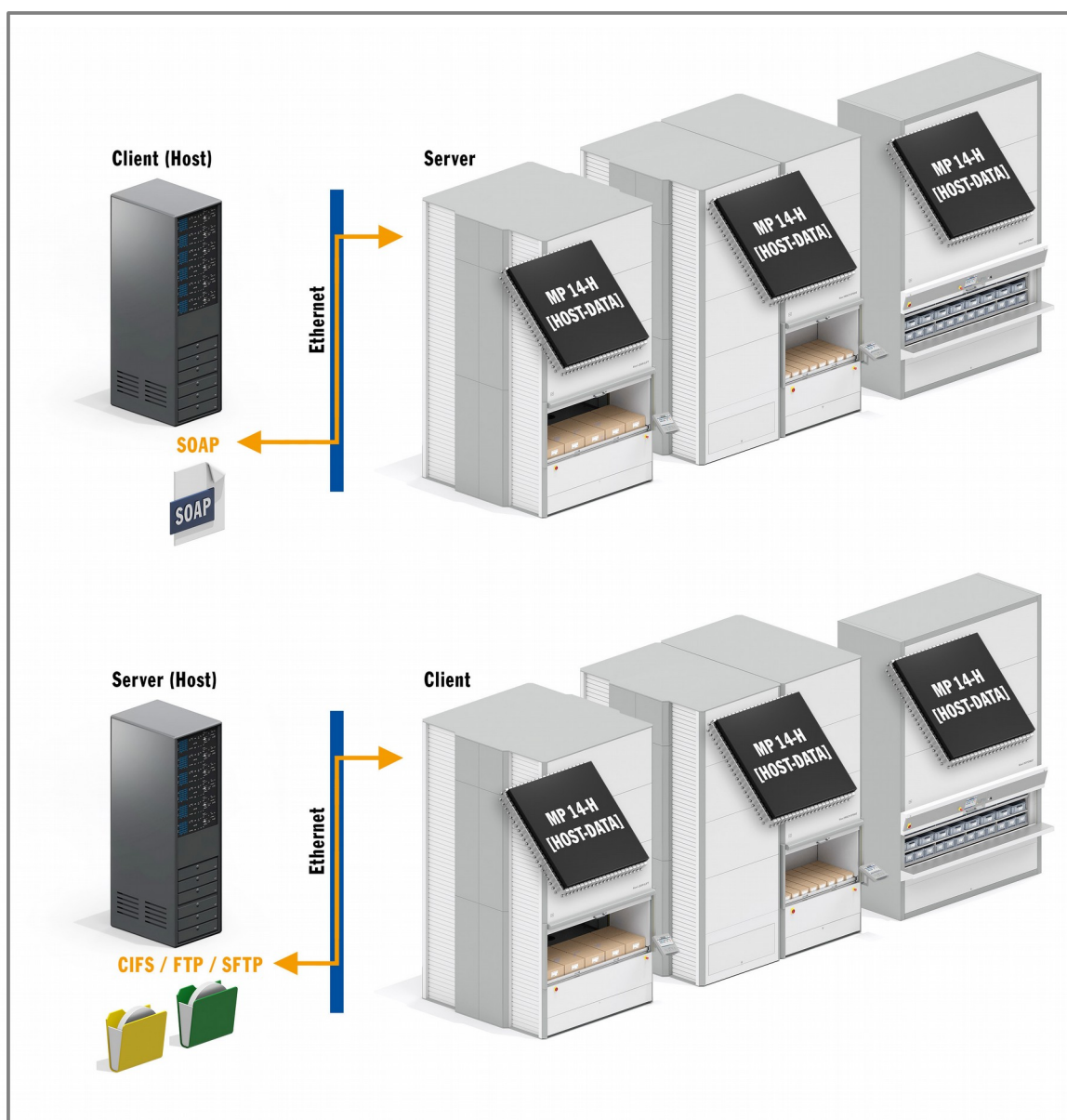


User Guide for the HOST-DATA Program Version MP 14-H microprocessor control system

Lean-Lift Multi-Space Rotomat



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1 Introduction

1.1 Basic information

1

Contents

This document contains information for operating the MP 14-H microprocessor control system in the "HOST-DATA program version".

Target group

This document has been written for:

- ◆ Operating personnel
- ◆ IT specialists
- ◆ Installation personnel
- ◆ Supervisors, service and maintenance personnel

Manufacturer

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Validity

This document is valid for lifts/carousels of the following series:

Type: Lean-Lift, Multi-Space, Rotomat

Access points: See operating manual

Serial number: See type plate on the lift/carousel

Model year: See type plate on the lift/carousel

If the lift/carousel has multiple access points, the type plate is located at the first access point.

This document is valid for MP control systems with the following or later software versions:

	Printed circuit board S0861
MP 14/12N SYSTEM	V 7.3
MP 14 CPU II	V 5.4 STANDARD PACKAGE 5

Keep in an accessible place as a complete document

- ◆ This documentation is a part of the lift/carousel and must be stored in a location that is accessible to authorised personnel at all times.
- ◆ Chapters may never be removed from this document. If the documentation or any of its pages are lost or missing, they must be replaced immediately.

Change service

This documentation is not subject to the change service of the manufacturer. Changes to this documentation may be made without further notification.

Copyright

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1

Introduction

1.2

Guide through the document

1

Symbols



Notes with this symbol warn you of a hazard caused by:

- ◆ possible severe injuries of a general nature, possibly including fatal injuries.

Terms

- ◆ The microprocessor control system uses the term **"shelf"**.
The term "shelf" corresponds to the following:
 - ◆ For the Lean-Lift and Multi-Space: ◆ **Containers**
 - ◆ For the Rotomat: ◆ **Carrier level**
 - ◆ For rack operation: ◆ **Shelf level**
- ◆ Instead of the term **MP 14-H[HOST-DATA]**, the term **MP control system** will also be used in the following.
- ◆ The term **job record** will be used for the term job item record.

Terms used

FTP server	File server for unencrypted transfer of files based on the "File Transfer Protocol" in accordance with RFC 959.
SFTP server	File server for encrypted transfer of files based on the "SSH File Transfer Protocol". (SSH from Version 2)
CIFS server	File server with CIFS protocol capability. With Windows, e.g. Windows File Sharing. With Unix / Linux systems, e.g. Samba server.
(S)FTP server	Umbrella term for FTP or SFTP server.
(S) FTP/CIFS client	FTP, SFTP or CIFS client integrated into the MP control system.
File server	Umbrella term for an FTP / SFTP or CIFS server.
Inbox	Input directory on the file server.
Outbox	Output directory on the file server.
CSV format	Comma-separated value. File format that describes the configuration of a text file.
SOAP	Simple Object Access Protocol

1 Introduction

1.3 Safety instructions

1



DANGER

All maintenance and repair work on Hänel lifts/carousels must be carried out by specially trained and authorised personnel only. Specially trained and authorised personnel are:

- Personnel who, because of their specialised education and special training in a Hänel factory, can provide proof of adequate skills and experience for these tasks and
- Who have received approval from the manufacturer or an agent authorised within the technical field to carry out these tasks and can carry out such tasks in a traceable manner.

SAFETY INSTRUCTION

Only specially trained and qualified personnel may operate the lift/carousel.

Operating personnel have to follow the lift/carousel user guide.

IT specialists have to follow the lift/carousel user guide and the lift/carousel operating manual.

Installation personnel have to follow the lift/carousel user guide and the lift/carousel operating manual as well as the installation instructions.

Supervisors, service and maintenance personnel have to follow the lift /carousel user guide and the lift/carousel operating manual.



SAFETY INSTRUCTION

Compliance with the following is mandatory:

- Safety Memorandum for Technical Field Staff
- Accident prevention regulation
For all work, the legal accident prevention regulations applicable to the respective country of use always have overriding authority. Furthermore, the owner/operator may have additional special regulations that also have to be taken into consideration.

1.4 Supplementary documents

- Technical Description of the Microprocessor Control System MP 14 Lean-Lift and Multi-Space
or
- Technical Description of the Microprocessor Control System MP 14 Rotomat
- Optional supplementary descriptions: See Chapter 12.1, page 165.

2 Technical specifications

2.1 Buffer management

General

- ◆ Connection to a higher-level host system via a 10 / 100 Mbit Ethernet interface.
- ◆ Host communication software with integrated (S)FTP/CIFS client for data transfer between an external file server and the master lift/carousel control system.
- Data record exchange via "UTF-8" encoded files.
- Conversion filter for each file type for reading in/reading out CSV files.
- Acknowledgement of the success of a data transfer in the form of a response file to the file server.
- Query of data from the MP control system via command lines in a request file.
- ◆ Alternative: Host communication software makes web service available via SOAP protocol.
- A customer-side web service client makes it possible to carry out the data exchange. (Customer-side programming effort required)
- ◆ Separate processing of unscheduled storage/retrievals (Article menu item) and job-related storage/retrievals (Job menu item).
- ◆ Integrated input and output buffer for up to 5000 individual data records.
- ◆ Integrated input and output buffer for up to 5000 jobs/job items each when the output buffer is empty. This enables a maximum of 5000 jobs with one job item each.
- ◆ Management of data records/jobs for single lift/carousel and MP multi-unit network possible.
- ◆ Visual display for pending article data records, or job data records, for processing at the lift/carousel/access point.
- ◆ User-selectable display of predefined data fields such as shelf, compartment, compartment depth, container, job, article number, article name, goods in/out operation, nominal quantity, inventory, total inventory, minimum inventory, priority.
- ◆ User-selectable display and query of user-defined article data record/job item-related special data fields U01 - U10.
- ◆ User-selectable display of user-defined job-related special data fields C01 - C10.
- ◆ Acknowledgement of the date and time of processing as well as of the actual quantity stored/retrieved and of the storage location actually used.
- ◆ Control of the sequence of processing on the lift/carousel possible using the data fields provided.
- ◆ Configuration of host communication using the configuration software installed on an external workstation (JACOMMAN).
- ◆ The article data record buffer and job buffer can be viewed using a browser on an external workstation.
- ◆ All articles or jobs in the input buffer can be deleted using a browser on an external workstation.

2 Technical specifications

Customer-side requirements

- ◆ Host system with an integrated storage management system that can manage the articles and the storage locations of the lift/carousel with the Lift and Shelf (or Job) minimum data fields.
- ◆ Host file server with 10 / 100 Mbit Ethernet interface and one input and one output directory for connection to the Hänel lifts/carousels.
- ◆ Interface software between the host system's storage management system and the file server / SOAP server for transferring the article data records and job items.

2

2 Technical specifications

2.2 Applications

Aggregate jobs	Aggregate jobs are used for time-optimised processing of multiple jobs that contain some of the same items. The higher-level system must combine these single jobs into an aggregate job with a separate job number. When processing one of these aggregate jobs, items of all jobs that pertain to a specific storage location are sorted in sequence to prevent the need to move back to the storage location. Therefore, in a job item, the information for the actual job number is displayed to ensure the allocation to the actual job. In addition, it is possible to show information for each job item describing the container that has to be picked in the job item. ➤ For the application solution, see Chapter 8.1 of the Annex: Integration into the IT system on page 151.
Inventory jobs	Inventory jobs are used to move to specific storage locations in order to count the quantity at these storage locations and report it back to the higher-level system. The time and scope of an inventory job is defined by the higher-level system. ➤ For the application solution, see Chapter 8.5 of the Annex: Integration into the IT system on page 156.
Storage jobs	Storage jobs are used to carry out storage operations, where applicable with query of data fields. ➤ For the application solution, see Chapter 8.6 of the Annex: Integration into the IT system on page 156.
Retrieval jobs	Retrieval jobs are used to carry out retrieval operations, where applicable with query of data fields. ➤ For the application solution, see Chapter 8.6 of the Annex: Integration into the IT system on page 156.
Batch processing of data records	The operator initiates an individual retrieval operation at the higher-level system. He or she then goes to the lift/carousel and starts the corresponding data record from the article buffer.

2 Technical specifications

2.3 Extended functions with supplementary features

To increase the standard scope of the software, supplementary features can be used in the carousel.

The range of functions offered by each supplementary feature is covered in a separate description.

Restrictions exist with regard to the possible combinations of supplementary features.

- ◆ High-speed door (Lean-Lift, Multi-Space)
- ◆ Pick-O-Light system (Lean-Lift, Multi-Space)
- ◆ Shelf weighing device (Lean-Lift and Multi-Space)
- ◆ Automatic sliding door (Lean-Lift, Multi-Space, Rotomat)
- ◆ Automatic shelf ejection (Lean-Lift)
- ◆ Automatic shelf locking (Lean-Lift)
- ◆ Shelves with power socket (Lean-Lift)
- ◆ Signal column (Lean-Lift, Multi-Space, Rotomat), consisting of:
 - a) Indicator lamp for "Data record present" (standard colour is yellow)
 - b) Indicator lamp for "Job present" (standard colour is blue)
- ◆ Eco-Mode (Lean-Lift, Multi-Space, Rotomat)
- ◆ Requisition processing strip (Lean-Lift, Multi-Space, Rotomat)
- ◆ Load imbalance indicator (Rotomat)

2 Technical specifications

2.4 Extended functions with supplementary modules

To increase the standard scope of the software, supplementary modules can be purchased and activated.

The range of functions offered by each supplementary module is covered in a separate description.

Restrictions exist with regard to the possible combinations of supplementary modules.

- ◆ With add-on module 00) Remote-controlled lift operation (Lean-Lift, Multi-Space, Rotomat)
- ◆ Module 02) Access code management with integrated user management (Lean-Lift, Multi-Space and Rotomat)
- ◆ With add-on module 04) Storage location height management (Lean-Lift and Multi-Space)
- ◆ With add-on module 07) Barcode cross-check (Lean-Lift, Multi-Space, Rotomat)
- ◆ With add-on module 20) Shelf pre-positioning for job processing (Lean-Lift, Multi-Space, Rotomat)
- ◆ Module 23) Decimal input for quantities (Lean-Lift, Multi-Space, Rotomat)
- ◆ With add-on module 24) Adjustable shelf speed (Lean-Lift and Multi-Space)
- ◆ With add-on module 28) Intermediate shelf buffer for job processing (Lean-Lift)
- ◆ With add-on module 29) Shelf transfer (Lean-Lift and Multi-Space)
- ◆ Module 30) Extractor park position (Lean-Lift and Multi-Space)
- ◆ Module 31) User management (Rotomat)
- ◆ With add-on module 33) Shelf pre-positioning for article/job (Lean-Lift, Multi-Space, Rotomat)
- ◆ Module 35) Article image (Lean-Lift, Multi-Space, Rotomat)

3 Operating elements / general operator advisories

3.1 Display / touchscreen

Graphical TFT module (thin-film transistor technology), is easily legible from any angle, with touchscreen

Size: 12.1" (30.7 cm)

Resolution: 1024 x 768 pixels

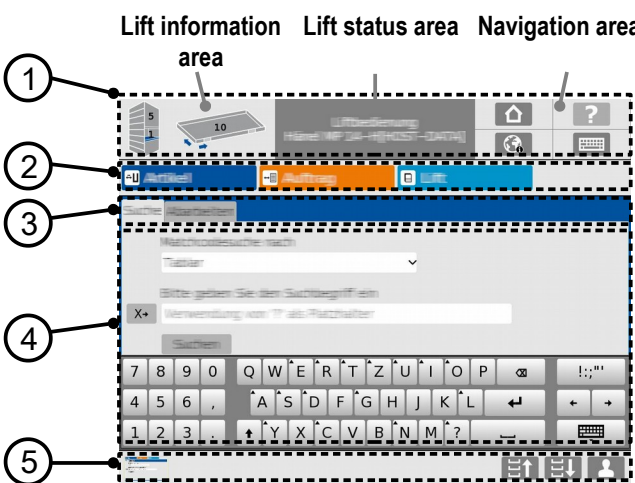


To prevent damage to the surface of the TFT display, touch it using your fingers or a blunt, non-smearing object only.

The buttons that appear in the corresponding menus must be touched just enough to visually indicate them as having been pressed on the screen.

3 Operating elements / general operator advisories

3.1.1 Division of the user interface

Description	Display
① Title bar - Lift information area: The lift number and access point number are displayed within the lift/carousel icon. The shelf number is displayed within the shelf icon. The compartment and compartment depth numbers of the start-up storage location are also displayed at the two arrows on the shelf icon. Note: This area is periodically superimposed with the <STOP> symbol when multiple access points are being operated. Title bar - Lift status area: Display of error messages / display of messages during lift run / display of shelf grid with display of the accessed storage location Title bar - Navigation area: The home start page, the storage area portal and the touchscreen keyboard can be started via touchscreen. Alternatively, the storage portal can be started with the [i] key.	 The diagram illustrates the user interface layout with five numbered callouts: 1 Title bar - Lift information area: Points to the top section containing lift and shelf icons. 2 Menu bar: Points to the bar below the title bar with icons for Article, Job, and Lift. 3 Function bar: Points to the bar below the menu bar with icons for various functions. 4 Interaction and display area: Points to the large central area for text input and graphics. 5 Taskbar: Points to the bottom bar containing a keyboard and navigation icons.
② Menu bar: Ability to toggle to the "Article", "Job" and "Lift" menu items. ③ Function bar: Ability to call up the individual functions of a menu item. ④ Interaction and display area: This area is used to display information as well as user inputs. ⑤ Taskbar: Display all open windows: Toggling between the open windows via touchscreen is possible. At the bottom right-hand side, additional instructions and control options are displayed depending on the menu and equipment features.	Note: The menu bar, function bar and interaction and display area are superimposed with the lift run graphics during the lift run. This also applies for the display of the storage portal. In addition, after the article selection, the menu bar and function bar have the interaction and display area superimposed.

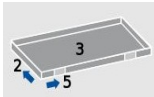
3 Operating elements / general operator advisories

3.1.2 Overview of available operating and display elements

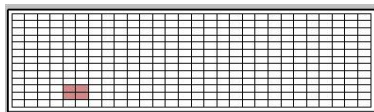
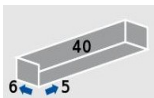
Elements of the title bar:



Lean-Lift:



Rotomat:



- ◆ Lift information area:
- ◆ Displays the lift number and access point number

Lift information area:

- ◆ Displays the shelf number
- ◆ Displays the compartment number and compartment depth number of the storage location to be accessed

Lift information area:

- ◆ Operator information for maintenance mode

Lift information area:

- ◆ Operator information for "Lift run is not possible", "Do not push shelf in".
- ◆ (A lift run for another access point is carried out or a shelf is located in another access opening).

Lift status area:

- ◆ Displays the storage location grid with marking of the storage location to be accessed

Navigation area:

- ◆ Configurable home page under "Settings" after the lift/carousel is switched on. The "Article", "Job" or "Lift" menu item can be used as the home page.

Navigation area:

- ◆ Currently has no function

Navigation area:

- ◆ Calling up the storage portal. This is used for data screening and configuring administrative settings.

The website of the storage portal can also be viewed at the workstation using a browser on an external PC.

Navigation area:

- ◆ Calls up the virtual keyboard

Taskbar:

- ◆ Toggles to the "Lift operation" window

Taskbar:

- ◆ Toggles to the "Storage portal" window

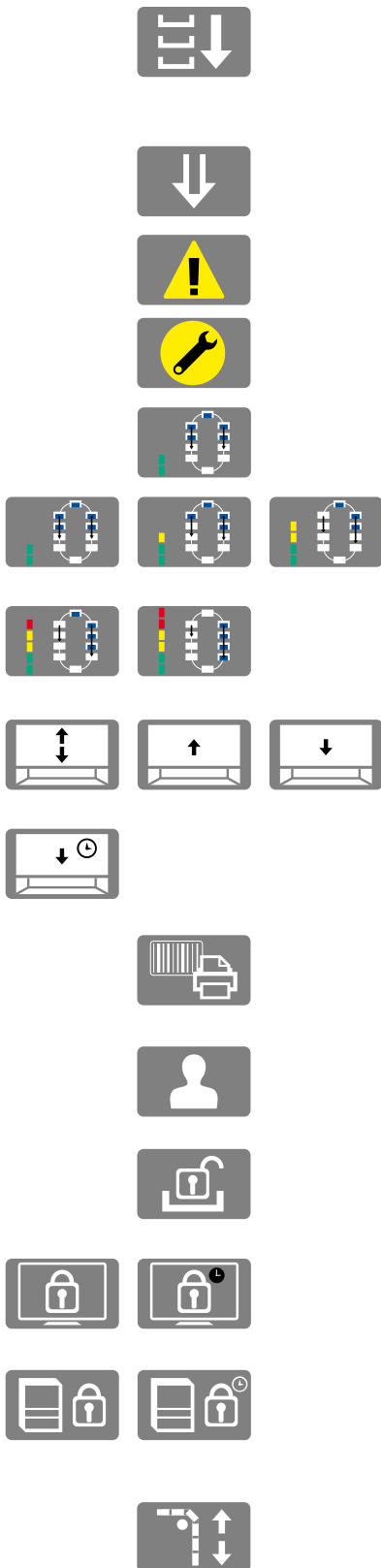
Taskbar:

- ◆ Calls up user settings / system services (service) with password prompt

Taskbar:

- ◆ The shelf in the access point is stored in the lift (Lean-Lift, Multi-Space).
- ◆ Manual shelf selection by sight, movement direction upward (Rotomat).

3 Operating elements / general operator advisories



Taskbar:

- ◆ After entering the shelf number, the corresponding shelf is brought to the access point (Lean-Lift, Multi-Space).
- ◆ Manual shelf selection by sight, movement direction downward. (Rotomat)

Taskbar:

- ◆ Manual positioning to a shelf location to enter it (Rotomat)

Taskbar:

- ◆ Calling up instructions for the safety inspection.

Taskbar:

- ◆ The imbalance situation is displayed (only for Rotomat).
- ◆ Symbols for the various imbalance situations. These range from "Rotomat is loaded optimally" to "Rotomat has high imbalance". (only for Rotomat).

Taskbar:

- ◆ Symbols for "Open / close door", "Open door via touchscreen", "Close door via touchscreen" and "Door closes automatically after a specified time span". (only in conjunction with the supplementary feature "Automatic sliding door")

Taskbar:

- ◆ Label printing is started. (only when using supplementary module 27) Label printing at the access point)

Taskbar:

- ◆ Call up the setting of the display language (if enabled in the "Lift - Settings" menu item).

Taskbar:

- ◆ Release shelf detent (if enabled in the "System services run sequence" menu item, for Lean-Lift and Multi-Space).

Taskbar:

- ◆ Symbol for "Activate display lock" and "Automatic activation of display lock after a specified time span".

Taskbar:

- ◆ Symbol for "Lock access to the access point via touchscreen" and "Lock access to the access point automatically after a specified time span" (only when using supplementary module 02) Access code management)

Taskbar:

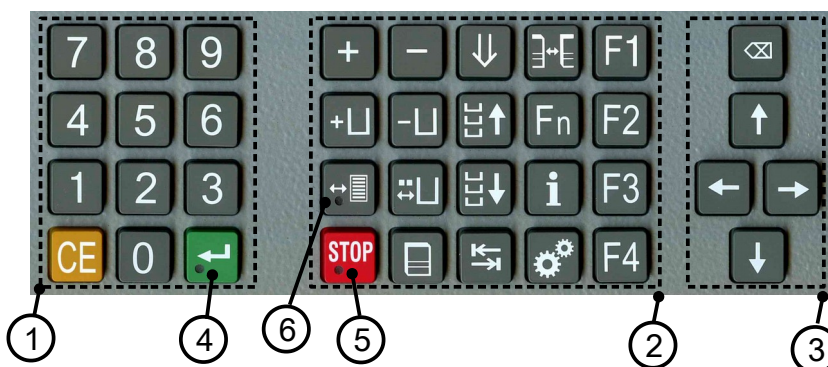
- ◆ Symbol for "Close/open the high-speed door" (only for Lean-Lift) (only when using the supplementary feature "High-speed door")

3 Operating elements / general operator advisories

3.2 Keyboard

3.2.1 Overview

- ① Number block for entering article numbers, quantity etc.
- ② Function keys for calling up individual functions
- ③ Navigation in input fields and tables / deleting characters in input fields.
- ④ Green LED illuminated
-> Safety circuit set
- ⑤ Red LED illuminated
-> Safety circuit interrupted
Red LED flashes
-> Safety circuit defective



3

3.2.2 Key functions

Meaning for Rotomat	Meaning for Lean-Lift / Multi-Space	Key
Confirm entry Set safety system Start lift run!	Confirm entry Set safety system Start lift run!	
Delete an entry, Cancel a function Acknowledge operator advisories and lift run error messages	Delete an entry, Cancel a function Acknowledge operator advisories and lift run error messages	
Stopping a lift run To stop a lift run in hazardous situations, use the emergency stop switch!	Stopping a lift run To stop a lift run in hazardous situations, use the emergency stop switch!	
Call up "Article" menu item	Call up "Article" menu item	
Call up "Job" menu item	Call up "Job" menu item	
Call up "Lift" menu item	Call up "Lift" menu item	
Manual shelf selection by sight (Start lift run!)	Bring shelf to access position	

3 Operating elements / general operator advisories

Meaning for Rotomat	Meaning for Lean-Lift / Multi-Space	Key
Manual shelf selection by sight (Start lift run!)	Store shelf from access position (Start lift run!)	
No function	Adding a new shelf	
No function	Removing a shelf	
Store an article		
Remove an article		
Tab		
Call up lift/carousel references		
Call up "Storage portal" menu item		
Calling up the "System services" menu item		
Function key		
Make selection / table row selection upwards		
Make selection / table row selection downwards		
Navigation in the input field to the right		

3

3 Operating elements / general operator advisories

Meaning for Rotomat	Meaning for Lean-Lift / Multi-Space	Key
Navigation in the input field to the left		
Manual positioning to a shelf location to enter it Automatic storage location assignment	Optimisation run Automatic storage location assignment	
Delete characters in input fields (backspace)		
Function keys F1 to F4: Reserve		 
Number keys 0-9		 

3

3 Operating elements / general operator advisories

3.3 Touchscreen keyboard

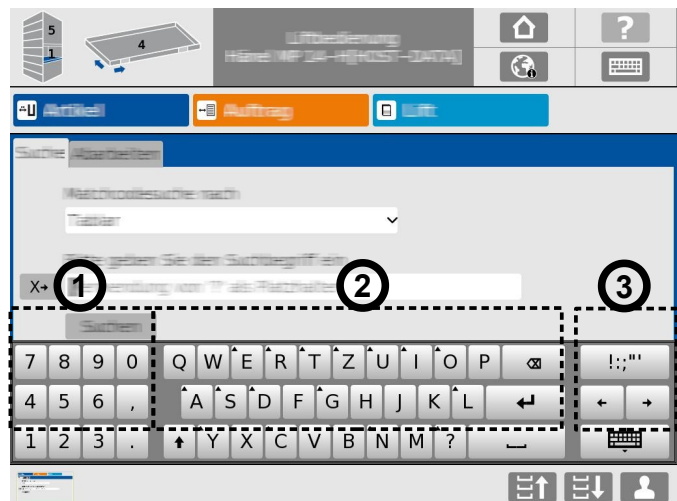
3.3.1 Overview

Description

The virtual alphanumeric keyboard consists of three rows and can, if necessary, be displayed in the lower area. It has a fixed height of 190 pixels.

- 1 Number block 0-9 with dot and comma key.
- 2 Alpha keys with Backspace, Return, Blank and Shift.
- 3 SHIFT key for the special characters. Navigation in input fields. Hide touchscreen keyboard.

Display



3.3.2 Available characters

Description

Alphanumeric home page of the virtual keyboard.

Display



Page 1 of the special characters



Page 2 of the special characters



The alphanumeric home page of the touchscreen keyboard features a few buttons with a small triangle in the top left corner. Pressing and holding these buttons for a long time brings up special characters related to this character.



3 Operating elements / general operator advisories

3.4 Switching on the lift

Description	Display
-------------	---------



- x Switch on lift/carousel at the main switch.
- x Wait for the MP control system to start up.
- The red LED in the **[STOP]** key lights up.

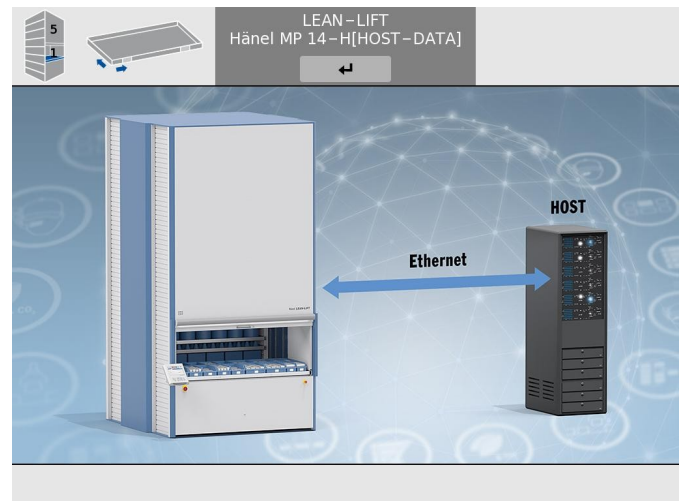


3

Switch-on screen after the lift run is completed.

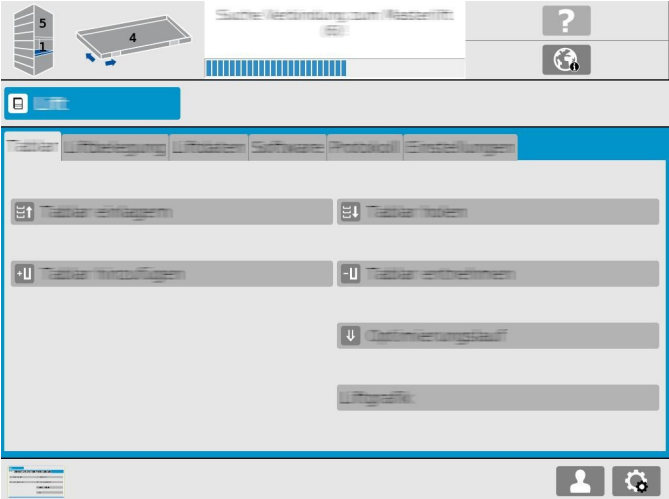
- The lift/carousel type and control system type appear on the display. The display text may vary depending on the configuration.

Switch-on screen, example for Lean-Lift:



3

Operating elements / general operator advisories

Description	Display
➔ Display if no connection to the master lift/carousel exists. The "Find connection to master lift" message appears in the lift/carousel status area and the lift number of the master lift/carousel being searched for is shown in parentheses. A blue progress bar illustrates the progress of the current search. The master lift/carousel is the lift/carousel in the GSC or Ethernet MP multi-unit network connected to the CIFS/ FTP/ SFTP server or via web service (SOAP) via host communication. The master lift/carousel must be switched on at all times.	 The screenshot shows the control interface with a top status bar. On the left, a diagram of a lift stack shows unit 4 selected. The main area has a title 'Suche Verbindung zum Masterlift' and a blue progress bar. Below this are several control buttons: 'Taster einlegen', 'Taster holen', 'Taster hinzufügen', 'Taster entnehmen', 'Tasterungslauf', and 'Taster'. A sidebar on the right contains icons for help and settings.

3

3 Operating elements / general operator advisories

3.5 Shelf division in compartment, compartment depth and container

The front side of a lift/carousel is the side where access point 1 is located.

The storage location of an article is defined by:

- ◆ Lift number
- ◆ Shelf number
- ◆ Compartment number (consecutive from left to right from the viewpoint of the operator for the access point on the front side).
- ◆ Compartment depth number (consecutive from front to back from the viewpoint of the operator for the access point on the front side).

The storage location size of an article is defined by:

- ◆ Container size in the direction of compartments (number of compartments being used by the article in the direction of compartments)
- ◆ Container size in the direction of compartment depths (number of compartments being used by the article in the direction of compartment depths)
- ◆ Container size in height
(only when using the supplementary module 04) Storage location height management)

The storage location can be displayed by:

- ◆ Compartment display without compartment depth display
- ◆ Compartment display with compartment depth display
- ◆ Compartment display with compartment depth display for container width (a maximum of 20 compartment displays are illuminated at the same time)
- ◆ Pick-O-Light system without display of the container size (fixed grid)
- ◆ Pick-O-Light system with display of the container size (fixed grid, up to 4 compartment emitters mark the corner points of the container)
- ◆ Pick-O-Light system (variable)

3 Operating elements / general operator advisories

3.6 Shelf detent

Description



Display

Release of shelf detent:



When shelf detent is activated, the shelf is not pushed all the way into the access point. The horizontal movement stops before the extractor drive catches leave the guides in the shelf. This locks the shelf in place so that it cannot be moved.

- x The shelf detent can be enabled or disabled with System services run sequence.
- x Shelf detent is possible only on lifts/carousels that are fitted with an incremental encoder for horizontal movement and that do **not** have the following supplementary features:
 - ◆ High-speed door
 - ◆ Automatic shelf ejection
 - ◆ Shelf weighing device
 - ◆ Automatic shelf detent
 - ◆ Multiple access points with guide rails or transporter/trolley

3

3 Operating elements / general operator advisories

3.7 Operating multiple access points

3.7.1 Lift/Carousel with guide rails (only for Lean-Lift and Multi-Space)

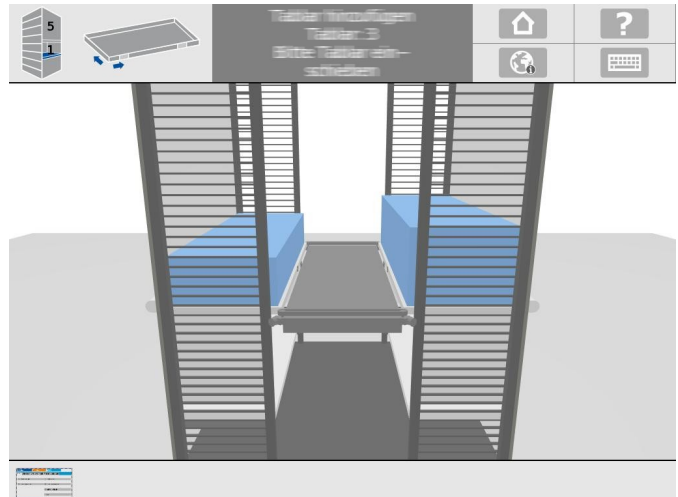
Description

When pushing the shelf into the access opening, please remember that:

- x The shelf must not be pushed in as long as the STOP symbol is displayed in the lift/carousel information area.
- x The shelf must be correctly positioned. It must cover the front and rear proximity switches of the access point simultaneously.

As long as a shelf is in the access point, no lift run is possible for another access point. Only after the shelf has been pulled completely onto the guide rails can a lift run be executed from another access point.

Display



3



- x When an access operation is completed, the accessed shelf should be pushed fully into the access point and stored in the lift/carousel from the access point. This allows the shelf to be accessed from another access point.
- x Moreover, an access point should never be left by the operator while an error message is displayed. In this case, the run at this access point is not concluded and access by the other access points is blocked.

3.7.2 Lift run with sliding door closed only (only for Lean-Lift and Multi-Space)



- x Before each lift run, the sliding door must be closed. The door must be opened after accessing a storage location.
- x In the "Lift status" area, the operator is prompted to open or close the door.

3.7.3 Lift/Carousel with high-speed door (only for Lean-Lift and Multi-Space)

- Refer to the "Supplementary Description of the High-speed Door Microprocessor Control System MP 14 Lean-Lift and Multi-Space"

3 Operating elements / general operator advisories

3.7.4 Lift run only with access point open (only for Rotomat)

A lift run is possible only if the operator's own access point is open and all other access points are closed and locked. For this reason, the access doors should always be closed after S/R procedures. As soon as one access point is opened, all other access points are locked. This prevents interruptions of the lift run caused by opening other access points.



- x During emergency operation, a lift run can be carried out with the door closed. Emergency operation means that the carousel can be operated with the doors closed if the safety light barriers or the safety rocker switches have failed. This feature is optional and is not available without additional modification to the electrical equipment. For activating emergency operation, refer to the "Technical Description of the Microprocessor Control System MP 14 for Rotomat".
- x Manual mode if the electronics fail:
When access points are closed, the manual-automatic selector switch can be used to unlock the access point. Manual mode may always be selected at one access point only.
- x If the door is open for another access point, the door at this access point cannot be opened. The STOP symbol appears in the "Lift information" area.

3

3.7.5 Lift run possible only when manually operated sliding doors are closed (for Rotomat only)



- x A lift run is possible only when all access points are closed and locked. For this reason, the access doors should always be closed after S/R procedures. As soon as one access point is opened, all other access points are locked.
- x If the door is open for another access point, the door at this access point cannot be opened. The STOP symbol appears in the "Lift information" area.

3

Operating elements / general operator advisories

3.8

Changing the language



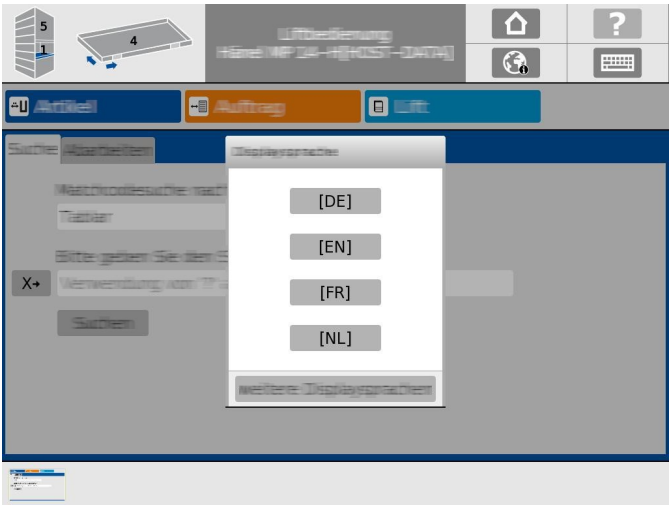
x After the carousel is switched off and on again, the operator prompts are again displayed in the language configured in the initialisation.

Description

- ◆ The four last configured display languages appear as buttons in a dialogue for quick selection.

Display

Switching in the taskbar:



3



x The quick switchover of language during operation is possible only if the "Multilingual display language" function has been enabled under the menu item "Lift - Settings - Operator prompts".

3

Operating elements / general operator advisories

3.9

Display lock

Description	Display
	Enabling in the taskbar: 
	Automatic activation after a specified time span: 
x Under the "Lift" menu item there is a "Settings" function that can be used to enable the display lock and set its password. Optionally, the setting "Activate display lock after the time span" can be used to activate the display lock automatically. x After the control system boots up or after manual or automatic enabling of the display lock, the user is prompted to enter a password as access protection.	5 1 4 Upliftanierung Hänel MP 14-H[HOST-DATA] Display-schließen Passwort: ↵ 4

3

3 Operating elements / general operator advisories

3.10 Match code search



- x The match code search is used in the Article menu item and in the Job menu item in the "Search" function.
- x The search windows within the storage portal also use the principle of the match code search.

The match code search function allows the user to look for data such as article data records, requisition data records and job data records in the memory according to various search criteria that can be applied to different data fields.

The search data field can be preset by setting a default match code search and remains active until the next time it is changed.

The search criterion is a character string (termed a match code) entered by the user. All the search data fields in the memory are searched for this string. All the data records that match the search criterion are shown on the display. The more characters contained in the match code, the narrower the search range will be and the fewer matching data records will be offered for selection.

3

Possible match codes	Description
?	Use of the question mark. All the data records with the search data field are selected.
<Character string>?	A character string followed by a question mark. The system searches for data which start with this character string.
?<Character string>	Use of the question mark at the beginning, followed by a character string. The system searches for data which end with this character string.
?<Character string>?<Character string>?	Multiple character strings separated by question marks and with question marks at the beginning and end. The system searches for data which contain the various character strings in the search data field in the order specified.

3 Operating elements / general operator advisories

3.11 Load imbalance indicator (only for Rotomat)

In a Rotomat, a load that is not evenly distributed with regard to the weight of the load capacity can cause great load fluctuations. An unevenly distributed load is called a load imbalance. The load fluctuations caused by load imbalances can lead to an impermissible operating state and increased wear of the Rotomat. Therefore, if a high imbalance occurs, it should be reduced by relocation or consideration of storage recommendations. For a low or moderate imbalance, no relocation is necessary. The load imbalance indicator informs the operator of the current imbalance situation of the carousel and makes storage recommendations.



- x The load imbalance indicator is optional electrical equipment for the Rotomat.
- x The load imbalance indicator determines a storage recommendation. This storage recommendation is considered during automatic storage location assignment when a storage location is created.

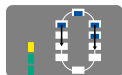
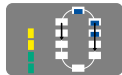
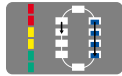
3

3.11.1 Display of the imbalance situation and the load imbalance recommendation (only for Rotomat)



The imbalance situation and the load imbalance recommendation can be queried by confirming the button in the taskbar.



Description	Example screenshot
→ The Rotomat has an optimal load.	
→ The Rotomat has a low imbalance. → Display of a load imbalance recommendation for which shelf should receive the next storage operation.	
→ The Rotomat has a medium imbalance. → Display of a load imbalance recommendation for which shelf should receive the next storage operation.	
→ The Rotomat has a high imbalance. → Display of a load imbalance recommendation for which shelf should receive the next retrieval operation.	
→ The Rotomat has an impermissible imbalance. → In addition, an audible alarm sounds. → Only limited operation of the Rotomat is possible. → Display of a load imbalance recommendation for which shelf should receive the next retrieval operation.	

3 Operating elements / general operator advisories

3.11.2 Limited operation with impermissible imbalance (not for Rotomat)

The limited operation begins with the next lift run after the impermissible imbalance is detected. From then on, each lift run is interrupted by the control system after every 4 carriers with the lift run error message described below:

Description of possible operator advisories

- x Press the [↔] key.
- ➔ The carousel continues moving for a maximum of 4 carriers.

Display text in the area

LIFT RUN FAULT :
OVER IMBALANCE
DETECTED
-> CE/↔

3.11.3 Initialisation run

When an initialisation run is carried out, the load table in the memory is updated to reflect the current loaded state.

- ◆ An initialisation run should also be carried out after each time the load imbalance is formatted.
During the formatting, the values in the load table are set to a default value. This default value is set to the actual power value by an initialisation run.
- ◆ An initialisation run should be carried out after storage or retrieval due to an impermissible imbalance.

During an initialisation run, the lift/carousel must carry out one full rotation in both run directions at a high speed. Rotation at fast speed is possible with the  and  keys, where the respective key must be pressed and held.

4 Lift operation

4.1 Lift menu item

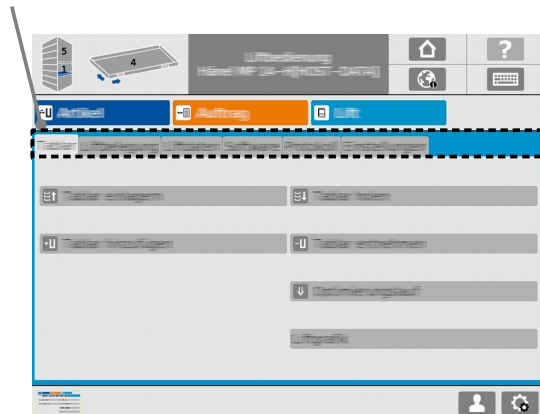
Description

Function bar - "Shelf" function:

-  • "Store shelf" button/key (for LL, MS)
 - The shelf in the access point is stored in the lift.
-  • "Get shelf" button/key (for LL, MS)
 - The entered shelf is brought to the access point. If the access point is occupied by another shelf, this is returned to storage in the lift first.
-  • "Add shelf" button/key (for LL, MS)
 - The MP control system receives notification of the shelf pushed into the access point. Articles can now be stored and registered in it.
-  • "Get shelf" button/key (for LL, MS)
 - The entered shelf is brought to the access point if it is not there already. After the shelf has been pulled out of the access point, it is unregistered from the MP control system. Articles can now no longer be stored or registered in it.
-  • "Optimisation run" button/key (for LL, MS)
 - In an optimisation run according to access time, the MP control system calculates the most favourable position for shelves with a frequent access rate or high AP (AP = Access Priority). If it is possible to optimise the shelf positions, the shelves are relocated automatically. Moreover, gaps that have arisen between shelves as a result of constantly changing article heights are closed by re-sorting the shelves.
 - An optimisation run according to packing density closes all the gaps between shelves by re-sorting from the bottom up.

Display

Function bar for "Lift" menu item (blue)



-  • "Get shelf" button (for RO)
 - The entered shelf position is accessed manually and the compartment or compartment depth display is activated.
-  • "Position shelf" button (for RO)
 - Depending on which key is pressed, the carousel moves upward or downward. Release the key to stop the carousel at the next shelf position. When the function is activated using buttons, after the "Start lift run" window is confirmed, the carousel moves into the selected direction by only one shelf position.
- "Shelf weight measurement" (for LL, MS)
 - (only with shelf weighing device)

4

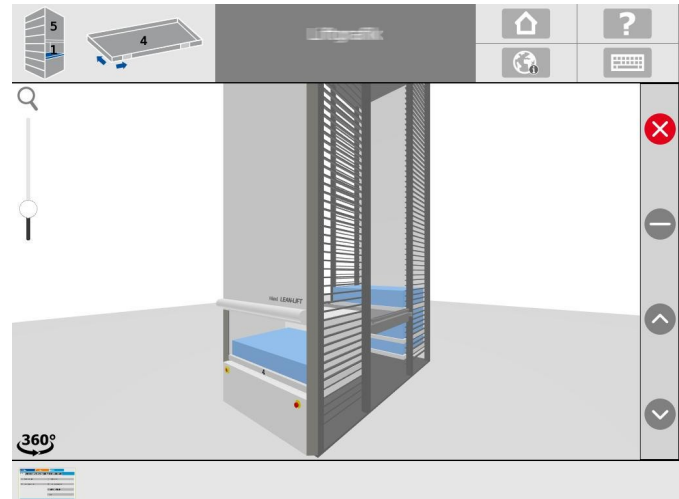
LL = Lean-Lift
MS = Multi-Space
RO = Rotomat

4 Lift operation

Description

- "Lift graphic" button (for LL, MS)
 - When not moving, the lift/carousel is portrayed based on a 3D model. The lift/carousel can be viewed from all sides using a three-dimensional view. The image size can be changed below the magnifying glass symbol.
 - In addition, the following functions are available via the right-hand taskbar:
 - a) Plus sign: View is closed.
 - b) Symbol with slash: Extractor can be hidden.
 - c) Upwards / downwards arrows: Exploring the lift/carousel vertically.
 - d) Left/right arrows (only for MS): The view point (camera position) can be changed horizontally.

Display



4 Lift operation

Description

Function bar - "Lift assignment" function:

Note. This menu item is displayed only for the Lean-Lift or Multi-Space version.

Shows a list in table form of the shelves present in the lift.

Table columns:

- Lift unit
 - is displayed only for the Multi-Space. Lift units are counted from left to right starting with "1" in relation to the side of the lift where access point 1 is found.
- Shelf
 - Shelf number
- Front carrier
 - is the side at which the operator is standing.
- Rear carrier
 - is the opposite side from the operator's viewpoint.
- Actual height
 - corresponds to the stored article height measured in carriers.
- Target height
 - appears only with supplementary module "Storage location height management".
- Weight
 - is shown only if the supplementary module "Shelf weighing device" is installed.

Function bar - "Lift data" function:

Shows various lift/carousel parameters in table form (model year, lift number, access point number, number of compartments, number of compartment depths, etc.).

Function bar - "Software" function:

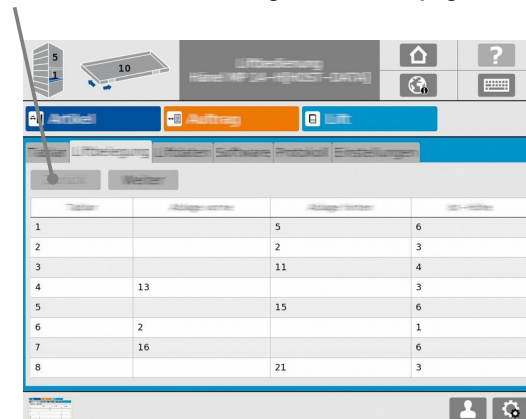
Shows the version statuses of the individual software modules.

Function bar - "Log" function:

Shows the protocol (log) for safety inspection (date, technician/company carrying out the inspections, responsible employee of the owner/operator).

Display

Back / Next button for scrolling between the pages



4 Lift operation

Description

Function bar - "Settings" function:

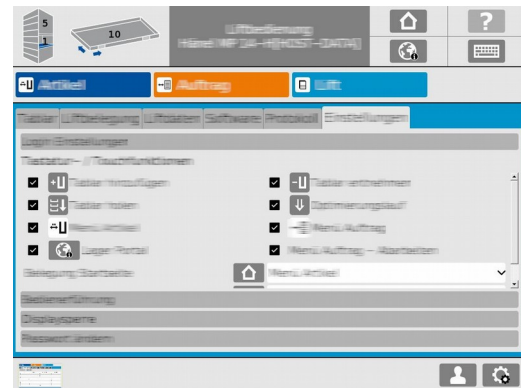
The following setting options are available.

- Login settings:
 - ➔ After a successful login, changes can be made in the setting screens.
- Keyboard/ touch functions:
 - ➔ The following key functions can be disabled at the computer:

	Add shelf (LL, MS)
	Remove shelf (LL, MS)
	Get shelf (LL, MS)
	Position shelf (RO)
	Optimisation run (LL, MS), Position shelf (RO)
	Menu item, Article
	Menu item, Job
	Menu item Job - Process
	Storage portal

- ➔ The assignment of the home button can be defined on a user-defined basis. Options: Article menu, Job menu or Lift menu.
- ➔ The assignment of the touchscreen keyboard can be defined on a user-defined basis. Options: QWERTZ, QWERTY, AZERTY.

Display



- Operator prompts:
 - ➔ Setting option "Automatically store shelf after direct storage/retrieval operation".
 - ➔ Setting option "Automatically store shelf after job processing".
 - ➔ Setting option "Remaining quantity storage for article processing" (see Chapter 9, Subchapter 8.4, Page 155).
 - ➔ Setting option "Remaining quantity storage for job processing" (see Chapter 9, Subchapter 8.4, Page 155).
 - ➔ Setting option "Multilingual display language" (see Chapter 3.8, Page 27).
 - ➔ Setting option "GUI Style 2". This setting brings about a change of the design of the operator prompts.
- Display lock
 - ➔ Activation / deactivation of the display lock (see Chapter 3.9, page 28).
- Change password:
 - ➔ Defining the password for "Login settings" and for the "Display lock".

4

Lift operation

4.2

Menu item, Article

Description	Display
In the Article menu item, articles sent by the higher-level system (Host) can be called up from the input buffer. The article number can be entered directly or selected through a search function (match code search). After the article is selected, further operating steps are used to approach the specified storage location and register the quantity. There is an option for changing the storage location and the quantity. If an article is to be stored at a new storage location or a remaining quantity is to be stored at another new storage location, there is an option for specifying multiple storage locations from the host so that an automatic search for the storage location can be carried out by the MP control system. There is also an option for sending associated containers to the storage locations specified from the host. For more detailed information about transmission of data from the host, see Chapter 9, Page 62 in the annex.	
	x As soon as data records for the access point are available for processing from the host, the "Article" button starts flashing as a signal to the operator.

4 Lift operation

Description

Function bar - "Input" function:

- Directly enter and select article numbers sent by the host.
 - After entering two characters from the article number to be subjected to a search, a search operation is started. If the number of the search result is between 1 and 5, a selection box appears below the input line. Then the touchscreen or keyboard can be used to select which article is searched for.
 - Press the Return button on the touchscreen or keyboard.

Note: If multiple data records with the same article number are present in the article buffer, a table of options will appear.
 - Processing of the selected article is started.

Note: When the "X→" button is pressed, a selection box appears below the input line that contains the last 5 user entries.

Note: The "Enter" function is visible only if the "Article number" data field has been initialised in the configuration software.

Function bar - "Search" function:

- It is possible to search in the article buffer for various data fields, such as the article number, article designation or user-defined U-special data fields.
 - The search term is a character string (termed a match code) entered by the user. For this string, a search is conducted for all the search data fields in the memory.

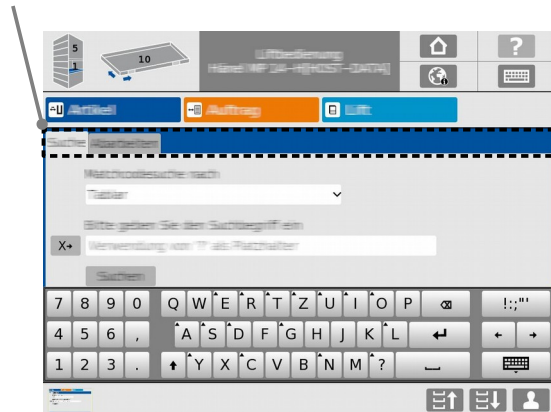
Note: For a more detailed description of using the match code search, see Chapter 3.10, page 29.
 - The search result is shown in table form.
 - Select the article using touchscreen or keyboard.
 - Processing of the selected article is started.

Function bar - "Process" function:

- The next item in the article buffer is called up for processing. If the priority field is enabled, the processing is done based on priority, beginning with the data record with the highest priority. If the priority field is disabled, the processing is done sequentially.
- If articles for the current access point are in the buffer, the "Article" button will flash.

Display

Function bar for the Article menu item (dark blue)



4 Lift operation

4.3 Menu item, Job

Description	Display
In the Job menu item, jobs sent by the higher-level system (Host) can be called up from the input buffer. The job number can be entered directly or selected through a search function (match code search). After the job is selected, all job items are processed in the next operating steps. As this happens, the specified storage location is accessed and the quantity is registered. There is an option for changing the storage location and the quantity as the item is being processed. For a job item, if an article is to be stored at a new storage location or a remaining quantity is to be stored at another new storage location, there is an option for specifying multiple storage locations from the host so that an automatic search for storage location can be carried out by the MP control system. There is also an option for sending associated containers to the storage locations specified from the host. For more detailed information about transmission of data from the host, see Chapter 9, Page 62 in the annex.	

4



- x As soon as jobs for the access point are available processing from the host, the "Job" button starts flashing as a signal to the operator.

4 Lift operation

Description

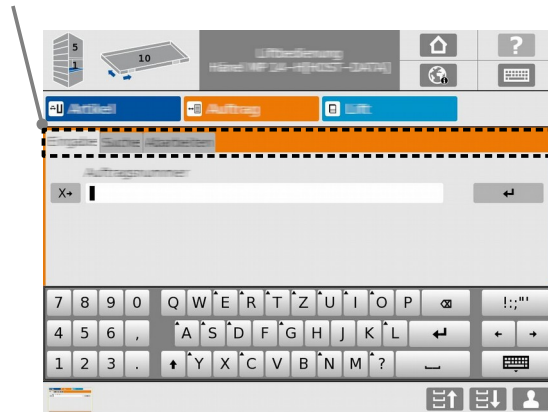
Function bar - "Input" function:

- Jobs already exist
 - After entering two characters from the job number to be subjected to a search, a search operation is started. If the number of the search result is between 1 and 5, a selection box appears below the input line. Then, an article can be searched for using a touch-screen or keyboard.
 - Press the Return button on the touchscreen or keyboard.

Note: When the "X→" button is pressed, a selection box appears below the input line that contains the last 5 user entries.

Display

Function bar for Job menu item (orange)



Function bar - "Search" function:

- A search operation can be run for the job number or user-defined C special data fields.
 - The search term is a character string (termed a match code) entered by the user. For this string, a search is conducted for all the search data fields in the memory.
- Note: For a more detailed description of using the match code search, see Chapter 3.10, page 29.
- The search result is shown in table form.
 - Select the job using a touchscreen or keyboard.
 - Processing of the selected article is started.

Function bar - "Process" function:

- The next item in the job buffer is called up for processing. If the priority field is enabled, the processing is done based on priority, beginning with the job with the highest priority. If the priority field is disabled, the processing is done sequentially.
- If jobs for the current access point are in the buffer, the "Job" button will flash.

4 Lift operation

Description of possible operator advisories

Only for remaining quantity storage:

→ As soon as only enough memory is available in the job output buffer to store fewer than 100 reservations, the advisory to the right appears. After each entry of a goods in/out operation in the job output buffer, this advisory is displayed on the screen.

- x <nn> = Number of free inputs (entries) remaining
- x Read out or delete job output buffer via host communication.

Only for remaining quantity storage:

→ If the job output buffer is full, an error message appears the next time an article is accessed.
No more registrations are possible, as registrations cannot be saved for the job output buffer.

- x Read out or delete job output buffer via host communication.

Only for remaining quantity storage:

→ As soon as only enough memory is available in the job input buffer to store fewer than 100 reservations, the advisory to the right appears. After each entry of a goods in/out operation in the job input buffer, this advisory is displayed on the screen.

- x <nn> = Number of free inputs (entries) remaining
- x Read out or delete job input buffer via host communication.

or

- x Manually delete job input buffer.

Only for remaining quantity storage:

→ If the job input buffer is full, an error message appears the next time an article is accessed.

No more registrations are possible, as registrations cannot be saved for the job input buffer.

- x Read out or delete job input buffer via host communication.

or

- x Manually delete job input buffer.

Display texts

JOB OUTPUT
BUFFER
FREE ENTRIES
<nn> -> ←

JOB OUTPUT
BUFFER IS FULL
NO REGISTRATION!
-> CE

JOB INPUT
BUFFER
FREE ENTRIES
<nn> -> ←

JOB INPUT
BUFFER IS FULL
NO REGISTRATION!
-> CE

4 Lift operation

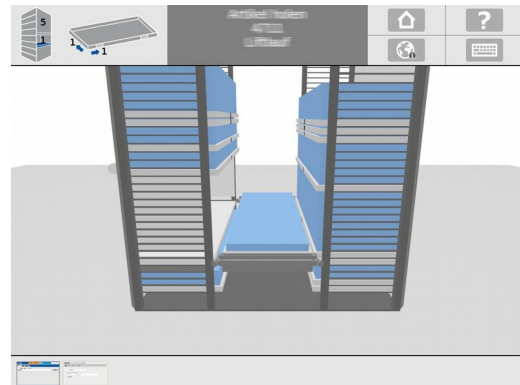
4.4 Lift run graphics

Description

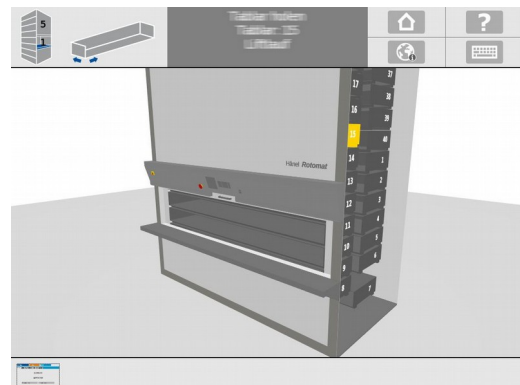
→ The lift run graphics are displayed during the lift run.

Display

Lift run graphics, example for Lean-Lift:



Lift run graphics, example for Rotomat:



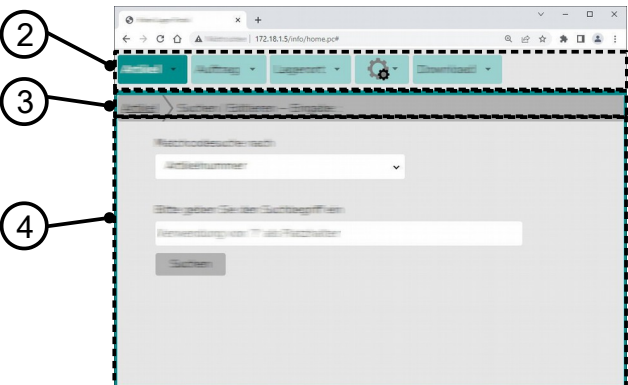
4

4.5 Manual operation following electronics failure (only for Rotomat)

If the electronics fail, the carousel can be rotated with the manual/ auto mode selection switch. For this, the switch must be put into the left, non-locking manual operation position. The carousel then rotates slowly downward. The direction of rotation cannot be reversed.

5 Storage portal operation

5.1 Division of the user interface

Description	Display
① Title bar - Navigation area: After you press the button with the letter abbreviation i and the globe icon, the storage portal starts. Alternatively, the storage portal can also be started with the i key. Note: Each time the button or key is pressed, the system switches between lift operation and storage portal. After pressing the "Home" button the home page of the active storage portal is loaded again. ② Menu bar: Ability to toggle to the Article and Job menu items. ③ Status bar: Display in which the function of the users is currently located. ④ Interaction and display area: This area is used to display information as well as user inputs. ⑤ Taskbar: Display all open windows: Toggling between the open windows via touchscreen is possible. At the bottom right-hand side, additional instructions and control options are displayed depending on the menu and equipment features.	Storage portal: Navigation area  PC browser: 

Note:

The title bar and the taskbar are not visible in the PC browser.

5 Storage portal operation

5.2 Overview of available functions in the menu bar



→ For a more detailed description of using the match code search, see Chapter 3.10, page 29.

5.2.1 Menu item, Article

Submenu / Function	Submenu / Function	Description
Search		• It is possible to search the job number, article number, article designation, shelf number, access point number and date data fields as well as user-defined U-special data fields. → The search term is a character string (match code) which the user has to enter. Based on this string, the search data fields of all articles in the input buffer are searched. • It is possible to search within one lift/carousel or in the entire multi-unit network. • The search result is shown in table form.
Storage allocation		• Display of the following data: - Number of data records in the input buffer - Number of data records in the input buffer for this access point - Number of processed data records in the output buffer.
Delete buffer		• All article data records in the input buffer sent from the higher-level system (Host) are deleted.

5 Storage portal operation

5.2.2 Menu item, Job

Submenu / Function	Submenu / Function	Description
Search		- It is possible to search for the job number and priority data fields as well as user-defined C-special data fields. → The search term is a character string (match code) which the user has to enter. Based on this string, the search data fields of all jobs in the input buffer are searched. - It is possible to search within one lift/carousel or in the entire multi-unit network. - The search result is shown in table form.
Storage allocation		- Display of the following data: - Number of data records in the input buffer - Number of data records in the input buffer for this access point - Number of processed data records in the output buffer.
Delete buffer		All job data records in the input buffer sent from the higher-level system (Host) are deleted.

5.2.3 Settings menu item



- x The password for the individual functions under the menu item "Settings" is as follows: "22488". The password cannot be changed.

Submenu / Function	Submenu / Function	Description
Access protection		- Activation / deactivation of the login prompt for the PC user of the storage portal (PC browser). - Activation / deactivation of the deleting functions in the storage portal.
Column view	Article / job	A list of article and job data records in table form can be changed individually. The operator themselves can determine which columns will be displayed and which ones will not be. The column sequence can also be defined. Exception: The column you are searching for always appears at the front (in the first column).
Buffer management	Supplementary modules	Configuration options of the various supplementary modules; for more information, see Chapter 5.2.3.1, Page 45.
Buffer management	Configuration	Setting options for optimising the job processing, manual storage location assignment and automatic storage location search. For additional information, see Chapter 5.2.3.2, Page 46.

5 Storage portal operation

5.2.3.1 Buffer management - Supplementary modules



x For more detailed information about the individual supplementary modules, refer to the respective supplementary descriptions.

Supplementary module	No.	Settings for supplementary module	Description
Access code management with integrated user management	02	Prompt for user / ID number	- Define access authorisations - A prompt for the user/ID number appears during the identification process. Otherwise, only a prompt for the password appears. Notes: - If there is no prompt for the user/ID number, the passwords must be unique - If access code management is enabled, the Compartment (F), Compartment depth (O) and Container (G) data fields absolutely must be transferred in the data record / job
		Delete user groups / users	All existing user groups and users are deleted.
Shelf pre-positioning for job	20	Start of job processing by host (send a single job to the empty job buffer)	- Serial / parallel shelf pre-positioning when processing a job with distributed storage locations across multiple lifts/carousels. - The job processing is started automatically as soon as a single job is sent to the MP control system. However, the job memory must be empty beforehand.
Decimal input for quantities	23		Specification of quantities and inventories with decimal places
User management (only for Rotomat)	31	Prompt for user/ID number	- Define access authorisations - Identification takes place immediately at the beginning of operation - A prompt for the user/ID number appears during the identification process. Otherwise, only a prompt for the password appears. Notes: - If there is no prompt for the user/ID number, the passwords must be unique - If access code management is enabled, the Compartment (F), Compartment depth (O) and Container (G) data fields absolutely must be transferred in the data record / job
		Delete user groups / users	All existing user groups and users are deleted.
Shelf pre-positioning for article / job	33		Serial/parallel shelf pre-positioning when processing a job and/or during direct storage/retrieval with distributed storage locations across multiple lifts.

5 Storage portal operation

	Start of job processing by host (send a single job to the empty job buffer) Start direct storage/retrieval at reference	The job processing is started automatically as soon as a single job is sent to the MP control system. However, the job memory must be empty beforehand.
Article image	35	An image can be stored for each article

5.2.3.2 Buffer management - Configuration

Configuration	Settings	Note
Optimisation of job processing	- Sequential - First compartment upward, then compartment depth upward - First compartment upward, then compartment depth downward - First compartment depth upward, then compartment upward	
Automatic search for storage location during data record processing		The Compartment (F), Compartment depth (O), Container (G), Operation (V), Alternative storage locations (h) and Alternative containers (g) data fields absolutely must be transferred in the data record / job.
Manual storage location assignment during data record processing		The Compartment (F), Compartment depth (O), Container (G) and Operation (V) data fields absolutely must be transferred in the data record / job.
Automatic search for storage location during job processing		The Compartment (F), Compartment depth (O), Container (G), Operation (V), Alternative storage locations (h) and Alternative containers (g) data fields absolutely must be transferred in the data record / job.
Manual storage location assignment during job processing		The Compartment (F), Compartment depth (O), Container (G) and Operation (V) data fields absolutely must be transferred in the data record / job.



x For additional information about the individual data fields, see Chapter 9, Subchapter 4, Page 118.

6 System services



- x The system services can be called up in the "Lift" menu item using the button .

Menu item / Function	Description
System services lift control System services Run sequence (Lean-Lift and Multi-Space) System services service functions	• Various system parameters of the lift/carousel control system can be configured in this menu. • System parameters that influence the sequence of operations can be altered here. • The service functions are used to check the function of the lift/carousel during installation and service. Service functions are auxiliary equipment that can be used to locate faults in the lift/carousel quickly and easily.
 Safety inspection log	SAFETY INSTRUCTION The service functions are protected by the service password. The service functions are intended for specially and verifiably trained, authorised personnel only. • In this menu item, you can update log data for the safety inspection. • The operator is reminded of the safety inspection annually. The information recorded in the MP control system is provided solely as an aid. The test book and test logs are authoritative. Refer to the operating manual.
 	For additional information, see: ➤ Technical Description of the Microprocessor Control System MP 14 Lean-Lift and Multi-Space - or ➤ Technical Description of the Microprocessor Control System MP 14 Rotomat

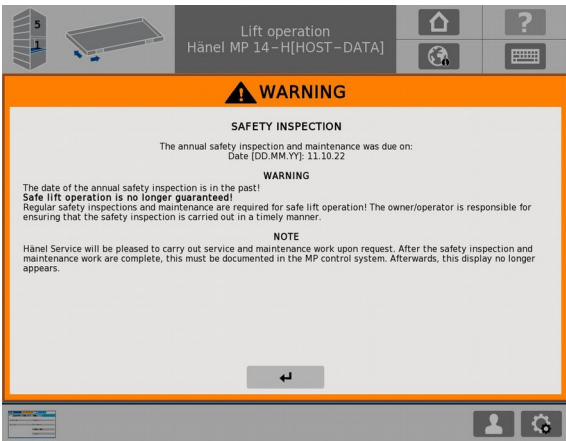
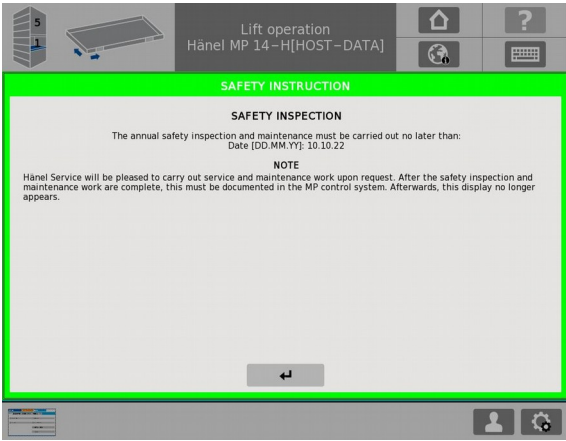
7 Operator advisories

7.1 Safety inspection

An annual lift/carousel safety inspection is necessary to ensure safe operation of the lift/carousel at all times.

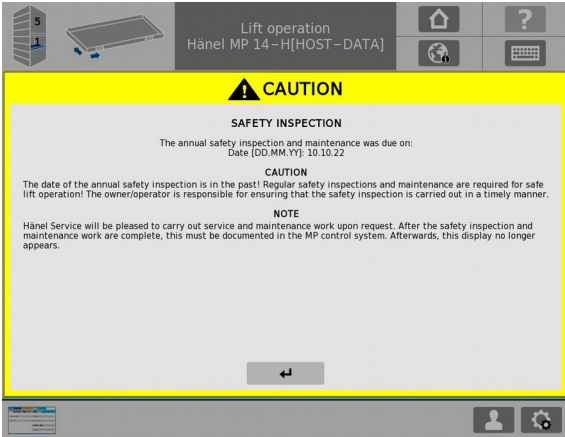
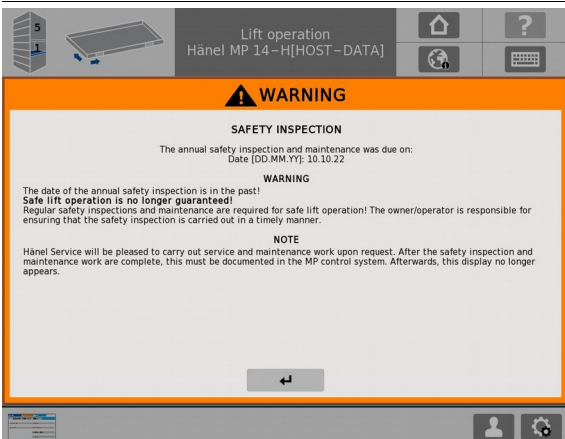
The MP control system reminds the operator of the pending annual safety inspections based on the entries in the safety inspection log using a note listed in the display below.

The entries in the safety inspection log are listed in table form under the menu item "Lift/Carousel log".

Note	Cause	Action
	As long as the first safety inspection, i.e. the safety inspection during commissioning, has not yet been carried out / entered, this note appears. ◆ The note is displayed every time the device is switched on. ◆ In addition, a warning symbol is displayed below in the taskbar. The note appears again by touching the warning symbol.	✗ Have a safety inspection carried out.
	As long as the pending safety inspections have not yet been carried out / entered, this note appears if the MP control is used in the period from 10 days before the due date to the due date. ◆ The note is displayed once on the Lean-Lift and Rotomat. ◆ On the Multi-Space, the note is displayed every time the device is switched on and every 24 hours. ◆ In addition, a warning symbol is displayed below in the taskbar. The note appears again by touching the warning symbol.	✗ Have a safety inspection carried out.

6-7

7 Operator advisories

Note	Cause	Action
 The screenshot shows the MP 14-H control system interface. At the top, it says 'Lift operation Hänel MP 14-H[HOST-DATA]'. Below this, a yellow banner with a warning triangle icon and the word 'CAUTION' is displayed. The text inside the banner reads: 'SAFETY INSPECTION The annual safety inspection and maintenance was due on: Date [DD.MM.YY]: 10.10.22. CAUTION The date of the annual safety inspection is in the past! Regular safety inspections and maintenance are required for safe lift operation! The owner/operator is responsible for ensuring that the safety inspection is carried out in a timely manner. NOTE Hänel Service will be pleased to carry out service and maintenance work upon request. After the safety inspection and maintenance work are complete, this must be documented in the MP control system. Afterwards, this display no longer appears.'	As long as the pending safety inspection has not been carried out / entered, this note appears in the time period after up to 5 days before the due date. • The note is displayed once on the Lean-Lift and Rotomat if no work has been carried out on the MP control system and the due date is already exceeded as a result before the due date up until the due date in the time period after 10 days. ◆ On the Multi-Space, the note is displayed every time the device is switched on and every 8 hours. ◆ In addition, a warning symbol is displayed below in the taskbar. The note appears again by touching the warning symbol.	✕ Have a safety inspection carried out.
 The screenshot shows the MP 14-H control system interface. At the top, it says 'Lift operation Hänel MP 14-H[HOST-DATA]'. Below this, an orange banner with a warning triangle icon and the word 'WARNING' is displayed. The text inside the banner reads: 'SAFETY INSPECTION The annual safety inspection and maintenance was due on: Date [DD.MM.YY]: 10.10.22. WARNING The date of the annual safety inspection is in the past! Safe lift operation is no longer guaranteed! Regular safety inspections and maintenance are required for safe lift operation! The owner/operator is responsible for ensuring that the safety inspection is carried out in a timely manner. NOTE Hänel Service will be pleased to carry out service and maintenance work upon request. After the safety inspection and maintenance work are complete, this must be documented in the MP control system. Afterwards, this display no longer appears.'	As long as no safety inspection has been carried out / entered, this note appears after the sixth day after the due date. ◆ The note appears once. ◆ In addition, a warning symbol is displayed below in the taskbar. The note appears again by touching the warning symbol.	✕ Have a safety inspection carried out.

7 Operator advisories

7.2 System

Note	Cause	Action
STORAGE MANAGEMENT NOT YET READY!	x Storage management cannot process the request at this time, as the internal start-up procedure is not yet completed.	x Operation is possible again after a short wait.
FIND CONNECTION TO MP 100D-5 SERVER!	No data transfer between lift/carousel control system and central control system. x No supply voltage to MP 100D-5 because main switch of "SERVER MP100" is off or because F13 cut-out is triggered. x Lines connecting lift control system(s) and MP 100D-5 interrupted.	x Switch on main switch of "SERVER MP100" or set F13 cut-out. x Check connecting lines and replace if defective.
FIND CONNECTION TO MP 14-S SERVER!	No data transfer between lift control system and MP 14-S for two carousels. x No supply voltage to the MP 14-S due to main switch being switched off. x Lines connecting lift control system(s) and MP 14-S interrupted. x Ethernet MP multi-unit network	x Switch on the main switch. x Check connecting lines and replace if defective. x Check Ethernet parameters and initialisation of master lift/carousel.
Only for multiple access points and only for Lean-Lift: LIFT RUN FOR OTHER ACCESS POINT ! (n) PLEASE WAIT	(n) = Access point number for multiple access points. x An operation is currently in progress at access point (n).	x Wait until the lift run for access point (n) is completed.
Only with multiple access points: OPERATION IS BLOCKED BY OTHER ACCESS POINT! (n)	(n) = Access point number for multiple access points. x A lift run error message is pending at access point (n).	x Resume lift run at access point (n).
Only for multiple access points and only for Lean-Lift: CANCELLING BLOCKS OTHER ACCESS POINTS! REALLY CANCEL? NO -> ↑/↓/CE/↵	x The horizontal movement within the access point is not completed and the [CE] key was pressed for the lift run error message.	x Confirm "NO" and exit the horizontal movement.
Only with Lean-Lift: <...> LIFT RUN FRONT <tt> <...> <...>	x Shelf <tt> is stored in the front lift unit. FRONT is the side at which the operator is standing.	x Wait until the lift run is finished.

7 Operator advisories

Note	Cause	Action
Only with Lean-Lift: <...> LIFT RUN BACK <tt> <...> <...>	x Shelf <tt> is stored in the rear lift unit. REAR (BACK) is the side opposite the operator.	x Wait until the lift run is finished.
Only with Multi-Space: <...> LIFT RUN FRONT <tt> LIFT UNIT : <n> <...>	x Shelf <tt> is stored in front lift unit number <n>. FRONT is the side at which the operator is standing. Lift units are counted from left to right starting with "1" at the side where the type plate is located.	x Wait until the lift run is finished.
Only with Multi-Space: <...> LIFT RUN BACK <tt> LIFT UNIT : <n> <...>	x Shelf <tt> is stored in rear lift unit number <n>. REAR (BACK) is the side opposite the operator. Lift units are counted from left to right starting with "1" at the side where the type plate is located.	x Wait until the lift run is finished.
DO NOT INCREASE ARTICLE HEIGHT -> CE/↵ ARTICLE HEIGHT INCREASED ? YES -> ↑/↓/CE/↵	x In the redundancy menu, the article height detection function or the monitoring of shelf management was deactivated. This necessitates a subsequent "Check article height" test run. As long as this test run has not been carried out, after a shelf is brought to the access point, the message "Do not increase article height" is displayed; when shelves are stored, the prompt "Article height increased?" is displayed.	x Have the "Check article height" test run carried out by Hänel service department. Refer also to the Technical Description.
REDUNDANCY SYSTEM FUNCTION IS NOT POSSIBLE AT PRESENT -> CE	x In the redundancy menu, the article height detection function or the monitoring of shelf management was deactivated. This necessitates a subsequent "Check article height" test run. As long as this test run has not been carried out, this message will be displayed when the functions "Adding a new shelf" and "Start optimisation run" are called up.	x Have the "Check article height" test run carried out by Hänel service department. Refer also to the Technical Description.

7 Operator advisories

Note	Cause	Action
Only for lifts without shelf weighing device: SHELF NUMBER LIMIT EXCEEDED ->  then AVERAGE MAX. SHELF LOAD [KG]: xxx -> CE/	x The system has detected that the shelf number limit has been exceeded. Shelf number limit = max. total load / (max. shelf load + shelf empty weight)	x When the shelf number limit is exceeded, the average maximum shelf load capacity is reduced to the displayed value. This is checked when the unit is switched on and when shelves are added.
Only for lifts without shelf weighing device: < . . . > LIFT RUNNING ! DO NOT EXCEED MAXIMUM LIFT LOAD	x This message is displayed for a lift run if the system has detected that the shelf number limit has been exceeded. Shelf number limit = max. total load / (max. shelf load + shelf empty weight)	
INCREASED NO. OF SHELVES PERMITTED ->  then MAXIMUM SHELF LOAD [KG]: xxx -> CE/	x The system has detected that the permitted default number of shelves has been increased using a lift/carousel-specific enable code.	x When the permitted standard shelf number is increased, the maximum shelf load capacity is reduced to the displayed value. This display is shown when the unit is switched on and when shelves are added.

8 Error messages during lift run

A lift run is possible only with the safety system set (green LED in the [↵] key is illuminated). In addition, the MP control system monitors the lift run. If the safety circuit is interrupted or the monitoring of the MP control system detects invalid statuses, the lift run stops. The red LED in the [STOP] key lights up and the error is listed in plain text on the display.

This chapter lists the errors that can be easily remedied from outside.

After the error is eliminated, the error message must be acknowledged with the [↵] key. If the lift run was interrupted, it is now resumed.

If an error cannot be eliminated, you have to inform Hänel after-sales service immediately.

- For more details on error messages intended for specially trained and authorised personnel, refer to the "Technical Description of the Microprocessor Control System MP 14 Lean-Lift and Multi-Space" or "Technical Description of the Microprocessor Control System MP 14 Rotomat".

8.1 Error messages during lift run due to interruption of safety circuit

8.1.1 Lean-Lift and Multi-Space

Lift run error message	Cause	Action
LIFT RUN FAULT : STOP BUTTON PRESSED -> CE/↵	x The red [STOP] key on the keyboard has been pressed.	Caution: The [↵] key starts a lift run! x Press the green [↵] key to continue the lift run. Press the [CE] key to cancel the lift run.
LIFT RUN FAULT : EMERGENCY STOP [F7] (n) -> CE/↵	(n) = Access point number for multiple access points. x Emergency stop switch is pressed.	Caution: The [↵] key starts a lift run! x Disengage the emergency stop button.
LIFT RUN FAULT : SERVICE DOOR -> CE/↵	x Service door is not properly closed.	Caution: The [↵] key starts a lift run! x Close service door correctly so that the door switch is actuated.
LIFT RUN FAULT : SECOND SERVICE SERVICE DOOR -> CE/↵	x Additional service door is not properly closed.	Caution: The [↵] key starts a lift run! x Close additional service door correctly so that the door switch is actuated.
Only with Multi-Space: LIFT RUN FAULT : SERVICE DOOR MOTORS -> CE/↵	x Additional service door for the vertical motor in the bottom front panel is not closed correctly.	Caution: The [↵] key starts a lift run! x Close the additional service door for the vertical motor in the bottom front panel so that the door switch is actuated.

8 Error messages during lift run

Lift run error message	Cause	Action
Only with Lean-Lift: LIFT RUN FAULT : MOTOR 1 TOO HOT -> CE/↩	x Motor 1 (vertical drive) overheated.	Caution: The [↩] key starts a lift run! x Allow motor to cool down for about 10 min.
Only with Lean-Lift: LIFT RUN FAULT : MOTOR 2 TOO HOT/ UPPER LIMIT SWITCH -> CE/↩	x Motor 2 (horizontal drive) overheated. x	Caution: The [↩] key starts a lift run! x Allow motor to cool down for about 10 min. x
LIFT RUN FAULT : LIGHT BARRIERS (n) -> CE/↩	(n) = Access point number for multiple access points. x Interruption of safety light barriers at access point due to protruding object. x Safety light barrier is not yet set. x After only a brief interruption of the safety circuit (e.g. emergency stop, frequency converter), light barrier remains triggered.	Caution: The [↩] key starts a lift run! x Clear the area monitored by the light barriers and press the [↩] key for about 0.5 sec. x Press the [↩] key for about 0.5 sec. to set the safety circuit. x Press the [↩] key for about 0.5 sec. to set the safety circuit.
Then (only with multiple access points with guide rails) LIFT RUN FAULT : ENABLE LIFT RUN AT ACCESS POINT (n) -> CE/↩ then LIFT RUN HAS BEEN ENABLED AT ACCESS POINT (n) -> CE/↩	x The [↩] key has been pressed without correcting the light barrier interruption at access point (n). x Interruption of safety light barriers at access point (n) has been corrected.	x Clear the area monitored by the light barriers at access point (n) and press the [↩] key for approx. 0.5 sec. x Interruption of safety light barriers at access point (n) has been corrected.
Only with multiple access points with guide rails: LIFT RUN ENABLE FOR ANOTHER ACCESS POINT WITH ↩	x Interruption of safety light barriers at this access point while lift run was carried out for other access point.	x Clear the area monitored by the light barriers at access point and press the [↩] key for approx. 0.5 sec.
Only with Multi-Space: LIFT RUN FAULT : MOTOR 1.1 TOO HOT -> CE/↩	x Motor 1.1 (vertical drive) overheated.	Caution: The [↩] key starts a lift run! x Allow motor to cool down for about 10 min.

8 Error messages during lift run

Lift run error message	Cause	Action
Only with Multi-Space: LIFT RUN FAULT : MOTOR 1.2 TOO HOT -> CE/↩	x Motor 1.2 (vertical drive) overheated.	Caution: The [↩] key starts a lift run! x Allow motor to cool down for about 10 min.
Only with Multi-Space: LIFT RUN FAULT : MOTOR 2 TOO HOT/ MOVEM. LIMIT SWITCH -> CE/↩	x Motor 2 (horizontal drive) overheated.	Caution: The [↩] key starts a lift run! x Allow motor to cool down for about 10 min.
Only with Multi-Space: LIFT RUN FAULT : MOTOR 3 TOO HOT/ LEFT LIMIT SWITCH -> CE/↩	x Motor 3 (movement unit) is overheated.	Caution: The [↩] key starts a lift run! x Allow motor to cool down for about 10 min.
Only with Multi-Space: LIFT RUN FAULT : MOTOR 4 TOO HOT -> CE/↩	x Motor 4 (movement unit) is overheated.	Caution: The [↩] key starts a lift run! x Allow motor to cool down for about 10 min.
Only with Multi-Space: LIFT RUN FAULT : TEMP. PROTECTION MOVEMENT UNIT -> CE/↩	x The movement unit motor monitor has tripped.	Caution: The [↩] key starts a lift run! x Allow motor to cool down for about 10 min.

8 Error messages during lift run

8.1.2 Rotomat

Lift run error message	Cause	Action
LIFT RUN FAULT : STOP BUTTON PRESSED -> CE/↵	x The red [STOP] key on the keyboard has been pressed.	Caution: The [↵] key starts a lift run! x Press the green [↵] key to continue the lift run. Press the [CE] key to cancel the lift run.
LIFT RUN FAULT : EMERGENCY STOP [F7] (n) -> CE/↵	(n) = Access point number for multiple access points. x Emergency stop switch is pressed.	Caution: The [↵] key starts a lift run! x Disengage the emergency stop button.
LIFT RUN FAULT : OPEN (n) -> CE/↵ or LIFT RUN FAULT : UPPER DOOR (n) -> CE/↵ or LIFT RUN FAULT : LOWER DOOR (n) -> CE/↵	n) = Access point number for multiple access points. x Sliding doors not fully open. x Safety rocker switch of upper or lower door actuated.	Caution: The [↵] key starts a lift run! x Open sliding door fully. x The safety rocker switches on the doors must move freely and be in the horizontal position. The metal fingers on the left and right of the rocker switches must be in contact with their fixed counterparts.
LIFT RUN FAULT : SERVICE DOOR -> CE/↵ or LIFT RUN FAULT : LOWER SERVICE DOOR -> CE/↵ or LIFT RUN FAULT : UPPER SERVICE DOOR -> CE/↵	x Lower service door or optional upper service door not correctly closed.	Caution: The [↵] key starts a lift run! x Close the service door properly.
LIFT RUN FAULT : MOTOR TOO HOT -> CE/↵	x Motor 1 or motor 2 overheated.	Caution: The [↵] key starts a lift run! x Allow motor to cool down for about 10 min.
LIFT RUN FAULT : FREQUENCY CONVERTER -> CE/↵	x Frequency converter has switched off because of overload.	Caution: The [↵] key starts a lift run! x Switch carousel off, then on again and allow frequency converter to cool down if necessary.

8 Error messages during lift run

Lift run error message	Cause	Action
LIFT RUN FAULT : LIGHT BARRIERS (n) -> CE/↵	(n) = Access point number for multiple access points. x Interruption of safety light barriers at access point due to protruding object. x Safety light barrier is not yet set. x After only a brief interruption of the safety circuit (e.g. emergency stop, safety rocker switch, frequency converter), the light barrier remains triggered. x Light barriers interrupted by dirt on Plexiglas screens on left and right of access opening.	Caution: The [↵] key starts a lift run! x Clear the area monitored by the light barriers and press the [↵] key for about 0.5 sec. x Press the [↵] key for about 0.5 sec. to set the safety circuit. x Press the [↵] key for about 0.5 sec. to set the safety circuit. x Clean the screens.
LIFT RUN FAULT : MANUAL OPERATION ACTIVATED -> CE/↵	x Manual/auto mode selection switch S5 is in centre position 0.	Caution: The [↵] key starts a lift run! x Turn the manual/auto mode selection switch to locking position ‡.
LIFT RUN FAULT : OPEN DOOR -> CE/↵	x If the system has a second safety circuit and emergency operation is activated. Light barriers are interrupted and door is not closed.	Caution: The [↵] key starts a lift run! x Close the door.
LIFT RUN FAULT : SENSOR TEST: OPEN AND CLOSE DOOR -> CE/↵	x If there is one access point and a second safety circuit: Lift run when emergency operation activated requires that the door be opened and closed after a safety interruption.	Caution: The [↵] key starts a lift run! x Open and close door.

8 Error messages during lift run

8.2 Error messages during the lift run due to software monitoring (Lean-Lift and Multi-Space)

Lift run error message	Cause	Action
LIFT RUN FAULT : SHELF REMOVAL POS TOO FAR INSIDE (n) -> CE/↩	(n) = Access point number for multiple access points. x The shelf is positioned too far towards the inside of the access point.	Caution: The [↩] key starts a lift run! x Pull shelf back to end position.
LIFT RUN FAULT : SHELF REMOVAL POS TOO FAR OUTSIDE (n) -> CE/↩	(n) = Access point number for multiple access points. x The shelf is positioned too far towards the outside of the access point.	Caution: The [↩] key starts a lift run! x Push shelf fully into the access point.
LIFT RUN FAULT : MOTOR IS OVERLOADED 7 -> CE	x Motor is overloaded.	x Reduce shelf load.
LIFT RUN FAULT : MOT.CURRENT TOO HIGH RETRIEVE SHELF x -> CE/↩ then LIFT RUN FAULT : MOT.CURRENT TOO HIGH REMOVE ARTICLES ! x -> CE/↩	x = 3 or 7 or 9 x = 3 or 7 or 9 x Motor is overloaded.	Caution: The [↩] key starts a lift run! x Press the [↩] key to bring the shelf to the access point. x Reduce shelf load.
LIFT RUN FAULT : THE ARTICLE IS TOO HIGH ! (n) -> CE/↩	(n) = Access point number for multiple access points. x One or more storage articles is higher than the permitted max. storage article height at the access point.	Caution: The [↩] key starts a lift run! x Reduce the height of the stored articles.
LIFT RUN FAULT : STOR.ART.PROTRUDING OVER SHELF AT REAR 1 (n) -> CE/↩	(n) = Access point number for multiple access points. x Stored articles are protruding over the rear edge of the shelf into the lift shaft.	Caution: The [↩] key starts a lift run! x Store articles so that they do not protrude over the edge of the shelf.
LIFT RUN FAULT : STOR.ART.PROTRUDING OVER SHELF AT REAR 2 (n) -> CE/↩	(n) = Access point number for multiple access points. x The stored articles protrude over the front edge of the shelf.	Caution: The [↩] key starts a lift run! x Store articles so that they do not protrude over the edge of the shelf.
LIFT RUN FAULT : LIFT IS FULL ! -> CE	x A shelf cannot be stored away because of its article height.	x Note: To save space, store articles in shelves so that packaging does not protrude at the top (e.g. lids of boxes, bags, etc.) x Reduce article height on this shelf; carry out an optimisation run. x Check lift for free space. It may be possible to create space by reducing the article height in several shelves.

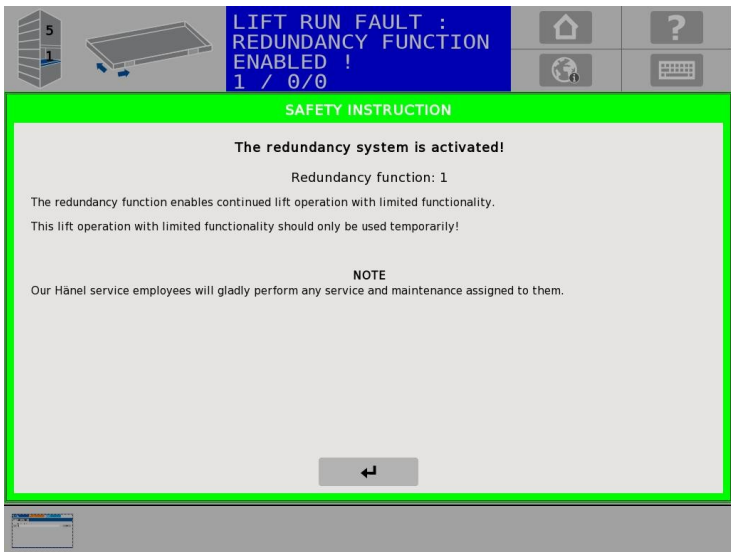
8 Error messages during lift run

Lift run error message	Cause	Action
LIFT RUN FAULT : SYNCHRO. RUN x -> CE/↵	x = cause of synchronisation run x The discrepancy between position values from front and rear position sensors is too great (mutual monitoring), or a position value at a carrier position slot is incorrect.	Caution: The [↵] key starts a lift run! x Pressing [↵] moves the extractor to the bottom reference position, after which the destination carrier is accessed. You can display the number of the carrier where the error took place by pressing [CE].
LIFT RUN FAULT : SHELF REMOVED BUT NOT REGISTERED x -> CE/↵	x = Shelf number x A shelf was removed from the access point or pulled out onto the roller guide rails without being unregistered.	Caution: The [↵] key starts a lift run! x Push the shelf in question back into the access point or unregister it.
LIFT RUN FAULT : REQUESTED SHELF IN OTHER ACCESS POINT (n) -> CE/↵	(n) = Access point number for multiple access points. x The shelf has been brought to access point (n) and has not yet been put back into storage.	Caution: The [↵] key starts a lift run! x Store shelf at access point (n).
LIFT RUN FAULT : UNKNOWN SHELF IN ACCESS POINT ! -> CE/↵	x A shelf was detected in the access point, although there should not have been one there. x Shelf pushed into access point without being registered.	Caution: The [↵] key starts a lift run! x Remove shelf from access point or register it.
LIFT RUN FAULT : REMOVE SHELF -> CE/↵	x When a shelf is pushed out into an access point, the system detects that there is another shelf in the access point. x Shelf was pushed into the access point manually.	Caution: The [↵] key starts a lift run! x Remove shelf from access point.
LIFT RUN FAULT : CLOSE DOOR -> CE/↵	x With second safety circuit and lift run with safety light barrier disabled (redundancy system): light barriers are interrupted and door is not closed.	Caution: The [↵] key starts a lift run! x Close the door.
LIFT RUN FAULT : OPEN DOOR -> CE/↵	x With one access point and second safety circuit: lift run with active safety light barriers is possible with door open only.	Caution: The [↵] key starts a lift run! x Open door.
LIFT RUN FAULT : SENSOR TEST: OPEN AND CLOSE DOOR -> CE/↵	x If there is one access point and a second safety circuit: lift run while the safety light barriers are deactivated (redundancy system) requires that the door be opened and closed after a safety interruption.	Caution: The [↵] key starts a lift run! x Open and close door.

8 Error messages during lift run

Lift run error message	Cause	Action
Only with multiple access points: LIFT RUN FAULT : END LIFT RUN AT OTHER ACCESS POINT (n) -> CE/↩	(n) = Access point number for multiple access points. The system has detected that a lift run at access point (n) has not ended. x No lift run is carried out for this access point because the lift run at access point (n) has not ended.	Caution: The [↩] key starts a lift run! x Carry out lift run at access point (n).
Only for lifts with multiple access points that do not have a safeguard between access point and extractor shaft (i. e. without high-speed door) and without lift run only with door closed: LIFT RUN FAULT : OTHER ACCESS POINT OCCUPIED WITH SHELF (n) -> CE/↩	(n) = Access point number for multiple access points. The system has detected that access point (n) is occupied with a shelf. x No lift run is carried out for this access point because access point (n) is occupied with a shelf.	Caution: The [↩] key starts a lift run! x Pull out the shelf at access point (n) onto the guide rails and continue at this access point using the [↩] key or interrupt the lift run at this access point and store the shelf at access point (n).

8 Error messages during lift run

Lift run error message	Cause	Action
For active automatic redundancy function only: LIFT RUN FAULT : REDUNDANCY FUNCTION ENABLED ! < Code > -> CE/↵	< Code > = <x> / <y> / <z> The lift run error message with code <Code> has occurred. The redundancy function <x> has been activated. x Limited lift operation is possible using redundancy and limited error monitoring.	Caution: The [↵] key starts a lift run! x Continue the lift run using the [↵] key. Limited continued operation of the lift is possible. x Contact the Hänel service department.
		

9 Annex: Integration into the IT system (for installation and maintenance personnel as well as IT specialists)



This chapter is intended for instructed installation and maintenance personnel and IT specialists only.

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1 TCP / IP connection via Ethernet

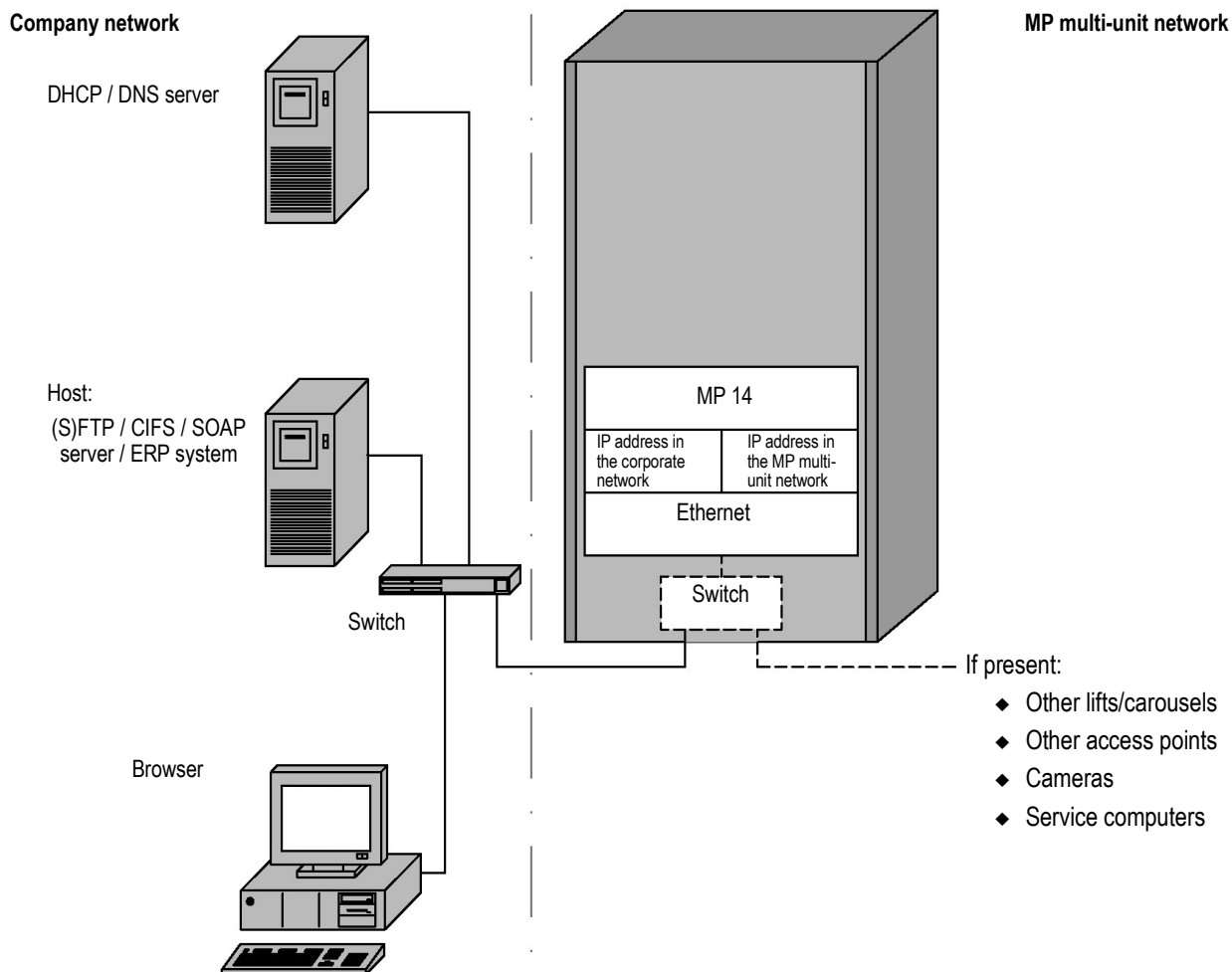
1.1 Terms used:

MP multi-unit network	Communication link of the Hänel MP control systems with each other. GSC or Ethernet MP multi-unit network design is possible.
Company network	All PCs, (S)FTP / CIFS servers, ERP systems, DHCP / DNS servers, network printers in a customer's network or alone, which are to be connected to the MP 14-H[HOST-DATA] via a network cable.
DNS name / MP name	Name of the MP control system which can be used in alternative to the IP address to access the MP control system if a DNS server is in the corporate network. By default, the name of the MP control system consists of a prefix and the commission number of the MP 14-H[HOST-DATA]. Prefix for MP 14: "mp14-" For the requisition number, some symbols are replaced to maintain a valid DNS name. These are "p" for ".", "s" for "/", "a" for "***". Example: mp14-322p128s1-2a1 The MP name can be overwritten with a user-defined name. ➤ Refer to the "Technical Description of the Microprocessor Control System MP 14 Lean-Lift and Multi-Space or Rotomat", chapter "System services lift control" -> "Setting interface parameters" -> "ETHERNET CORPORATE NETWORK".
Switch	A switch (adapter / diverter) is a coupling element that interconnects network segments / network participants.
Ethernet patch cable	Connecting cable between MP 14 (X12) and the corporate network or a unit with an Ethernet connection. In the base model "Cat. 6 patch cable". In the crossover model, as a point-to-point connection between the MP 14 and a unit with an Ethernet connection. In the standard model, as a connecting cable from the MP 14 to a switch.  Ethernet patch cables are not included in the scope of delivery and must be provided by the customer.

1.2 Network overview (schematic illustration)

IP addresses	The 10 / 100 Mbit Ethernet connection of the MP 14 has 2 logical addresses. 1. IP address for the connection to the MP multi-unit network 2. IP address for the connection to the corporate network. The IP address of the MP 14 for the corporate network is set to DHCP by default.  Since the MP multi-unit network and the corporate network are physically in the same network, all participants must have unique IP addresses.
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IP addresses in the Ethernet MP multi-unit network

MP 14	172.<IP address range>.<Access point number>.<Lift number> 172.<IP address range>.<Access point number>.<Reserved>
Camera	172.<IP address range>.<Camera/access point number>.<Lift number>
Service	172.<IP address range>.1.200

<IP address range>	16 - 31 (default is 16)
<Access point number>	1 - 8
<Camera/access point number>	11 - 18 and 21 - 28
<Lift number>	1 - 99
<Reserved>	100 - 110

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1.3 Integration into corporate network, Part I "Data screening using a browser"



- The following step-by-step procedure checks whether additional initialisation is necessary.
- If the "Installation support for data screening using a browser" service was ordered, the basis is the form filled in by the customer from Chapter 10 Annex: Customer form for integration into corporate network, Part I.
- A physical connection to the corporate network must not be made until after the last step is completed.

1st step:

Check and initialise the address range for the MP multi-unit network

The IP address of the MP 14 for the MP multi-unit network is in a Class B address range (subnet). It is possible to configure 16 different subnets from 172.16.0.0/16 to 172.31.0.0/16.

See Chapter 1.2 Network overview (schematic illustration) on page 65.

By default, subnet 172.16.0.0/16 is configured for the MP 14.



Initialisation is required only if multiple MP multi-unit networks have to be connected to the corporate network (each MP multi-unit network requires its own address range), or if the IP addresses for the MP multi-unit network overlap with the IP addresses for the corporate network.

- Refer to the "Technical Description of the Microprocessor Control System MP 14 Lean-Lift and Multi-Space or Rotomat", chapter "System services lift control" -> "Setting interface parameters" -> "ETHERNET MP MULTI-UNIT NETWORK".

2nd step:

Integration into the corporate network when a DHCP server is present (dynamic address allocation)

The IP address of the MP 14 for the corporate network is obtained from the DHCP server by default. If no DHCP server is in the network or no DHCP address could be obtained, the interface is set to 0.0.0.0 and thus is disabled.



An initialisation of the IP address for the corporate network to DHCP is required.

- Refer to the "Technical Description of the Microprocessor Control System MP 14 Lean-Lift and Multi-Space or Rotomat", chapter "System services lift control" -> "Setting interface parameters" -> "ETHERNET CORPORATE NETWORK".

Integration into the corporate network when a DNS server with DNS UPDATE is present



If there is a DNS server in the corporate network which supports a dynamic update of the Domain Name System (DNS UPDATE) in accordance with RFC 2136 by the DHCP server, then the name of the MP 14 is passed on automatically to the DNS server. Thus the DNS name can be used instead of the IP address (e.g. in the URL of the browser).

Initialisation is required only if another DNS name is to be assigned to the MP control system.

- Refer to the "Technical Description of the Microprocessor Control System MP 14 Lean-Lift and Multi-Space or Rotomat", chapter "System services lift control" -> "Setting interface parameters" -> "ETHERNET CORPORATE NETWORK".

Then the MP control system can be physically integrated into the corporate network.

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Integration into the corporate network when a DNS server without DNS UPDATE is present



If there is a DNS server in the corporate network that does not support DNS UPDATE, the DNS server must be informed of the MAC address and the name of the MP 14 (system administrator).

- Refer to the "Technical Description of the Microprocessor Control System MP 14 Lean-Lift and Multi-Space or Rotomat", chapter "System services lift control" -> "Setting interface parameters" -> "ETHERNET CORPORATE NETWORK".

Then the MP control system can be physically integrated into the corporate network.

Integration into the corporate network if no DHCP server is present in the network (manual address allocation)

The MP 14 must be initialised to "GET IP ADDRESS FROM DHCP: NO". Then, initialise the IP address, the subnet mask and the standard gateway (information from system administrator or form from Chapter 10 Annex: Customer form for integration into corporate network, Part I).

- Refer to the "Technical Description of the Microprocessor Control System MP 14 Lean-Lift and Multi-Space or Rotomat", chapter "System services lift control" -> "Setting interface parameters" -> "ETHERNET CORPORATE NETWORK".

Then the MP control system can be physically integrated into the corporate network.

3rd step:

Browser access to the MP control system

A max. of 8 PC / host systems can access the MP control system at the same time as the browser (e.g. Microsoft Internet Explorer). Either the IP address of the MP 14, e.g. <http://192.168.100.20>, or the name of the MP 14 control system must be entered as the URL.



The "Installation support for data screening using a browser" service can be ordered at extra charge from Hänel.

To do so, also refer to the form to be filled in by the customer from Chapter 10 Annex: Customer form for integration into corporate network, Part I.

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1.4 Integration into corporate network, Part II "Host communication (file transfer / data conversion)"



- Not for web service.
- Prerequisite is the completed integration into corporate network, Part I (Data screening using a browser) and the physical connection into corporate network.
- If the "Installation support for host communication (file transfer / data conversion)" service is ordered, the basis is the form filled in by the customer from Chapter 11 Annex: customer form for integration into corporate network, Part II.

1st step:

(S)FTP / CIFS server host communication

Refer also to Chapter 6.5 Communication on page 132.

2nd step:

File types

Refer also to Chapter 6.6 File types on page 135.

3rd step:

Data conversion

Refer also to Chapter 6.8 "Conversion" menu on page 144.

4th step:

File transfer

Refer also to Chapter 6.9 File transfer on page 147.



The "Installation support for host communication (file transfer / data conversion)" service can be ordered at extra charge from Hänel.

To do so, also refer to the form to be filled in by the customer from Chapter 11 Annex: customer form for integration into corporate network, Part II.

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2 Host communication through file transfer

2.1 Software requirement

FTP server	◆ On the customer's host/PC system, at least one FTP server must be installed. ("File Transfer Protocol" based on RFC 959). ◆ The installation instructions for the respective software must be observed.
SFTP server (alternative)	◆ Alternatively, an SFTP server can be used for encrypted transfer of files. ("SSH File Transfer Protocol" SSH version 2 and up). ◆ The installation instructions for the respective software must be observed.
CIFS server (alternative)	• A Samba server can be installed on the host/PC system for Unix/Linux systems. In Windows, the Windows File Sharing is sufficient. • A transfer directory has to be shared on the file server for this. This directory is provided with a share name via Windows File Sharing in Windows. The share name can be defined by the user. • When using a domain, the domain name must be known.
Transfer directories	◆ Furthermore, one input directory (Inbox) and one output directory (Outbox) must be created in the file system of the file server. ◆ The inbox serves as the target directory for the data files sent by the MP control system. ◆ The outbox serves as a source directory from which the MP control system can read its files.
User account	◆ The following default user must be created on the file server: ◆ User: MP100D ◆ Password: 22488 These are factory settings and can be modified as desired (see Chapter 6.5.1 on page 133).
Access authorisations	◆ Furthermore, the following access authorisations must be granted: ◆ Writing, reading, deleting and adding rights. ◆ Access to the inbox ◆ Access to the outbox

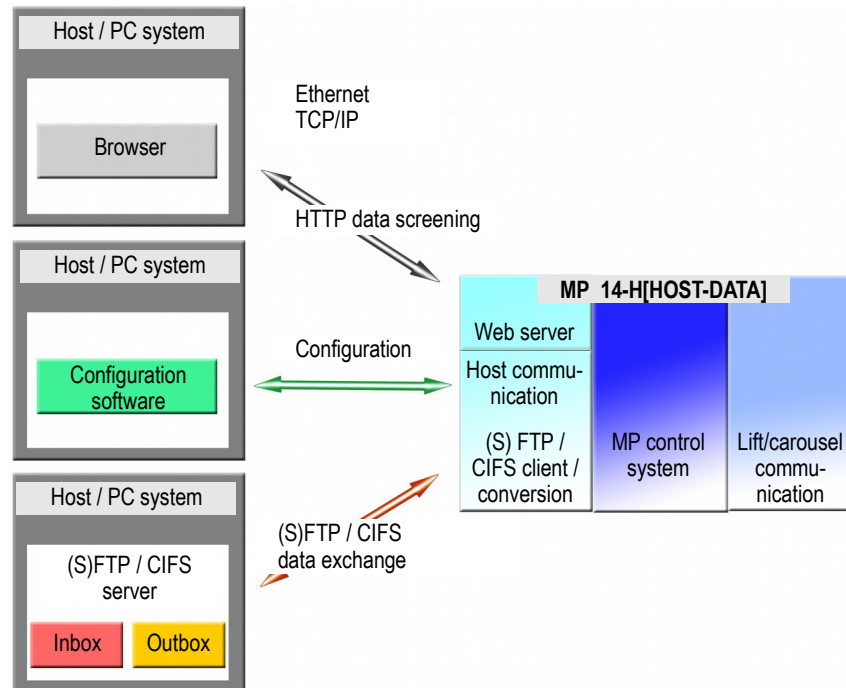


See Chapter 6.5.1 on page 134.

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2.2 Function

Function diagram



Host communication

The host communication consists of 2 interfaces: An interface for (S)FTP / CIFS data exchange and an interface to the configuration software (Jacomman).

(S)FTP / CIFS data exchange

The (S)FTP / CIFS client integrated into the MP control system communicates with a file server on the customer-side host/PC system. The transfer interface is provided by an input directory (**Inbox**) and an output directory (**Outbox**) on the (S)FTP / CIFS server. For the FTP server, the data transfer takes place with the "File Transfer Protocol" in accordance with RFC 959. When using an SFTP server, it takes place using the "SSH File Transfer Protocol", SSH version 2 and up. Alternatively, the CIFS protocol (Common Internet File System) can be used.

Data record buffer

On the MP control system side, there is a data record input buffer that stores the article data records sent by the host/PC system and a data record output buffer for the processed article data records. Both have a maximum size of 5000 data records.

Job buffer

On the MP control system side, there is a job input buffer that stores the jobs sent by the host/PC system and a job output buffer for the processed jobs. Both have a maximum size of 5000 item records.

Conversion

After the transfer via (S)FTP / CIFS protocol, the data can optionally be routed through a converter. If necessary, this converter translates incoming CSV files into the Hänel MP format and outgoing Hänel MP format files into the CSV format.

Configuration

The host communication can be configured according to the customer's wishes using the "Jacomman" configuration software via the configuration interface.

Web server

The integrated Web server enables access to the data of the MP control system from an external PC using a browser via HTTP protocol.

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2.3 General notes about files

Contents	No empty files may be transmitted. Each file must contain at least 1 data record/command.
File format	The file transfer between the MP control system and file server takes place via UTF-8 encoded files.

2.4 General notes about data records

Data record format	Data records can be transmitted in Hänel MP format (see Chapter 2.4.1) or, alternatively, in CSV format (see Chapter 2.4.2).
Data record closure	All data records end with "CRLF " (Carriage Return ASCII 13 and Line Feed ASCII 10).
Compatible character range for display	◆ Unicode character range "C0 Controls and Basic Latin" (0x20 - 0x7F) ◆ Unicode character range "C1 Controls and Latin 1 Supplement" (0x80 - 0xFF) ◆ All other Unicode ranges also cover the corresponding character range of the configured language. ◆ Exceptions are the "\$" and "?" characters, which are reserved internally and not available.

2.4.1 Hänel MP format (standard)

In Hänel MP format, "*" is used as a start character and "\$" is used as a separator between the data fields and at the end of a data record. A letter is positioned before the data field contents as a data field code. The data fields may be in any sequence. The data field content can vary between 1 and the maximum number of characters defined for this data field. See Chapter 6.7.2 on page 142.

Example: *\$S.....\$L..\$F...\$T...\$B.....\$G.....\$R.....\$O..\$N.....\$U01...\$

2.4.2 CSV format (conversion to Hänel MP format)

Most databases and spreadsheets offer CSV files as an export format. In CSV format, individual data fields are separated by field separators (e.g. ";" or ","). In the case of text fields, a distinction can be made between an alphanumeric text and a numeric text. The alphanumeric text is separated by text separators (e.g. " " or "). However, the data fields cannot contain both data fields. Otherwise these separators are not subject to any further restrictions. The assignment to the Hänel MP data fields is configured separately. See Chapter 6.8.1 on page 145.

The files can be transferred either in Hänel MP format or in CSV format. See Chapter 6.9.1 on page 147.

The converted data fields can also be reconverted back into the CSV format. See Chapter 6.9.2 on page 148.

Example: 120087;1;2;2;100;1;101;10;1;"NAME"

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2.4.3 Display of data fields in the operator prompt window (top centre)

The following basic information applies for these data fields (see Chapter 4 on page 118):
If the data field has been enabled via the Jacomman configuration software and transmitted in the data record, depending on the operating status, it is displayed in the blue operating window.

2.4.4 Display of data fields in the info browser

The following basic information applies for these data fields (see Chapter 4 on page 118):

Transmission without conversion

For data transfer in the Hänel MP format, the display options listed below exist.

Data field enabled in host communication	Data field name (Example)	Data field in data record (example)	Display
Yes	Info:	\$U01Text\$	Info: Text
Yes	Info:	\$U01 \$	Info:
Yes	Info:	\$U01\$	Info: --
Yes	Info:	not transferred	No indicator
NO		\$U01Text\$	No indicator

\$U01Text\$ = Data field with content "Text"

\$U01 \$ = Data field with content " " (space)

\$U01\$ = Data field without content (considered not transferred)

If data fields are transferred that have not been configured, their content remains intact during the reading back process.

Transmission with conversion

For data transfer in the Hänel CSV format, the display options listed below exist.

Data field enabled in host communication	Data field name (Example)	Data field in the data record (example with ';' as field separator)	Display
Yes	Info:	;Text;	Info: Text
Yes	Info:	; ;	Info:
Yes	Info:	::	Info: --
NO		;Text;	No indicator

;Text; = Data field with content "Text"

; ; = Data field with content " " (space)

:: = Data field without content (considered not transferred)

If data fields are transferred that have not been configured, these are blank (space) during the reading back process.

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2.5 File transfer

- ◆ The software requirements described in Chapter 2.1 on page 70 must be fulfilled. Refer also to Chapter 6.9 on page 147.
- ◆ The (S)FTP / CIFS client polls the host file server (outbox) for files. Following the file transfer, the MP control system generates a response file with status return messages in the inbox of the file server.
- ◆ Additional status messages are appended to an existing response file.

2.5.1 Send data to the MP control system

- ◆ The file to be transferred must be copied into the outbox.
- ◆ The data record input buffer or job input buffer must have enough room for the new article data records/job items; otherwise, the entire file is rejected. The sum of the data records in the corresponding input buffer and the sum of the data records in the corresponding output buffer must not add up to a value greater than 5000. If no more room is available, the respective output buffer must be read out or cleared by the host system.
- ◆ When the polling cycle is complete, the request file is picked up by the MP control system and deleted in the outbox.
- ◆ The file is converted (only if configured) and imported to the data record buffer or job buffer.
- ◆ A line with a status message is written into the response file, which is then copied to the inbox.
- ◆ If a file is copied to the outbox once again before the outbox has been picked up by the control system and deleted, it will be overwritten. However, if it has already been picked up, the file will be transferred once again. The MP control system writes a status message into the response file and copies it to the inbox.
- ◆ If multiple files are in the outbox simultaneously, they are sent to the MP control system in alphabetical order.

2.5.2 Reading data from the MP control system

- ◆ Request file (control file with command to read data) has to be copied into the outbox.
- ◆ When the polling cycle is complete, the request file is picked up by the MP control system and deleted in the outbox.
- ◆ The command is decoded and executed.
- ◆ The file to be exported is copied into the inbox.
- ◆ A line with a status message is written into the response file, which is then copied to the inbox.
- ◆ The sequence of messages in the response file may differ from the actual processing sequence.

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2.5.3 Deleting data from the MP control system

- ◆ Request file (control file with command to delete data) has to be copied into the outbox.
- ◆ When the polling cycle is complete, the request file is picked up by the MP control system and deleted in the outbox.
- ◆ The command is decoded and executed.
- ◆ A line with a status message is written into the response file, which is then copied to the inbox.

2.6 File types

2.6.1 Article buffer file

Send data records

Article data records can be transferred in one article buffer file or split into multiple article buffer files. If no priority is specified, all data records are processed in the order in which they were received and assigned to the corresponding lifts/carousels. Therefore, the lift number and shelf number are the minimum information that must always be transmitted so that when the data record is called up, a storage location can be positioned. Transfer of all other data fields is optional; see Chapter 4 on page 118. For each transferred data record, a status message is written into the response file. See Chapter 2.6.4 on page 80.

Read all unprocessed data records from the article input buffer

Command in request file	Explanation
<code>READ BUFFER <filename></code>	◆ READ = read ◆ BUFFER = article input buffer ◆ <filename> = specify the file name here in which the unprocessed data records will later be located. The file name extension can be configured and is added automatically by the MP control system. ◆ After being read out, the data records are still stored in the MP control system. ◆ Unprocessed buffer data are read out to the "backupfile.buf" file in the inbox. A status message is written into the response file.
Example: <code>READ BUFFER backupfile</code>	

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	Command in request file	Explanation
Read all processed data records from the article output buffer	<code>READ BUFFPROC <filename></code>	◆ READ = read ◆ BUFFPROC = article output buffer with processed data records ◆ <filename> = specify the file name here in which the processed data records will later be located. The file name extension can be configured and is added automatically by the MP control system. ◆ After being read out, the article output buffer is deleted automatically. ◆ Processed data records are written to the file "test.buf" and copied to the inbox. A status message is written into the response file.
	Example: <code>READ BUFFPROC test</code>	
Delete all unprocessed data records from the article input buffer	<code>DELETE BUFFER</code>	◆ DELETE = delete ◆ BUFFER = article input buffer ◆ All unprocessed data records are deleted. ◆ A status message is written into the response file. ◆ Caution: this command should be used only if no data records are in progress.
Delete all processed data records from the article output buffer	<code>DELETE BUFFPROC</code>	◆ DELETE = delete ◆ BUFFPROC = data record output buffer ◆ All processed data records are deleted. ◆ A status message is written into the response file.

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2.6.2 Job buffer file

Send job items

Jobs can be transferred in one job buffer file or be split into multiple job buffer files. Job items should be transferred together. It is possible to subsequently transfer job items for a job transferred earlier. However, note that in this case, path-optimised processing of a job begun earlier is no longer possible.

All job items of a job must have identical entries in the job number and priority data fields and in the selected C-special data fields.

If no priority is specified, all jobs are processed in the order in which they were received and assigned to the corresponding lifts/carousels.

Therefore, the lift/carousel, shelf and job number are the minimum information that must always be transmitted so that when the data record is called up, a storage location can be positioned. Transmission of all other data fields is optional. See Chapter 4 on page 118.

For each transferred job item data record, a status message is written into the response file. See Chapter 2.6.4 on page 80.

Read all job items from the job input buffer

Command in request file	Explanation
<code>READ JOBBUFFER <filename></code>	◆ READ = read ◆ JOBBUFFER = job input buffer ◆ <filename> = specify the file name here in which the job items from the job input buffer will later be located. If the setting is "Read back complete jobs" (see Chapter 6.6.2 on page 137), this also includes job items in addition to the unprocessed job items, as long as the job has not been completely finished. Otherwise, these are unprocessed job items. The file name extension can be configured and is added automatically by the MP control system. ◆ After being read out, the job items are still stored in the MP control system. ◆ The job items are read out to the inbox in the "backupfile.buf" file. A status message is written into the response file.
Example: <code>READ JOBBUFFER backupfile</code>	

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	Command in request file	Explanation
Read all processed job items from the job output buffer.	<code>READ JOBBUFFPROC <filename></code> Example: <code>READ JOBBUFFPROC test</code>	◆ READ = read ◆ JOBBUFFPROC = job output buffer with processed job items. ◆ <filename> specify the file name here in which the processed job items will later be located. If the setting is "Read back complete jobs" (see Chapter 6.6.2 on page 137), only job items of completely processed jobs are in the job output buffer. The file name extension can be configured and is added automatically by the MP control system. ◆ After being read out, the job output buffer is deleted automatically. A status message is written into the response file. ◆ The job items are written to the "test.buf" file and copied to the inbox.
Delete all job items from the job input buffer	<code>DELETE JOBBUFFER</code>	◆ DELETE = delete ◆ JOBBUFFER = job input buffer ◆ All job items are deleted from the job input buffer. ◆ Caution: this command should be used only if no jobs are in progress.
Delete all job items from the job output buffer	<code>DELETE JOBBUFFPROC</code>	◆ DELETE = delete ◆ JOBBUFFPROC = job output buffer with processed job items. ◆ All job items are deleted from the job output buffer.
Delete a certain job from the job input buffer	<code>DELETE JOB <jobname></code> Example: <code>DELETE JOB 35007</code>	◆ DELETE = delete ◆ JOB = job to be read ◆ New and partially processed jobs can be deleted. ◆ Job "35007" is deleted from the job input buffer.

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2.6.3 Request file

Request files are files which contain commands for the MP control system.

They are used to read or delete data records from the MP control system or check the connection

One line is used per command. A "!" at the start of the line indicates a user-defined comment.

Several commands can be combined in one request file.

The command sequence in the request file corresponds to the processing sequence.

For each command in the request file, a status message is written into the response file.

The request file is encoded by default in the "ISO 8859-1" character set. For languages not supported by the "ISO 8859-1" character set, "UTF-8" encoding is possible.

The name of the request file must consist of ASCII characters only.

Overview of commands

Command	Goods in/out
READ BUFFER <filename>	◆ Reads all unprocessed data records from the data record input buffer.
READ BUFFPROC <filename>	◆ Reads all processed data records from the data record output buffer and deletes them.
DELETE BUFFER	◆ Deletes all unprocessed data records from the data record input buffer.
DELETE BUFFPROC	◆ Deletes all processed data records from the data record output buffer.
READ JOBBUFFER <filename>	◆ Reads all job items from the job input buffer.
READ JOBBUFFPROC <filename>	◆ Reads all job items from the job output buffer.
DELETE JOBBUFFER	◆ Deletes all job items from the job input buffer.
DELETE JOBBUFFPROC	◆ Deletes all job items from the job output buffer.
DELETE JOB <jobname>	◆ Deletes the job <jobname> from the job input buffer if it is not in progress or partially processed.
CHECK CONNECTION <filename>	◆ Checks the connection between the MP control system and file server. ◆ If the connection is correct, an empty file with specified file names is generated in the inbox.

The file names are always specified without a file name extension. See Chapter 6.6 on page 135. The file names must contain only legible characters from the ASCII character sets and no \ / : * ? " < >.

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2.6.4 Response file

Response files are automatically copied by the MP control system into the inbox of the file server.

They contain status acknowledgements to commands from a request file and status acknowledgements to transmission of buffer data. Positive status acknowledgements are confirmed with OK. Negative status acknowledgements contain an error number. See Chapter 5 on page 124.

If there is no response file in the inbox, the MP control system will create one in the inbox of the file server, or the file will be extended.

The response file is encoded by default in the "ISO 8859-1" character set. For languages not supported by the "ISO 8859-1" character set, "UTF-8" encoding is possible.

The structure of the response file can be configured. See Chapter 6.6.4, Page 139.

Example of a response file:

```
2010.01.29 16:14:58 WRITE BUFFER *$S3001$NTX15$L01$T3$F2$O1$V-$Q200$ OK Buffer data imported
2010.01.29 16:21:45 WRITE BUFFER *$S1502$NTX16$L01$T3$F3$O1$V-$Q200$ OK Buffer data accepted
2010.01.29 16:23:43 DELETE JOBBUFFER --- OK Buffer data cleared
2010.01.29 16:24:12 WRITE JOBBUFFER *$S1201$NTX17$L01$T4$F2$O1$V-$Q200$ OK Buffer data imported
2010.01.29 16:25:00 WRITE JOBBUFFER *$S1231$NTX18$L01$T4$F3$O1$V-$Q200$ OK Buffer data accepted
2010.01.30 09:43:59 READ BUFFPROC dataproc.buf OK Buffer data read out
2010.01.30 09:44:01 READ JOBBUFFPROC jobsproc.jbf OK Buffer data read out
```

2.7 Data conversion

An import/export converter can be defined for data records. This converter enables comma-separated files (CSV files) to be sent directly to the MP control system (import) or read out from the MP control system (export).

See Chapter 6.8 on page 144.

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3 Host communication by web service via SOAP protocol

3.1 Software requirement

ERP system

- ◆ The ERP system on the host/PC system must support the HTTP-based SOAP 1.1 protocol.
- ◆ Developing a web service client requires a corresponding development environment for the favoured programming language and the option to generate a client service proxy from a WSDL file.
- ◆ Generation of passed objects and return projects as well as error handling has to be programmed on the customer side.

Configuration software for MP 14-H[HOST-DATA] host communication

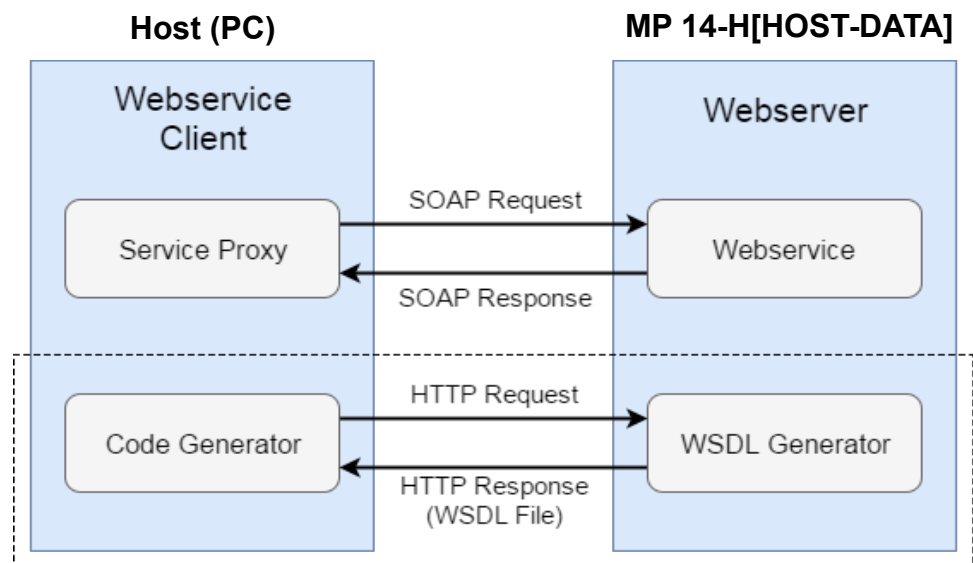
- ◆ You can enable the web service interface using the configuration software. See Chapter 6 on page 129.

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3.2 Web service "Data"

- The MP control system provides access to the "Data" web service. This allows an application on a connected host/PC system to call the various methods of this web service in order to transfer data to and from the MP control system.

Overview of function



- ◆ Per selection (link, button, form etc.) or with JavaScript, a URL is sent from the browser to the Web application on the host Web server.
- ◆ The Web application calls up the method of a Webservice client class on the host Web server. The method call is sent to the web service as a SOAP message in XML form via HTTP protocol (Port 80) on the MP control system. There, the SOAP message is converted back into a method call and the code programmed there is executed.
- ◆ Parameters can be passed to a method call in the form of objects (for example, Java Beans). The return parameters of a method are also returned in the form of objects.

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WSDL file

A WSDL file (WSDL1.1) can be downloaded via the MP control system. To do so, the following URL has to be entered in a Web browser connected to the MP control system:

<http://<IP-address-of-the-MP-control-system>/jwsdata/services/Data?wsdl>

Then the WSDL file is shown. The contents can be copied out and saved as a *.wsdl file. Alternatively, the *.wsdl file is provided in the documentation.

Excerpt of the "Data.wsdl" file

Configuration of WSDL 1.1	Contents
definitions	<pre><?xml version="1.0" encoding="UTF-8"?> <wsdl:definitions targetNamespace="http://main.jws.data.hanel.de" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/" xmlns:ns="http://main.jws.data.hanel.de" xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl" xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/" xmlns:http="http://schemas.xmlsoap.org/wsdl/http/" xmlns:xs21="http://main.jws.data.hanel.de/xsd" xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/" xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:ns1="http://org.apache.axis2/xsd" xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"> <wsdl:documentation> MP 14-H[HOST-DATA]SOAP WSDL-File V1.0 </wsdl:documentation></pre>
types	<pre><wsdl:types> <xs:schema attributeFormDefault="qualified" elementFormDefault="qualified" targetNamespace="http://main.jws.data.hanel.de/xsd"> <xs:complexType name="JobRecordV01"> <xs:sequence> <xs:element minOccurs="0" name="accessPoint" type="xs:int"/> <xs:element minOccurs="0" name="actualQuantity" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="articleName" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="articleNumber" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="compartment" type="xs:int"/> <xs:element minOccurs="0" name="compartmentDepth" type="xs:int"/> <xs:element minOccurs="0" name="containerSize" type="xs:int"/> <xs:element minOccurs="0" name="date" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="inOut" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="inventory" nillable="false" type="xs:string"/> <xs:element minOccurs="1" name="job" nillable="false" type="xs:string"/> <xs:element minOccurs="1" name="lift" type="xs:int"/> <xs:element minOccurs="0" name="nominalQuantity" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="priority" type="xs:int"/> <xs:element minOccurs="0" name="properties" nillable="false" type="xs:string"/> <xs:element minOccurs="1" name="shelf" type="xs:int"/> <xs:element minOccurs="0" name="status" type="xs:int"/> <xs:element minOccurs="0" name="time" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="totalInventory" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="minimumInventory" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="c01SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="c02SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="c03SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="c04SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="c05SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="c06SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="c07SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="c08SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="c09SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="c10SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="u01SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="u02SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="u03SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="u04SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="u05SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="u06SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="u07SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="u08SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="u09SpecialField" nillable="false" type="xs:string"/> <xs:element minOccurs="0" name="u10SpecialField" nillable="false" type="xs:string"/> </xs:sequence> </xs:complexType> </wsdl:types></pre>
message	<pre><wsdl:message name="deleteDataBufferV01Req"> <wsdl:part name="parameters" element="ns:deleteDataBufferV01"> </wsdl:part> </wsdl:message> <wsdl:message name="readJobBuffProcV01Req"> <wsdl:part name="parameters" element="ns:readJobBuffProcV01"> </wsdl:part> </wsdl:message></pre>
portType	<pre><wsdl:portType name="DataPortType"> <wsdl:operation name="readJobBuffProcV01"> <wsdl:input message="ns:readJobBuffProcV01Req" wsaw:Action="urn:readJobBuffProcV01"> </wsdl:input> <wsdl:output message="ns:readJobBuffProcV01Res" wsaw:Action="urn:readJobBuffProcV01Res"> </wsdl:output> </wsdl:operation> </wsdl:portType></pre>
binding	<pre><wsdl:binding name="DataSoap12Binding" type="ns:DataPortType"> <soap12:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/> <wsdl:operation name="readJobBuffProcV01"> <soap12:operation soapAction="urn:readJobBuffProcV01" style="document"/></pre>

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	<pre><wsdl:input> <soap12:body use="literal"/> </wsdl:input> <wsdl:output> <soap12:body use="literal"/> </wsdl:output> </wsdl:operation> </wsdl:binding></pre>
service	<pre><wsdl:service name="Data"> <wsdl:port name="DataHttpSoap11Endpoint" binding="ns:DataSoap11Binding"> <soap:address location="http://localhost/jwsdata/services/Data.DataHttpSoap11Endpoint/"> </soap:address> </wsdl:port> </wsdl:service></pre>

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SOAP message

The Webservice client generated from the WSDL file has to support SOAP 1.1. Method calls are implemented in SOAP requests. Return parameters are returned in SOAP responses. See the example below with the "sendJobBufferV01" method.

SOAP request (Example)

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:main="http://main.jws.data.hanel.de" xmlns:xsd="http://main.jws.data.hanel.de/xsd">
  <soapenv:Header/>
  <soapenv:Body>
    <main:sendJobBufferV01>
      <main:parSendJobV01>
        <xsd:accessPoint>1</xsd:accessPoint>
        <xsd:actualQuantity>100</xsd:actualQuantity>
        <xsd:articleName>Schraube M10 x 20</xsd:articleName>
        <xsd:articleNumber>4714</xsd:articleNumber>
        <xsd:compartment>1</xsd:compartment>
        <xsd:compartmentDepth>2</xsd:compartmentDepth>
        <xsd:inOut>+</xsd:inOut>
        <xsd:inventory>100</xsd:inventory>
        <xsd:job>0818</xsd:job>
        <xsd:lift>6</xsd:lift>
        <xsd:nominalQuantity>3</xsd:nominalQuantity>
        <xsd:priority>20</xsd:priority>
        <xsd:shelf>2</xsd:shelf>
        <xsd:totalInventory>333</xsd:totalInventory>
      </main:parSendJobV01>
    </main:sendJobBufferV01>
  </soapenv:Body>
</soapenv:Envelope>
```

SOAP response (Example)

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
  <soapenv:Body>
    <ns2:sendJobBufferV01Res xmlns:ns2="http://main.jws.data.hanel.de">
      <ns2:returnValue>0</ns2:returnValue>
    </ns2:sendJobBufferV01Res>
  </soapenv:Body>
</soapenv:Envelope>
```

Binding

<http://<IP-address-of-the-MP-control-system>/jwsdata/services/Data.DataHttpSoap11Endpoint>

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General
information about
the passed
parameters

A method can be called up with or without passed parameters. This depends on the selected method. For a method call with passed parameters, these are passed to the method in the form of an object (for example, Java Bean). All parameters do not always have to be used within an object. Whether a parameter has to be set and what value it has to have if inactive can be found in the tables of Chapter 3.4 Methods in the standard in the "Inactive" column. If a passed parameter is to be set, you can get information about its "Type" and the "Active value range" from the tables in Chapter 3.4 Methods in the standard.

General
information about
the return
parameters

Each method returns its return parameters in the form of an object (for example, Java Bean).
Unavailable parameters are returned with -1 (Int) or zero (String).
Each return object has a "returnValue" parameter.

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General return values in the "returnValue" parameter

return Value	Meaning		
0	OK, method was executed correctly. Remaining return parameters are valid		
1	reserved		
2	Method was not executed, as a method that has not yet returned data was called previously. The system must wait for the acknowledgement before a new method call can be made. An asynchronous call is not possible. Remaining return parameters are invalid.		
	ErrorV01		
	returnErrorNumber	returnErrorMessage	returnErrorIndex
	201	Connection to MP at work. Try it later once again.	-
3	reserved		
4	reserved		
5	reserved		
6	Internal error. Used for troubleshooting/analysis during programming. Additional error parameters enable more precise localisation of the problem. If the problem initially occurs in a specific data record, the returnErrorIndex points to the number of the transferred data record that caused the problem. Remaining return parameters are invalid.		
	ErrorV01		
	returnErrorNumber	returnErrorMessage	returnErrorIndex
	601	Failed to make <file>	-
	602	Failed to convert to <file> record: <record>	0-n
	603	Timeout Request - Response <file>	-
	604	Cannot start request	-
	605	Failed to make request: <file> -> <content>	-
	606	Cannot open response: <file>	-
	607	Response file empty: <file>	-
	608	Cannot delete response: <file>	-
	609	Error in response <file> -> <content>	-

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General return values in the "returnValue" parameter

return Value	Meaning		
7	The MP has detected an error due to incorrect data fields. Remaining return parameters are invalid.		
	ErrorV01		
	returnErrorNumber	returnErrorMessage	returnErrorIndex
	Error code according to Chapter 5 on page 124.	Error text according to Chapter 5 on page 124.	0-n (index of the data record that threw an error during transfer.)

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3.3 Overview of the individual methods of the "Data" web service

Method	Description	
isConnectedV01	Checks connection to web service	See Chapter 3.4.1, page 90.
sendDataBufferV01	Sends one or more article data records to the data record input buffer	See Chapter 3.4.2, page 91.
sendDataBufferV02	Sends one or more article data records to the data record input buffer	See Chapter 3.4.3, page 92.
sendJobBufferV01	Sends one or more article data items to the job input buffer	See Chapter 3.4.4, page 93.
sendJobBufferV02	Sends one or more article data items to the job input buffer	See Chapter 3.4.5, page 94.
readDataBufferV01	Reads the unprocessed article data records from the data record input buffer.	See Chapter 3.4.6, page 95.
readDataBufferV02	Reads the unprocessed article data records from the data record input buffer.	See Chapter 3.4.7, page 96.
readDataBuffProcV01	Reads the processed article data records from the data record output buffer	See Chapter 3.4.8, page 97.
readDataBuffProcV02	Reads the processed article data records from the data record output buffer	See Chapter 3.4.9, page 98.
readJobBufferV01	Reads the unprocessed job items from the job input buffer	See Chapter 3.4.10, page 99.
readJobBufferV02	Reads the unprocessed job items from the job input buffer	See Chapter 3.4.11, page 100.
readJobBuffProcV01	Reads the processed job items from the job output buffer	See Chapter 3.4.12, page 101.
readJobBuffProcV02	Reads the processed job items from the job output buffer	See Chapter 3.4.13, page 102.
deleteDataBufferV01	Deletes all unprocessed article data records from the data record input buffer	See Chapter 3.4.14, page 103.
deleteDataBuffProcV01	Deletes all processed article data records from the data record output buffer	See Chapter 3.4.15, page 104.
deleteJobBufferV01	Deletes all unprocessed job items from the job input buffer	See Chapter 3.4.16, page 105.
deleteJobBuffProcV01	Deletes all processed job items from the job output buffer	See Chapter 3.4.17, page 106.
deleteJobV01	Deletes a defined job from the job input buffer	See Chapter 3.4.18, page 107.
readBuffInfoV01	Reads information about the data record and job buffer	See Chapter 3.4.19, page 108.

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3.4 Methods in the standard

3.4.1 Method "isConnectedV01" -

Description With this method, the host has the ability to check whether a connection to the web service exists.
The method is not blocking.

Passed message Message type **isConnectedV01**

Passed parameters None

Return message Message type **isConnectedV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	connected	Connection to web service possible	Boolean	0/1	Yes
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.2 Method "sendDataBufferV01" - Sends article data records to the article buffer

Description With this method, the host has the ability to write one or more article data records to the data record input buffer. In doing so, note that the sum of the article data records in the data record input buffer + the sum of processed article data records in the data record output buffer of the MP must not exceed 5000. For additional information, refer to Method "readBuffInfoV01".

The method is blocking until the article data records have been written to the data record input buffer.

Passed message Message type **sendDataBufferV01**

Passed parameters	Parameters	Meaning	Type	Area	Mandatory
	parSendDataV01[]	For 1-n data records, see Chapter 3.5.1 on page 109.	DataRecordV01	1-n	Yes

Return message Message type **sendDataBufferV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	returnValue	General return values	Int	0-7	Yes
	returnError[]	Error entry For each data record that has caused an error during transfer, an error entry of type ErrorV01 exists in this array. The corresponding data record was not stored. If all data records have been transmitted correctly, only the returnValue = 0 is transferred.	ErrorV01	0-x	No

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3.4.3 Method "sendDataBufferV02" - Sends article data records to the article buffer

Description With this method, the host has the ability to write one or more article data records to the data record input buffer. In doing so, note that the sum of the article data records in the data record input buffer + the sum of processed article data records in the data record output buffer of the MP must not exceed 5000. For additional information, refer to Method "readBuffInfoV01".
The method is blocking until the article data records have been written to the data record input buffer.

Passed message Message type **sendDataBufferV02**

Passed parameters	Parameters	Meaning	Type	Area	Mandatory
	parSendDataV02[]	For 1-n data records, see Chapter 3.5.2 on page 111.	DataRecordV0	1-n	Yes

Return message Message type **sendDataBufferV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	returnValue	General return values	Int	0-7	Yes
	returnError[]	Error entry For each data record that has caused an error during transfer, an error entry of type ErrorV01 exists in this array. The corresponding data record was not stored. If all data records have been transmitted correctly, only the returnValue = 0 is transferred.	ErrorV01	0-x	No

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3.4.4 Method "sendJobBufferV01" - Sends one or more job items to the job buffer

Description With this method, the host has the ability to write one or more job items to the data record input buffer. In doing so, the job input buffer + the total of the processed items in the job output buffer of the MP must not exceed 5000. For additional information, refer to Method "readBuffInfoV01".
The method is blocking until the items have been written to the job input buffer.

Passed message Message type **sendJobBufferV01**

Passed parameters	Parameters	Meaning	Type	Active Area	Mandatory
	parSendJobV01[]	1-n job items. See Chapter 3.5.3 on page 112.	JobRecordV01	1-n	Yes

Return message Message type **sendJobBufferV01Res** Contains return parameters

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	returnValue	General return values	Int	0-7	Yes
	returnError[]	Error entry For each job item that has caused an error during transfer, an error entry of type ErrorV01 exists in this array. The corresponding item was not stored. If all items were transferred correctly, only the returnValue = 0 is transferred.	ErrorV01	0-x	No

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3.4.5 Method "sendJobBufferV02" - Sends one or more job items to the job buffer

Description With this method, the host has the ability to write one or more job items to the data record input buffer. In doing so, the job input buffer + the total of the processed items in the job output buffer of the MP must not exceed 5000. For additional information, refer to Method "readBuffInfoV01".
The method is blocking until the items have been written to the job input buffer.

Passed message Message type **sendJobBufferV02**

Passed parameters

Parameters	Meaning	Type	Active Area	Mandatory
parSendJobV02[]	1-n job items. See Chapter 3.5.4 on page 114.	JobRecordV0	1-n	Yes

Return message Message type **sendJobBufferV02Res** Contains return parameters

Return parameters

Parameters	Meaning	Type	Area	Mandatory
returnValue	General return values	Int	0-7	Yes
returnError[]	Error entry For each job item that has caused an error during transfer, an error entry of type ErrorV01 exists in this array. The corresponding item was not stored. If all items were transferred correctly, only the returnValue = 0 is transferred.	ErrorV01	0-x	No

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3.4.6 Method "readDataBufferV01" - Reads unprocessed article data records from the article input buffer

Description With this method, the host has the option of reading unprocessed article data records from the data record input buffer.
The method is blocking until the article data records have been read from the data record input buffer.

Passed message Message type **readDataBufferV01**

Passed parameters None

Return message Message type **readDataBufferV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	dataRecord[]	For 0-n data records, see Chapter 3.5.1 on page 109.	DataRecordV01	0-n	No
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.7 Method "readDataBufferV02" - Reads unprocessed article data records from the article input buffer

Description With this method, the host has the option of reading unprocessed article data records from the data record input buffer.
The method is blocking until the article data records have been read from the data record input buffer.

Passed message Message type **readDataBufferV02**

Passed parameters None

Return message Message type **readDataBufferV02Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	dataRecord[]	For 0-n data records, see Chapter 3.5.2 on page 111.	DataRecordV0	0-n	No
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.8 Method "readDataBuffProcV01" - Reads processed article data records from the article output buffer

Description With this method, the host has the option of reading processed article data records from the data record output buffer.
The method is blocking until the article data records have been read from the data record output buffer.

Passed message Message type **readDataBuffProcV01**

Passed parameters None

Return message Message type **readDataBuffProcV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	dataRecord[]	For 0-n data records, see Chapter 3.5.1 on page 109.	DataRecordV01	0-n	No
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.9 Method "readDataBuffProcV02" - Reads processed article data records from the article output buffer

Description With this method, the host has the option of reading processed article data records from the data record output buffer.
The method is blocking until the article data records have been read from the data record output buffer.

Passed message Message type **readDataBuffProcV02**

Passed parameters None

Return message Message type **readDataBuffProcV02Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	dataRecord[]	For 0-n data records, see Chapter 3.5.2 on page 111.	DataRecordV0	0-n	No
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.10 Method "readJobBufferV01" - Reads unprocessed job items from the job input buffer

Description With this method, the host has the option of reading unprocessed job items from the job input buffer.
The method is blocking until the job items have been read from the job input buffer.

Passed message Message type **readJobBufferV01**

Passed parameters None

Return message Message type **readJobBufferV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	jobRecord[]	For 0-n items, see Chapter 3.5.3 on page 112.	JobRecordV01	0-n	No
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.11 Method "readJobBufferV02" - Reads unprocessed job items from the job input buffer

Description With this method, the host has the option of reading unprocessed job items from the job input buffer.
The method is blocking until the job items have been read from the job input buffer.

Passed message Message type **readJobBufferV02**

Passed parameters None

Return message Message type **readJobBufferV02Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	jobRecord[]	For 0-n items, see Chapter 3.5.4 on page 114.	JobRecordV0	0-n	No
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.12 Method "readJobBuffProcV01" - Reads processed job items from the job output buffer

Description Using this method, the host has the option of reading processed job items from the job output buffer.
The method is blocking until the job items have been read from the job output buffer.

Passed message Message type **readJobBuffProcV01**

Passed parameters None

Return message Message type **readJobBuffProcV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	jobRecord[]	For 0-n items, see Chapter 3.5.3 on page 112.	JobRecordV01	0-n	No
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.13 Method "readJobBuffProcV02" - Reads processed job items from the job output buffer

Description Using this method, the host has the option of reading processed job items from the job output buffer.
The method is blocking until the job items have been read from the job output buffer.

Passed message Message type **readJobBuffProcV02**

Passed parameters None

Return message Message type **readJobBuffProcV02Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	jobRecord[]	For 0-n items, see Chapter 3.5.4 on page 114.	JobRecordV0	0-n	No
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.14 Method "deleteDataBufferV01" - Deletes all unprocessed article data records from the article input buffer

Description With this method, the host has the option of deleting all unprocessed article data records from the article input buffer.
The method is blocking until the article data records have been deleted from the article input buffer.

Passed message Message type **deleteDataBufferV01**

Passed parameters None

Return message Message type **deleteDataBufferV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.15 Method "deleteDataBuffProcV01" - Deletes all processed article data records from the article output buffer

Description With this method, the host has the option of deleting all processed article data records from the data record output buffer.
The method is blocking until all article data records have been deleted from the article output buffer.

Passed message Message type **deleteDataBuffProcV01**

Passed parameters None

Return message Message type **deleteDataBuffProcV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.16 Method "deleteJobBufferV01" - Deletes all unprocessed job items from the job input buffer

Description With this method, the host has the option of deleting all unprocessed job items from the job input buffer.
The method is blocking until the job items have been deleted from the job input buffer.

Passed message Message type **deleteJobBufferV01**

Passed parameters None

Return message Message type **deleteJobBufferV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.17 Method "deleteJobBuffProcV01" - Deletes all processed job items from the job output buffer

Description With this method, the host has the option of deleting all processed job items from the job output buffer.
The method is blocking until the job items have been deleted from the job output buffer.

Passed message Message type **deleteJobBufferV01**

Passed parameters None

Return message Message type **deleteJobBufferV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.18 Method "deleteJobV01"- Deletes a defined job from the job input buffer

Description With this method, the host has the option of deleting all items of a defined job from the job input memory. New and partially processed jobs can be deleted.
The method is blocking until the job items have been deleted from the job input buffer.

Passed message Message type **DeleteJobV01**

Passed parameters	Parameters	Meaning	Type	Area	Mandatory
	jobname	Job number of the job to be deleted.	String	1-40 characters	Yes

Return message Message type **SendDataBufferV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.4.19 Method "readBuffInfoV01" - Reads information about the buffer

Description With this method, the host has the option of retrieving the status of the input and output buffers of data records and job items.
The method is not blocking.

Passed message Message type **readBuffInfoV01**

Passed parameters None

Return message Message type **readBuffInfoV01Res**

Return parameters	Parameters	Meaning	Type	Area	Mandatory
	infoRecord	Data record with information on the status of the data record and job buffers.	InfoRecordV01	0/1	Yes
	returnValue	General return values	Int	0-7	Yes
	returnError	Error entry	ErrorV01	0-x	No

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3.5 Object types for the data exchange



Objects are used for the data exchange. The configuration of these objects and the object types are explained below.

3.5.1 Object "DataRecordV01" - Article data record

This object type describes a possible article data record structure. The actual data fields to be transferred depend upon the usage case.

One article data record or an entire list of article data records can be transferred.

Usage:

- Method "sendDataBufferV01" Chapter 3.4.2 on page 91.
- Method "readDataBufferV01" Chapter 3.4.6 on page 95.
- Method "readDataBuffProcV01" Chapter 3.4.8 on page 97.

Object type **DataRecordV01**

Parameter value	Meaning	Type	Area	Mandatory
articleNumber	Article number [S]	String	1-40 characters	No
articleName	Article name [N]	String	1-40 characters	No
lift	Lift number (storage location) [L]	Int	1-99	Yes
accessPoint	Access point number [E]	Int	0-8	No
shelf	Shelf number (storage location) [T]	Int	1-255(999)	Yes
compartment	Compartment number (storage location) [F]	Int	1-255	No
compartmentDepth	Compartment depth number (storage location) ([O])	Int	1-99	No
containerSize	Container size [G]	Int	See Chapter 4	No
job	Job number [K]	String	1-40 characters	No
priority	Priority[p]	Int	1-255	No
inOut	Operation [V]	String	See Chapter 4	No
nominalQuantity	Nominal quantity [Q]	String	See Chapter 4	No
actualQuantity	Actual quantity [M]	String	See Chapter 4	No
inventory	Inventory at storage location [B]	String	See Chapter 4	No
minimumInventory	Minimum inventory [R]	String	See Chapter 4	No

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totalInventory	Total inventory of all storage locations [P]	String	0-99999999	No
properties	Properties [e]	String	0-40 characters	No
uxxSpecialField	10 special data fields for the data record [C] xx = 01 - 10	String	0-40 characters	No
status	Status [W]	Int	See Chapter 4	No
date	Date [d]	String	See Chapter 4	No
time	Time [u]	String	See Chapter 4	No

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3.5.2 Object "DataRecordV02" - Article data record

This object type describes a possible article data record structure. The actual data fields to be transferred depend upon the usage case.

One article data record or an entire list of article data records can be transferred.

Usage:

- Method "sendDataBufferV02" Chapter 3.4.3 on page 92.
- Method "readDataBufferV02" Chapter 3.4.7 on page 96.
- Method "readDataBuffProcV02" Chapter 3.4.9 on page 98.

Object type **DataRecordV02**

Parameter value	Meaning	Type	Area	Mandatory
articleNumber	Article number [S]	String	1-40 characters	No
articleName	Article name [N]	String	1-40 characters	No
lift	Lift number (storage location) [L]	Int	1-99	Yes
accessPoint	Access point number [E]	Int	0-8	No
shelf	Shelf number (storage location) [T]	Int	1-255(999)	Yes
compartment	Compartment number (storage location) [F]	Int	1-255	No
compartmentDepth	Compartment depth number (storage location) [O]	Int	1-99	No
containerSize	Container size [G]	Int	See Chapter 4	No
job	Job number [K]	String	1-40 characters	No
priority	Priority [p]	Int	1-255	No
inOut	Operation [V]	String	See Chapter 4	No
nominalQuantity	Nominal quantity [Q]	String	See Chapter 4	No
actualQuantity	Actual quantity [M]	String	See Chapter 4	No
inventory	Inventory at storage location [B]	String	See Chapter 4	No
minimumInventory	Minimum inventory [R]	String	See Chapter 4	No
totalInventory	Total inventory of all storage locations [P]	String	0-99999999	No
properties	Properties [e]	String	0-40 characters	No

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uxxSpecialField	10 special data fields for the data record [C] xx = 01 - 10	String	0-40 characters	No
alternativeLocations	Alternative storage locations for the automatic search for the storage location [h]. (Max. 8 x 10 characters)	String	80 characters	No
alternativeContainer Size	Alternative container sizes for the automatic search for the storage location [g]. (Max. 8 x 7 characters)	String	56 characters	No
status	Status [W]	Int	See Chapter 4	No
date	Date [d]	String	See Chapter 4	No
time	Time [u]	String	See Chapter 4	No

3.5.3 Object "JobRecordV01" - Job item data record

This object type describes a possible job item structure. The actual data fields to be transferred depend upon the usage case.

One job item data record or an entire list of job item data records can be transferred.

Usage:

- Method "sendJobBufferV01" Chapter 3.4.4 on page 93.
- Method "readJobBufferV01" Chapter 3.4.10 on page 99.
- Method "readJobBuffProcV01" Chapter 3.4.12 on page 101.

Object type **JobRecordV01**

Parameter value	Meaning	Type	Area	Mandatory
articleNumber	Article number [S]	String	1-40 characters	No
articleName	Article name [N]	String	1-40 characters	No
lift	Lift number (storage location) [L]	Int	1-99	Yes
accessPoint	Access point number [E]	Int	0-8	No
shelf	Shelf number (storage location) [T]	Int	1-255(999)	Yes
compartment	Compartment number (storage location) [F]	Int	1-255	No
compartmentDepth	Compartment depth number (storage location) [O]	Int	1-99	No
containerSize	Container size [G]	Int	See Chapter 4	No
job	Job number [S]	String	1-40 characters	Yes
priority	Priority [p]	Int	1-255	No

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inOut	Operation [V]	String	'-', '+', 'p', 'c'	No
nominalQuantity	Nominal quantity [Q]	String	See Chapter 4	No
actualQuantity	Actual quantity [M]	String	See Chapter 4	No
inventory	Inventory at storage location [B]	String	See Chapter 4	No
minimumInventory	Minimum inventory [R]	String	See Chapter 4	No
totalInventory	Total inventory of all storage locations [P]	String	See Chapter 4	No
properties	Properties [e]	String	0-40 characters	No
cxxSpecialField	10 special data fields for job header [C] xx = 01 - 10	String	0-40 characters	No
uxxSpecialField	10 special data fields for the job item [U] xx = 01 - 10	String	0-40 characters	No
status	Status [W]	Int	See Chapter 4	No
date	Date [d]	String	See Chapter 4	No
time	Time [u]	String	See Chapter 4	No

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3.5.4 Object "JobRecordV02" - Job item data record

This object type describes a possible job item structure. The actual data fields to be transferred depend upon the usage case.

One job item data record or an entire list of job item data records can be transferred.

Usage:

- Method "sendJobBufferV02" Chapter 3.4.5 on page 94.
- Method "readJobBufferV02" Chapter 3.4.11 on page 100.
- Method "readJobBuffProcV02" Chapter 3.4.13 on page 102.

Object type **JobRecordV02**

Parameter value	Meaning	Type	Area	Mandatory
articleNumber	Article number [S]	String	1-40 characters	No
articleName	Article name [N]	String	1-40 characters	No
lift	Lift number (storage location) [L]	Int	1-99	Yes
accessPoint	Access point number [E]	Int	0-8	No
shelf	Shelf number (storage location) [T]	Int	1-255(999)	Yes
compartment	Compartment number (storage location) [F]	Int	1-255	No
compartmentDepth	Compartment depth number (storage location)[O]	Int	1-99	No
containerSize	Container size [G]	Int	See Chapter 4	No
job	Job number [S]	String	1-40 characters	Yes
priority	Priority [p]	Int	1-255	No
inOut	Operation [V]	String	'-', '+', 'p', 'c'	No
nominalQuantity	Nominal quantity [Q]	String	See Chapter 4	No
actualQuantity	Actual quantity [M]	String	See Chapter 4	No
inventory	Inventory at storage location [B]	String	See Chapter 4	No
minimumInventory	Minimum inventory [R]	String	See Chapter 4	No
totalInventory	Total inventory of all storage locations [P]	String	See Chapter 4	No
properties	Properties [e]	String	0-40 characters	No

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cxxSpecialField	10 special data fields for job header [C] xx = 01 - 10	String	0-40 characters	No
uxxSpecialField	10 special data fields for the job item [U] xx = 01 - 10	String	0-40 characters	No
alternativeLocations	Alternative storage locations for the automatic search for the storage location [h]. (Max. 8 x 10 characters)	String	80 characters	No
alternativeContainer Size	Alternative container sizes for the automatic search for the storage location [g]. (Max. 8 x 7 characters)	String	56 characters	No
status	Status [W]	Int	See Chapter 4	No
date	Date [d]	String	See Chapter 4	No
time	Time [u]	String	See Chapter 4	No

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3.5.5 Object "InfoRecordV01" - Information data record

This object type describes the information data record, which contains the status of the input and output buffers for data records and job items.

Object type

InfoRecordV01

Parameter value	Meaning	Type	Area	Mandatory
maxDataRecords	Size of the article buffer	Int	x	Yes
numberOfDataRecords	Number of article data records in the data record input buffer	Int	0-x	Yes
numberOfFreeDataRecords	Number of free (still transferable) article data records.	Int	0-x	Yes
maxJobRecords	Size of the job buffer	Int	x	Yes
numberOfJobRecords	Number of items in the job input buffer	Int	0-x	Yes
numberOfJobs	Number of jobs in the job input buffer	Int	0-x	Yes
numberOfFreeJobRecords	Number of free (still transferable) items.	Int	0-x	Yes
numberOfProcDataRecords	Number of processed article data records in the data record output buffer.	Int	0-x	Yes
numberOfProcJobRecords	Number of processed items in the job output buffer.	Int	0-x	Yes

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3.5.6 Object "ErrorV01" - Error acknowledgement

This object type describes an error entry. Depending on the method and acknowledgement, zero, one or multiple error acknowledgements may be sent. If multiple error acknowledgements exist, the data record to which the error acknowledgement refers is referenced based on the "**returnErrorIndex**". (Index 0 = first transferred data record).

Object type **ErrorV01**

Parameter value	Meaning	Type	Area	Mandatory
returnErrorNumber	General error number	Int	0-x	No
returnErrorMessage	General error message	String	0-x characters	No
returnErrorIndex	General error index	Int	0-x	No

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4 Data fields

Code	Name	No. of characters	Contents	Data record	Job	Operator prompts	Info browser	Keyboard input	Comment
L	Lift (storage location)	1 - 2	1 - 99	Z	Z	-	-	-	This data field defines the lift/carousel at which the data record/job record is processed.
T	Shelf (storage location)	1 - 3	1 - 999*)	Z	Z	Z	-	-	This data field defines the shelf on which the data record/job record is processed. *) The shelf number is valid only if the shelf is also present in the corresponding lift/carousel.
E	Access point	1	1 - 8	O	O	-	-	-	This data field defines the access point at which the data record/job record is processed. If the data field is <u>not</u> transferred or is transferred with the value "0", the data record/job record can be processed at any access point. (Standard) If the data field is transferred with an access point number, the data record/job record can be processed only at this access point. (For example, lifts/carousels with multiple access points in which storage is to take place at the first access point and picking is to take place at the second access point).
F	Compartment (storage location)	1 - 3	1 - 255	O	O	A + G	-	-	This data field defines the compartment in which the data record/job record is processed. If the compartment display is present and initialised, a compartment LED is activated.

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Code	Name	No. of characters	Contents	Data record	Job	Operator prompts	Info browser	Keyboard input	Comment
O	Compartment depth (storage location)	1 - 2	1 - 99	O	O	A + G	-	-	This data field defines the compartment depth in which the data record/job record is processed. If the compartment depth display is present and initialised, the compartment depth is displayed visually.
G	Container	7 (FFFOOHH)	0010101 - 2559931	O	O	-	A + G	-	The container displays the number of compartments / compartment depths / height the article covers at its storage location. The container is displayed in combination with compartment depth display 2 and 3 or with the "fixed grid Pick-O-Light system". Format: FFFOOHH FFF = Number of compartments OO = Number of compartment depths HH = Height In combination with the "storage location height management" supplementary module for Lean-Lift / Multi-Space and the "fixed shelf height" and "shelf height monitor" functions, the height can accept values other than "01".
K	Job	1 - 40	alpha-numerical	O	Z	A + G	A + G	-	This data field contains a job number. It appears in the first line of the display. For jobs, all associated items must have the same job number.
S	Article number	1 - 40	alpha-numerical	O	O	A + G	A + G	-	This data field contains an article number. It appears in the second line of the display.
N	Name	1 - 40	alpha-numerical	O	O	A + G	A + G	-	This data field contains the name. It appears in the third line of the display.

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Code	Name	No. of characters	Contents	Data record	Job	Operator prompts	Info browser	Keyboard input	Comment
V	Goods in/out	1	"+", "-", etc.	O	O	A + G	-	-	This data field contains the storage/retrieval operation. Standard: "+"= Store articles, "-" = Retrieve articles For other customer-specific storage/retrieval operations, other displayable characters can be used that may be selected as desired. These appear in the fourth line.
Q	Specified quantity	1 - 8	0 - 99999999	O	O	A + G	-	-	This data field contains the nominal quantity to be stored/retrieved. It appears in the fourth line of the display.
M	Actual quantity	1 - 8	0 - 99999999	O	O	-	-	Z	If this data field has been transmitted with "0" as the content, when the data record/job record is processed, the actual stored/retrieved quantity is entered and acknowledged in this data record.
B	Inventory	1 - 8	0 - 99999999	O	O	-	A + G	-	This data field contains the inventory at storage location.
P	Total inventory	1 - 8	0 - 99999999	O	O	-	A + G	-	This data field contains the total inventory of the article.
R	Minimum inventory	1 - 8	0 - 99999999	O	O	-	A + G	-	This data field contains the minimum inventory of the article.

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Code	Name	No. of characters	Contents	Data record	Job	Operator prompts	Info browser	Keyboard input	Comment
p	Priority	1 - 3	1 - 255	O	O	-	A + G	-	This data field contains the priority with which a data record/job is to be processed. Data records with higher priority are given preference to those with lower priority. 1 = low priority 255 = high priority If no priority field is transferred, "100" is assumed. For jobs, all job items must have the same priority. For article data records / jobs of equal priority, the processing sequence is determined by the sequence in which they were received.
d	Date	6	ddmmyy	O	O	-	-	-	If this field is transferred with "0" as its contents, the transfer date is entered first. After the data record/item is processed, the processing date is entered.
u	Time	4	hhmm	O	O	-	-	-	If this field is transferred with "0" as its contents, the transfer time is entered first. After the data record/item is processed, the processing time is entered.
W	Status	2	00 - 02	O	O	-	-	-	This data field contains the status of the data record. 00 = New data record For reading back: 01 = Data record processed 02 = Data record could not be processed, as storage location was not found. The data field is not displayed. The data field is appended if not transferred.

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Code	Name	No. of characters	Contents	Data record	Job	Operator prompts	Info browser	Keyboard input	Comment
C01 - C10	Special data Cxx	1 - 40	alpha-numerical	-	O	-	A + G	X	These 10 special data fields can contain additional job-related data. All items of a job must have the same entries.
U01 - U10	Special data Uxx	1 - 40	alpha-numerical	O	O	-	A + G	X	These 10 special data fields can contain additional data record-related or job item-related data. In conjunction with the "e" field, these data fields can also be queried.
e	Properties	1 - 40	alpha-numerical	O	O	-	-	-	In the properties field, enter the U special data fields to be entered at the keyboard (up to 10 data fields). The U special data fields to be queried can vary. Example: Data record / item ... U01U05 ...
h	Alternative storage locations	80	numerical (Integer)	O	O	G	-	-	In this control data field, alternative storage location recommendations can be transferred, which can then be called up using the 'p' operation or the "Remaining quantity storage" function. Each storage location has 10 characters. Up to 8 storage locations can be entered successively in the data field. E.g.: hLLTTTFFFOOLLTTTFFFO OLLTTTFFFOOLLTTTFFFO OO LL = Lift number TTT = Shelf number FFF = Compartment number OO = Compartment depth number Note: If an h-field is transferred, then a g-field must also be transferred.

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Code	Name	No. of characters	Contents	Data record	Job	Operator prompts	Info browser	Keyboard input	Comment
g	Alternative container	56	numerical (Integer)	O	O	G	-	-	In this control data field, containers that are suitable to the alternative storage location recommendations can be transferred, which can then be called up using the 'p' operation or the "Remaining quantity storage" function. Each container has 7 characters. Up to 8 containers can be entered successively in the data field. The container character in the g-field corresponds to the storage location of the same character in the h-field. E.g.: gFFFOOHHFFFOOHH FFFOOHHFFFOOHH FFF = Direction of compartments OO = Direction of compartment depth HH = Height If the g-field is empty, the container from data field 'G' is used for all alternative storage locations.

Remark:

O = Optional

Z = Transfer of this data field is mandatory.

Z = Mandatory

A = Activated (data field has been activated via the Jacomman configuration software)

G = Sent (data field has been sent along in the data record)

- = Not supported.

X = Supported

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5 Error codes of the MP 14-H[HOST-DATA] host communication

Terms

- MP = MP 14-H[HOST-DATA] control system
 Host communication (JACOM) = Host communication software of the MP
 Host FTP server = FTP server on the host system
 Host SFTP server = SFTP server on the host system
 Host (S)FTP server = FTP or SFTP server on the host system
 Host CIFS server = Windows File Sharing or Samba server on the host system
 SOAP = data transfer via web service using the SOAP protocol
- x The error codes appear in the response file and the host communication log.
 - x For a web service using SOAP, the error codes are displayed "errorNumber" parameter for returnValue 7.

Error code	Data exchange	Source	Description	Action
E300	FTP / SFTP / CIFS	MP host communication	Host communication cannot be started.	Internal error.
E301	FTP / SFTP / CIFS	MP host communication	Default initialisation cannot be written in file.	Internal error.
E302	FTP / SFTP	MP host communication	Unknown host.	Check TCP/IP address.
E303	FTP / SFTP	MP host communication	Host cannot be reached/timeout.	Check TCP/IP address.
E304	FTP / SFTP	MP host communication	Host (S)FTP server not responding.	Activate the (S)FTP server.
E305	FTP	Host FTP server	Error in connection setup.	Check FTP server settings.
E306	FTP	Host FTP server	Unknown user name.	User / FTP server; check rights.
E306	SFTP	Host SFTP server	Failed authentication.	Verify the account user / password.
E307	FTP	Host FTP server	Incorrect password.	Password / FTP server; check rights.
E308	FTP / SFTP	Host (S)FTP server	Error in changing directories.	Check (S)FTP server rights.
E309	FTP / SFTP	Host (S)FTP server	Directory could not be listed.	Directory / (S)FTP server; check rights.
E310	FTP	Host FTP server	File could not be downloaded.	Directory / FTP server; check rights.
E311	FTP	Host FTP server	Error in closing the download connection.	Internal error.
E312	FTP / SFTP / CIFS	Host file server	File could not be deleted.	Directory / file server; check rights.
E313	FTP / SFTP / CIFS	MP host communication	JACOM upload source directory not found.	Check the directory.

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Error code	Data exchange	Source	Description	Action
E314	FTP / SFTP	Host (S)FTP server	Host (S)FTP server file could not be uploaded.	Directory / (S)FTP server; check rights.
E315	FTP	Host FTP server	Host FTP server error in closing the upload connection.	Internal error.
E316	FTP	Host FTP server	Host FTP server does not support PASSIVE MODE.	Check FTP server.
E317	FTP	Host FTP server	Host FTP server: unknown response.	Check FTP server.
E318	FTP / SFTP	MP host communication	JACOM download target directory not found.	Check the directory.
E319	FTP / SFTP / CIFS	MP host communication	JACOM conversion source directory not found.	Check the directory.
E320	FTP / SFTP / CIFS	MP host communication	JACOM conversion target directory not found.	Check the directory.
E321	FTP / SFTP / CIFS	MP host communication	JACOM conversion error.	Check conversion parameters.
E322	FTP / SFTP / CIFS / SOAP	MP host communication	JACOM directory not found Error adding data record. Error adding job.	Check the directories. Check data record structure. Check job structure.
E323	FTP / SFTP / CIFS	MP host communication	MP-JACOM connection could not be set up.	Start MP control system.
E326	FTP / SFTP	MP host communication	JACOM host (S)FTP server communication incorrect.	TCP/IP connection error. The file must be saved as "UTF-8".
E327	FTP / SFTP	Host (S)FTP server	Host (S)FTP server error in reading download file.	TCP/IP connection error.
E330	FTP / SFTP / CIFS	MP host communication	JACOM WebComServer could not be started.	Internal error.
E331	FTP / SFTP / CIFS	MP host communication	JACOM WebComServer connection refused.	Internal error.
E334	FTP / SFTP / CIFS	MP host communication	Host request file command unknown	Check syntax.
E337	FTP / SFTP / CIFS / SOAP	MP host communication	Command is not supported.	Check syntax.
E348	FTP / SFTP / SOAP	MP host communication	Job is in progress or has already been partially processed.	A job can only be deleted if it is new.
E350	FTP / SFTP	MP host communication	Incorrect character encoding.	The file must be saved as "UTF-8".
E352	FTP / SFTP / CIFS	MP host communication	Error in data transfer host-JACOM.	See system protocol.

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Error code	Data exchange	Source	Description	Action
E353	FTP / SFTP / CIFS	MP host communication	Host file server disconnected.	File server inactive.
E360	FTP / SFTP / SOAP	MP host communication	Job not found.	Specify a different job number.
E362	FTP / SFTP	MP host communication	Error converting data record data or job buffer data.	Check conversion parameters.
E363	FTP / SFTP / CIFS / SOAP	MP host communication	Buffer data (data record / job items) not accepted.	Total number of buffer data records too high. Number of new buffer data + number of buffer data in input buffer + number of buffer data in output buffer > 5000. Remedy: Read / delete the processed items from the output buffer. Process unprocessed buffer data.
E370	FTP / SFTP / CIFS / SOAP	MP host communication	General syntax error. Error at character (x)	Check the syntax of the buffer data record at position (x).
E371	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'K'.	Check data field 'K'.
E372	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'S'.	Check data field 'S'.
E373	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'N'.	Check data field 'N'.
E374	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'L'.	Check data field 'L'.
E375	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'E'.	Check data field 'E'.
E376	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'T'.	Check data field 'T'.
E377	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'F'.	Check data field 'F'.
E378	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'O'.	Check data field 'O'.
E379	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'G'.	Check data field 'G'.
E380	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'R'.	Check data field 'R'.
E381	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'P'.	Check data field 'P'.
E382	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'B'.	Check data field 'B'.

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Error code	Data exchange	Source	Description	Action
E383	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'V'.	Check data field 'V'.
E384	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'Q'.	Check data field 'Q'.
E385	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'M'.	Check data field 'M'.
E386	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'W'.	Check data field 'W'.
E387	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'p'.	Check data field 'p'.
E388	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'd'.	Check data field 'd'.
E389	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'u'.	Check data field 'u'.
E390	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'U01'.	Check data field 'U01'.
E391	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'U02'.	Check data field 'U02'.
E392	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'U03'.	Check data field 'U03'.
E393	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'U04'.	Check data field 'U04'.
E394	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'U05'.	Check data field 'U05'.
E395	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'U06'.	Check data field 'U06'.
E396	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'U07'.	Check data field 'U07'.
E397	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'U08'.	Check data field 'U08'.
E398	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'U09'.	Check data field 'U09'.
E399	FTP / SFTP / CIFS / SOAP	MP host communication	Syntax error in data field 'U10'.	Check data field 'U10'.
E400	FTP / SFTP / CIFS / SOAP	MP host communication	Unknown data field.	Check buffer data record.
E401	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'C01'.	Check data field 'C01'.
E402	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'C02'.	Check data field 'C02'.

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Error code	Data exchange	Source	Description	Action
E403	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'C03'.	Check data field 'C03'.
E404	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'C04'.	Check data field 'C04'.
E405	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'C05'.	Check data field 'C05'.
E406	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'C06'.	Check data field 'C06'.
E407	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'C07'.	Check data field 'C07'.
E408	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'C08'.	Check data field 'C08'.
E409	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'C09'.	Check data field 'C09'.
E410	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'C10'.	Check data field 'C10'.
E411	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'e'.	Check data field 'e'.
E412	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'h'.	Check data field 'h'.
E413	FTP / SFTP / CIFS	MP host communication	Syntax error in data field 'g'.	Check data field 'g'.

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6 Configuration software for the host communication

6.1 Features

The following settings are possible using the configuration software (JacomMan):

- ◆ Configuration of the MP 14-H[HOST-DATA] host communication
 - Export and local saving of the host communication parameters
 - Initialisation of the supplementary module
 - Initialisation of job processing
 - Definition of the data fields which are to be displayed.
- ◆ Host connection via file transmission FTP / SFTP / CIFS
 - ◆ Specifying the file server
 - ◆ Defining the host connection parameters
 - ◆ Enabling/disabling the data exchange
 - ◆ Defining the data conversion of article buffer files
 - ◆ Defining the data conversion of job buffer files
 - ◆ Display of the log file
- ◆ Host connection via web service / SOAP
- ◆ Extensive help in clarifying the individual functions.

6.2 Installation

Prerequisites for operating the configuration software

- ◆ Windows 7 / Windows 10
- ◆ jacm_vxx_vm.exe -> 200 MB available hard disk space

Installation on the service or customer computer

- x The configuration software can be downloaded and installed from the documentation DVD.
- x To install, double-click the file "jacm_vxx_vm.exe".
- x Select the installation directory (default is "C:\jacomman").
 - ➔ The installation files are unpacked. After the installation, the files "jacomman.jar" (Java Archive) and jacomman.bat are in the installation directory.
 - ➔ For the file "jacm_vxx_vm.exe", a separate JRE is also in the directory.
- x Double-click the file "jacomman.bat" in the installation directory.

The configuration software is started. After the software is called up for the first time, a window opens automatically for displaying the operating mode.

- x Select MP 14-H[HOST-DATA].
- x If there are problems, open the file "jacomman.bat" in the installation directory and check the directory paths.

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6.3

General operating instructions

The program contains the following menus:

Menu	See Chapter	Page
Transfer	6.4	131
Communication	6.5	132
File types (not for web service)	6.6	135
Configuration	6.7	142
Conversion (not for web service)	6.8	144
File transfer (not for web service)	6.9	147
Log (not for web service)	6.10	148
Information	6.11	148

The program offers the following basic functions:

Symbols	Function
Right arrow button 	Go to next page
Left arrow button 	Go to previous page
Help button 	Call up help
Hand button  	Applying the settings on a page x Caution: To save the settings for a page, you must click the hand button before navigating away from the page. The hand symbol then turns into a fist symbol. This indicates that the settings on the current page have been applied to the configuration software. x The changes, however, are not applied to the host communication of the MP control system until the configuration data have been sent to the MP control system. See Chapter 6.12 on page 149.

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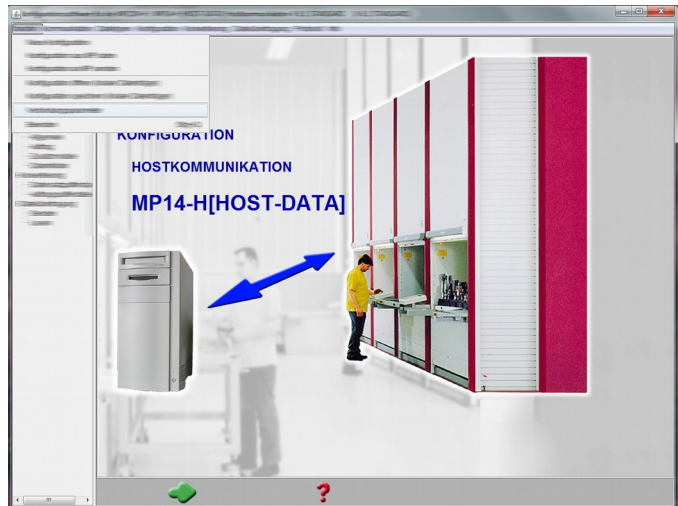
6.4 "Transfer" menu

Description of the operator prompts

The following functions are possible in the "transfer" menu:

- ◆ **New configuration:** The factory settings are loaded into the configuration software.
- ◆ **Load configuration from MP:** The current settings of the MP control system are loaded into the configuration software.
- ◆ **Send configuration to MP:** The settings loaded in the configuration software are transferred to the MP control system.
- ◆ **Open configuration (local data carrier):**
A configuration file (*.prop) is loaded by a local data carrier.
- ◆ **Save configuration (local data carrier):**
The settings loaded in the configuration software are saved on a local data carrier.
- ◆ **Connection parameters:**
 - x For an installation in a corporate network, use the "IP address in corporate network" of the MP control system.
 - ◆ With DHCP / DNS operation:
Enter MP name, e.g. mp14-58p320s7-9
 - ◆ Without DHCP / DNS operation:
Enter the "IP address in corporate network" of the MP control system, e.g. 192.168.1.1 (network administrator).
 - x For an installation on a service computer, use the "IP address in multi-unit network" of the MP control system.
 - ◆ This requires the service computer and MP control system to be within the same subnet (e.g.: 172.16.0.0/16).
 - ◆ The access point number, for example 1 (x.x.1.x), and the lift number, for example 2 (x.x.x.2), of the master lift/carousel must be known.
Sample IP address: 172.16.2.1
 - x For instructions regarding the IP addresses of the MP control system, refer to the "Technical Description of the MP 14", or consult the network administrator.
- ◆ **Close:** The configuration software is closed.

Display



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6.5 "Communication" menu

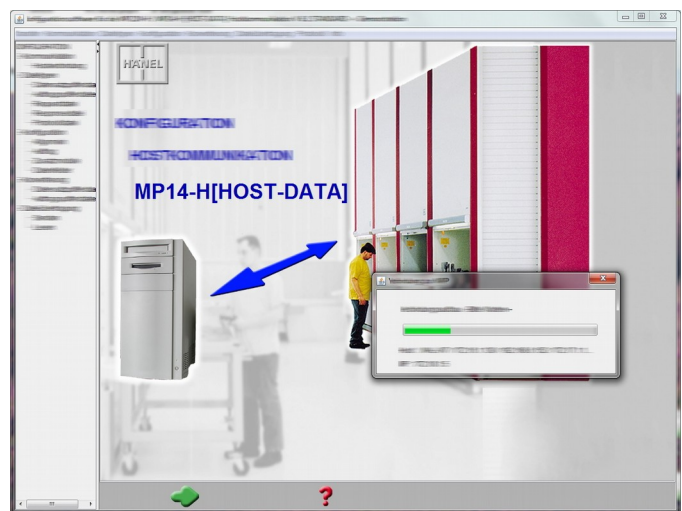
The HÄNEL multi-unit network is connected to the corporate Ethernet via the MP control system from access point 1 of the master lift/carousel. The master lift/carousel is configured in the initialisation.

Description of the operator prompts

Establish connection to MP control system

- x After the program start, click the right arrow button.
- The configuration software attempts to establish a connection to the MP control system and load the configuration data.
- x If you want to load these data again, you can do so in the menu "Transfer" -> "Load configuration from MP".

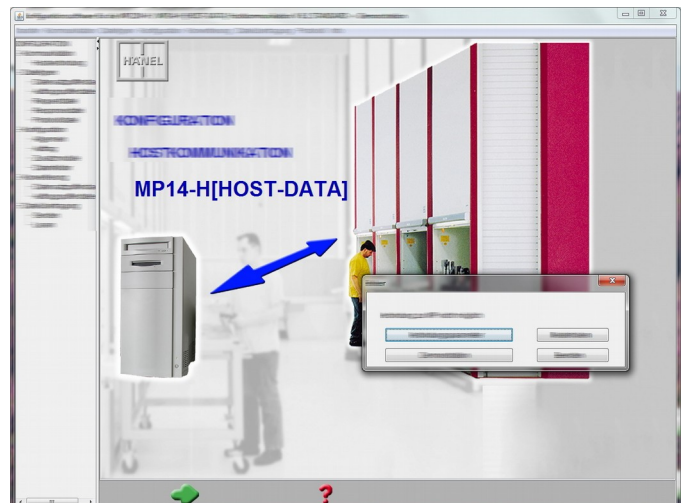
Display



- If no connection can be established with the MP control system, the "Connection to MP not possible" message appears.

The following functions are available:

- ◆ **Connection parameters:** You can change the name or IP address of the MP control system here.
- ◆ **Demonstration:** A demo version of the configuration software is started here. No connection to the MP control system is necessary to do so.
- ◆ **Repeat:** Another attempt is made to establish a connection to the MP control system.
- ◆ **Close:** The configuration software is closed.



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6.5.1 Host connection

Description of the operator prompts

Define parameters for host communication

- x In the "Communication" menu, select the "Host connection" menu item.
- x Configure connection parameters.

FTP client:

Selects the FTP client for host communication via file transfer protocol with an FTP server. (RFC 959)

SFTP client (SSH FTP): (alternative)

Selects the SFTP client for host communication via SSH file transfer protocol (encrypted) with an SFTP server.

CIFS client (SMB / CIFS): (alternative)

Selection of the CIFS client for host communication via CIFS protocol (for example, for Windows File Sharing / Samba server).

Web service server (SOAP): (alternative)

Selection of the web service server for host communication via the SOAP 1.1 protocol.

inactive:

- ◆ For "active": The host communication of the MP control system is activated
- ◆ For "inactive": The host communication of the MP control system is deactivated. Host communication is not possible.

MP 14-H[HOST-DATA]:

The IP in the multi-unit network and the IP in the corporate network are displayed for informational purposes.

Host / PC-System ((S)FTP/CIFS server): (not for web service)

You have to enter the IP address of the host / PC system on which the file server is installed.

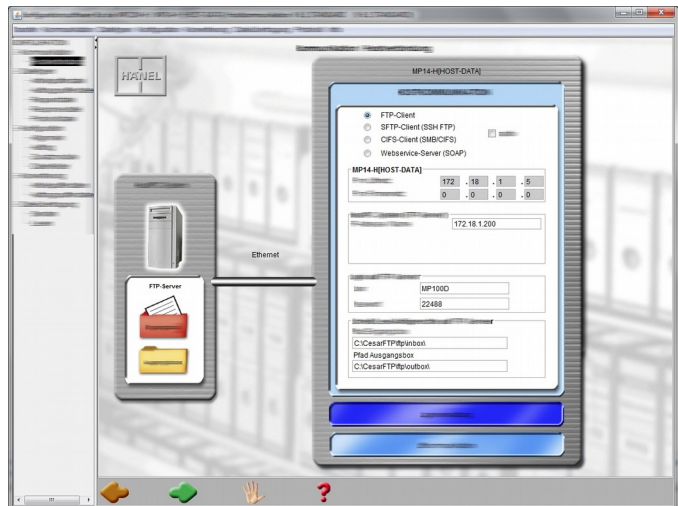
Alternatively, it is possible to enter the DNS name of the file server as long as the MP 14-H[HOST-DATA] obtains its IP address via DHCP.

See Chapter 2.1 on page 70.

Release name: (not for FTP/SFTP and web service)

When using the CIFS protocol, the share name of the transfer directory containing the inbox and outbox has to be entered here additionally.

Display



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Login on (S)FTP / CIFS server: (not for web service)

The values configured here for "User" and "Password" are factory settings. They can be changed as desired. When doing this, you must ensure that these settings match those of the file server. The file server may restrict the number of characters or the type (numeric or alphanumeric) of characters used here. A domain can be specified on a CIFS server for MP control system V5.0 and later as necessary. For older MP control systems, the domain must be entered in the "Domain\User" form.
See Chapter 2.1 on page 70.

Read / write / append rights to (S)FTP/CIFS server (not for web service):

Here, specify the absolute or relative path, including the name of the directory for the inbox and outbox.
See Chapter 2.1 on page 70.

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6.6 "File types" menu (not for web service)

Through the configuration of the file types, the MP 14-H[HOST-DATA] host communication receives information on the type of file, the time sequence of transfer and the structure of the file.

In the "File types" menu, certain parameters have to be assigned to the file types:

- ◆ **File name extension:**
File names must have the form `<filename>.<ext>`. `<ext>` is the file name extension.
File name extensions can be selected as desired. However, different file types must also be assigned different extensions.
- ◆ **Polling cycle of the MP (S)FTP / CIFS client:**
The polling cycle determines the time which elapses before the MP control system polls the output box of the host file server for a specific file type.
The polling cycle can be set separately for the individual file types and the request file (1-360 sec.).
- ◆ **Reading back individual job items:**
If this function is enabled, individual processed job items can be read back even while the job is still in progress.
- ◆ **Reading back complete jobs:**
If this function is enabled, a job cannot be read back until it has been completely processed.
- ◆ **Cyclical acknowledgement:**
After a certain cycle time, processed jobs/job items can be cyclically sent by the MP control system to the inbox of the file server.
- ◆ **Output cycle of the (S)FTP/CIFS client:**
When cyclical acknowledgement is enabled, here define the time after which the MP control system outputs the processed jobs / job items to the inbox of the file server (1-360 min.).
- ◆ **File name:**
If cyclical acknowledgement is enabled, here assign the file name to the file that contains the processed job items.
- ◆ **(8.3) Notation:**
The response file is stored by default under the file name "yyyymmdd-hhmmss.res". Enabling 8.3 notation shortens this to yyyymmdd.res.
yyyy = year
mm = month
dd = day
hh = hours
mm = minutes
ss = seconds

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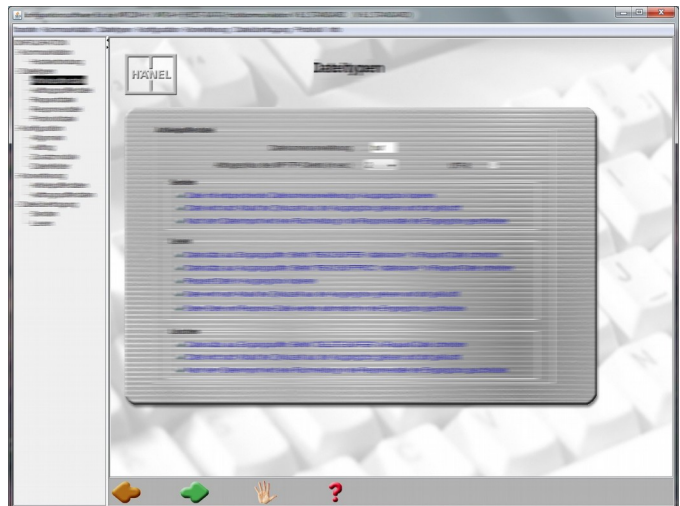
6.6.1 Article buffer file (not for web service)

Description of the operator prompts

Configuring an article buffer file

- x Select the "Article buffer file" file type in the navigation bar.
- The "Article buffer file" display is shown.
- x Enter the file name extension.
- x You cannot enter file name extensions that have been assigned for other file types. The default ending is *.buf.
- x Select "Polling cycle of the MP (S)FTP client".
- x You can select this in defined increments between 1 and 360 seconds. The default time is 2 seconds.

Display



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6.6.2 Job buffer file (not for web service)

Description of the operator prompts

Configure job buffer file

- x Select the file type "Job buffer file" in the navigation bar.
- The "Job buffer file" display is shown.
- x Enter the file name extension.
- x You cannot enter file name extensions that have been assigned for other file types. The default ending is *.jbf.
- x Select "Polling cycle of the MP (S)FTP client".
- x You can select this in defined increments between 1 and 360 seconds. The default time is 2 seconds.

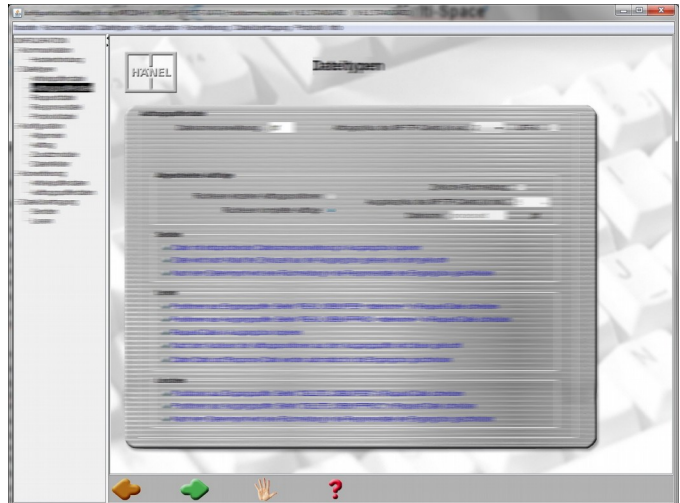
Processed jobs

- x Select "Reading back individual job items":
- Processed job items can be read back even if the job has not yet been completely processed.
- x Select "Reading back complete jobs".
- Processed jobs can be read back only if the job has been completely processed.
- x Default value is "Reading back complete jobs".
- x Caution: Changing this setting will result in a confirmation prompt being displayed. If this is confirmed, the entire job input buffer is deleted.

Cyclical acknowledgement

- x Select "Cyclical acknowledgement".
- The processed job records are cyclically reported back to the inbox of the (S)FTP server in the form of a file. The processed job records are added to this file automatically. This function is disabled by default.
- x Setting "Output cycle of the MP (S)FTP client".
- x You can select this in defined increments between 1 and 360 min. The default value is 5 min.
- x Enter the file name for the processed job records to be reported back cyclically.
- The file is stored under this name in the inbox of the (S)FTP server.

Display



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6.6.3 Request file (not for web service)

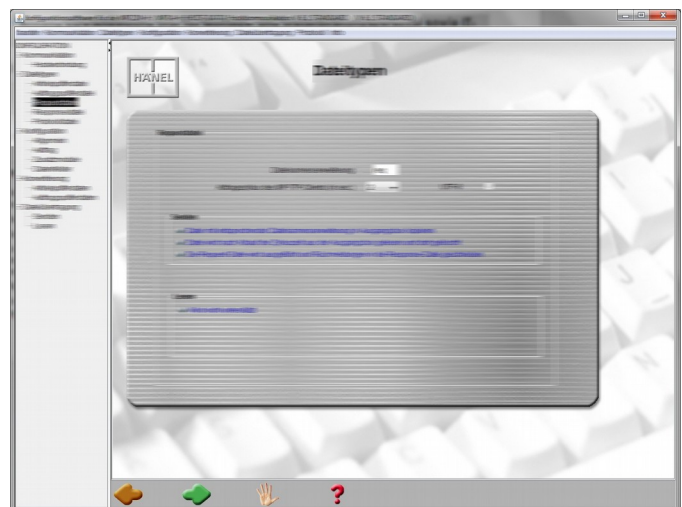
- x The request file contains commands.
See Chapter 2.6.3 on page 79.

Description of the operator prompts

Configure request file

- x Select the file type "Request file" in the navigation bar.
→ The "Request file" display is shown.
- x Enter the file name extension.
- x You cannot enter file name extensions that have been assigned for other file types. The default ending is *.req.
- x Select "Polling cycle of the MP (S)FTP client".
- x You can select this in defined increments between 1 and 360 seconds. The default time is 2 seconds.

Display



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6.6.4 Response file (not for web service)



- x Acknowledgements from the MP control system are saved in the inbox as a status line in the response file.
See Chapter 2.6.4 on page 80.

Structure of the file name

The file name of the response file has the following default structure:
yyyymmdd-hhmmss.res

yyyy	= year	hh	= hour
mm	= month	mm	= minute
dd	= day	ss	= second

Description of the operator prompts

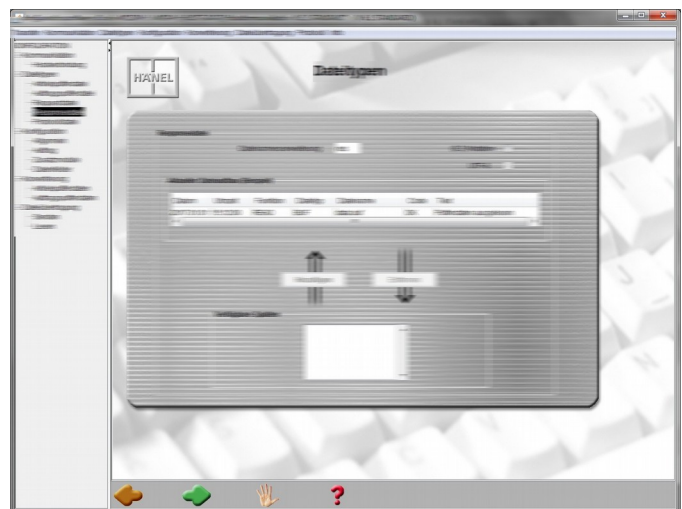
Configure response file

- x Select the file type "Response file" in the navigation bar.
- The "Response file" display is shown.
- x Enter the file name extension.
- x You cannot enter file name extensions that have been assigned for other file types. The default ending is *.res.
- x If necessary, enable the tick box next to "(8.3) Notation".
- x In this case, the file is saved in the form **"yyyymmdd.res"**.
- x Adapt the file structure if necessary.

Move field:

- x Left-click one of the grey fields, such as Date, Time, Function etc. and hold the mouse button down.
- x Move the field towards the left or right into the desired position.
- The field sequence of the subsequent response file has been defined.

Display



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Remove field from file structure:

- x Left-click one of the white fields.
- The selected field is marked.
- x Click the **Remove** button.
- The selected field has been moved from "Current file structure" to the "Available columns" selection list.

Add field to file structure:

- x Select the field in the "Available columns" selection list and click the **Add** button.
- The selected field has been added to the rear in "Current file structure".

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6.6.5 Log file (not for web service)



The log file records the communication between the (S)FTP server and (S)FTP client or the storage management system. The data record structure of the log file can be configured.

- x The file name extension is set by default to ".log" and cannot be changed.
- x The log file can be read out using the configuration software.

Description of the operator prompts

Configure log file

- x Select the file type "Log file" in the navigation bar.
- x Adapt the file structure if necessary.

Move field:

- x Left-click one of the grey fields, such as Date, Time, Function etc. and hold the mouse button down.

- x Move the field towards the left or right into the desired position.

→ The field sequence of the subsequent log file has been defined.

Remove field from file structure:

- x Left-click one of the white fields.

→ The selected field is marked.

- x Click the **Remove** button.

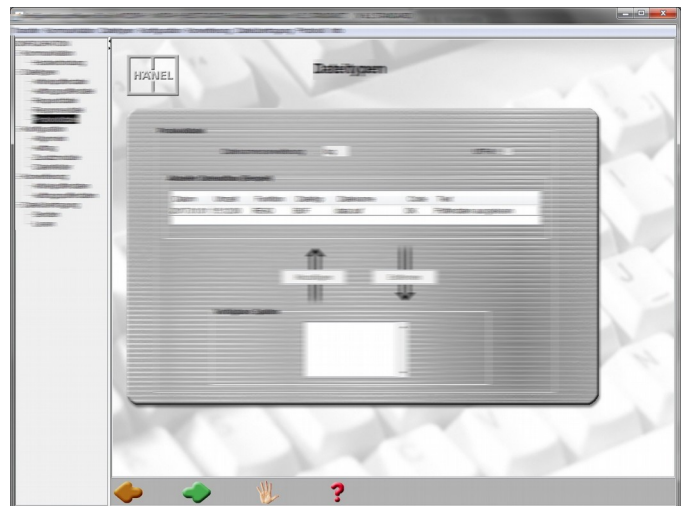
→ The selected field has been moved from "Current file structure" to the "Available columns" selection list.

Add field to file structure:

- x Select the field in the "Available columns" selection list and click the **Add** button.

→ The selected field has been added to the rear in "Current file structure".

Display



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6.7 "Configuration" menu

6.7.1 General

Setting option for the date format. The following setting options are available: "ddmmyy" and "mmddyy".

yy = Year
mm = month
dd = day

6.7.2 Data fields

Configuration of the data fields that can be transmitted in the data record and in the job record. This affects the conversion, the data fields that can be transmitted, their size and the displayed field names.

Description of the operator prompts

- x Select the file type "Configuration of data fields" in the navigation bar.
- The "Configuration of data fields" display appears.

Select data field

- x For data record and job record, activate the corresponding data fields by clicking the tick boxes.
- x C-special data fields can be enabled in the job record only.

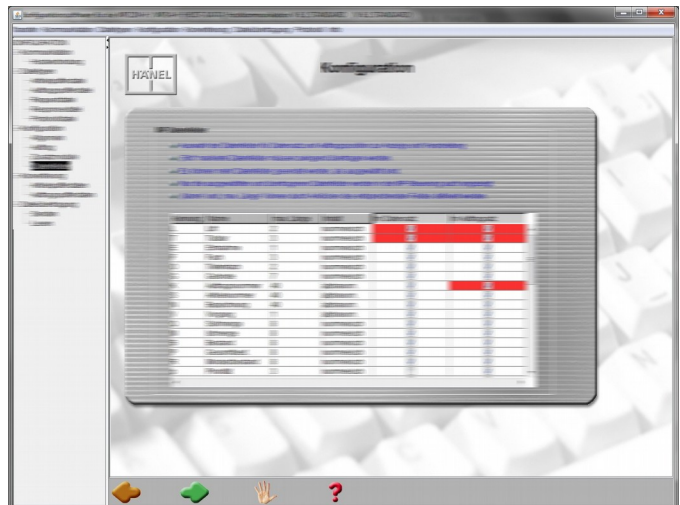
The following applies for FTP / SFTP / CIFS:

- x For conversion from the CSV format, only those data fields can be converted and displayed for which a tick mark has been set in the data record or job record.
- x Without conversion, only the data fields can be displayed for which a tick mark has been set in the data record or job record.
- x Without conversion, data fields can be sent and read back even if no tick mark is set for them.

The following applies for web service:

- x Data fields are only displayed which have been marked with a check in the data record or job record. Furthermore, data fields can only be sent or read back if no tick mark is set for them. The host system determines which data fields can be sent in this process.

Display



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Description of the operator prompts

Display

- x **Enter/modify the data field name and number of characters.**
- x Click the row/column of the desired data field.
- x The "Configuration" window opens.
- x Enter/change user-defined names, e.g. ID number.
- x For alphanumeric data fields:
Enter the maximum length of the data field contents.
- x Each sent data field is checked for the maximum length specified here.

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6.8 "Conversion" menu (not for web service)



The "Conversion" menu defines how a conversion takes place from the CSV format to the Hänel MP format and back. The prerequisite is the correct configuration of the data fields.

See Chapter 6.7.2 on page 142.

6.8.1 Article buffer data (not for web service)

The import/export converter of the MP control system can be configured such that comma-separated files (CSV files) can be sent to the MP control system (import) or read out from the MP control system (export).

Description of the operator prompts

- x Select "Article buffer data conversion" in the navigation bar.

Set delimiter

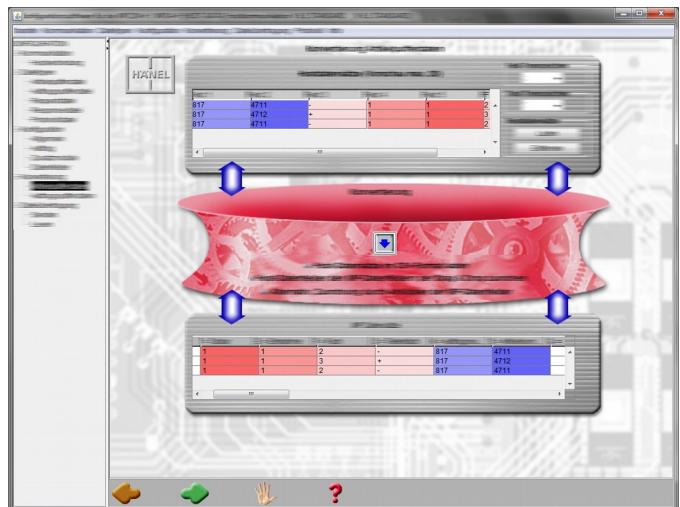
Field separator:

- x Depending on the structure of the CSV file, a field separator for the individual fields must be selected here.
- x The following characters in brackets can be selected: (;), (,), (:), (SPACE), (TAB).
- x However, it is also possible to enter characters manually. When doing this, these characters must not have already been used in the data fields to be transferred.

Text separator:

- x A few programs export alphanumeric data fields in text separators.
- x The following characters in parentheses can be selected: ('), (' '), (").
- x However, it is also possible to enter characters manually. When doing this, these characters must not have already been used in the data fields to be transferred.

Display



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Description of the operator prompts

Display

Preview host data records

Requirements: The field and text separators are configured and the file to be loaded is adapted correspondingly.

- x Select a test file using the Load button.
- The data in this file are taken over as host data records.
- The data are written into the fields corresponding to the field separators defined for this file. A maximum of 20 data records are displayed in a preview. Errors can be detected and corrected.
- x You can delete the test file from the view using the **Remove** button.

Assign host data fields corresponding MP data fields

There are two options for selecting the fields of the host data records:

1. Load a CSV file using Host data records. Then use drag and drop to copy one column from the "Host data records" to "MP data records".
2. Double-click the desired field column of the MP data record.

In both cases, a "Configuration" window opens.

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Description of the operator prompts

- The "Configuration" window opens.
- x All settings made here apply to sending to the MP control system (import) and to reading from the MP control system (export). See Chapter 2.5 on page 74.
- x Select or enter the parameters for the article buffer file to be transferred.

Host data field:

The host data fields are specified in detail here.

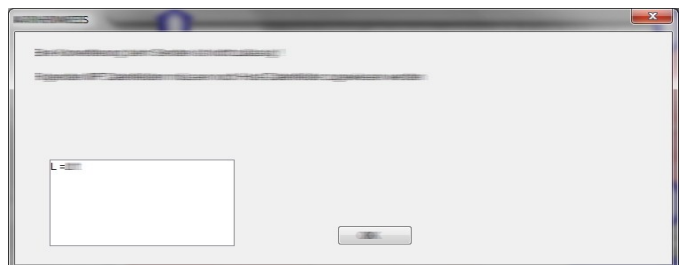
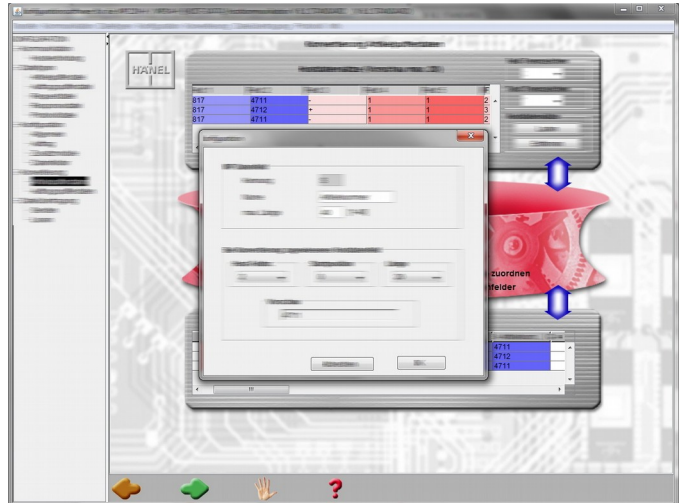
- ◆ **Host field number:** Specifies which host data field of the host data record is to be defined. (Applies to Send and Read). To delete an allocation, you have to select "---" here.
- ◆ **Start position:** Here you have to set the position within the host data field at which conversion is to start. (Only applies to Send. The setting is ignored for the reading process.)
- ◆ **Length:** The number of digits for the data field must be defined here. (Only applies to Send. Setting is ignored for Read.)

MP data field:

The data field of the MP control system (e.g. S = article number) that is to correspond to this host data field must be specified here.

- x Click the **OK** button.
- Host data field has been assigned to an MP data field and is highlighted in colour.
- x Repeat steps for additional host data fields to be converted.
- x Click the hand button to accept the settings.
- x It is mandatory for the lift number and shelf number to be transferred.
- If one of these fields is not defined and you click the hand button, a warning appears. Only when all mandatory data fields have been assigned is the warning cleared, and conversion during sending is possible.
- x If a host data field is allocated to multiple MP data fields, a warning message appears. However, such an assignment is permitted for the conversion during reading in only. In this case, a conversion during read out is not permitted.

Display



9 Annex: Integration into the IT system (for installation and maintenance personnel as well as IT specialists)

6.8.2 Job buffer data (not for web service)



The sequence corresponds to "Article buffer data conversion" Chapter 6.8.1 on page 144.

6.9 "File transfer" menu (not for web service)



The "File transfer" menu defines which file types have to undergo a conversion from the CSV format to the Hänel MP format and vice versa. If a conversion is to be carried out, the prerequisite is that the conversion is set correctly. See Chapter 6.8.1 on page 144 and Chapter 6.8.2 on page 147.

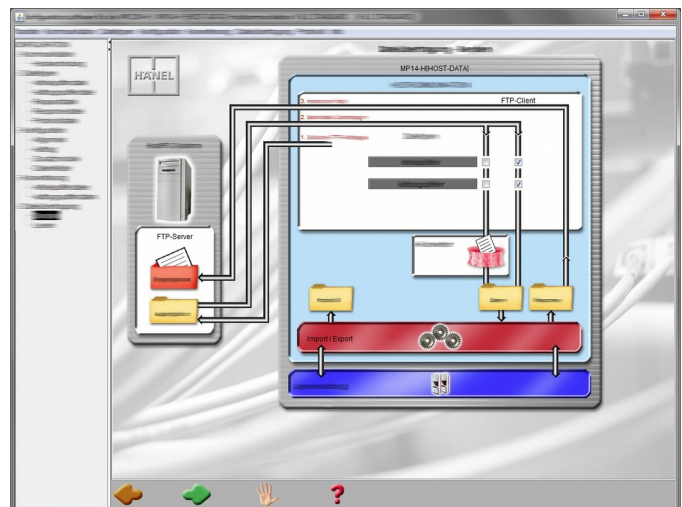
6.9.1 Send to MP control system (import) (not for web service)

Description of the operator prompts

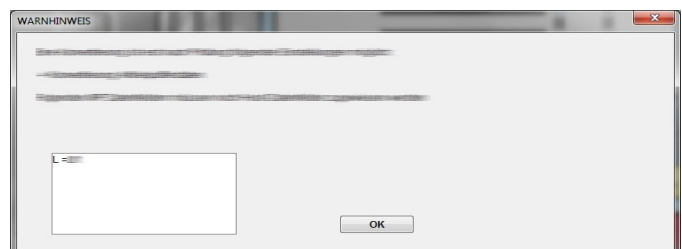
Activate with conversion / without conversion

- ➔ Under "File types", there is a list of files that can be sent. You can choose between the article buffer file and job buffer file.
- ➔ Two white tick boxes appear to the right of the possible file types.
- x Enable the left tick box if the file is to be converted. Here, the MP data fields must have been assigned corresponding host data fields.
- x Enable the right tick box if the file is to be sent directly to the MP control system in the Hänel format.

Display



- ➔ An error message appears if the mandatory MP data fields have not yet been assigned host data fields.
Error message text: "Conversion is only possible when the following settings have been checked: Article buffer data conversion"



9 Annex: Integration into the IT system (for installation and maintenance personnel as well as IT specialists)

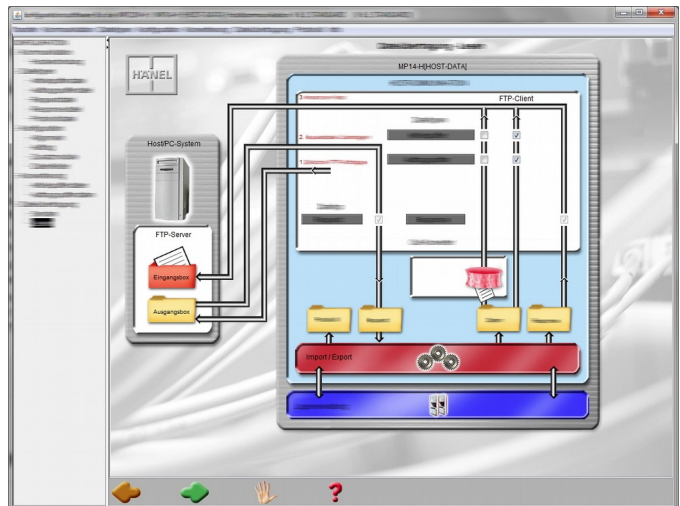
6.9.2 Read from MP control system (export) (not for web service)

Description of the operator prompts

Activate with conversion / without conversion

- ➔ Under "File types", there is a list of files that can be read. You can choose between the article buffer file and job buffer file.
- ➔ Two white tick boxes appear to the right of the file types.
- x Enable the left tick box if the file is to be converted.
- x Enable the right tick box if the file is to be sent directly from the MP control system in the Hänel MP data record format.

Display



6.10 "Log" menu (not for web service)

- x In the "Log" menu, the internal log file can be deleted or displayed.
- x When the log file is displayed, all saved log entries are shown in a separate window. The form of the log entries can be configured. See Chapter 6.6.5 on page 141.

6.11 "Info" menu

In the "Info" -> "Settings" menu you can configure the following parameters:

- x Language (DE, EN, FR etc.)
- x Font (Arial etc.)
- x Program version ("MP 12N-H[HOST-DATA] / MP 14-H[HOST-DATA]" or "MP100D / MP 12N-S / MP100D-5 / MP 14-S" when the program is started)
- x Password (password prompt when the program is started)
 - No (no password prompt)
 - Yes (password can be entered or applied)
 - New password (password can be overwritten)

9 Annex: Integration into the IT system (for installation and maintenance personnel as well as IT specialists)

6.12 Send configuration to MP control system

Description of the operator prompts

The data are not applied in the host communication of the MP control system until the configuration is sent to the MP control system.

Send configuration data to MP control system

Requirements: All settings have been accepted using the hand button.

- x After the last window is displayed, click the **right arrow** button.
- or
- x In the "Transfer" menu, select the "Send configuration to MP" menu item.
- The window to the right opens.
- x Click the **Yes** button.
- Configuration settings are sent to the MP control system.

Send configuration data to MP control system when exiting the program

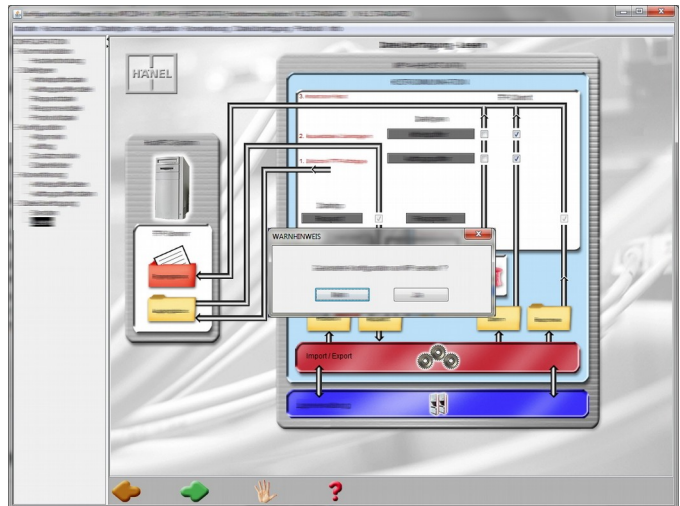
Requirements: All settings have been accepted using the "hand" button.

- After the program is closed or cancelled, the window shown above is opened.
- x Click the **OK** button.
- Configuration settings are sent to the MP control system.

Configuration settings are sent to the MP control system.

- x Note that at this time, no more processing may take place in the MP multi-unit network. Otherwise, the result would be that data records are no longer registered and jobs are cancelled, because the host communication is restarted.
- When the lift/carousel is subsequently operated, a note will be displayed to indicate that an automatic update will be carried out between the MP control system and buffer management.
- After you confirm with the **[CE]** key, the MP control system returns to the last operated menu item.
- If the data records and jobs are not deleted explicitly, you can continue operation on the lift/carousel subsequently.

Display



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7 SOAP monitor

For development purposes, a SOAP monitor is available. This SOAP monitor can be used to monitor the SOAP protocol between the Web application server and the MP control system.

Calling up in the PC browser via the URL:

"<http://<IP address of MP control system>/jwsdata/SOAPMonitor>"



The free demonstration software "IT Integration Tool" has an integrated SOAP monitor. This can be used to monitor the SOAP protocol between the web application server of the IT Integration Tool and the MP control system.

9 Annex: Integration into the IT system (for installation and maintenance personnel as well as IT specialists)

8 Application solutions

8.1 Aggregate jobs

Function

Aggregate jobs are used for time-optimised processing of multiple jobs that contain some of the same items. The higher-level system must combine these single jobs into an aggregate job with a separate job number. When processing one of these aggregate jobs, items of all jobs that pertain to a specific storage location are sorted in sequence to prevent the need to move back to the storage location. Therefore, in a job item, the information for the actual job number is displayed to ensure the allocation to the actual job. In addition, it is possible to show information for each job item describing the container that has to be picked in the job item.

Solution option

Data field	Name	Used as	Contents (example)
K	Job number	Aggregate job number	123002
S	Article number	Article number	12001
V	Goods in/out	Goods in/out	-
Q	Retrieval quantity	Retrieval quantity	3
L	Lift number	Lift number	2
T	Shelf number	Shelf number	4
F	Compartment number	Compartment number	3
C01 ^{*)}	Special data field for job header:	Job identifier (S = aggregate job, E = single job)	S
U01	Spec. data field for job item	Job number	123666
U02	Spec. data field for job item	Information	Bin A

^{*)} If you want to work with aggregate jobs and single jobs, you can, for example, use a code 'S' or 'E' to search for aggregate jobs or single jobs by match code search.

9 Annex: Integration into the IT system (for installation and maintenance personnel as well as IT specialists)

8.2 Automatic search for storage location - Storage jobs / remaining quantity storage

Function

"Automatic search for storage location" is used so that the operator can choose one storage location from multiple potential storage locations when storing articles. This is only possible, however, if the articles do not yet have a storage location and a new storage location has to be created (operation = "p").

One storage location is sent along with each data record / job. During an automatic storage location search, the higher-level system can send along additional potential storage locations in the "h" data field. As soon as the storage location has to be defined in the operating sequence, the next storage location sent along in the "h" data field will be suggested for the storage operation when the ↵ key is pressed. Each storage location has 10 characters. Up to 8 storage locations can be transferred successively in the "h" data field.

Data record structure: LLTTTFFFOO

LL = lift number, TTT = shelf number, FFF = compartment number, OO = compartment depth number

(Note: The lift number "LL" must match the lift number in the data field "L".)

Containers that are suitable to the alternative storage location recommendations can be transferred in the "g" data field; these containers are used later when the storage location is created.

Each container has 7 characters. Up to 8 containers can be entered successively in the data field. The container character in the "g" data field corresponds to the storage location of the same character in the "h" data field.

Data record structure: FFFOOHH

FFF = direction of compartments, OO = direction of compartment depth, HH = height

When "Remaining quantity storage" is enabled, then "Automatic search for storage location" can also be used with the associated container types for storing the remaining quantity. For information on how to enable the "Automatic search for storage location", see Chapter 5.2.3, page 44.

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Solution option

Data field	Name	Used as	Contents (example)
K	Job number	Storage job number	123003
S	Article number	Article number	12002
V	Goods in/out	Goods in/out	p
Q	Storage quantity	Storage quantity	5
L	Lift number	Lift number	1
T	Shelf number	Shelf number	5
F	Compartment number	Compartment number	4
h	Alternative storage locations	Alternative storage locations	01002002010100500303 01007012020103200101
g	Alternative container	Alternative container	00101010010201001010 20010202
C01 ^{*)}	Special data field for job header:	Job identifier (I = storage job, O = retrieval job)	I
U02	Spec. data field for job item	Information	Bin C

^{*)} If you want to work with storage jobs and retrieval jobs, you can, for example, use a code 'I' or 'O' to search for storage jobs or retrieval jobs via a match code search.

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8.3 Manual storage location assignment

Function

During processing of data records or jobs, the storage location can be manually changed (operation = "p") when the "Manual storage location assignment during data record processing / job processing" configuration is enabled.

The higher-level system can learn and enter the manually changed storage location by reading back the data records from the output buffer.

Solution option

Sent data record:

Data field	Name	Used as	Contents (example)
S	Article number	Article number	12002
V	Goods in/out	Goods in/out	p
Q	Storage quantity	Storage quantity	5
L	Lift number	Lift number	1
T	Shelf number	Shelf number	5
F	Compartment number	Compartment number	4
O	Compartment depth number	Compartment depth number	1
G	Container	Article dimensions	0010101

Data record which has been read back:

Data field	Name	Used as	Contents (example)
S	Article number	Article number	12002
V	Goods in/out	Goods in/out	p
Q	Storage quantity	Storage quantity	5
L	Lift number	Lift number	1
T	Shelf number	Shelf number	6 (changed)
F	Compartment number	Compartment number	5 (changed)
O	Compartment depth number	Compartment depth number	2 (changed)
G	Container	Article dimensions	0010101

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8.4 Remaining quantity storage

Function

During processing of data records or jobs, the nominal quantity to be stored can be changed when "Remaining quantity storage" is enabled (see Chapter 4.1, page 32, "Settings" submenu). A button with the following symbol appears for the nominal quantity change: 

If the nominal quantity to be stored is reduced, for example, because there is not enough space at the storage location for the total specified nominal quantity, the remaining quantity can be stored in a new storage location (remaining quantity storage). This operation is carried out automatically by the MP control system.

There are two options for the remaining quantity storage:

1) The storage location for the remaining quantity is specified manually by the operator.

(Requirement: The "Manual storage location assignment during data record processing / job processing" configuration is enabled - see Chapter 5.2.3.2, page 46)

2) The storage location for the remaining quantity is specified by using the "Automatic search for storage location".

(Requirement: The "Automatic search for storage location" configuration is enabled - see Chapter 5.2.3.2, page 46)



When "Remaining quantity storage" is enabled, the Operation (V), Nominal quantity (Q) and Actual quantity (M) data fields are mandatory for transferring the data records.

Remaining quantity storage can be used only for the "+" or "p" operation.



The higher-level system can learn and enter the changed nominal quantity and the newly created storage location for the remaining quantity by reading back the data records from the output buffer.



For application solutions on the subject of "manual storage location assignment" and "automatic search for storage location", see Chapter 8.2, page 152 and Chapter 8.3, page 154.

9 Annex: Integration into the IT system (for installation and maintenance personnel as well as IT specialists)

8.5 Inventory job

Function Inventory jobs are used to move to specific storage locations in order to count the quantity at these storage locations and report it back to the higher-level system. The time and scope of an inventory job is defined by the higher-level system.

Solution option

Data field	Name	Used as	Contents (example)
K	Job number	Inventory job number	123002
S	Article number	Article number	12001
L	Lift number	Lift number	2
T	Shelf number	Shelf number	4
F	Compartment number	Compartment number	3
C01 *)	Special data field for job header:	Job identifier (I = inventory job)	I
U03	Spec. data field for job item	Information	Count quantity at storage location
e	Properties	Properties	Uxx

8.6 Configuring different job types

Function A basic distinction can be made between other job types such as storage jobs/retrieval jobs. How a job is processed and which information is displayed is determined via the data fields of the job data record.

See Chapter 4 on page 118.

Therefore, when configuring the data fields using the configuration software (see xxx), the following must be taken into account:

The sum of all data fields used must always be configured.

For example, job type A uses fields K, S, V, Q, L, T, F, U01, U02

Job type B uses fields K, S, V, Q, L, T, U03

Therefore, data fields K, S, V, Q, L, T, F, U01, U02, U03 must be configured.

10 Annex: Customer form for integration into corporate network, Part I

Ethernet connection to corporate network

This form must be filled in by the customer's IT specialists if the following services have been ordered: "Installation support for data screening using a browser" or "Installation support for host communication (file transfer / data conversion)".

Please fill in this form and give it to the Hänel Service technician when the MP control system is connected to the company network.



The "Technical Description of the Microprocessor Control System MP 14 Lean-Lift and Multi-Space or Rotomat is the basis for the following tables to be filled in:

MP 14-H-[HOST-DATA] - Connection to corporate network	
1.	Lift number of the master lift/carousel: _____ (Lift/carousel to be integrated into the corporate network)
2.	Type of MP multi-unit network (if present) ☐ GSC ☐ Ethernet ☐ No
3.	Is the master lift/carousel to receive the TCP/IP address via a DHCP server? ☐ Yes ☐ No
4.	✗ Fill in only if the answer to "3" was "No": Which TCP/IP parameters should the master lift/carousel receive? TCP/IP address : _____ Sub-network mask : _____ Standard gateway : _____
5.	The master lift/carousel uses another TCP/IP address internally for the MP multi-unit network. This is always active. It can be located in the B-class network in the address range 172.16.0.0/16 to 172.31.0.0/16. Which address range is free: 172._____.0.0/16

[illegible]

11 Annex: customer form for integration into corporate network, Part II

Host communication (file transfer / data conversion)

This form must be filled in by the customer's IT specialists if the following service has been ordered: "Installation support for host communication (file transfer / data conversion)".

Please fill in the form and hand it to the Hänel Service technician on the day of the installation support.

To optimise the installation with regard to time and function, you can send a copy of the filled in form Part I and II to Hänel in advance, including any example files to be converted. This allows any adaptation problems to be detected in a timely manner.

Contact:

Hänel Büro- und Lagersysteme
Abt. Elektronik-Entwicklung
Postfach 1161
D-74173 Bad Friedrichshall
E-mail: DEL@haenel.biz



The following chapters are the basis for filling in the following tables:

- Chapter 6.5.1 on page 133.
- Chapter 6.7.2 on page 142.
- Chapter 6.8.1 on page 144.
- Chapter 6.8.2 on page 147.

Only the sheets corresponding to the scope of the data to be converted need to be filled in.

11 Annex: customer form for integration into corporate network, Part II

(S)FTP server connection

Host communication MP 14-H[HOST-DATA] - Connection to (S)FTP server	
1.	Connection to an FTP server (RFC 959) ☐ Connection to an SFTP server (SSH version 2 and up) ☐ Connection via the CIFS protocol (for example, Windows File Sharing, Samba) ☐
2.	Which TCP/IP address does the file server have for the host communication? TCP/IP address: _____ Domain: (only for CIFS) _____ Share name (only for CIFS) _____
3.	Path of the output directory on the file server: _____ Path of the input directory on the file server: _____
4.	The MP control system requires read/write/append/delete rights to the directories (under 3) on the file server. Login account of the MP control system: User: _____ Password: _____

File types import / export

	MP 14-H[HOST-DATA] File types	Send file to MP 14-H[HOST-DATA] (import)		Read file from MP 14-H[HOST-DATA] (export)	
		Yes		No	
		MP ¹⁾	CSV ²⁾	MP ¹⁾	CSV ²⁾
1.	Article buffer file				
2.	Job buffer file				

¹⁾ Hänel MP format

²⁾ CSV format

User Guide for the Microprocessor Control System MP 14-H[HOST-DATA]

Lean-Lift Multi-Space Rotomat

11 Annex: customer form for integration into corporate network, Part II

Article buffer (only fill in if articles of the article buffer are to be converted)

CSV file	Example	Customer data
File ending	*.buf	
Field delimiter	;	
Text delimiter	"	

Example data record	12004 ; "+" ; 300 ; 300 ; 1 ; 12 ; 270903 ; 1505 ; 11								
Field number:	1	2	3	4	5	6	7	8	9
Customer data record									
Field number									

Max. no of characters	Field type	Data field	Mandatory ¹⁾	Example:		Customer data														
				Field content			Field No.	Field content (From the above customer data record example, enter the individual fields here)												Field No.
2	numerical	Lift (L)	X	1			5													
3	numerical	Shelf (T)	X	1	2		6													
1	numerical	Access point (E)																		
3	numerical	Compartment (Q)		1	1		9													
2	numerical	Compartment depth (O)																		
5 - 7	numerical	Container (G)																		
40	alpha-numerical	Job (K)																		
40	alpha-numerical	Article number (S)		1	2	0	1													
40	alpha-numerical	Article name (N)																		
1	alpha-numerical	Process (V)		+			2													
8	numerical	Nominal quantity (Q)		3	0	0	3													
8	numerical	Actual quantity (M)																		
8	numerical	Inventory (B)																		
8	numerical	Total inventory (P)		3	0	0	4													
8	numerical	Minimum inventory (R)																		
3	numerical	Priority (p)																		
6	numerical	Date (d)																		
4	numerical	Time (u)																		
2	numerical	Status (W)																		
40	alpha-numerical	Special data field (U01)		2	7	0	7													
40	alpha-numerical	Special data field (U02)		1	5	0	5													
40	alpha-numerical	Special data field (U03)																		
40	alpha-numerical	Special data field (U04)																		

9..

User Guide for the Microprocessor Control System MP 14-H[HOST-DATA]

Lean-Lift Multi-Space Rotomat

11 Annex: customer form for integration into corporate network, Part II

Job buffer (only fill in if job records of the job buffer are to be converted)

CSV file	Example	Customer data
File ending	*.jbf	
Field delimiter	;	
Text delimiter	"	

Example data record	12004;"+";300;300;1;12;270903;1505;11;08200									
Field number:	1	2	3	4	5	6	7	8	9	10
Customer data record										
Field number:										

Max. no of characters	Field type	Data field	Mandatory ¹⁾	Example:		Customer data														
				Field content			Field No.	Field content (From the above customer data record example, enter the individual fields here)												Field No.
2	numerical	Lift (L)	X	1			5													
3	numerical	Shelf (T)	X	1	2		6													
1	numerical	Access point (E)																		
3	numerical	Compartment (Q)		1	1		9													
2	numerical	Compartment depth (O)																		
5 - 7	numerical	Container (G)																		
40	alpha-numerical	Job (K)	X	0	8	2	10													
40	alpha-numerical	Article number (S)		1	2	0	1													
40	alpha-numerical	Article name (N)																		
1	alpha-numerical	Process (V)		+			2													
8	numerical	Nominal quantity (Q)		3	0	0	3													
8	numerical	Actual quantity (M)																		
8	numerical	Inventory (B)																		
8	numerical	Total inventory (P)		3	0	0	4													
8	numerical	Minimum inventory (R)																		
3	numerical	Priority (p)																		
6	numerical	Date (d)																		
4	numerical	Time (u)																		
2	numerical	Status (W)																		
40	alpha-numerical	Special data field (C01)																		
40	alpha-numerical	Special data field (C02)																		
40	alpha-numerical	Special data field (C03)																		
40	alpha-numerical	Special data field (C04)																		

9..

User Guide for the Microprocessor Control System MP 14-H[HOST-DATA]

Lean-Lift
Multi-Space
Rotomat

11 Annex: customer form for integration into corporate network, Part II

Max. no of char- acters	Field type	Data field	Mandatory ¹⁾	Example:		Customer data				
				Field content	Field No.	Field content (From the above customer data record example, enter the individual fields here)	Field No.			
40	alpha- numerical	Special data field (C05)								
40	alpha- numerical	Special data field (C06)								
40	alpha- numerical	Special data field (C07)								
40	alpha- numerical	Special data field (C08)								
40	alpha- numerical	Special data field (C09)								
40	alpha- numerical	Special data field (C10)								
40	alpha- numerical	Special data field (U01)		2	7	0	9	0	3	7
40	alpha- numerical	Special data field (U02)		1	5	0	5			8
40	alpha- numerical	Special data field (U03)								
40	alpha- numerical	Special data field (U04)								
40	alpha- numerical	Special data field (U05)								
40	alpha- numerical	Special data field (U06)								
40	alpha- numerical	Special data field (U07)								
40	alpha- numerical	Special data field (U08)								
40	alpha- numerical	Special data field (U09)								
40	alpha- numerical	Special data field (U10)								
40	alpha- numerical	Property (e)								
80	numerical	Alternative storage locations (h)								
56	numerical	Alternative containers (g)								

1) All mandatory data fields must have a corresponding field in the host data record when imported to the MP control system.

12 Annex

12.1 Overview of optional supplementary descriptions

In the following list, the optional Supplementary Descriptions that have been included in the documentation folder are ticked. The list provides no information about possible applications and combinations of supplementary modules and supplementary features.

	Lift/carousel version according to order confirmation Ausführung des Lifts gemäß Auftragsbestätigung	The marked (x) supplementary descriptions are part of the machine documentation Markierte (x) Zusatzbeschreibungen sind Teil der Maschinendokumentation
	With add-on module 00) Remote-controlled lift operation (LL, MS, RO) Modul 00) Ferngesteuerter Liftlauf (LL, MS, RO)	Supplementary Description of the Remote-controlled Lift Operation Zusatzbeschreibung Ferngesteuerter Liftlauf MP-BEDIENIZ-FERN.MP_14
	With add-on module 02) Access code management (LL, MS, RO) Modul 02) Zugangscodoverwaltung (LL, MS, RO)	Supplementary Description of the Access Code Management Zusatzbeschreibung Zugangscodoverwaltung MP-BEDIENIZ-PVW.MP_14
	With add-on module 04) Storage location height management (LL, MS) Modul 04) Verwaltung der Lagerorthöhe (LL, MS)	Supplementary Description of the Storage Location Height Management Zusatzbeschreibung Verwaltung der Lagerorthöhe MP-BEDIENIZ-HOEHE.MP_14
	With add-on module 07) Barcode cross-check (LL, MS, RO) Modul 07) Barcode-Gegencheck (LL, MS, RO)	Supplementary Description of the Barcode Cross-check Zusatzbeschreibung Barcode-Gegencheck MP-BEDIENIZ-BARCHK.MP_14
	With add-on module 20) Shelf pre-positioning for job processing (LL, MS, RO) Modul 20) Tablarvorpositionierung bei Auftrag (LL, MS, RO)	Supplementary Description of the Shelf Pre-positioning Zusatzbeschreibung Tablarvorpositionierung MP-BEDIENIZ-PREPOS.MP_14
	With add-on module 23) Decimal input for quantities (LL, MS, RO) Modul 23) Dezimalstellen bei Mengeneingabe (LL, MS, RO)	Supplementary Description of Decimal Input for Quantities Zusatzbeschreibung Dezimalstellen bei Mengeneingabe MP-BEDIENIZ-DEZMEN.MP_14
	With add-on module 24) Adjustable shelf speed (LL, MS) Modul 24) Einstellbare Tablargeschwindigkeit (LL, MS)	Supplementary Description of the Adjustable Shelf Speed Zusatzbeschreibung Einstellbare Tablargeschwindigkeit MP-BEDIENIZ-GESCHW.MP_14
	With add-on module 28) Intermediate shelf buffer for job processing (LL) Modul 28) Tablar Zwischenpuffer bei Auftrag (LL)	Supplementary Description of the Intermediate Shelf Buffer for Requisition/Job Processing Zusatzbeschreibung Tablar Zwischenpuffer bei Kommission / Auftrag MP-BEDIENIZ-TABPUF.MP_14

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	Lift/carousel version according to order confirmation Ausführung des Lifts gemäß Auftragsbestätigung	The marked (x) supplementary descriptions are part of the machine documentation Markierte (x) Zusatzbeschreibungen sind Teil der Maschinendokumentation
	With add-on module 29) Shelf transfer (LL, MS) Modul 29) Tablartransport (LL,MS)	Supplementary Description of the Shelf Transfer Zusatzbeschreibung Tablartransport MP-BEDIEN\Z-TABTRA.MP_14
	Module 30) Extractor park position (LL, MS) Modul 30) Park-Position Extraktor (LL, MS)	Supplementary description of extractor park position Zusatzbeschreibung Park-Position Extraktor MP-BEDIEN\Z-PARKPOS.MP_14
	Module 31) User management (RO) Modul 31) Benutzerverwaltung (RO)	Supplementary Description of User Management Zusatzbeschreibung Benutzerverwaltung MP-BEDIEN\Z-BENUTZER.MP_14
	With add-on module 33) Shelf pre-positioning for article/job (LL, MS, RO) Modul 33) Tablarvorpositionierung bei Artikel / Auftrag (LL, MS, RO)	Supplementary Description of the Shelf Pre-positioning for Article / Job Zusatzbeschreibung Tablarvorpositionierung bei Artikel / Auftrag MP-BEDIEN\Z-PREPOS.ARTICLE_JOB.MP_14
	Module 35) Article image (LL, MS, RO) Modul 35) Artikelbild (LL, MS, RO)	Supplementary description of article image Zusatzbeschreibung Artikelbild MP-BEDIEN\Z-ARTIKELBILD.MP_14

LL = Lean-Lift, MS = Multi-Space, RO= Rotomat

12 Annex

Lift/carousel version according to order confirmation Ausführung des Lifts gemäß Auftragsbestätigung	The marked (x) supplementary descriptions are part of the machine documentation Markierte (x) Zusatzbeschreibungen sind Teil der Maschinendokumentation
High-speed door between access opening and drive shaft Schnell-Lauftor zwischen Entnahmeöffnung und Fahrschacht	Supplementary Description of the High-speed Door Zusatzbeschreibung Schnell-Lauftor MP-BEDIENIZ-STOR.MP_14
with automatically opening and closing sliding door mit automatisch öffnende und schließende Schiebetüre	Supplementary Description of the Automatic Sliding Door Zusatzbeschreibung Automatische Schiebetüre MP-BEDIENIZ-AUTOSD.MP_14
automatischer Ein-/Ausschub eines Containers automatischer Ein-/Ausschub eines Containers	Supplementary Description of the Automatic Shelf Ejection Zusatzbeschreibung Automatischer Tablarausschub MP-BEDIENIZ-ATA.MP_14
with container weighing device in the access point mit Container-Wiegeeinrichtung in der Entnahmestelle	Supplementary Description of the Shelf Weighing Device Zusatzbeschreibung Tablarwiegeeinrichtung MP-BEDIENIZ-WEIGHT.MP_14
Special Access Point for Operation with Standard / High Lift Truck and Container in Dimensions ..., in Special Version for Barrier On All Sides Sonderentnahmestelle für Bedienung mit Standard- / Hochhubwagen und Container in den Abmessungen ..., in Spezialausführung für umlaufende Begrenzung	Supplementary Description of the Automatic Shelf Locking for Operation with High Lift Truck or Forklift Truck Zusatzbeschreibung Automatische Tablarverriegelung für eine Bedienung mit Hochhubwagen oder mit Gabel-Hubwagen MP-BEDIENIZ-TABVER.MP_14
Unit prepared for containers with power socket Gerät vorbereitet für elektrifizierte Container	Supplementary Description of Shelves with Power Socket Zusatzbeschreibung Elektrifizierte Tablare MP-BEDIENIZ-ELTAB.MP_14
with Pick-o-Light system, moving in the access point mit Leuchtpunktanzeige, verfahren in der Entnahmestelle	Supplementary Description of the PICK-O-LIGHT SYSTEM (VARIABLE) Zusatzbeschreibung Leuchtpunktanzeige (verfahren) MP-BEDIENIZ-LPAVER.MP_14
Requisition processing strip Kommissionierleiste	Supplementary Description of the requisition processing strip Zusatzbeschreibung Kommissionierleiste MP-BEDIENIZ-VFDLEISTE.MP_14

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	Lift/carousel version according to order confirmation Ausführung des Lifts gemäß Auftragsbestätigung	The marked (x) supplementary descriptions are part of the machine documentation Markierte (x) Zusatzbeschreibungen sind Teil der Maschinendokumentation
	with demo function (with trade fair demo function lift run warning sign) mit Messefunktion Demolauf (mit Warnschild Messe-Liftlauf)	Supplementary Description of the Demo Function Zusatzbeschreibung Messefunktion MP-BEDIEN\Z-DEMO.MP_14

12 Annex

12.2 Revision notes

Last issue dated:

06.02.2020

- Chap. 4.1: Extension of lift graphic view
- Chap. 4.3: Extension of operator advisories
- Chap. 9: Appendix: Integration into the IT system - Host communication by web service via SOAP protocol
- Complete revision - redesign MP14

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