used in RFID tags to indicate AFI activated (alarm enabled).

AFI deactivate value

Value used in RFID tags to indicate AFI deactivated (alarm disabled).

Danish: Check CRC

If this setting is enabled, CRC (error checking) is enabled for Danish data model.

Empty block byte

Value indicating an empty block. Typically this would be zero (0). This value is used to determine empty tags when EmptyTagMask is not defined.

Empty block count

Number of data blocks from start of data (i.e. block offset) where all data bytes equal that set in Empty block byte setting. This is used if Empty tag mask setting has not been set.

Empty tag mask

This mask is used to determine empty tags, for example tags that are not actually empty but contain some test data from manufacturing. The mask should contain the values, and uses a question mark (?) to denote a character that is ignored. For example, a typical value would be

0000000000000000????????00000000

This would check if there is 16 zero characters, followed by 8 characters having any value, and finally 8 more zero characters - this would then be considered an empty tag.

ISO 28560-2: Maximum item id length

Maximum item identifier length, when ISO 28560-2 data model is used.

ISO 28560-2: Minimum item id length

Minimum item identifier length, when ISO 28560-2 data model is used.

Models to use

Select data models to use from the drop down list. Do NOT select data models that are not used, as that can lead to incorrect data parsing. The data is not always marked as being some specific data model, and the system must then attempt to parse the data and use whatever value comes out, which may not always be correct, actual item identifiers.

Device: Shelf

These settings relate to the actual RFID reader in the unit.

Block count

Number of blocks to read from the RFID tags.

Email connection info

Libshelf can send email receipts and other messages as emails. These settings control the technical aspects of sending email from the system.

Port

Port number to use to connect to the email server. Default SMTP server port is 25, or 587 for SSL secured connections.

Server

Email server name or IP address.

SMTP password

Password used to send email through the server.

SMTP user

User name used to send email through the server.

Use authentication

Enable this setting if authentication needs to be used in the email server. If the server allows sending email without authenticating the sender, this can be disabled.

Use SSL

Enable this setting if the email server requires a secured SSL connection.

Functions

These settings control how the device behaves.

Remind patron to take the receipt

If enabled, there will be a reminder screen shown when a receipt is printed.

Show farewell at end of session

If enabled, a page is shown at the end of session with a message and optionally a picture.

Languages

User interface language related settings.

Default culture

Default culture for the system. Use fully qualified culture codes, such as fi-FI or sv-FI for example. See available codes in chapter Language codes.

Language list

Add all available languages in this drop down list. Write a new language in the edit area and press Enter key to add a new language. These languages will be available in the start screen for patrons to choose from, and must also exist in the LanguageTexts.xml file.

To delete a language, select it and press the Delete key on your keyboard. Note that deleting a language will not delete translations from the LanguageTexts.xml document, so you can re-add a deleted language simply by adding it to this list again.

Log

Controls global logging options. For device specific selections on what to log, see Log option in local settings.

Server name for logging

This setting is deprecated, please do not use.

Offline

These settings control how the system should react when SIP (TCP socket) connection is lost.

Allow checkin when offline

If enabled, check in is allowed even when connection to library server is lost. During an offline situation, the system will record all checked in items in the local computer, and when a connection is restored this data will be uploaded to the library server.

Receipt

These settings control how the patron receipts are printed.

Check in print mode

Select how the check in receipt is generated.

Normal: The software generates the receipt itself, from data available from SIP messages.

ACS: Receipt is printed as it comes from the library system; all AG fields from the SIP check in response message.

Footer print font

Select the font to use to print the footer of receipts.

Footer print font size

Select the font size to use to print the footer of receipts.

Header print font

Select the font to use to print the header of receipts.

Header print font size

Select the font size to use to print the header of receipts.

Hold slip print data

Select what data should be printed on hold slips; receipts that are automatically printed when a reserved item is returned to the shelf.

ItemId: If selected, item identifier is printed. Item name is always printed.

PatronId: If selected, patron identifier is printed.

PatronName: If selected, patron name is printed.

Print data

This dropdown allows selecting what data is to be printed on receipts. Note that this only applies to receipts when generated by the software.

Date: Prints the current date on the receipt.

Time: Prints the time on the receipt.

PatronId: Prints the patron identifier.

PatronName: Prints the name of the patron.

Phone: Patron's phone number, if available.

Email: Patron's email address, if available.

Address: Patron's address, if available.

ItemCount: Prints the total number of items on the receipt.

FineInCheckout: If checked, any fines (total fine amount) the patron may have will be printed on the check out receipt.

AlwaysFineInAccountInfo: If checked, the account information receipt will also contain any fines (total fine amount) the patron may have.

SummaryInAccountInfo: This selection will print a summary of items - number of items on hold, number of items on loan and so on - in the account information receipt.

RenewFailedItems: Will print a list of items that were attempted to renew, but renewal failed, in the renew check out receipt.

RenewBeforeItems: Will print a list of items that are on loan but were not attempted to renew, on the renew checkout receipt.

AlreadyCheckoutItems: Previously checked out, "books at home".

HoldItemsInCheckout: Check out receipt will contain a list of reserved items.

UnavailableHoldItemsInCheck: Check out receipt will contain a list of reserved items that are not yet available for pickup.

OverdueItemsInCheckout: Check out receipt will contain a list of overdue items.

RecallItemsInCheckout: Check out receipt will contain a list of recalled items.

ItemId: Item identifier is printed in addition to item name.

Text print font

Plain text font selection.

Text print font size

Plain text font size.

Use email receipt

If enabled, email receipt will be offered to patrons as an option. This function requires SIP message pair 63-64 to be used, and that there is an email address returned from the library system in the 64 response message.

Scripting

Libshelf software allows scripting, to manage data that has to be modified before sending it to library system, or displaying it to user.

There is only one script file, **ItemScript.cs**, to works on item identifiers.

Scripting is done in .NET (C#) language. Any editor can be used to edit the scripts. The script files are loaded and compiled at application start, and any errors in them are logged.

Default script files will be placed under the program folder and copied to **<Program Data>\PV-Supa\Libcabinet** folder, if they are not already there. Existing scripts will not be overwritten in program data folder. The originals can be used to start anew, in case a script is accidentally removed or just does not work.

Use script for item identifiers

If this setting is enabled, the item id script is executed before sending the item identifier to library system, thus allowing it to be modified. Typical use would be stripping out leading or trailing blank or zero characters, or removing a check digit.

SIP

SIP behaviour related settings.

Code page for receiving

Select Windows code page to use for decoding received SIP messages.

Code page for sending

Select Windows code page to use for encoding SIP messages that are sent to the library system.

Due date culture

What culture style is used in Due Dates. This determines how due dates are parsed when received from the library system.

Use a culture code as specified in Appendix A.

You can also use a Regular Expression in this field, to further format date values as needed. To

use a Regular Expression, prefix the information with “format:”, for example:

```
format:(?<day>\d+)(?:.)(?<month>\d+)(?:.)(?<year>\d+)
```

Ignore supported messages

This dropdown list allows ignoring when library system reports certain SIP messages as not supported. Sometimes the information is not entirely true, and messages can be used even when the library system reports them as not available.

Mark any / all messages in the list with a checkbox, if you want to ignore how the library system reports the availability of those messages.

Library service supports item information (17)

If this setting is enabled, item information (titles) is retrieved from the library system by sending SIP 17 messages.

Library type

Select what type of library system is used. Please make sure to select the correct one if available. This determines many things in the SIP communications, as different library systems use slightly different dialects of SIP messaging.

Max print line width

Sent to the SIP server; the library system will then adjust all print-line messages accordingly.

Protocol version

SIP protocol version to use in communications with the library system.

Starting sequence number

SIP messages starting sequence number; some library systems may require SIP messages to have a certain sequence numbering, and this setting can be used to control where the numbering starts from.

Use BL and CQ fields for patron authentication

This setting is meaningless in Libshelf, please do not use.

This is an alternative method to use, for authenticating patron ID and PIN-code. Use this if the library system requires.

Use error handling

Select this setting to enable error handling in SIP communications. Do not use this if the library system does not implement error checking (CRC).

Use Fee Acknowledge in Checkout

Enabling this setting causes the software to send a fee acknowledge flag in check out SIP message 11. Value Y in BO field ("BOY"). Use this if the library system requires so.

Use sip message 63

This setting is meaningless in Libshelf, please do not use.

Alternative message pair 63-64 will be used to retrieve patron information, if this setting is enabled. Enable this if the library system returns patron information in 64 message, otherwise leave disabled.

Statistics

These settings control the built-in statistics functionality of the Libshelf system. For more detailed statistics, use the **Supa Reporter** software.

Interval (in days) for the statistics report

Number of days to include in the statistics report when printed from the device, counting backwards from the current day.

Timers

These timer settings control how long various states in the device last. It is possible to change the behavior somewhat, but caution should be taken to not decrease or increase the timers too much, as that may cause impossible scenarios where the device will cease to function correctly.

AC refresh time in minutes

The interval at which the system checks the SIP connection. Default value is 5 minutes.

Error show time in seconds

How many seconds will an error message be displayed on screen.

Idle timeout for offline sync (sec)

How many seconds to wait for the device to be idle, before starting the offline synchronisation background task.

Info show time in seconds

How long will the info screen be shown, at the start of a session.

Receipt reminder show time in seconds

How many seconds will the user be shown a reminder to take receipt.

Reset to default language (seconds)

How many seconds will the start screen stay in a language other than default, before reverting automatically back to the default language.

Session end info show time in seconds

After a session ends, how many seconds to show the session end screen.

Session timeout in seconds

How many seconds the device waits for new items to appear, before ending the session.

Sip received timeout in seconds

How long will the system wait for SIP server to respond to a message.

Value 0: information received from SIP server, in 98 message.

Greater than 0: use this value, instead of what the SIP server indicates.

User interface

Settings related to user interface of the software.

AF message type in UI

How the error page content is formed.

AF: Show text received in SIP message as-is.

Internal: Show error message as defined by software.

AFInternal: Combination of the two; shows text from SIP message and the text as defined in software.

Default currency

Currency code (text), used where ever currency is displayed, such as fines on receipts and on screen.

Hide flag in language selection

If selected, there will not be any flags displayed in language selection, in the UI, only names of languages. If not selected, flags will be displayed.

Maximum number of maintenance messages

How many messages will be displayed on screen, in maintenance mode.

Show item ID before item title

If this setting is enabled, item identifier is displayed on the screen as soon as the RFID tag data is read. The device will then send the SIP message to retrieve the item title, and replace the ID on screen with the title when it is available. This makes the response of the device seem faster (as identifiers appear on screen quite quickly) but it may seem strange to users to see the item

identifiers to begin with.

If this setting is disabled, item identifiers are not shown on screen, only titles when they are available. This may make the device appear to respond slower, especially if there is a lot of latency in the SIP responses.

Use current language in maintenance mode

If enabled, the device will use the currently selected language when opening the maintenance mode. If disabled, default language will always be used in the maintenance screens.

Local settings

These settings apply to a single Libshelf unit at a time and thus can be different for each device.

Admin

Maintenance mode settings.

Admin password

This setting configures how the Maintenance mode is activated. Use numbers 1 – 4, to indicate corners of the screen to touch as follows:

- 1: Top left corner
- 2: Bottom left corner
- 3: Bottom right corner
- 4: Top right corner

Any sequence can be combined, for example setting this value to just "1" means that when the screen is touched in the top left corner, the Maintenance mode is activated. Entering "1234" means that all four corners must be touched in the order of top left, bottom left, bottom right, top right, to enter the Maintenance mode.

Note that the numbers must be entered as one string, no separator characters. The sequence can be of any length, starting from just one character, and may repeat the same corners multiple times. The following examples are all valid:

"1": A single touch of top left corner.

"111": Three consecutive touches of top left corner.

"112211": Two touches of top left corner, then two on bottom left, then again two top left.

"12341234": Two full rounds of all corners, starting from top left, counter-clockwise.

Admin password timeout

Number of seconds to "remember" admin password corner touches. If this amount of seconds is passed between touches, the password attempt is reset.

Device: Shelf

These settings control how the integrated RFID-reader works.

Antennas to use

Select which of the antennas are in use. Normally these should all be enabled.

Auto reconnect

If this setting is enabled, the device will attempt to automatically connect the RFID reader if the connection is lost for some reason.

COM port

COM port to which the RFID reader has been connected.

Ignore security errors

If selected, security errors are ignored. This allows users to return items even when writing the security bit (AFI value) to tags.

Reader IP address

IP address of the RFID reader, if connected via network.

Reader IP port

Port number of the RFID reader, if connected via network.

Set tag security

If enabled, returned item security bits will be set automatically.

Shelf reader type

Type of reader to use in the device. This will not change after initial setup, unless the physical device is changed.

Use reader over network

If this setting is enabled, the RFID reader connection is formed through network. This is not used normally, instead a serial port (COM) connection is in use.

Inventory

Settings related to how the unit handles inventories of its content.

Number of milliseconds to wait between inventories

The system waits for this amount of milliseconds between each inventory cycle. A lower value here will make the device work faster, but also puts more load on the readers; a higher number increases the waiting time between inventories thus making the device work slower.

A reasonable compromise would be 3000 ms (3 seconds).

Removed item is discarded from added (seconds)

If an item is removed from the shelf it is marked as truly removed after this number of seconds. A value of something like 30 seconds allows patrons to take items, look at them briefly and return them on the shelf without causing a new return to happen.

Timeout for full inventory (seconds)

Number of seconds to wait for a full inventory, at application start or in maintenance mode, to finish, before reporting it as failure. Default value is 60 seconds.

Language files

Translation related settings.

Language texts

Select from the drop down list the translation texts file to use in the device. The file contains all languages and user interface as well as receipt texts. What languages are used is defined by setting [Language list](#) ¹⁶ in global settings.

Log

These settings control how logging is done.

Hide sensitive info

If enabled, sensitive information such as patron card numbers and PIN codes will be replaced with an asterisk (*) character in log.

Number of hours to run debug logging

Number of hours from application start, before debug logging is automatically disabled. Disabling is done automatically to prevent log database from filling up, as debug logging will cause a lot of messages to be added.

Save log

Select what type of information should be stored in the log.

Notifications

Libshelf can send email notifications to administrators (staff) of various events. These settings control those messages; how and when they are sent.

Recipients of email notifications

To whom the emails are sent; multiple email addresses are allowed, separated by commas, for example:

administrator@pv-suppa.com,support@pv-suppa.com

Send email notifications about

A list of possible events that may cause an email notification to be sent. Select all events for which you want to be notified.

Available choices are:

Critical errors: A message is sent when the device encounters a critical error. This could be for example a problem with the RFID reader or SIP connection. Be aware though, that for network connection failures it is not possible to send a notification, since a network connection is required to send email.

Empty tags: An email is sent when empty tags are found.

Failed check-ins: An email is sent when a check in of an item fails, i.e. the library system rejects the item. This would typically mean that a book belonging to another library is placed on the shelf.

Hold items: An email is sent when an item that is determined to have a reservation, is checked in.

Incomplete sets: This message is generated from both check in and check out of set items that are incomplete.

Transfer items: An email is sent when an item that is determined to be a transfer item, i.e. it belongs to another library, is checked in.

These events always trigger a Messageboard notification, it does not have to be selected anywhere.

Send message board notifications about

A list of possible events that may cause a message to be shown in **Messageboard**. Select all events for which you want to be notified.

Note, that most message types are sent always to Messageboard. These include messages about hold (reserved) items, transfer items, critical errors and failed check-ins.

Available optional messages are:

Succesfull check-ins: A message is sent to Messageboard from every succesfully checked in item. This is typically not used in production environment, only for testing.

Tag read errors: Send message to messageboard when tag data can not be read correctly.

Sender address for email notifications

Email address of sender of messages. This does not have to be a real email address, typically it would be something identifying the cabinet, for example "cabinet.downstairs@library.com".

Pictures

Pictures shown in the user interface of the device. These must be uploaded to the database using Management Utility, and then selected from the drop down lists in these settings. A software restart is required for the settings to take effect.

Company logo

Company logo on the start page. If something is selected here, it will replace the default P.V. Supa logo.

Email receipt image

Image shown as email receipt selection button, when email receipts are selected and the user is prompted for receipt.

Farewell image

Image shown on the "farewell" page, when a session has ended.

Library logo

Library logo shown on the top left corner of the start page.

Receipt image

Image shown for paper receipt.

Receipt

Receipt printing settings.

Hold slip printer name

Printer name as it is in Windows, for the hold slip printer. This would typically be a printer on a staff station.

Write "test" here to direct the receipt printing to a file, as XPS documents.

Print hold slips for hold items

If enabled, items with a reservation (hold items) will cause a separate receipt to be printed on the hold slip printer.

Print transfer slips for transfer items

If enabled, items indicated to belong to another location (transfer items) will cause a separate receipt to be printed on the transfer slip printer.

Receipt printer mode

How is the patron receipt printed. Possible values are

No: There is no patron receipt printed.

Optional: Patrons can choose to have a receipt printed or not.

Mandatory: A receipt will always be printed automatically.

Receipt printer name

Patron receipt printer name, as it is in Windows. Write "test" here to direct the receipt printing to a file, as XPS documents.

Transfer slip printer name

Printer name as it is in Windows, for the transfer slip printer. This would typically be a printer on a staff station.

Write "test" here to direct the receipt printing to a file, as XPS documents.

SIP

SIP connection settings.

Login location code

If the SIP server requires a location code for login messages, enter the location code here.

Login user id

If login is used for SIP connection, this is the username to use in login messages.

Login user password

If login is used for SIP connection, this is the password to use in login messages.

Server ip address

SIP server IP address, or server name.

Server port

Port to use for connection. This must match what is set for SIP server.

Terminal password

This is the password for the SC unit. If this feature is not used by the ACS in the library then the field should be zero length if it is required in the command, and can be omitted entirely if the field is optional in the command.

Use ACS login

Select this checkbox if the SIP server requires ACS login messages.

Sorting rules

Sorting rules are used in system to determine when items are transfer items, or when they have reservations (holds) for them. Rules are created using **Sorting editor** software, and uploaded to database using Management Utility.

Rule

Select the sorting rule set from the drop down list.

User interface

User interface settings for a single machine.

Mouse cursor visible

If enabled, mouse cursor will be visible on screen during operation. Disabled by default, and should be disabled in normal use.

Troubleshooting

This section lists some common problems the library may encounter when using the device.

Tag read errors in Messageboard

The device may sometimes seem to be sending a lot of Tag read error messages to Messageboard. This is not automatically a sign of an abnormal situation, it may be just because the RFID tags used in the library are of varying quality, and/or placed badly in books. It can also happen if patrons place the items on the shelves carelessly so that the tags are hanging outside of the antennas.

To resolve this issue, a staff member should visit the cabinet and check the placement of the books. It is often enough to just tidy the rows of books, perhaps move some books to distribute them more evenly among the shelves, and push them back towards the back of the shelf.

Very large books, typically comic books or other childrens books, may have tags placed so that if the book is put on its side, the tag remains outside the antennas and may not be readable. In this case the book should be moved to an upright position so that the tag is within the antenna field.

Language codes

The following list contains all language codes and date formats that can be used with Supa software.

| Language code | Language name | Date format |
|---------------|------------------------------|-------------|
| af | Afrikaans | yyyy/MM/dd |
| af-ZA | Afrikaans (South Africa) | yyyy/MM/dd |
| am | Amharic | d/M/yyyy |
| am-ET | Amharic (Ethiopia) | d/M/yyyy |
| ar | Arabic | dd/MM/yy |
| ar-AE | Arabic (U.A.E.) | dd/MM/yyyy |
| ar-BH | Arabic (Bahrain) | dd/MM/yyyy |
| ar-DZ | Arabic (Algeria) | dd-MM-yyyy |
| ar-EG | Arabic (Egypt) | dd/MM/yyyy |
| ar-IQ | Arabic (Iraq) | dd/MM/yyyy |
| ar-JO | Arabic (Jordan) | dd/MM/yyyy |
| ar-KW | Arabic (Kuwait) | dd/MM/yyyy |
| ar-LB | Arabic (Lebanon) | dd/MM/yyyy |
| ar-LY | Arabic (Libya) | dd/MM/yyyy |
| ar-MA | Arabic (Morocco) | dd-MM-yyyy |
| arn | Mapudungun | dd-MM-yyyy |
| arn-CL | Mapudungun (Chile) | dd-MM-yyyy |
| ar-OM | Arabic (Oman) | dd/MM/yyyy |
| ar-QA | Arabic (Qatar) | dd/MM/yyyy |
| ar-SA | Arabic (Saudi Arabia) | dd/MM/yy |
| ar-SY | Arabic (Syria) | dd/MM/yyyy |
| ar-TN | Arabic (Tunisia) | dd-MM-yyyy |
| ar-YE | Arabic (Yemen) | dd/MM/yyyy |
| as | Assamese | dd-MM-yyyy |
| as-IN | Assamese (India) | dd-MM-yyyy |
| az | Azeri | dd.MM.yyyy |
| az-Cyrl | Azeri (Cyrillic) | dd.MM.yyyy |
| az-Cyrl-AZ | Azeri (Cyrillic, Azerbaijan) | dd.MM.yyyy |
| az-Latn | Azeri (Latin) | dd.MM.yyyy |
| az-Latn-AZ | Azeri (Latin, Azerbaijan) | dd.MM.yyyy |
| ba | Bashkir | dd.MM.yy |
| ba-RU | Bashkir (Russia) | dd.MM.yy |

| | | |
|------------|--|---------------|
| be | Belarusian | dd.MM.yyyy |
| be-BY | Belarusian (Belarus) | dd.MM.yyyy |
| bg | Bulgarian | d.M.yyyy 'r.' |
| bg-BG | Bulgarian (Bulgaria) | d.M.yyyy 'r.' |
| bn | Bengali | dd-MM-yy |
| bn-BD | Bengali (Bangladesh) | dd-MM-yy |
| bn-IN | Bengali (India) | dd-MM-yy |
| bo | Tibetan | yyyy/M/d |
| bo-CN | Tibetan (PRC) | yyyy/M/d |
| br | Breton | dd/MM/yyyy |
| br-FR | Breton (France) | dd/MM/yyyy |
| bs | Bosnian | d.M.yyyy |
| bs-Cyrl | Bosnian (Cyrillic) | d.M.yyyy |
| bs-Cyrl-BA | Bosnian (Cyrillic, Bosnia and Herzegovina) | d.M.yyyy |
| bs-Latn | Bosnian (Latin) | d.M.yyyy |
| bs-Latn-BA | Bosnian (Latin, Bosnia and Herzegovina) | d.M.yyyy |
| ca | Catalan | dd/MM/yyyy |
| ca-ES | Catalan (Catalan) | dd/MM/yyyy |
| co | Corsican | dd/MM/yyyy |
| co-FR | Corsican (France) | dd/MM/yyyy |
| cs | Czech | d.M.yyyy |
| cs-CZ | Czech (Czech Republic) | d.M.yyyy |
| cy | Welsh | dd/MM/yyyy |
| cy-GB | Welsh (United Kingdom) | dd/MM/yyyy |
| da | Danish | dd-MM-yyyy |
| da-DK | Danish (Denmark) | dd-MM-yyyy |
| de | German | dd.MM.yyyy |
| de-AT | German (Austria) | dd.MM.yyyy |
| de-CH | German (Switzerland) | dd.MM.yyyy |
| de-DE | German (Germany) | dd.MM.yyyy |
| de-LI | German (Liechtenstein) | dd.MM.yyyy |
| de-LU | German (Luxembourg) | dd.MM.yyyy |
| dsb | Lower Sorbian | d. M. yyyy |
| dsb-DE | Lower Sorbian (Germany) | d. M. yyyy |
| dv | Divehi | dd/MM/yy |
| dv-MV | Divehi (Maldives) | dd/MM/yy |
| el | Greek | d/M/yyyy |

| | | |
|--------|---------------------------------------|------------|
| el-GR | Greek (Greece) | d/M/yyyy |
| en | English | M/d/yyyy |
| en-029 | English (Caribbean) | MM/dd/yyyy |
| en-AU | English (Australia) | d/MM/yyyy |
| en-BZ | English (Belize) | dd/MM/yyyy |
| en-CA | English (Canada) | dd/MM/yyyy |
| en-GB | English (United Kingdom) | dd/MM/yyyy |
| en-IE | English (Ireland) | dd/MM/yyyy |
| en-IN | English (India) | dd-MM-yyyy |
| en-JM | English (Jamaica) | dd/MM/yyyy |
| en-MY | English (Malaysia) | d/M/yyyy |
| en-NZ | English (New Zealand) | d/MM/yyyy |
| en-PH | English (Republic of the Philippines) | M/d/yyyy |
| en-SG | English (Singapore) | d/M/yyyy |
| en-TT | English (Trinidad and Tobago) | dd/MM/yyyy |
| en-US | English (United States) | M/d/yyyy |
| en-ZA | English (South Africa) | yyyy/MM/dd |
| en-ZW | English (Zimbabwe) | M/d/yyyy |
| es | Spanish | dd/MM/yyyy |
| es-AR | Spanish (Argentina) | dd/MM/yyyy |
| es-BO | Spanish (Bolivia) | dd/MM/yyyy |
| es-CL | Spanish (Chile) | dd-MM-yyyy |
| es-CO | Spanish (Colombia) | dd/MM/yyyy |
| es-CR | Spanish (Costa Rica) | dd/MM/yyyy |
| es-DO | Spanish (Dominican Republic) | dd/MM/yyyy |
| es-EC | Spanish (Ecuador) | dd/MM/yyyy |
| es-ES | Spanish (Spain, International Sort) | dd/MM/yyyy |
| es-GT | Spanish (Guatemala) | dd/MM/yyyy |
| es-HN | Spanish (Honduras) | dd/MM/yyyy |
| es-MX | Spanish (Mexico) | dd/MM/yyyy |
| es-NI | Spanish (Nicaragua) | dd/MM/yyyy |
| es-PA | Spanish (Panama) | MM/dd/yyyy |
| es-PE | Spanish (Peru) | dd/MM/yyyy |
| es-PR | Spanish (Puerto Rico) | dd/MM/yyyy |
| es-PY | Spanish (Paraguay) | dd/MM/yyyy |
| es-SV | Spanish (El Salvador) | dd/MM/yyyy |
| es-US | Spanish (United States) | M/d/yyyy |

| | | |
|------------|--|------------|
| es-UY | Spanish (Uruguay) | dd/MM/yyyy |
| es-VE | Spanish (Bolivarian Republic of Venezuela) | dd/MM/yyyy |
| et | Estonian | d.MM.yyyy |
| et-EE | Estonian (Estonia) | d.MM.yyyy |
| eu | Basque | yyyy/MM/dd |
| eu-ES | Basque (Basque) | yyyy/MM/dd |
| fa | Persian | MM/dd/yyyy |
| fa-IR | Persian | MM/dd/yyyy |
| fi | Finnish | d.M.yyyy |
| fi-FI | Finnish (Finland) | d.M.yyyy |
| fil | Filipino | M/d/yyyy |
| fil-PH | Filipino (Philippines) | M/d/yyyy |
| fo | Faroese | dd-MM-yyyy |
| fo-FO | Faroese (Faroe Islands) | dd-MM-yyyy |
| fr | French | dd/MM/yyyy |
| fr-BE | French (Belgium) | d/MM/yyyy |
| fr-CA | French (Canada) | yyyy-MM-dd |
| fr-CH | French (Switzerland) | dd.MM.yyyy |
| fr-FR | French (France) | dd/MM/yyyy |
| fr-LU | French (Luxembourg) | dd/MM/yyyy |
| fr-MC | French (Monaco) | dd/MM/yyyy |
| fy | Frisian | d-M-yyyy |
| fy-NL | Frisian (Netherlands) | d-M-yyyy |
| ga | Irish | dd/MM/yyyy |
| ga-IE | Irish (Ireland) | dd/MM/yyyy |
| gd | Scottish Gaelic | dd/MM/yyyy |
| gd-GB | Scottish Gaelic (United Kingdom) | dd/MM/yyyy |
| gl | Galician | dd/MM/yyyy |
| gl-ES | Galician (Galician) | dd/MM/yyyy |
| gsw | Alsatian | dd/MM/yyyy |
| gsw-FR | Alsatian (France) | dd/MM/yyyy |
| gu | Gujarati | dd-MM-yy |
| gu-IN | Gujarati (India) | dd-MM-yy |
| ha | Hausa | d/M/yyyy |
| ha-Latn | Hausa (Latin) | d/M/yyyy |
| ha-Latn-NG | Hausa (Latin, Nigeria) | d/M/yyyy |
| he | Hebrew | dd/MM/yyyy |

| | | |
|------------|--|-------------|
| he-IL | Hebrew (Israel) | dd/MM/yyyy |
| hi | Hindi | dd-MM-yyyy |
| hi-IN | Hindi (India) | dd-MM-yyyy |
| hr | Croatian | d.M.yyyy. |
| hr-BA | Croatian (Latin, Bosnia and Herzegovina) | d.M.yyyy. |
| hr-HR | Croatian (Croatia) | d.M.yyyy. |
| hsb | Upper Sorbian | d. M. yyyy |
| hsb-DE | Upper Sorbian (Germany) | d. M. yyyy |
| hu | Hungarian | yyyy.MM.dd. |
| hu-HU | Hungarian (Hungary) | yyyy.MM.dd. |
| hy | Armenian | dd.MM.yyyy |
| hy-AM | Armenian (Armenia) | dd.MM.yyyy |
| id | Indonesian | dd/MM/yyyy |
| id-ID | Indonesian (Indonesia) | dd/MM/yyyy |
| ig | Igbo | d/M/yyyy |
| ig-NG | Igbo (Nigeria) | d/M/yyyy |
| ii | Yi | yyyy/M/d |
| ii-CN | Yi (PRC) | yyyy/M/d |
| is | Icelandic | d.M.yyyy |
| is-IS | Icelandic (Iceland) | d.M.yyyy |
| it | Italian | dd/MM/yyyy |
| it-CH | Italian (Switzerland) | dd.MM.yyyy |
| it-IT | Italian (Italy) | dd/MM/yyyy |
| iu | Inuktitut | d/MM/yyyy |
| iu-Cans | Inuktitut (Syllabics) | d/M/yyyy |
| iu-Cans-CA | Inuktitut (Syllabics, Canada) | d/M/yyyy |
| iu-Latn | Inuktitut (Latin) | d/MM/yyyy |
| iu-Latn-CA | Inuktitut (Latin, Canada) | d/MM/yyyy |
| ja | Japanese | yyyy/MM/dd |
| ja-JP | Japanese (Japan) | yyyy/MM/dd |
| ka | Georgian | dd.MM.yyyy |
| ka-GE | Georgian (Georgia) | dd.MM.yyyy |
| kk | Kazakh | dd.MM.yyyy |
| kk-KZ | Kazakh (Kazakhstan) | dd.MM.yyyy |
| kl | Greenlandic | dd-MM-yyyy |
| kl-GL | Greenlandic (Greenland) | dd-MM-yyyy |
| km | Khmer | yyyy-MM-dd |

| | | |
|------------|--|-------------|
| km-KH | Khmer (Cambodia) | yyyy-MM-dd |
| kn | Kannada | dd-MM-yy |
| kn-IN | Kannada (India) | dd-MM-yy |
| ko | Korean | yyyy-MM-dd |
| kok | Konkani | dd-MM-yyyy |
| kok-IN | Konkani (India) | dd-MM-yyyy |
| ko-KR | Korean (Korea) | yyyy-MM-dd |
| ky | Kyrgyz | dd.MM.yy |
| ky-KG | Kyrgyz (Kyrgyzstan) | dd.MM.yy |
| lb | Luxembourgish | dd/MM/yyyy |
| lb-LU | Luxembourgish (Luxembourg) | dd/MM/yyyy |
| lo | Lao | dd/MM/yyyy |
| lo-LA | Lao (Lao P.D.R.) | dd/MM/yyyy |
| lt | Lithuanian | yyyy.MM.dd |
| lt-LT | Lithuanian (Lithuania) | yyyy.MM.dd |
| lv | Latvian | yyyy.MM.dd. |
| lv-LV | Latvian (Latvia) | yyyy.MM.dd. |
| mi | Maori | dd/MM/yyyy |
| mi-NZ | Maori (New Zealand) | dd/MM/yyyy |
| mk | Macedonian (FYROM) | dd.MM.yyyy |
| mk-MK | Macedonian (Former Yugoslav Republic of Macedonia) | dd.MM.yyyy |
| ml | Malayalam | dd-MM-yy |
| ml-IN | Malayalam (India) | dd-MM-yy |
| mn | Mongolian | yy.MM.dd |
| mn-Cyrl | Mongolian (Cyrillic) | yy.MM.dd |
| mn-MN | Mongolian (Cyrillic, Mongolia) | yy.MM.dd |
| mn-Mong | Mongolian (Traditional Mongolian) | yyyy/M/d |
| mn-Mong-CN | Mongolian (Traditional Mongolian, PRC) | yyyy/M/d |
| moh | Mohawk | M/d/yyyy |
| moh-CA | Mohawk (Mohawk) | M/d/yyyy |
| mr | Marathi | dd-MM-yyyy |
| mr-IN | Marathi (India) | dd-MM-yyyy |
| ms | Malay | dd/MM/yyyy |
| ms-BN | Malay (Brunei Darussalam) | dd/MM/yyyy |
| ms-MY | Malay (Malaysia) | dd/MM/yyyy |
| mt | Maltese | dd/MM/yyyy |
| mt-MT | Maltese (Malta) | dd/MM/yyyy |

| | | |
|--------|---------------------------------|------------|
| nb | Norwegian (Bokmål) | dd.MM.yyyy |
| nb-NO | Norwegian, Bokmål (Norway) | dd.MM.yyyy |
| ne | Nepali | M/d/yyyy |
| ne-NP | Nepali (Nepal) | M/d/yyyy |
| nl | Dutch | d-M-yyyy |
| nl-BE | Dutch (Belgium) | d/MM/yyyy |
| nl-NL | Dutch (Netherlands) | d-M-yyyy |
| nn | Norwegian (Nynorsk) | dd.MM.yyyy |
| nn-NO | Norwegian, Nynorsk (Norway) | dd.MM.yyyy |
| no | Norwegian | dd.MM.yyyy |
| nso | Sesotho sa Leboa | yyyy/MM/dd |
| nso-ZA | Sesotho sa Leboa (South Africa) | yyyy/MM/dd |
| oc | Occitan | dd/MM/yyyy |
| oc-FR | Occitan (France) | dd/MM/yyyy |
| or | Oriya | dd-MM-yy |
| or-IN | Oriya (India) | dd-MM-yy |
| pa | Punjabi | dd-MM-yy |
| pa-IN | Punjabi (India) | dd-MM-yy |
| pl | Polish | yyyy-MM-dd |
| pl-PL | Polish (Poland) | yyyy-MM-dd |
| prs | Dari | dd/MM/yy |
| prs-AF | Dari (Afghanistan) | dd/MM/yy |
| ps | Pashto | dd/MM/yy |
| ps-AF | Pashto (Afghanistan) | dd/MM/yy |
| pt | Portuguese | dd/MM/yyyy |
| pt-BR | Portuguese (Brazil) | dd/MM/yyyy |
| pt-PT | Portuguese (Portugal) | dd-MM-yyyy |
| qut | K'iche | dd/MM/yyyy |
| qut-GT | K'iche (Guatemala) | dd/MM/yyyy |
| quz | Quechua | dd/MM/yyyy |
| quz-BO | Quechua (Bolivia) | dd/MM/yyyy |
| quz-EC | Quechua (Ecuador) | dd/MM/yyyy |
| quz-PE | Quechua (Peru) | dd/MM/yyyy |
| rm | Romansh | dd/MM/yyyy |
| rm-CH | Romansh (Switzerland) | dd/MM/yyyy |
| ro | Romanian | dd.MM.yyyy |
| ro-RO | Romanian (Romania) | dd.MM.yyyy |

| | | |
|------------|--|------------|
| ru | Russian | dd.MM.yyyy |
| ru-RU | Russian (Russia) | dd.MM.yyyy |
| rw | Kinyarwanda | M/d/yyyy |
| rw-RW | Kinyarwanda (Rwanda) | M/d/yyyy |
| sa | Sanskrit | dd-MM-yyyy |
| sah | Yakut | MM.dd.yyyy |
| sah-RU | Yakut (Russia) | MM.dd.yyyy |
| sa-IN | Sanskrit (India) | dd-MM-yyyy |
| se | Sami (Northern) | dd.MM.yyyy |
| se-FI | Sami, Northern (Finland) | d.M.yyyy |
| se-NO | Sami, Northern (Norway) | dd.MM.yyyy |
| se-SE | Sami, Northern (Sweden) | yyyy-MM-dd |
| si | Sinhala | yyyy-MM-dd |
| si-LK | Sinhala (Sri Lanka) | yyyy-MM-dd |
| sk | Slovak | d. M. yyyy |
| sk-SK | Slovak (Slovakia) | d. M. yyyy |
| sl | Slovenian | d.M.yyyy |
| sl-SI | Slovenian (Slovenia) | d.M.yyyy |
| sma | Sami (Southern) | yyyy-MM-dd |
| sma-NO | Sami, Southern (Norway) | dd.MM.yyyy |
| sma-SE | Sami, Southern (Sweden) | yyyy-MM-dd |
| smj | Sami (Lule) | yyyy-MM-dd |
| smj-NO | Sami, Lule (Norway) | dd.MM.yyyy |
| smj-SE | Sami, Lule (Sweden) | yyyy-MM-dd |
| smn | Sami (Inari) | d.M.yyyy |
| smn-FI | Sami, Inari (Finland) | d.M.yyyy |
| sms | Sami (Skolt) | d.M.yyyy |
| sms-FI | Sami, Skolt (Finland) | d.M.yyyy |
| sq | Albanian | yyyy-MM-dd |
| sq-AL | Albanian (Albania) | yyyy-MM-dd |
| sr | Serbian | d.M.yyyy |
| sr-Cyrl | Serbian (Cyrillic) | d.M.yyyy |
| sr-Cyrl-BA | Serbian (Cyrillic, Bosnia and Herzegovina) | d.M.yyyy |
| sr-Cyrl-CS | Serbian (Cyrillic, Serbia and Montenegro (Former)) | d.M.yyyy |
| sr-Cyrl-ME | Serbian (Cyrillic, Montenegro) | d.M.yyyy |
| sr-Cyrl-RS | Serbian (Cyrillic, Serbia) | d.M.yyyy |
| sr-Latn | Serbian (Latin) | d.M.yyyy |

| | | |
|-------------|---|------------|
| sr-Latn-BA | Serbian (Latin, Bosnia and Herzegovina) | d.M.yyyy |
| sr-Latn-CS | Serbian (Latin, Serbia and Montenegro (Former)) | d.M.yyyy |
| sr-Latn-ME | Serbian (Latin, Montenegro) | d.M.yyyy |
| sr-Latn-RS | Serbian (Latin, Serbia) | d.M.yyyy |
| sv | Swedish | yyyy-MM-dd |
| sw | Kiswahili | M/d/yyyy |
| sv-FI | Swedish (Finland) | d.M.yyyy |
| sw-KE | Kiswahili (Kenya) | M/d/yyyy |
| sv-SE | Swedish (Sweden) | yyyy-MM-dd |
| syr | Syriac | dd/MM/yyyy |
| syr-SY | Syriac (Syria) | dd/MM/yyyy |
| ta | Tamil | dd-MM-yyyy |
| ta-IN | Tamil (India) | dd-MM-yyyy |
| te | Telugu | dd-MM-yy |
| te-IN | Telugu (India) | dd-MM-yy |
| tg | Tajik | dd.MM.yy |
| tg-Cyrl | Tajik (Cyrillic) | dd.MM.yy |
| tg-Cyrl-TJ | Tajik (Cyrillic, Tajikistan) | dd.MM.yy |
| th | Thai | d/M/yyyy |
| th-TH | Thai (Thailand) | d/M/yyyy |
| tk | Turkmen | dd.MM.yy |
| tk-TM | Turkmen (Turkmenistan) | dd.MM.yy |
| tn | Setswana | yyyy/MM/dd |
| tn-ZA | Setswana (South Africa) | yyyy/MM/dd |
| tr | Turkish | dd.MM.yyyy |
| tr-TR | Turkish (Turkey) | dd.MM.yyyy |
| tt | Tatar | dd.MM.yyyy |
| tt-RU | Tatar (Russia) | dd.MM.yyyy |
| tzm | Tamazight | dd-MM-yyyy |
| tzm-Latn | Tamazight (Latin) | dd-MM-yyyy |
| tzm-Latn-DZ | Tamazight (Latin, Algeria) | dd-MM-yyyy |
| ug | Uyghur | yyyy-M-d |
| ug-CN | Uyghur (PRC) | yyyy-M-d |
| uk | Ukrainian | dd.MM.yyyy |
| uk-UA | Ukrainian (Ukraine) | dd.MM.yyyy |
| ur | Urdu | dd/MM/yyyy |
| ur-PK | Urdu (Islamic Republic of Pakistan) | dd/MM/yyyy |

| | | |
|------------|---|------------|
| uz | Uzbek | dd/MM/yyyy |
| uz-Cyrl | Uzbek (Cyrillic) | dd.MM.yyyy |
| uz-Cyrl-UZ | Uzbek (Cyrillic, Uzbekistan) | dd.MM.yyyy |
| uz-Latn | Uzbek (Latin) | dd/MM/yyyy |
| uz-Latn-UZ | Uzbek (Latin, Uzbekistan) | dd/MM/yyyy |
| vi | Vietnamese | dd/MM/yyyy |
| vi-VN | Vietnamese (Vietnam) | dd/MM/yyyy |
| wo | Wolof | dd/MM/yyyy |
| wo-SN | Wolof (Senegal) | dd/MM/yyyy |
| xh | isiXhosa | yyyy/MM/dd |
| xh-ZA | isiXhosa (South Africa) | yyyy/MM/dd |
| yo | Yoruba | d/M/yyyy |
| yo-NG | Yoruba (Nigeria) | d/M/yyyy |
| zh | Chinese | yyyy/M/d |
| zh-CHS | Chinese (Simplified) Legacy | yyyy/M/d |
| zh-CHT | Chinese (Traditional) Legacy | d/M/yyyy |
| zh-CN | Chinese (Simplified, PRC) | yyyy/M/d |
| zh-Hans | Chinese (Simplified) | yyyy/M/d |
| zh-Hant | Chinese (Traditional) | d/M/yyyy |
| zh-HK | Chinese (Traditional, Hong Kong S.A.R.) | d/M/yyyy |
| zh-MO | Chinese (Traditional, Macao S.A.R.) | d/M/yyyy |
| zh-SG | Chinese (Simplified, Singapore) | d/M/yyyy |
| zh-TW | Chinese (Traditional, Taiwan) | yyyy/M/d |
| zu | isiZulu | yyyy/MM/dd |
| zu-ZA | isiZulu (South Africa) | yyyy/MM/dd |

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