



# Operational Manual

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## **Introduction**

Congratulations on purchasing an Espaso Asparagus Sorting Machine. These instructions will tell you how to manage the Espaso software on your machine.

Due to continual further developments of our machines there may be slight changes and also new features. To enable you to make full use of them, we kindly ask you to read the software instructions.

Amongst others, the following features are offered by our machines:

- The machine can be fed with as many different grades as you want and sort them accordingly to your individual requirements.
- Due to the features of the new camera, 30% more images are taken per spear to ensure that every single spear is analysed and sorted even better.
- During sorting, other features of the machine can be used.
- If you have broadband internet access (e.g. DSL), Neubauer Automation offers you a remote maintenance programme to monitor and reset your machine from our office. In addition, our service staff can quickly analyse the software of your machine upon request and solve the problem together with you from the factory.

The instructions are to be used with any asparagus sorting machine. As, however, Neubauer Automation offers numerous different models of the asparagus sorting machine, some options or features may not be available on your specific machine. These features have been marked as **optional**.

We wish you success with your new asparagus sorting machine.

## **Operation of the ESPASO Asparagus Sorting Machine**

To operate the Espaso asparagus sorting machine you will use a touch screen monitor. This method is easy and comfortable.

### **Starting the machine**

To start the machine, the machine must be, first of all, powered by electricity. In addition, the machine needs a fresh water supply and a compressed air supply providing at least 6 bar. During operation of the machine, minimum pressure may not be below 6 bar.

Turn on the machine at the main switch and press the black button next to the main switch (start button for the PC).

After a short time, the Espaso logo with a load bar will be displayed on the screen. Start the Espaso software when the load bar has been filled completely.

## The main screen

The main screen shows the current status of your machine, amongst others the actual sorting chart used with the respective asparagus grades, their distribution in percentage and weight for that day. Image 1 shows the results of that screen. The main screen is the first controllable surface after starting the asparagus sorting machine. From this screen you can go to all software-related settings of your machine.

## Functions

Date/ Time
Grades
Pieces
Weight
Distribution

The screenshot shows the main interface of the Aspawaag software. At the top left is the 'Aspawaag' logo and contact information. Below it, the date and time are displayed as '30.07.2018' and '14:46'. An 'info window' on the left provides system status, including 'system stopped', speed, performance, and output per hour. The central part of the screen features a table with columns for 'class names', 'number of pieces', 'weight in kg', and 'distribution', listing various asparagus grades from '01 Jumbo +' to '23 Small -'. Below the table, there are control buttons for 'slower' and 'faster', and a status bar with indicators for 'not allocated to any box' and 'sort is weighed'. At the bottom, there are buttons for 'select chart', 'sorting chart', 'harvesting date', and 'password'. A bar chart at the bottom left shows a percentage scale from 0% to 100%. Arrows point from text boxes at the bottom to specific elements: 'Warnings' points to the 'no camera found' message; 'Scannerno.' points to the 'OK' button; 'Info' points to the 'info window'; 'Speed' points to the 'slower' and 'faster' buttons; 'Control' points to the status bar; 'Utilisation' points to the bar chart; and 'System' points to the 'password' button.

Date / Time	Current date and time. If the setting is incorrect, you can reset date and time. Date / time and day change have an impact on data evaluation.
Grades	Shows the individual grade names of the current sorting chart. If a name is shown in black, the basin is occupied with that grade. If the name of the grade is shown in red, this grade will be deviated to a different basin (see Deviating grades (mixing)) or no other basin was selected for this grade. In this case, during sorting, the grade is moved to the basin behind the machine.
Piece number	The number of spears that have been sorted since the beginning of that day are shown here. This display restarts at zero every day. The reset time for the display can be set in system functions (see 4.4. system functions)
Weight	The total weight of the asparagus that have been sorted since the beginning of the day is shown here. This display starts at zero every day. The point in time where the weight display is reset to zero can be set in system functions (see system functions, see 4.4)
Distribution	Distribution of individual grades in percentage is calculated and shown here. This display restarts to zero every day.
Warning messages	In this box, warning messages for the machine are shown. For example;  <u>Wrong date:</u> Date and time are set incorrectly.  <u>Single image test:</u> The machine carries out a single image test. The first spear detected by the camera is shown in detail on the screen. As long as the single image test is active and no spear has been detected by the camera, the warning message "single image test" is displayed in this area.
Speed (spears/h)	This is where the desired speed of the machine is set.
Indicator	The machine cannot be started, unless the following conditions have been met: 1. The emergency stop must be pulled. 2. The washing unit flap should be closed. 3. The knife flap should be closed. 4. Fresh water supply should be on. For sorting, additional conditions must be met: 1. Air pressure of 6 bar must be connected. If the compressor supplies too much pressure, pressure can be reduced at the pressure control.
Notes	Instruction notes for the service staff.
Scanner no.	If a field number or cutter number is scanned, this message will be shown. As asparagus for the previous cutter is still being sorted during the scanning process, the numbers will be shown on the right next to the actual numbers. The display will move to the left by one column as soon as the asparagus of the new cutter (or field) has been detected by the camera.  The use of a scanning device S12 bilateral is only available as an <b>option</b> .

Info window	<p>This shows the current status information of your machine. It shows whether the machine is running or stopped.</p> <p>Speed The number of spears that can be sorted per hour.</p> <p>Utilisation Current machine utilisation in percentage</p> <p>Daily number of spears Absolute number of spears sorted that day</p> <p>Daily spear weight Absolute weight of spears sorted that day</p> <p>Average weight Average spear weight</p> <p>Sorting time This clock always counts when the machine is running. It shows the sorting time in hours and minutes. If the Espaso is only switched on, after a period of time it will stop by itself. The sorting time is automatically reset to zero every day.</p> <p>Harvesting date This is usually the current date. If the asparagus that was cut the day before is sorted, the harvesting date must be changed. (This is important for the wage of the cutters).</p> <p>Sorting chart Shows the sorting chart according to which sorting is currently done.</p> <p>Extra asparagus The number of spears that do not fit into the indicated grades.</p> <p>Current class The currently recognised grade. (This display changes with the cycle of asparagus sorting)</p>
Utilisation	Utilisation diagram showing the entire day. It shows utilisation of the sorting time during the day.

Operation	<p>Shows which function keys must be used to carry out the available options. Important options must be unlocked with a password.</p> <p>Start cleaning mode: The machine goes into cleaning mode.</p> <p>In cleaning mode, the machine runs very slowly and the tilt trays can be cleaned well from the rear using a high pressure cleaner.</p> <p>This mode is not available for S12 bilateral</p> <p>If available: The computer display switches to cutting mode.</p> <p>Switch off the computer: switches off the computer and switched to the computer for the cutting mode, if available.</p> <p>Select chart: The selected sorting chart is shown</p> <p>Sorting table: Shows the current sorting chart. After entering the password all available sorting charts and grades can be processed.</p> <p>For further information please see chapter "Sorting" Harvesting date: The harvesting date of the spears to be sorted can be set.</p> <p><b>After entering the password</b> After entering your password you will go to system settings where you find evaluations, the diagnosis centre and data administration.</p> <p>For further information please see chapter "System settings" Password After entering the password, additional settings will be available. The background colour of the column with the operating options will change. For further information please see chapter "Entering password".</p> <p>Back <b>After entering the password</b> If a password was entered before, this password is withdrawn by pressing the return key once again. The background colour of the operating option will change back to grey.</p>
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## **Cutting mode**

An optional water jet cutting unit ensures selective asparagus cutting.

## **Entering password**

The password is used to prohibit unauthorised persons from making changes in the settings while the machine is in operation. After entering the password, all settings for the operation of the machine will be available.

To enter the password, you must be in the main screen. Press the key: password.  
You will be requested to enter your password. It is:

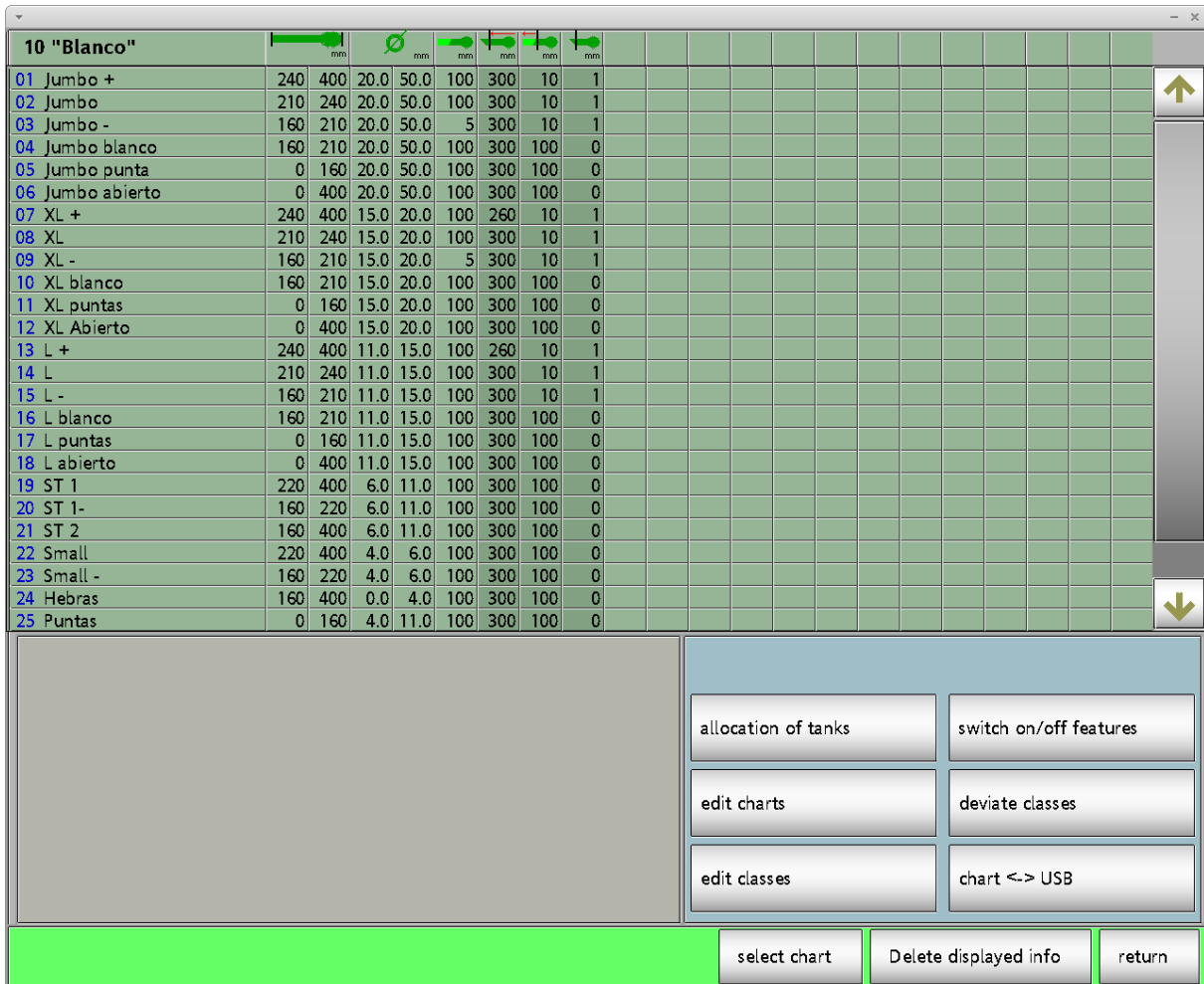


After pressing the „enter key“ „√” the control line at the bottom will change and the bottom line will turn red. If you want to cancel your password after having entered it successfully, press “return” on the main screen. Then the settings will be safe from unauthorised changes again. The operating elements of the bottom line will switch back to their original parameters and the bottom line itself will change back to grey.



## Sorting

To go to this feature, enter the password on the main screen and press the **sorting chart** key. The screen will show the current sorting chart with the respective asparagus grades and their characteristics (read more in chapter “Asparagus characteristics”). During sorting, the chart is worked off from top to bottom and the asparagus is sorted into the grade it can be classified first in the chart. Therefore, when a new chart is created, it **must** be ensured that the better grades are positioned at the top of the chart, as inferior grades have higher tolerances. If an inferior grade is placed too far up, even very good “class one” asparagus spears will be allocated to that grade.



The sorting chart has the following options/functions:

Work in the chart	Working on asparagus features for all grades in the just selected chart. See process chart
Select chart	Select from previously defined charts. See select chart
Allocation of basins	Determines which basin the grades will be dropped in See Basin allocation

Copy chart	Copies an existing chart including grades and basin allocation. See copy chart.
Define grade names	Determines the name of an asparagus grade in the chart and the chart name itself. See define grade names
Move grades	Moves, copies or deletes a grade and its features to a different place in the chart. See move grades
Add/delete asparagus features	Adds/deletes asparagus features (curvature, thickness, length etc.), See asparagus characteristics
Deviate grades	Settings to deviate an asparagus grade to a different basin See deviate grades - mixing
Weighing	Settings for weighing the asparagus using the weighing equipment (optional)
Chart for green/white asparagus	Marks the current chart as chart for green or white asparagus. See green asparagus

### **Select chart**

Using the “select chart” function, you can select one chart from the existing charts which can then be used for changes or for sorting.  
From this time on, however, the chart will not be active for sorting yet.

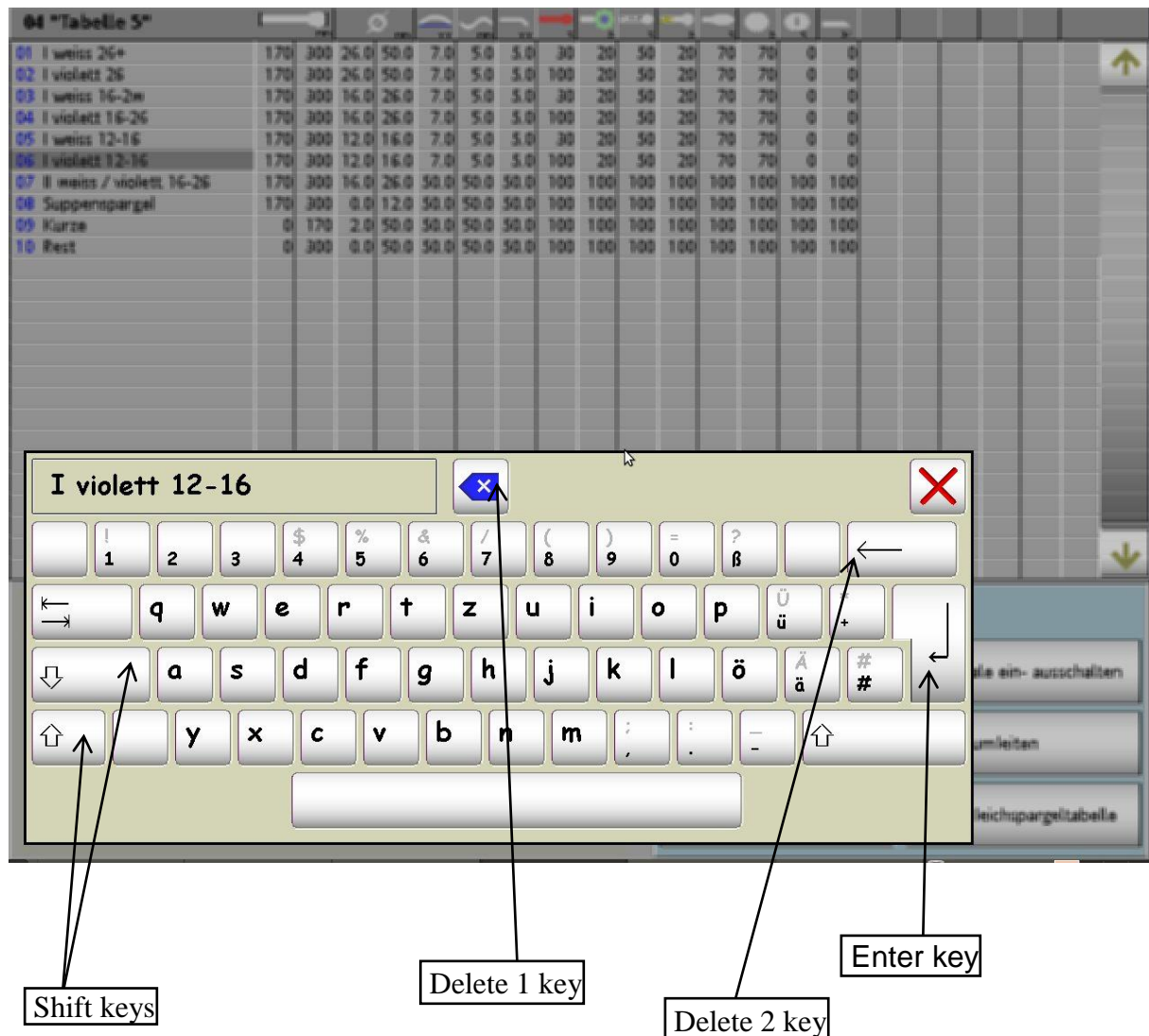
**The chart will only become active for sorting when you leave the sorting chart settings and go back to the main menu (press return key). The advantage is that the chart can be changed during sorting without the intermediate changes being used for sorting.**

## Define grade names

Define grade names is one of the first settings when creating a new sorting chart. In the Espaso, defining grade names is not only giving a grade a name but also changing an existing name. The predetermined features will not be changed together with a name change.

When creating a new grade name or changing an already existing one it must be ensured that good grades are created first, i.e. they are put at the top of the chart, as the sorting table is worked off from top to bottom and the asparagus is allocated to the first grade on the list that it fits in. Otherwise, as inferior grades have higher tolerances, even an excellent “class one” spear would be allocated to an inferior grade.

To change an asparagus name in the selected chart, simply touch this name with your finger and the keyboard will be shown where you can then change the name.



With the “shift keys” you can switch from small to big. With the “delete 1 key”, the entire word can be deleted and with the “delete 2 key” the last letter. To save the changes, press enter.

## Asparagus characteristics

The Espaso Asparagus Sorting Machine distinguishes between 17 different spear characteristics.

Length	Length of a spear in mm. For every grade, a parameter for minimum length and maximum length can be entered (e.g. from 210 to 220 mm). The standard ESPASO asparagus sorting machine comes with a feeding belt and cuts the spears according to the belt settings.
Thickness	Thickness of the spear in mm. For every grade, a minimum and a maximum thickness can be entered (e.g. from 16 to 22 mm). It is important that there is no gap between the grades. If one grade is set to between 12 and 16 mm, the next grade should start at 16 mm and not at 17 mm, as spears with a diameter between 16 and 17 mm would not be sorted properly.
Curvature	The curvature is determined by placing the spear with the highest curvature upwards on the measuring surface and then the maximum distance of the spear to the measuring surface is determined from below (which does not necessarily have to be in the middle of the spear). Curvature is indicated in mm. The maximum admissible curvature for that grade must be entered.
S-curvature	S-curvature is always measured on the side opposite to the main curvature. Maximum S-curvature is also indicated in mm.
Head curvature	Head curvature is calculated like the normal curvature, but only on the first centimetres of the spear.
Purple	<p>If required, purple can be divided into two parts:</p> <p>purple spear This parameter and the following parameters are entered in percentages. The purple percentage of the spear is determined, The head is not considered. The higher the purple part, the higher the parameter in percent. The maximum admissible purple parameter must be entered here. As the camera is very sensitive, it is recommended to set a purple parameter between 5 and 20 percent even for white asparagus.</p> <p>purple head The maximum admissible purple share for the head must be entered in percent.</p>
Green	Similar to purple. Head and spear are determined together.
Flower (sprouting)	Indicates the maximum parameter for sprouting in percent. A closed "class one" spear has a parameter between 0 and 20 % and the more sprouting a spear shows, the higher the parameter in percentage.
Rust spear	Rust is examined on the spear. Black tips on the leaves and dark spots that may be at the bottom of the spears are detected. The higher the parameter, the more rust is admitted on a spear.

Rot spots	The spears are examined for rot spots (dark, brown spots). The number must be indicated in percent. The actual percentage is set by internal parameters during commissioning.
Difference in thickness	If the spear shows bulges, there is a difference in thickness between the middle and the bottom of the spear. (This also happens, if the spear was cut off too far down, if the bottom is stringy and thinner than the rest of the spear). If you do not want to have such spears in a certain grade, the parameter must be reduced.
Ovality	As the Espaso takes several pictures of every spear (up to 10, thickness is determined in every image. If the spear is oval (e.g. double spears), there will be a difference in thickness between the images. That is called ovality. If a spear is perfectly round, the parameter will be 0. If a spear is twice as thick in one direction as in the other, the parameter will be 100.
Double spears / hollow spears	The Espaso Asparagus Sorting Machine is able to detect double spears. Hollow asparagus is measured in percentage.
Break	Spears without heads are called break. If you want to add breaks to one particular grade, the parameter for this grade must be set to 1, otherwise to 0.
Grooves	These are grooves in the spears and the parameters are entered in percent. If fewer grooves are detected than indicated, the spears will be allocated to that grade, if all other features match.

When the spear is measured by the camera, the result is compared with the current sorting chart. By doing so, the sorting chart is worked off from top to bottom and every spear characteristic is compared with the feature of the respective line. If one characteristic of the spear is worse (has a higher parameter than the limit parameter for this grade), the next line will be checked until an applicable grade is found. If no grade matches (e.g. if the chart has gaps) the spear is sent to the overflow basin.

Only active characteristics will be compared. Not required characteristics can be activated/deactivated at "switch on/off characteristic" improving clear arrangement of the chart. Here you can also activate previously deactivated spear characteristic.



A feature can be selected by pressing a key. The fields behind the feature name show the current status. "ON" means that feature is active and "OFF" means that the feature is inactive.

To be able to activate the features "purple spear" and "purple head", the feature "purple" must be inactive.

By pressing the return key, the new settings for the current chart will be saved and you will go back to the sorting chart screen.

## Process chart

In the sorting chart you can define the limit parameters for your grades. The grade names are indicated below the chart name on the left. On the right you see the features indicated for the respective grades.

The screenshot shows a software interface for defining sorting chart parameters. The main window displays a table with columns for various parameters and a numeric keypad for editing values. Callouts identify the following elements:

- Table name:** 01 "Standard"
- Grade name:** 02 I violett 26+
- Cursor:** The value 26.0 in the table is highlighted.
- Spear characteristics:** The row of icons above the table represents different spear features.
- Values:** The numerical data in the table columns.
- Image for example above:** A 3D model of a spear tip.

Grade name	mm	mm	mm	mm	%	%	%	%	%	
01 I weiss 26+	170	300	26.0	50.0	7.0	30	30	50	30	20
02 I violett 26+	170	300	26.0	50.0	7.0	100	30	50	30	20
03 I weiss 16-26	170	300	16.0	26.0	7.0	30	30	50	30	20
04 I violett 16-26	170	300	16.0	26.0	7.0	100	30	50	30	20
05 I weiss 12-16	170	300	12.0	16.0	7.0	30	30	50	30	20
06 I violett 12-16	170	300	12.0	16.0	7.0	100	30	50	30	20
07 II weiss / violett 16-26	170	300	16.0	26.0	50.0	100	100	100	100	100
08 Suppenspargel	170	300	0.0	12.0	50.0	100	100	100	100	100
09 Kurze	0	170	0.0	50.0	50.0	100	100	100	100	100
10 Rest	0	300	0.0	50.0	50.0	100	100	100	100	100

actual value 26.0  
range: 0.0 - 50.0

26.0

spear thickness in mm [0 mm - 50 mm]

select chart    Anzeige loeschen    return

The parameters for length, thickness and curvatures must be entered in millimetres. With the exception of "break", all other parameters will be in percentages. Smaller percentages mean lower tolerances.

Using the arrow keys, the cursor is moved to the feature (black field, see image) to be changed. The function keys increase or decrease the parameters by the indicated parameter.

Press the return key to leave this screen.



## Basin allocation

The basin allocation determines to which basin of the Espaso sorting machine a specific asparagus grade is sent. When one grade is allocated to several basins, these spears will be distributed equally to all the indicated basins.

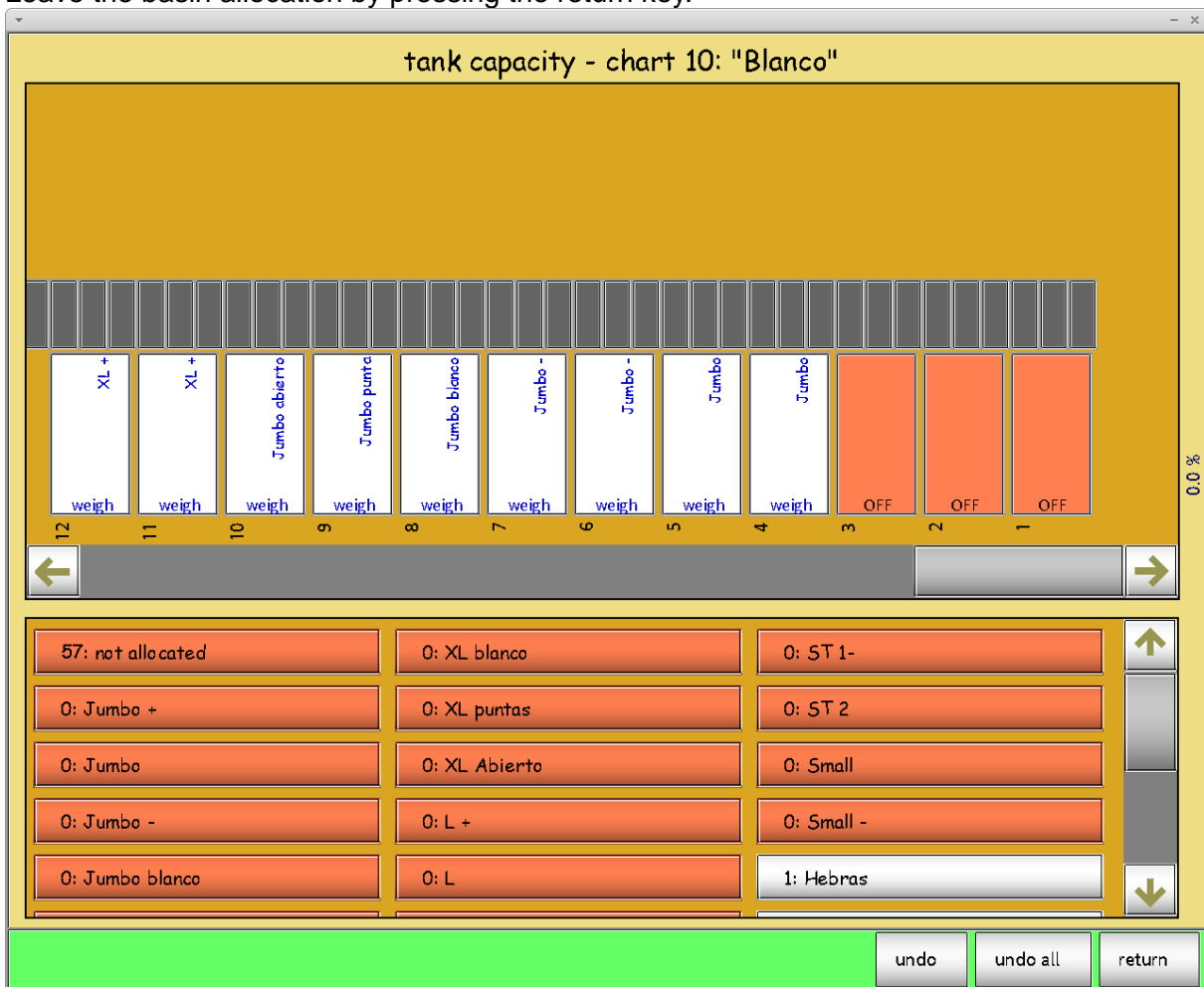
Select the respective basin by drawing the grade to the basin. Grades without basins or not allocated basins are highlighted in orange.

The number in front of each grade shows how often this grade has been allocated to a basin.

Experience has shown that frequently occurring asparagus grades require several basins. You should also ensure that the workload of the sorting staff is as balanced as possible.

Press "cancel" or "cancel all" to cancel the last step or to cancel all changes.

Leave the basin allocation by pressing the return key.



The image shows the surface of a bilateral Espaso Asparagus Machine with a total of twelve output boxes. The first field on the bottom left shows the first basin that is closest to the control cabinet.

Above it, you see the sorting belt and above that the basin on the second side.

Depending on the machine size and model, the display of your machine may vary.

## Copy chart

To create a new chart based on an old one or to change parameters as a test, we recommend copying a chart.

Select “copy chart” from the menu “sorting chart”.



The screen shows all available sorting charts in each column. Use the draw function for the chart you want to copy.

If you do not want to overwrite a chart, you can copy the selected chart to the end. Prior to this, a safety query is displayed to ask whether you really want to carry out this procedure. Confirm with “yes” or cancel with “no”.

You can also delete a chart by drawing it to the bin.

## Deviate grades (mixing)

The Espaso Asparagus Sorting Machine can deviate grades and their features up to a certain percentage to a different basin. This will not affect the evaluation.

Select the option “deviate grades” to go to “deviate varieties”.

	initial class:		target class:
01	Jumbo +	100 →	Jumbo +
02	Jumbo	100 →	Jumbo
03	Jumbo -	100 →	Jumbo -
04	Jumbo blanco	100 →	Jumbo blanco
05	Jumbo punta	100 →	Jumbo punta
06	Jumbo abierto	100 →	Jumbo abierto
07	XL +	100 →	XL +
08	XL	100 →	XL
09	XL -	100 →	XL -
10	XL blanco	100 →	XL blanco
11	XL puntas	100 →	XL puntas

switch off deviation    return

When touching a target grade, a list with the available grades will be shown. From this list, the desired grade can be selected. The percentage will change by touching the numeric field and a new number can be entered in the displayed box. Deviations cannot be interlaced that way.

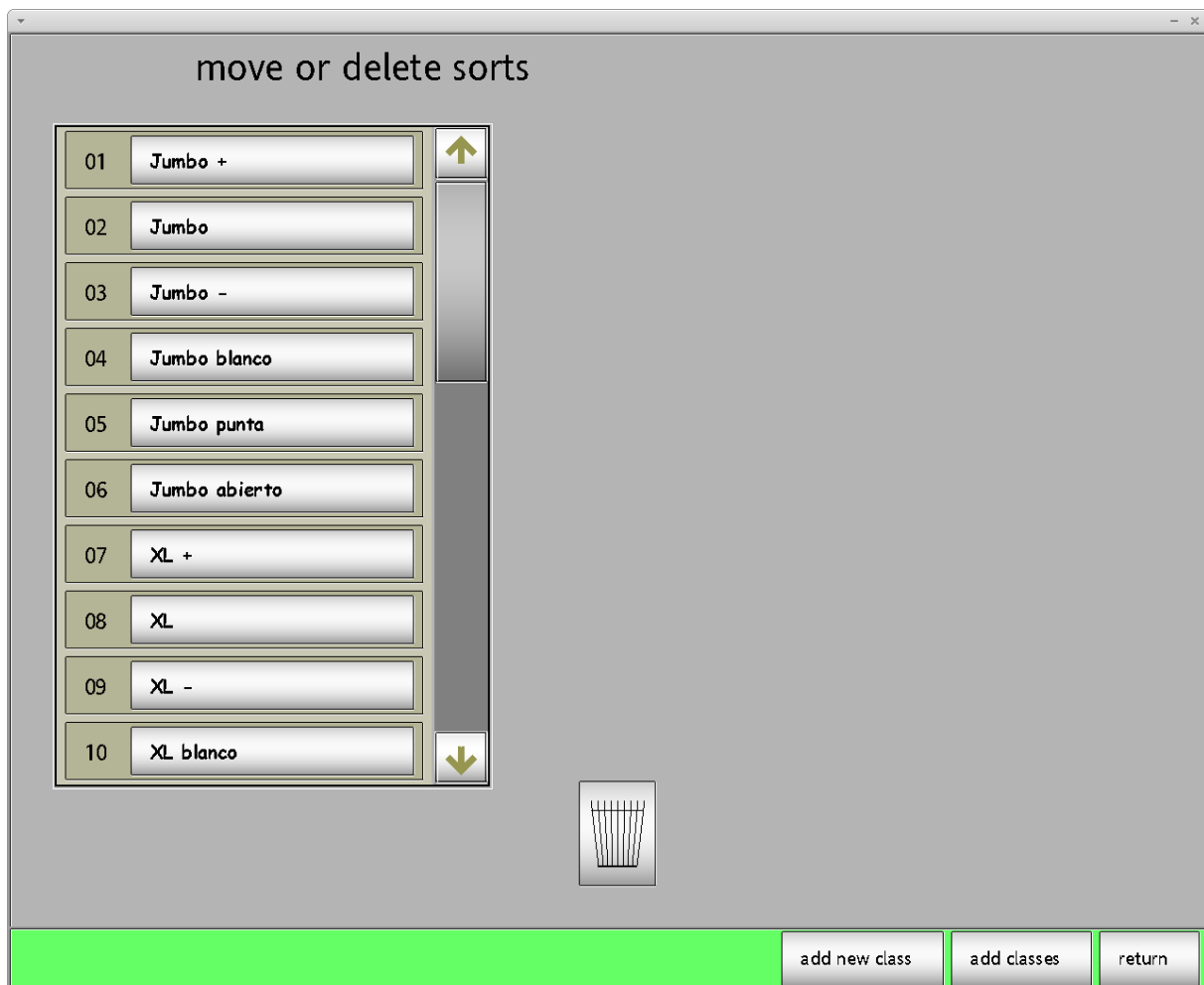
The deviation can be switched off by pressing the key “deviation switch off”

**Please note:** Deviations will affect sorting. Therefore, deviated grades will be shown in red on the main screen.

## Move grades

Grades can be moved by one line in the sorting table. This is mainly used, if a better grade was created too far down in the chart by mistake.

If a good grade is placed too far down in the chart, this grade is often not detected because the sorting table is worked off from top to bottom and inferior grades permit higher limit parameters for their features.



If you want to move a grade upwards, draw the grade to be moved to the selected space in the opposite column. If a target grade is selected instead of the space, the moved grade will be copied by overwriting the target grade.

By pulling the grade to the bin, this grade will be deleted. A safety query will be shown prior to this.

The grade cannot be used any more after being deleted. If you want to use that grade again, you will have to create a new one by pressing the key “create new grade”. The grade name can be changed in the menu.

### **Green asparagus**

The Espaso Asparagus Sorting Machine is able to sort green asparagus. However, as green and white asparagus must be analysed differently according to their colour, the sorting chart must be marked as green asparagus sorting chart. It is recommended to create an additional chart for green asparagus.

Use the option “green-white asparagus chart” to change from white to green asparagus and vice versa. Green asparagus charts are highlighted in green.

Please note:

Please note that other features can be activated for green asparagus and settings may have to be changed accordingly. System settings

Go to system settings via the main screen by entering your password and pressing the "System" key.

The system settings are divided into four groups: Evaluations, diagnosis, data management and settings.

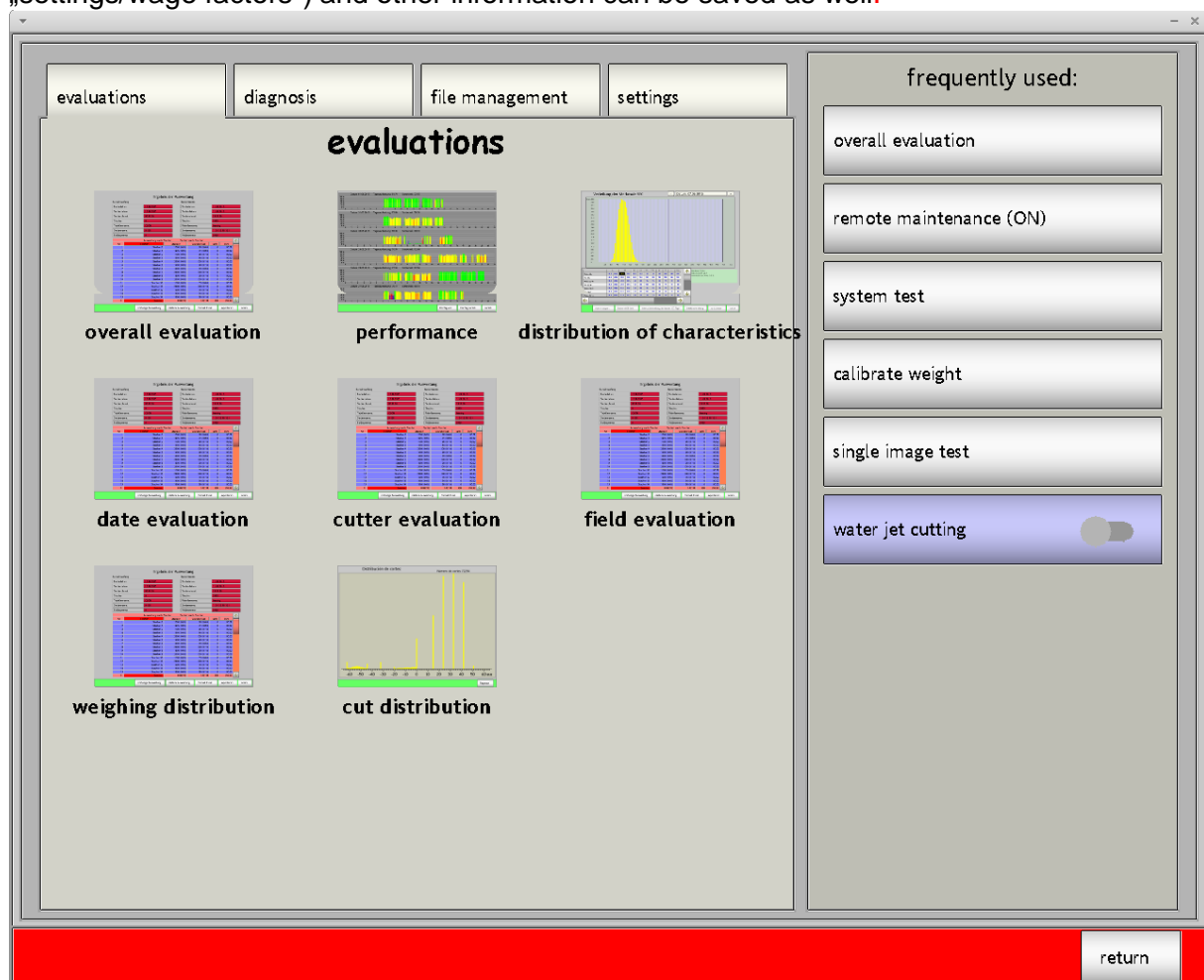
## 1. Evaluations

While the Espaso Asparagus Sorting Machine is operating, data is collected and saved in order. If you use a scanner (for S12 bilateral this is only an option), the data is saved during each scanning process. All machines save the raw data for the evaluation every 20 minutes at the latest. The collected data can be analysed and evaluated according to its specific criteria.

Five preset evaluation types are available.

Overall evaluation, date evaluation, cutter evaluation, field evaluation and chart evaluation. The last four are preset parameters, so their results can also be looked into from the overall evaluation.

The evaluation data displayed can be released to the network of the machine or saved in a USB stick. The file format can be a txt or csv. which is readable in Excel. During exporting, the average spear weight, the sorting times and the wage data (if indicated in the menu „settings/wage factors“) and other information can be saved as well.



## 1.1 Overall evaluation

Go to overall evaluation from system menu -> overall evaluation.

Overall evaluation is the most comprehensive evaluation category. Data can be evaluated here according to all possible criteria. After opening the feature you see a time selection, an area limitation and a separation column. As a principle, all data ever saved in the Espaso will be evaluated. To evaluate just your own selected data, it can be selected in the following screen:

data evaluation

Here you can limit the data scope  
Restrict data range (for ex., this season only).

After starting the evaluation, you can then choose between evaluation types  
like harvester evaluation or field evaluation.

to separate	beginning of range	end of range
<input type="checkbox"/>	harvesting date: <input type="text"/> all allowed	harvesting date: <input type="text"/> all allowed
<input type="checkbox"/>	sorting date: <input type="text"/> all allowed	sorting date: <input type="text"/> all allowed
<input type="checkbox"/>	sorting time /hour: <input type="text"/> all allowed	sorting time /hour: <input type="text"/> all allowed
<input type="checkbox"/>	cutter: <input type="text"/> all allowed	cutter: <input type="text"/> all allowed
<input type="checkbox"/>	chart name: <input type="text"/> all allowed	chart name: <input type="text"/> all allowed
<input type="checkbox"/>	class name: <input type="text"/> all allowed	class name: <input type="text"/> all allowed
<input type="checkbox"/>	field number: <input type="text"/> all allowed	field number: <input type="text"/> all allowed

start evaluation return

The range limit determines the limits for the data to be evaluated.  
Selectable areas are:

- Harvesting date,
- Sorting date,
- Sorting time,
- Cutter number,
- Chart name,
- Grade name,
- Field number

When you touch a box, a new box will open where you can enter your data (date, time, name or number).

date

day:	month:	year:
23		2010
24		2011
25	1	2012
26	2	2013
27	3	2014
28	4	2015
29	5	2016

cancel      accept

Uhrzeit

Stunde:	Minute:	Sekunde:
13	10	25
14	11	26
15	12	27
16	13	28
17	14	29
18	15	30
19	16	31

Abbrechen      Übernehmen  
cancel      accept

chart name	
Blüte	↑
D süd 1	
D süd 2	
D süd 3	
D süd 4	
D süd 5	
D süd 6	
D west	
Dickensortierung	
Farbe	↓
Fr 1	✓

value: 0  
range: 0 - 9999

0

1	2	3
4	5	6
7	8	9
-	0	✓

Press Enter to save the changes. If you want to cancel your changes again, press the box with the appropriate window again and then press cancel. The display shows: "all permitted".

One feature per evaluation can be separated by pressing on the box on the left next to characteristics. The evaluation will then be concentrated on this features, i.e. a separate evaluation is then made for every different occurrence of this feature. Pressing the "start evaluation" key will start the evaluation with the respective limitations.

If separation was activated, a selection is displayed like in the image above. A data record is available for selection for every individual separated feature.

Pressing the column title will sort the chart entries accordingly. Touching a data set will select this data set and pressing "view evaluation" will adapt this selection. The result will be the entire evaluation of the selected range.

The different evaluations can be selected by pressing "next evaluation". They are in the following sequence of order:

Overall evaluation, cutter evaluation, chart name evaluation, chart number evaluation, grade name evaluation, sorting date evaluation, harvesting date evaluation, field evaluation, evaluation of field and cutter, box evaluation.

If the text is longer than what the screen can display, move the list using the shift on the right side of the list. Pressing "export" will export the evaluation to a USB stick. In a network the export file will also be available in that network.

With the „format“ you can select whether you want to save the data as txt or Excel file, in one file or in several files.

## 1.2 Data evaluation

Go to data evaluation directly in the system screen or via the overall evaluation for the current season and Start evaluation and change to evaluation according to date.

The available limes are numbered consecutively. In the total line, the number of the different calendar days is shown in the left. Dates are indicated in the column with the heading "name". In addition, the number of spears that were sorted that day is shown, mentioning their weight and the average workload in spears per hour. On the right you see the actual range limitations to get an overview of the evaluated data.

If the text is longer than the screen can display, the list can be moved using the shift on the right. Pressing "export" will export the evaluation to a USB stick. If you are working in a network, the file will also be available to the network and can be saved as txt or an Excel file.

If you wish to have detailed information on the days shown, extended data evaluation is available. Go to data evaluation in the system screen by pressing the „extend“ key or go to the overall evaluation, current season, separation according to data evaluation and start the application.



**evaluation result**

beginning of range		end of range	
harvesting date:	04/15/17	harvesting date:	07/04/18
sorting date:	04/15/17	sorting date:	07/04/18
sorting time /hour:	08:29:09	sorting time /hour:	23:20:14
cutter:	9999	cutter:	9999
chart name:	16-20	chart name:	test
class name:	+20	class name:	new class
field number:	9999	field number:	9999

evaluation according to: sorting date		Sorted according to: sorting date			
no.	sorting date	spears	weight (kg)	kg/h	h:m
46	sorting date 06/06/17	122719 (08%)	3744 (07%)	1006	03:43
47	sorting date 06/07/17	121126 (07%)	3547 (07%)	862	04:06
48	sorting date 06/08/17	147365 (09%)	3903 (08%)	811	04:48
49	sorting date 06/09/17	103457 (06%)	2952 (06%)	811	03:38
50	sorting date 06/10/17	85464 (05%)	2408 (05%)	812	02:57
51	sorting date 06/11/17	92683 (06%)	2497 (05%)	833	02:59
52	sorting date 06/12/17	77009 (05%)	2230 (04%)	814	02:44
53	sorting date 06/13/17	81406 (05%)	2248 (04%)	824	02:43
54	sorting date 06/14/17	76192 (05%)	2069 (04%)	838	02:28
55	sorting date 06/15/17	82235 (05%)	2440 (05%)	830	02:56
56	sorting date 06/16/17	77863 (05%)	2155 (04%)	809	02:39
57	sorting date 06/17/17	94831 (06%)	2760 (06%)	852	03:14
58	sorting date 06/18/17	72347 (04%)	2091 (04%)	887	02:21
59	sorting date 06/19/17	63675 (04%)	1922 (04%)	980	01:57
60	sorting date 06/20/17	68615 (04%)	1783 (04%)	769	02:19
141	total:	16309160	500583	983	509:12

	previous evaluation	next evaluation	format: Excel	export	return
--	---------------------	-----------------	---------------	--------	--------

### 1.3 Cutter evaluation

Go to cutter evaluation from the system screen or the overall evaluation and current season, start the application and go to cutter number:

### evaluation result

**beginning of range**

harvesting date:	04/15/17
sorting date:	04/15/17
sorting time /hour:	08:29:09
cutter:	9999
chart name:	16-20
class name:	+20
field number:	9999

**end of range**

harvesting date:	07/04/18
sorting date:	07/04/18
sorting time /hour:	23:20:14
cutter:	9999
chart name:	test
class name:	new class
field number:	9999

evaluation according to: cutter		Sorted according to: cutter			
no.	cutter	spears	weight (kg)	kg/h	h:m
1	cutter 9999	16309160 (100%)	500583 (100%)	983	509:12
1	total:	16309160	500583	983	509:12

previous evaluation
next evaluation
format: Excel
export
return

The details and features correspond to those of the data evaluation.

If you require detailed information on the days shown, an extended cutter evaluation is available. Go to system screen, cutter evaluation and press the „extend“ key or to overall evaluation, current season, separation cutter evaluation and start the application.

## 1.4 Field evaluation

Go to field evaluation directly on the system screen or via overall evaluation, current season, start the evaluation or change to field evaluation.

### evaluation result

beginning of range		end of range	
harvesting date:	14.02.2012	harvesting date:	26.02.2013
sorting date:	14.02.2012	sorting date:	26.02.2013
sorting time /hour:	00:03:56	sorting time /hour:	23:49:05
cutter:	0	cutter:	9999
chart name:	D süd 1	chart name:	Standard
variety name:	AA Xwit.SQ	variety name:	Suppenspargel
field number:	0	field number:	9999

evaluation according to: Felder		Sorted according to: Felder			
no.	Felder	spears	weight (kg)	kg/h	h:m
1	select field 0	1.295 (12%)	64 (13%)	0	00:03
2	select field 1	1.200 (12%)	60 (12%)	0	00:06
3	select field 2	946 (9,1%)	47 (9,3%)	0	00:02
4	select field 3	986 (9,5%)	50 (9,8%)	0	00:07
5	select field 4	723 (7,0%)	36 (7,1%)	0	00:02
6	select field 5	942 (9,1%)	47 (9,2%)	0	00:02
7	select field 6	474 (4,6%)	24 (4,6%)	0	00:01
8	select field 7	505 (4,9%)	25 (5,0%)	0	00:01
9	select field 8	641 (6,2%)	32 (6,3%)	0	00:01
10	select field 9	943 (9,1%)	47 (9,2%)	0	00:02
11	select field 9999	1.721 (17%)	77 (15%)	25	02:57
11	total:	10.376	508	146	03:28

	previous evaluation	next evaluation	format: Excel	export	return
--	---------------------	-----------------	---------------	--------	--------

The details and features correspond to those of the data evaluation.

If you require detailed information on the days shown, an extended cutter evaluation is available. Go to system screen, cutter evaluation and press the „extend“ key or to overall evaluation, current season, separation cutter evaluation and start the application.

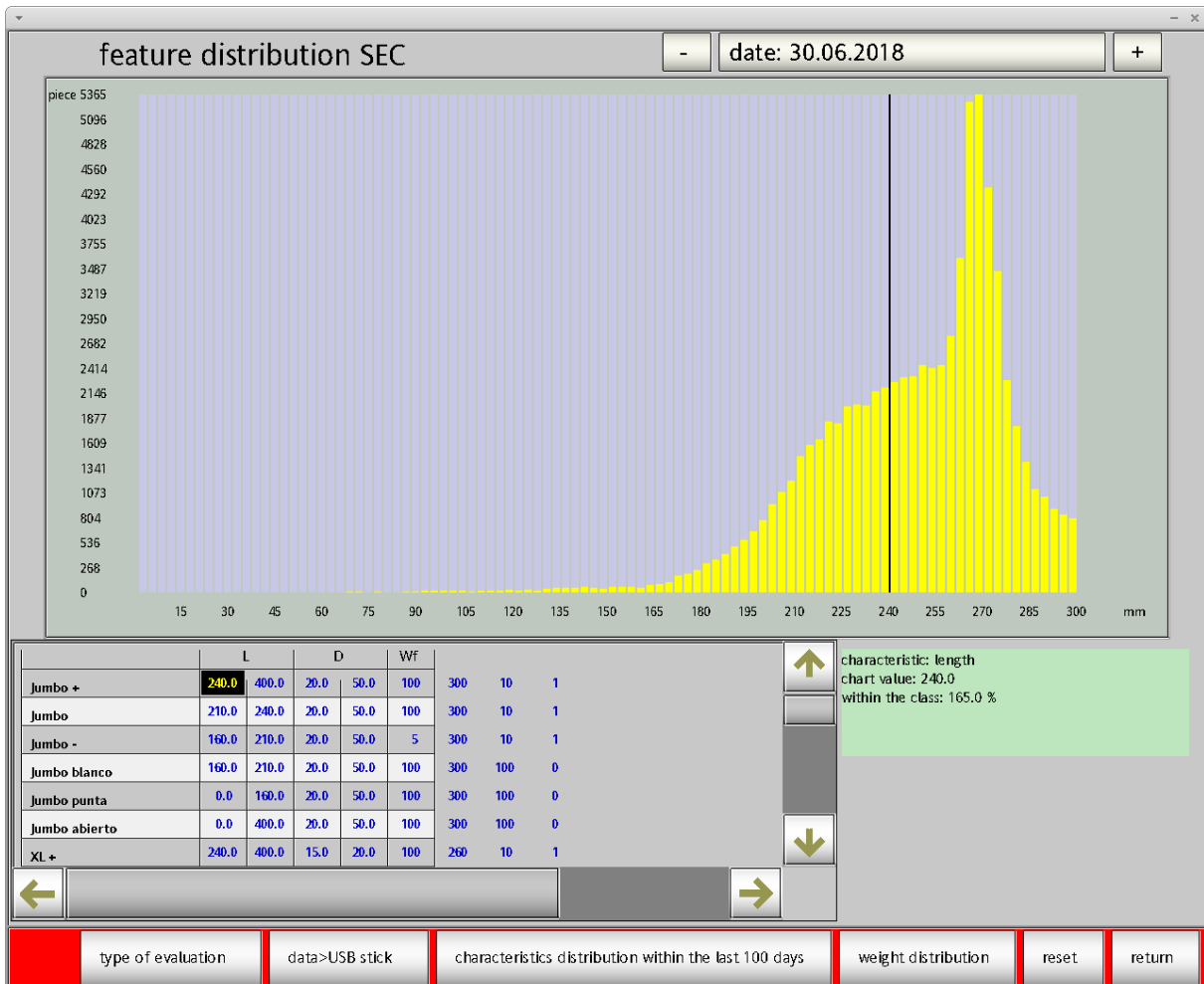
## 1.5 Chart evaluation

Go to chart evaluation directly on the system screen or via overall evaluation, current season, start the evaluation or change to chart evaluation.

The details and features correspond to those of the data evaluation.

If you require detailed information on the days shown, an extended cutter evaluation is available. Go to system screen, cutter evaluation and press the „extend“ key or to overall evaluation, current season, separation cutter evaluation and start the application.

## 1.6 Feature distribution



During the regular sorting process of the Espaso, all measuring data are collected and saved. The measuring results are separately saved for each feature such as thickness or colouring etc. which can then be viewed. In the above screen image, the length distribution for a certain sorting day can be seen. This display can be opened for every day of the harvesting period and for every single feature. The results can be exported to a USB stick and processed further. As weight is no sorting feature, but is saved anyway, the weight chart can be viewed as well. In general, the values for one day are shown, but it is also possible to calculate and view the data for the last 100 days.

## 1.7 Workload screen



At the bottom of the screen of the normal Espaso screen, the workload of the Espaso for the current day is shown from midnight to midnight. These images can be saved for each day and found in this subscreen.

With the keys "one day ahead" and "one day back" you can look at the time scheme and the previous workload. In addition the average day workload and sorting time is shown for each day.

## 2. Diagnosis

The diagnosis offers features for error detection and supports system settings.

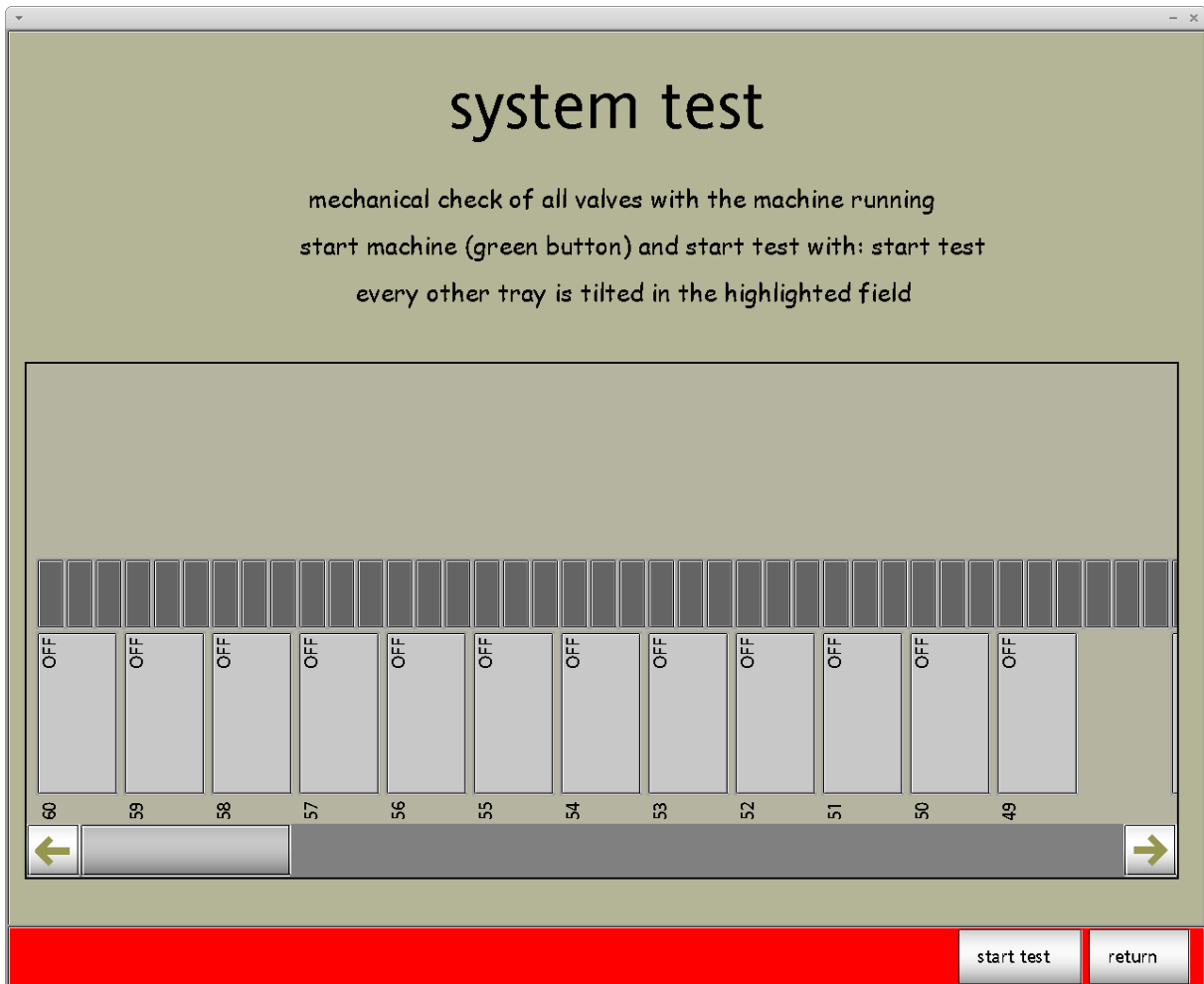


### 2.1. System test

The system test checks the electrical, pneumatic and mechanical system of your asparagus sorting machine.

The spears roll over a measuring surface onto the sorting belt and are led into the transport trays. These trays are tilted to the left or to the right, depending on the settings of your asparagus sorting machine. The software activates a valve supplying a cylinder with compressed air that moves an alterable switch deviating the tray.

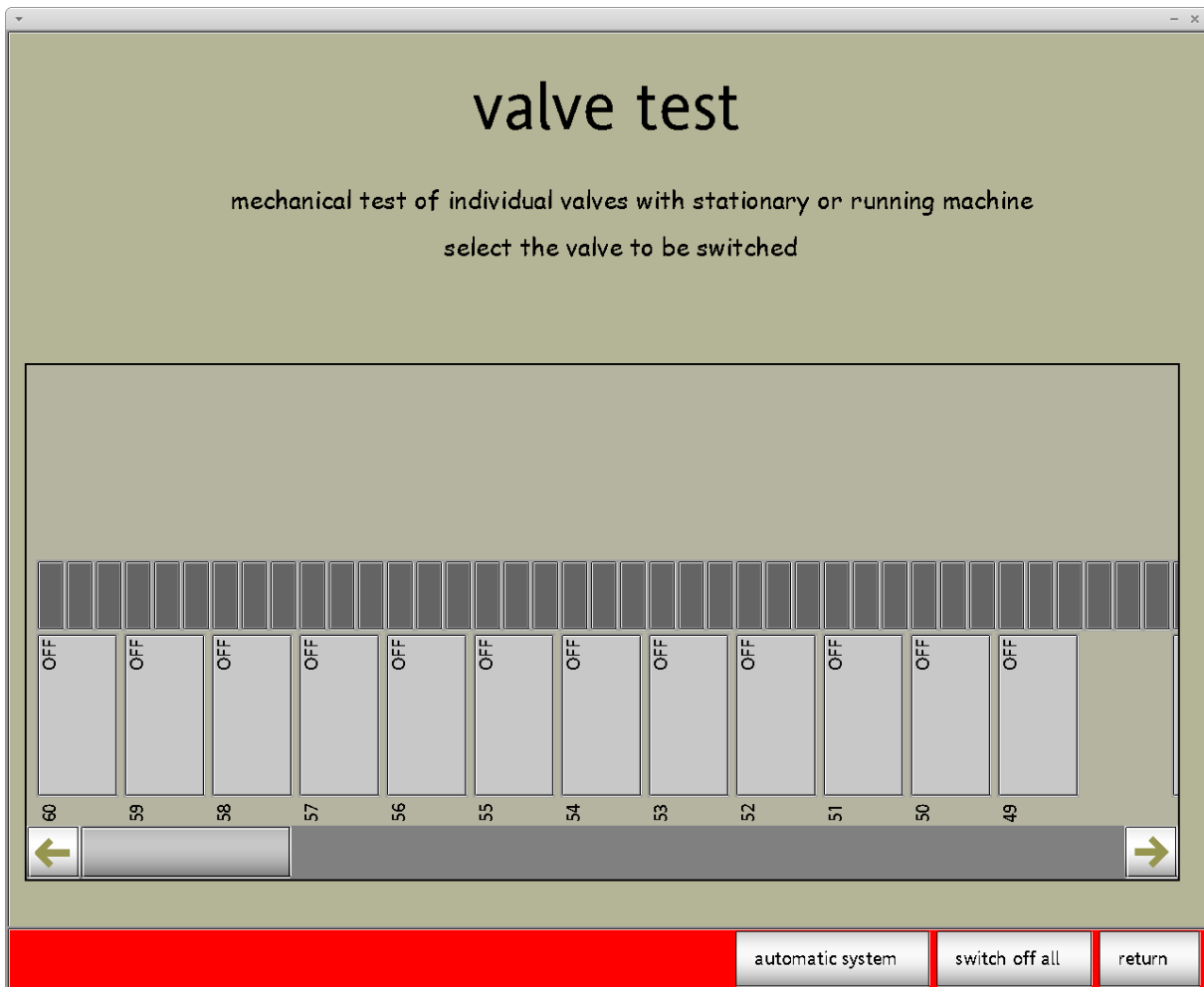
If the machine runs without problems, every second tray is tilted with the conveyor of the asparagus sorting machine **running**.



The screen also shows the output basins of the Espaso (the image shows an S12 bilateral). Now start the machine. By using „start test” key, you can start the test, pressing “continue” takes you to a basin an output basin which will receive the content of the tilted trays. You can also select a certain output basin by touching it on the screen. If the system test is successful, every second tray will be tilted towards this basin.

## 2.2. Valve test

The valve test is a mechanical test to check the valves. The machine conveyor is switched off.



Select a basin by touching it on the screen and to activate the respective valve. The alterable switch is moved and produces a clicking sound. All valves can be switched to interval mode by pressing the "automatic" key. This will enable you to monitor the sorting line. To do so, the belt on the sorting line must be lifted.

**Please note:** Make sure that the belt is properly replaced and alined on the sorting line after the valve check.

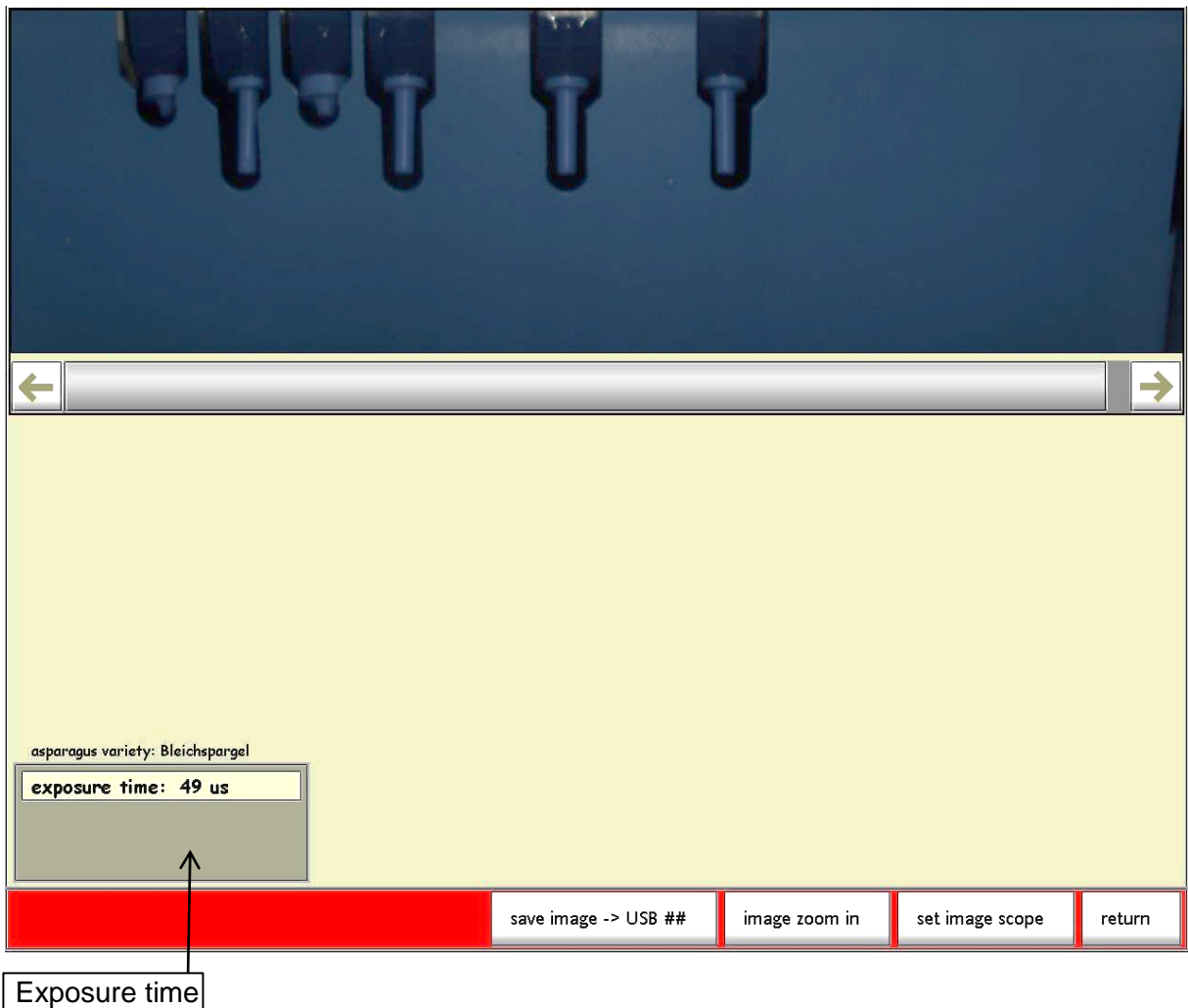


### 2.3. Camera test

The camera takes up to 10 images of a spear rolling over the measuring surface. The camera test checks the camera function and provides camera setting options.

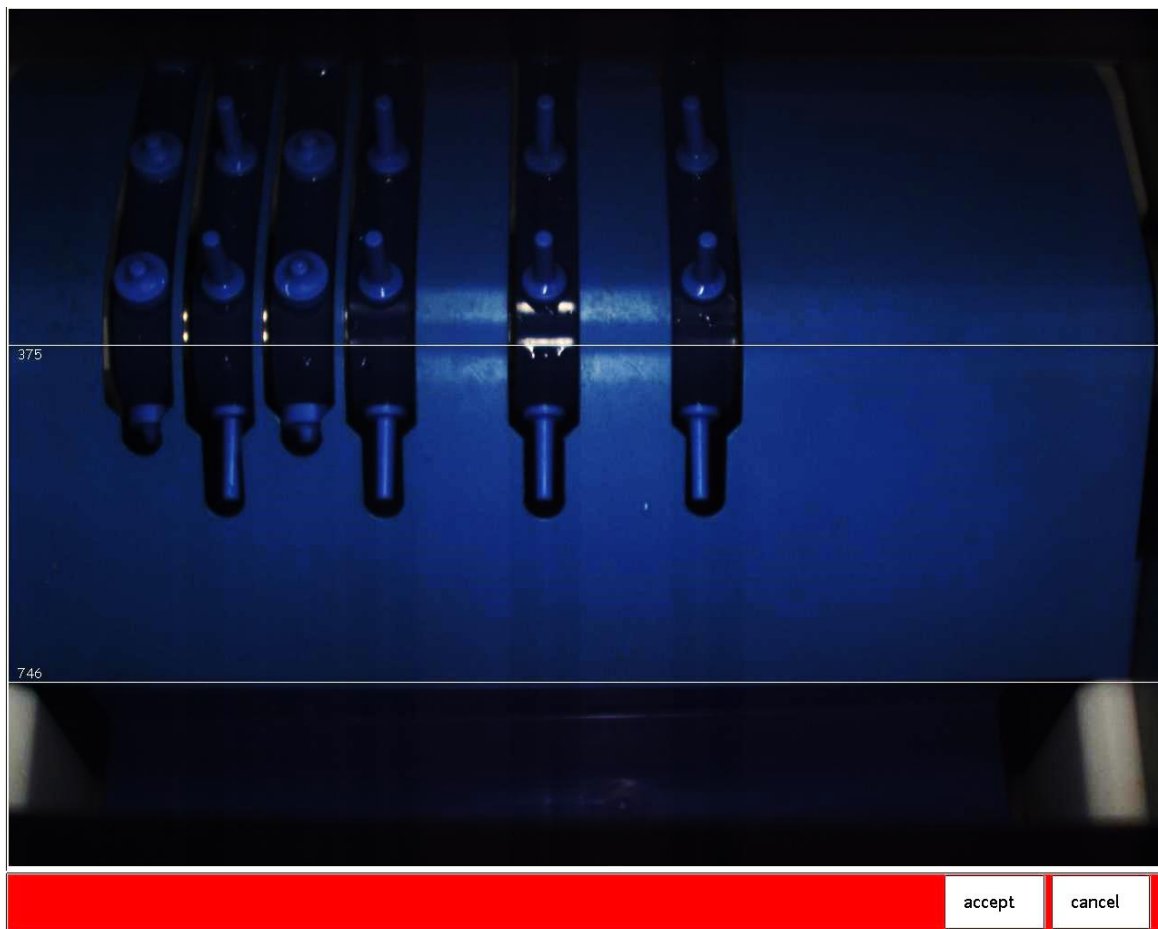
The screen will show the measuring surface monitored by the camera. To get an optimal sorting result, this area must be kept as clean as possible. The measuring surface is cleaned through a maintenance opening. Dirt caused by old asparagus skin or residuals can be easily removed through that opening.

Camera-Live-image



Change camera settings using the arrow keys:

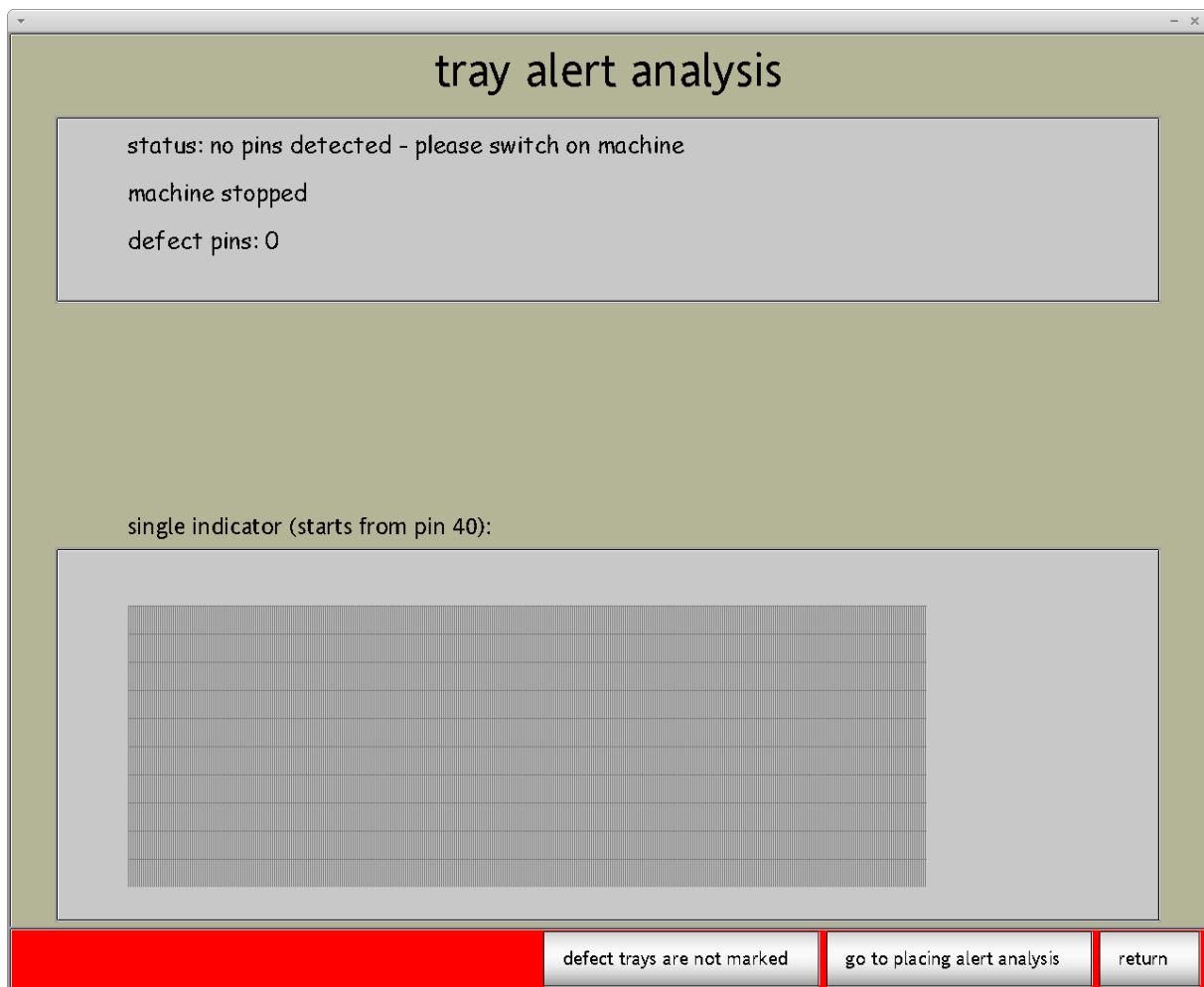
Change exposure time	Changes the exposure time of the camera.
Zoom in/zoom out	This feature is selected by pressing the key “zoom in” to zoom in 5 steps. The key “zoom out” is used to zoom out. To move the zoomed in image, touch the zoomed image. Press Return to leave this feature.
Manually select image area	<p>Press “select image area” to set an image area. This should show exactly the blue measuring surface.</p> <p>The image is shown with two white horizontal lines (one line might be at the top of the image and the other one at the bottom so they might not be visible). You can move the lines by touching them.</p> <p>The actual positions of the lines and the maximum distance are shown.</p> <p>The above image shows the optimal settings for the image area.</p> <p>Save the new settings and close the image by pressing “save image”. The Espaso will need a moment to do that.</p>
Save image	Save snapshot of current image with “save image”. The Espaso will need a moment to do that.



**Please note:** Camera settings should only be changed after previous instructions. Changing the settings may lead to unintended sorting results.

## 2.4. Message analysis

Two sensors for the position of the conveyor transmit data for exact camera processing. One sensor transmits the position of the conveyor and the other one the position of the transport trays.



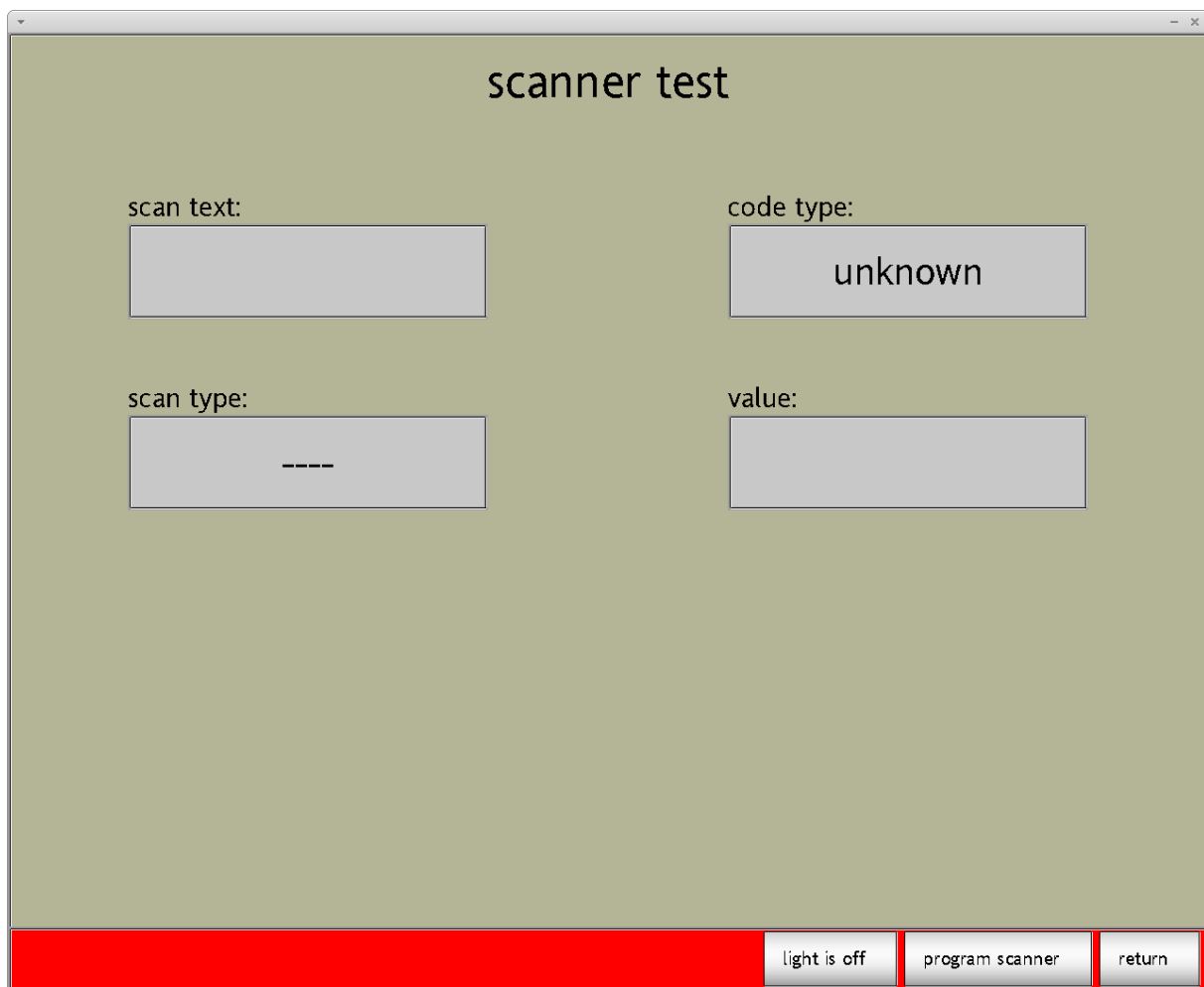
The message analysis checks the conveyor (conveyor analysis) and the sorting line (tray analysis). For every measuring impulse of the sensors, a green line is shown on the screen.

When accessing this function, the tray analysis is shown. Pressing key "go to conveyor analysis" to go to the conveyor analysis. Pressing the Return key takes you back to the tray analysis.

Leave this feature by pressing the Return key in tray analysis.

## 2.5. Scanner test

The scanner test checks the scanner system (optional for Espaso S12 bilateral) and reprograms it, if required.



The scanners Sabre1400 and SR30 can scan directly from the codes on the screen. For the scanner PowerScan, printed barcodes are required. Examples are enclosed in the appendix of these instructions (see Espaso scanner barcodes).

Every barcode has four options that are shown on the screen:

Scan text	The scan text shows the barcode the way the PC reads it.
Code type	The code type is determined in the scan test. This should be called "Espaso", if the barcode that was read belongs to the Espaso.
Scan type	Shows whether the barcode applies to a harvest helper (cutter) or a field.
Value	Shows the parameter that applies to the respective scanner type. If, for example, the first harvest helper was scanned, this will show as 1. If the fourth field was scanned, this will show as 4.


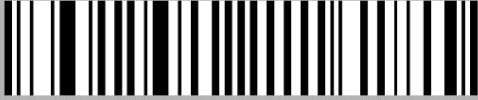




The "light is off" key switches off/on the light on the scanner unit.

Press "reprogram scanner" to reprogram the scanner. Neubauer Automation offers machines with two different scanners. So please get information on which scanner you use, before

reprogramming it. During commissioning, the scanner is preset for you and in general no reprogramming will be necessary.


The scanner type SR30 can be programmed using the barcodes on the screen.


program scanner SR30


scanner reset:	
activate code128 :	
Baud rate 9600:	
data bits 7:	
parity even:	
stopbits 2:	

For the scanner type Sabre 1400, press the “next scanner” key and the programming codes for this scanner will be displayed.

program scanner Sabre 1400

scanner reset: 

general settings: 

activate code128 : 

return

Press the Return key to leave scanner programming. By pressing the Return key again, you leave the scanner test and go to system settings.

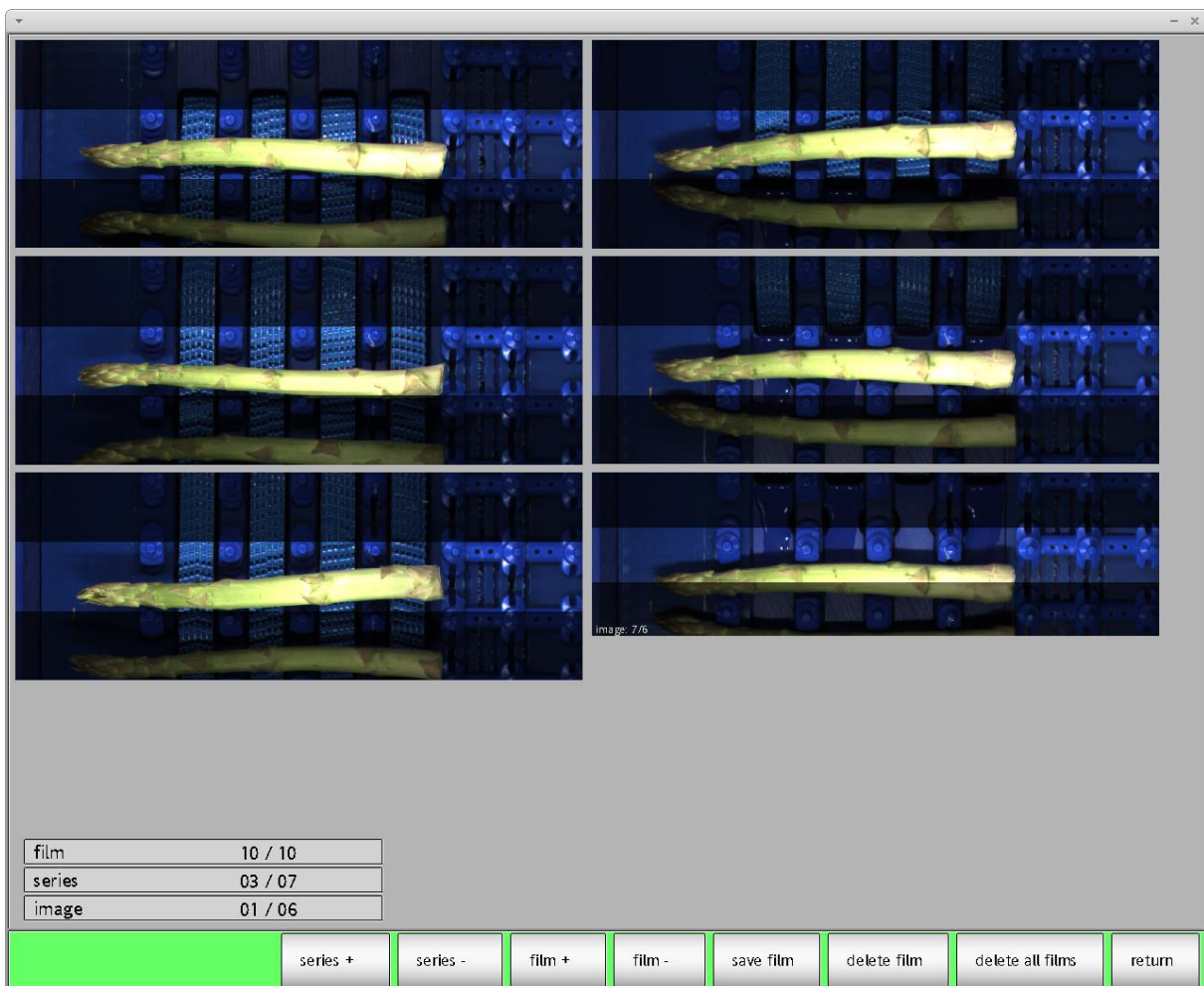
## 2.6. Single image test

The single image test is one of the most important diagnosis features you require for the settings of your asparagus grades. It shows a detailed analysis of the asparagus sorting machine for every single camera image that the Espaso takes of the first spear that passes the Espaso during the test.

In the single image test, the sensitivity settings for the individual asparagus features are also determined.

When using this feature, the conveyor of the machine should be stopped and only the spear to be analysed should be placed on the conveyor. Then start the single image test by pressing the “single image” key, if this option was selected. The screen then shows the main screen. In the warning window only “single image test” is displayed. Start the machine. As soon as the spear has been detected by the camera, the screen will change again.

The single image test can be carried out during normal operation, as it has no influence on the sorting. However, if it is done during normal operation, you cannot determine which spear will be detected, as the Espaso will select the first spear the camera detects. In addition, no changes in the sensitivity settings should be carried out as long as the machine is sorting.



The above image shows the screen of the Espaso after detection of the first spear. The image series of this spear is displayed. Pressing the “save series” key will save the series of images taken on a USB stick and/or in the PC. Touching an image to select this image for analysis (please see image below). Use the keys “more time” or “less time” to change the time the image is taken. That is the time the first image is taken.

If, for example, no spear is shown in the first image of the image series, this parameter must be increased. If in the first image the spear is already too far in the middle or too far down in the picture, the parameter must be decreased.

Spear image

Espasa evaluation							
overall result:	214.8 mm	18.6 mm	0				
image result:	209.3 mm	18.6 mm	0				
Jumbo +	240.0	400.0	20.0	50.0	100	300	10 1
Jumbo	210.0	240.0	20.0	50.0	100	300	10 1
Jumbo -	160.0	210.0	20.0	50.0	5	300	10 1
Jumbo blanco	160.0	210.0	20.0	50.0	100	300	100 0
Jumbo punta	0.0	160.0	20.0	50.0	100	300	100 0
Jumbo abierto	0.0	400.0	20.0	50.0	100	300	100 0
XL +	240.0	400.0	15.0	20.0	100	260	10 1
XL	210.0	240.0	15.0	20.0	100	300	10 1
XL -	160.0	210.0	15.0	20.0	5	300	10 1
XL blanco	160.0	210.0	15.0	20.0	100	300	100 0
XL puntas	0.0	160.0	15.0	20.0	100	300	100 0
XL Abierto	0.0	400.0	15.0	20.0	100	300	100 0

length correction 1.018 + -

thickness correction 1.000 + -

white foot parameter 80 + -

diagonal cut 15 + -

Frayed cut 15 + -

Wei8Fu8: 0.0 mm  
Gew. 49.64 g

image 5/6 series 3/7 -> SEC evaluation next image next page previous page contour mode RGB-Modus return

Detected grade Data-Analysis-Chart Sensitivity settings

The image will be displayed in the upper part of the screen. The properties of the spear detected by the camera will be included in the picture. The contours, for example, are in purple. The green lines show that the spear shows a minor S-curve.

Below the image of the spear you see a data analysis chart with its features.





If the machine sorts too strictly, sensitivity of the feature that was determined too strict must be increased. From then on the machine will evaluate this feature less strictly. If the machine is to evaluate a certain feature more strictly, decrease the sensitivity parameter for the respective feature. The changes will be displayed immediately in the spear image.

**These settings affect all your charts, so they should only be changed with the utmost care.**

Go to the following image by pressing the “next image” key

**Please note:** If you leave all settings by pressing the return key, the single image test will still be active. You can switch off the single image test in the overview of the taken images of the spear or go back to system settings and press the “single image test” key again.

## 2.7. Drop time

The passage from the measuring surface to the transport boxes must function smoothly to ensure that the spears are dropped into the right boxes.

The drop time is not set correctly, if the spears do not correctly hit a transport box anymore after passing the measuring surface. If several spears fall into a box or if the spears touch a metal edge of the box, the drop time must be reset by entering a new corrective setting for the conveyor (see image below).

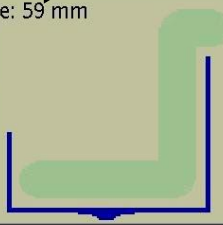
Antriebsueberwachung

**Auflegebandantrieb**

falling time: 59 mm

-

+



Linearfaktor: 70000

Notlauf: 6800

Kraft (%): 0

Notlaufmodus: OFF

Betriebszustand: 1 - Reglersperre  
Fallzeitpunkt Soll / Ist: 7 mm / 7 mm  
Fehlercode: 0 - kein fehler


performance 0 %

Betriebsbereit:  Motor steht:   
Notlauf:  Drehzahl OK:   
Can Bus:  Störung:

**Turboladerantrieb**

**Korrekturwert Fallzeitpunkt**

+ +22 mm -



Linearfaktor: 0

Notlauf: 4000

Kraft (%): 100

Notlaufmodus: OFF

Betriebszustand: 1 - Reglersperre  
Fallzeitpunkt Soll / Ist: 22 mm / 23 mm  
Fehlercode: 0 - kein fehler

performance 0 %

Betriebsbereit:  Motor steht:   
Notlauf:  Drehzahl OK:   
Can Bus:  Störung:

return

Control indicator

Emergency run /Speed

By using servomotors it is possible to control each conveyor via the software. That way, the turbo loader speed is set by adjusting the corrected value to the speed of the placement area. The placement conveyors are synchronised to the machine speed accordingly. As the corrected values are not exactly reflected by the motor, there is a desired value and an actual value, the difference of which is shown by the black bar in the green area (see image). The bar is exactly in the middle of the green area when the “desired” and “actual” values are the same.

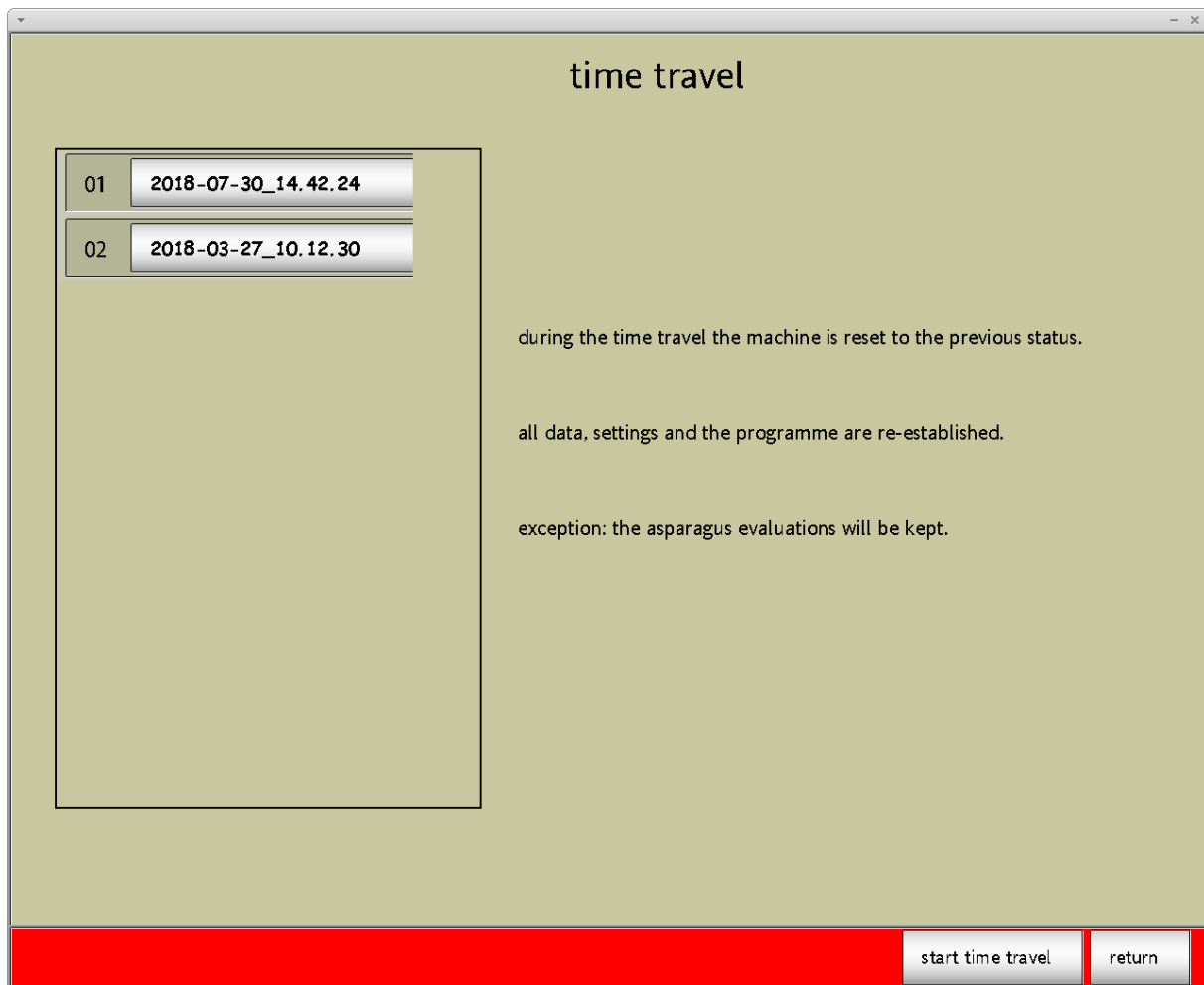
When the speed of the machine is changed, the drop time is re-calculated by a so-called linear factor (see image.)

All the above drop time settings are done and tested in the factory and hardly changed.

This indicator provides information on the motor status, the actual and desired drop time and possible malfunctions. In certain conditions, the machine can also be run in emergency mode.

## 2.8. Time travel

The time travel function restores the status of the Espaso prior to the last saving of the Espaso status. This concerns all data, settings and also the software version. Only the evaluations will be kept. Prior to using this function, the status of the Espaso should be saved to ensure that this status can be restored as well.



When accessing the time travel feature, all available Espaso restore points will be shown. A restore point is created every day, if at least 2000 spears were sorted in one go without switching off the machine. Alternatively you can also create a restore point using the "save Espaso status" function (see 4.4). Select a restore point using the keys "date+" and "date -" and start time travel to that point. After about 15 seconds, your Espaso software will be restarted in the status it was in at the time this was saved.

## 2.9 Not allocated asparagus

If the sorting chart was created with gaps, spears that exactly match the parameters of those gaps fall into the overflow basin at the end of the machine. However, these spears are measured as well. These parameters will be saved in a “not allocated spears” chart to enable you to find the gaps in your chart. This chart is displayed in system functions.

non-allocated spears																						
	L	D	K	SK	KK	V	VS	VK	G	B	RS	RK	F	DD	O	DS	B	Ri	SC	WF	GW	Pos
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

L : length	V : purple	RS : rust spear	DS : double spears	GW : weight
D : thickness	VS : purple spear	RK : rust head	B : breaking	Pos : position
K : curvature	KK : purple head	F : rotten parts	Ri : nuts	
SK : S-curvature	G : green	DD : thickness difference	SC : cut	
KK : head curvature	B : blossom	O : ovality	WF : white foot	

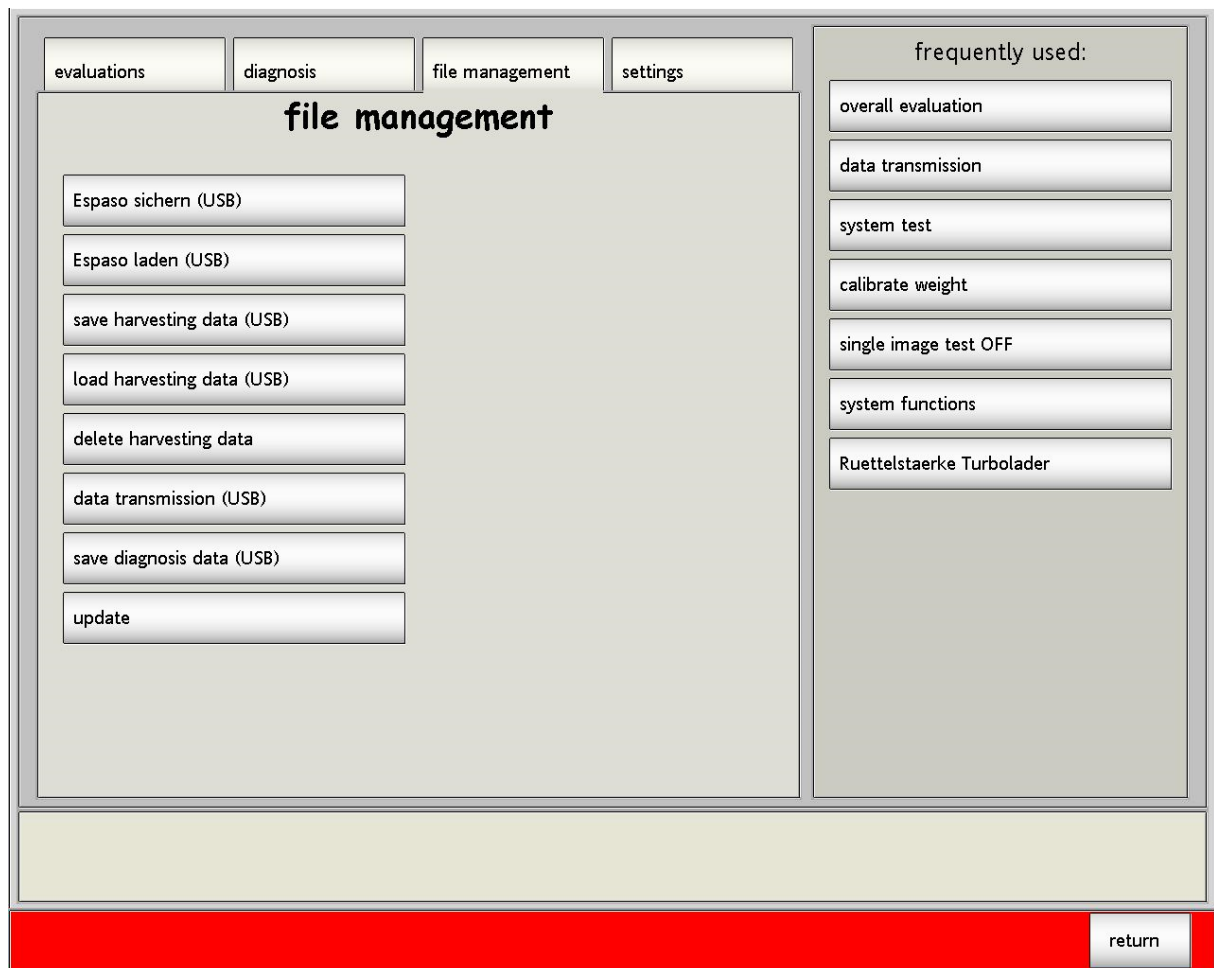
  

		Bildschirm runter	Bildschirm hoch	return
--	--	-------------------	-----------------	--------

The displayed parameters are set up similar to the data analysis chart for single image test (see 0).

### 3. Data management

Data management offers functions to save the data of the Espaso and use it again. The data concerned is all machine settings and raw data for evaluation.



#### 3.1 Save system data

Saves the Espaso configuration and the sorting chart settings of your Espaso on a USB stick. Save data by pressing the “system save” key. If no USB stick is plugged into the USB slot, you will be requested to put one in. If the USB stick is not plugged in quickly enough, press “save system” again. The data will then be copied to the stick.

**Your old system data on the USB stick will be overwritten without further request.**

#### 3.2 Load system data

Previously saved system data is loaded again. To do so, you need the USB stick where the system data is saved. After pressing the “load system data” key, you will be asked to plug a USB stick into the USB slot. If the USB stick is not plugged in quickly enough, press the key again.

The data will then be restored and the programme restarted in max. 15 seconds. If no system data is found on the USB stick, an error message will appear.

### 3.3 Save measuring data

The measuring data is raw data that the machine collects during operation and it is the basis for evaluation. An USB stick is required to save it. If the feature is opened by pressing the “save measuring data” key, you will be requested to plug in an USB stick. If the USB stick is not plugged in within a certain time, this feature must be restarted by pressing the key once again.

### 3.4 Load measuring data

Reloading of measuring data is done by pressing this key. If an USB stick is in the USB slot, data transfer will start immediately, otherwise you will be asked to plug in an USB stick. If the USB stick is not plugged in within a certain time, this feature must be restarted again. The USB stick can be left in the slot. After successful data transfer, the USB stick can be removed. Your data will be on the Espaso again. If no measuring data is found on the USB stick, an error message will appear.

### 3.5 Delete measuring data

With the “delete measuring data” function, the raw data that was collected during the current year will be deleted by the Espaso Asparagus Sorting Machine. To restore it, an USB stick with the saved data is required. This can be copied to the machine by pressing “load measuring data” (see 3.4 Load measuring data).

### 3.6. Data transfer

transmit harvesting data:

start date:			final date:		
day:	month:	year:	day:	month:	year:
23		2010	23		2010
24		2011	24		2011
25	1	2012	25	1	2012
26	2	2013	26	2	2013
27	3	2014	27	3	2014
28	4	2015	28	4	2015
29	5	2016	29	5	2016

Data transfer exports the evaluation data to a USB stick and if the Espaso is connected to a network, the evaluation data will also be available in the network. The network name of the Espaso sorting machine is "espaso\_pc", unless you or a Neubauer Automation technician changed the name during commissioning.

Documentation on the data structure of the exported data is enclosed as appendix to this instruction manual.

First, enter the start and finish dates. All data between these parameters will be exported as soon as you press the "transfer" key. For export to an USB stick, this stick must be plugged into the USB port prior to starting the export.

### 3.7 Update

An update will be necessary, if major changes were made to the Espaso software and an improvement can be expected for the machine. Press this key to start the update. It is recommended to save the current Espaso status before starting the update (see 3.1 Save system data). Press "yes" to save the data right away, press "no" to ignore saving. You will be asked to plug an USB stick into the USB slot prior to starting the process. Press "install update" to carry out the update and the software will be restarted in max. 15 seconds.



## 4. Settings

### 4.1 Wage factors

enter wage factors

sorting chart: 01 Standard  
wage factors for: one kg asparagus

I weiss 26+ese	0.00000
aa 20 28	0.00000
I weiss 16-26	0.00000
I violett 16-26	0.00000
I weiss 12-16	0.00000
I violett 12-16	0.00000
II weiss / violett 16-26	0.00000
Suppenspargel	0.00000

change wage type    change sorting chart    return

In this screen, the wage factors for all asparagus grades can be set. First, select a chart ("change sorting chart" key). Then select whether you want to pay according to spears or kg ("change wage type" key). Subsequently, the respective wage factors are entered for each chart category. A box opens where the figures can be entered. If you work with more than one chart, a set of wage data must be entered for each chart.

## 4.2 Calibrate weight

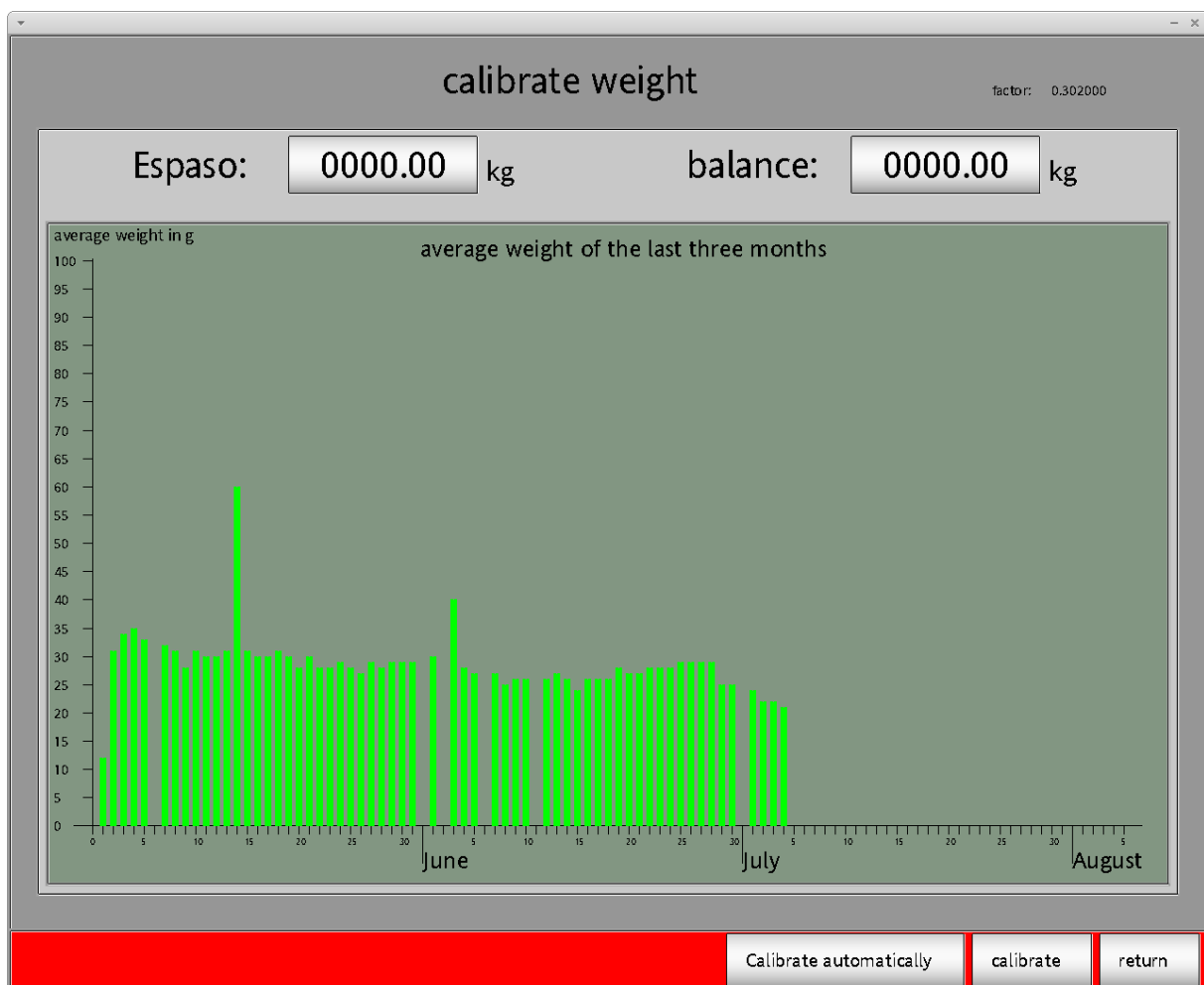
The Espaso measures the spear weight on the basis of its volume and density. As the asparagus sorter takes about 10 images per spear, a 3D model can be calculated. Using the density, the actual weight of the spear is calculated. There might be some irregularities depending on the weather, as the density changes slightly according to the weather. It is recommended to calibrate the Espaso in regular intervals during the season to ensure that the weight indications remain within the tolerances.

For the calibration, about 100 kg must be sorted. The weight determined by the Espaso is then noted. The sorted asparagus is then weighed on calibrated scales and this value is also noted.

Open the feature “calibrate weight”.

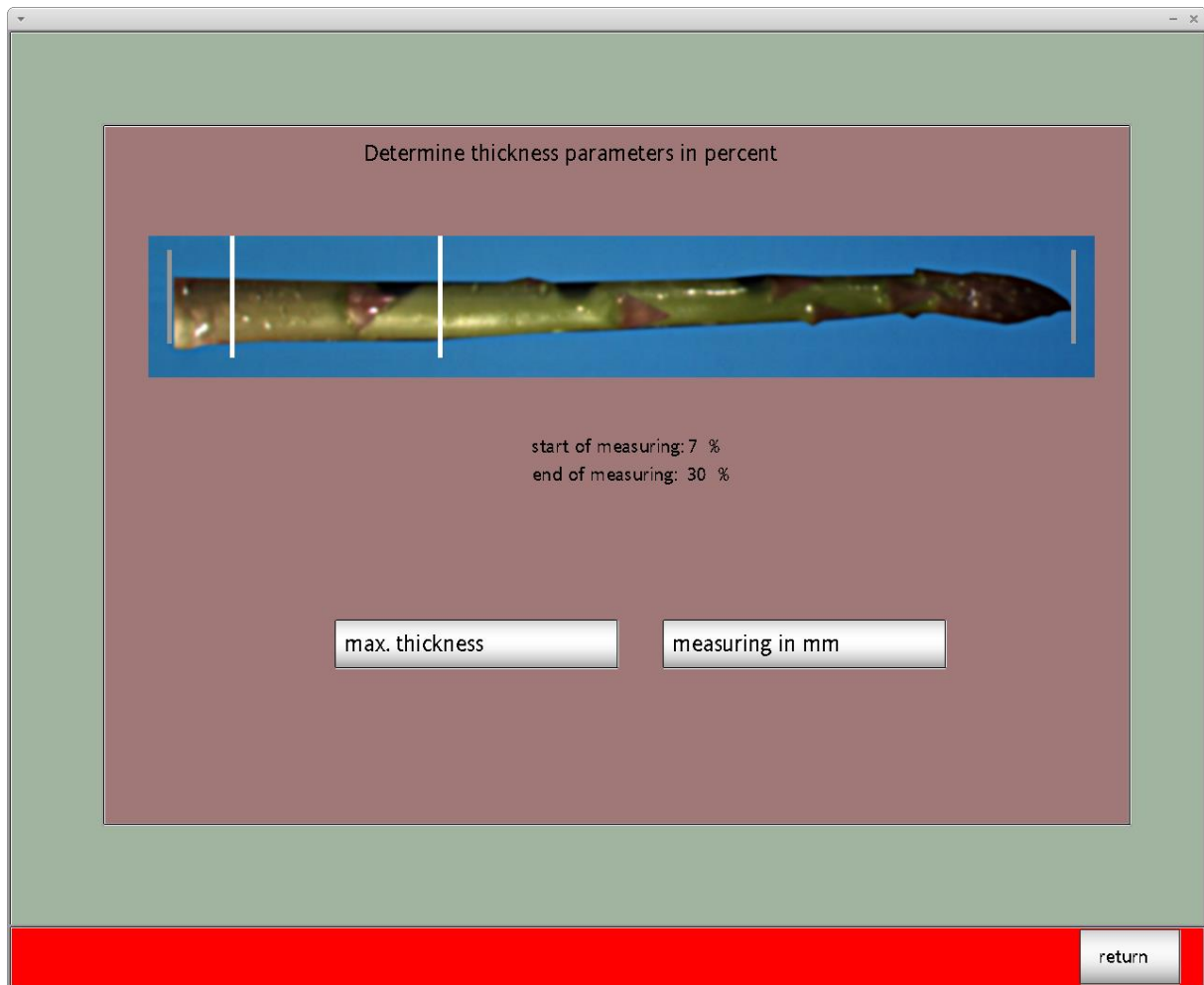
By touching the keys “Espaso” and “Scales”, a box will open where the two weights can be entered.

Then press the key “calibrate” to start calibration. The density will be calculated from these parameters and saved. From the time the “return” key is pushed, the Espaso will continue calculating the spear weight using this parameter.



### 4.3 Thickness parameters

Parameters in the Espaso can be set as to where and how the thickness of a spear is determined. These settings are made in the thickness parameters.

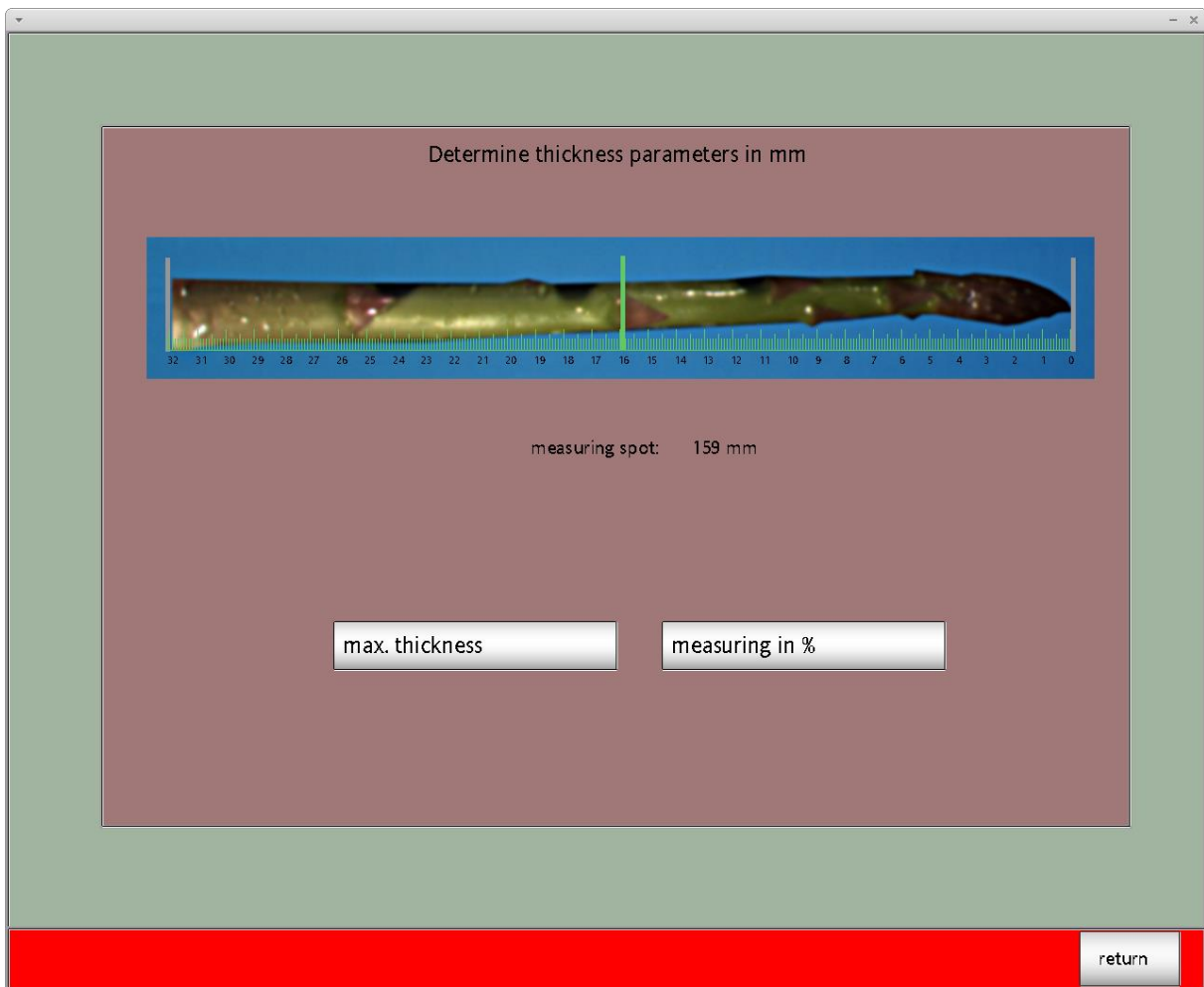


The area selected to measure the thickness can be determined here. The parameters for this area are indicated in percent (%) of the entire length. The area for thickness measurement must be at least 20% of the spear.

From the base of the spear at 5% of the length, thickness measurement can be started (start of measuring). The highest possible value is 90% from the base of the spear (end of measuring)

With the two lines, the range and the range size can be changed (start and end of measuring).

You can also determine the area in mm by touching the key "measure in mm" and by moving the green bar (see image below). The area to measure the thickness starts at the base of the spear and ends at the green bar.



From the bottom three settings it can be selected whether the thickest or the smallest available value should be taken as thickness or whether the average value should be calculated from all values. If you measured the thickness with a gauge prior to introducing the asparagus sorting machine, the “smallest thickness” is the right parameter for you. If the spears were pushed through holes to determine the thickness, the “largest thickness” is the best for you. In all other cases, “medium thickness” is the best choice.

## 4.4 System functions

The system functions include basic system settings:

system functions			
day change	0	minimum number of asparagus per box	0
quantity indicator visible	yes	keep previous scan code	OFF
switching table	---	saving delay	100
tray displacement	65	field cutter time in sec	0
save ESPASO status		scan boxes	YES
save diagnosis data		scan cutters	YES
set date/time	14:50 30.07.18	scanning process	YES
language	English	remote maintenance	ON
file format	short	Set remote maintenance parameters	
spears per basin	6	Espaso Master	slave
type of quantity display	Sum of charts	start pump	yes
weigh consistently	no	limit for green light	80
weighing distance	2	limit for green-yellow light	65
pump rotation speed white	---	limit for yellow light	50
pump rotation speed green	---	record film	OFF
SEC cutting pressure white	1200 bar	show film	
SEC cutting pressure green	900 bar	show film E	
			return

The settings and how to operate the panel are described in the chart below. In general, the settings are only saved when leaving the system functions. Exceptions will be highlighted.

Change of day	Setting of the time up to which the sorted spears are added to the previous day.  A parameter between 0 and 23 can be selected.
Quantity indicator visible	If this option is set to “yes”, the main screen will display the quantities for the individual grades, their weights and their share in percent – otherwise these values will not be displayed.
Weight factor	The weight factor describes the difference in percent between the specific spear weight and the weight determined by the feature: calibrate weight (see above 4.2 Calibrate weight)

Tray offset	<p>At which point a tray is tilted, depends on the tray detector, the time of the image and the tray offset.</p> <p>Settings for the time the image is taken are carried out in single image test (see above Single image test). The impulse of the tray detector arrives in regular periods and cannot be manipulated by the software. The try offset indicates how many tray impulses occur between the time of the image and the time of tilting. The try offset must always be checked, when the image time is changed. You can check this by placing a spear on the machine and check whether this spear is also tilted into a basin. If the spear ends up in the basin for the remains, the try offset must be reset.</p>
First chart to be opened upon starting the machine	<p>The chart that should normally open when the Espaso is switched on. If you select the three lines, the last used chart will be shown.</p>
Save diagnosis data	<p>This feature saves the data used for diagnosis onto a USB stick. Service technicians will need this information to detect and eliminate possible errors.</p> <p>When pressing the key for the first time you will be requested to plug a USB stick into the USB slot. When pressing the key again the data will be copied to the USB stick.</p>
Set date/time	<p>Sets the date and time. This is required in particular for the change of the BIOS battery.</p>
Minimum spears per box	<p>In this feature, the minimum quantity of spears for a box is set. This feature is mainly used for tests, as usually only few spears are required for the tests. For these spears, no separate settings should be saved. This setting ensures smooth allocation of cutter and his/her respective harvest box.</p>
Language	<p>The Espaso supports different languages that are integrated in the system via language packages.</p>
Save Espaso status	<p>Once a day the Espaso saves all data in a special log file. This procedure starts, if minimum 2000 spears have been sorted continuously. If no 2000 were sorted that day, NO restore point will be created that day.</p> <p>With this feature, the current status of the Espaso can be saved manually. The only difference from automatic saving is that the time the status was saved is also included in the restore point. If several restore points exist for one day, they can be distinguished that way.</p>

Field-cutter-time	This feature should not be taken into account for sorting and be set to zero. It determines how many seconds may be used between the scanning processes for field and cutter.
Delayed saving	Delayed saving is the expression for the number of pins between the beginning of the conveyor and the camera image. A new box is not started before the spears that are already lying on the conveyor, have been sorted and saved by the Espaso.
Scan fields only	It can be determined, if fields and cutters or only field should be scanned. Is this parameter ON, only fields will be scanned, otherwise fields and cutters will be scanned.
Keep previous barcode	If the machine is stopped, the last read barcode is stored and reused when the machine is restarted. This process can be switched off by setting this parameter to OFF. Then the barcode will set to the standard value 9999 when the machine is restarted.
Use network	Switches on the network function of the Espaso, (ON) or switches it off (OFF). If you do not use the network, it should be switched off to be able to use the resources in an optimal way. When the network is on, exported evaluations are saved on an USB stick AND in the network of your Windows application. For network use, previous installation by a service technician is recommended.
File format	The file format determines how the evaluation data are exported. Different third party software systems require different formats. „Short“ is the most usual form for most third party systems.
Remote maintenance	Maintenance of the machine can be carried out by Neubauer Automation.  This key starts a remote maintenance session or stops an existing session.  Remote maintenance is described in detail in chapter “Remote maintenance”.
Check connection	Checks the encrypted connection for remote maintenance.
Set network parameters	Changes the network parameters to enable remote access for maintenance.
Spears per basin	Determines the distribution of the spears in the basins. For example, if “3” is entered instead of “1” and there are 2 basins for the same grade, the spears will only be dropped

	in the second basin, if 3 spears have already been dropped into it before.
start pump	Determines when the pump is started. There are 3 possibilities: - only for white asparagus - always (yes) - do not start pump (no)
Type of quantity indicator	The data on the main screen in info screen are shown according to 3 criteria: - asparagus type: green or white asparagus - for the current chart only - for all charts (total of all charts)
Limit for green light	The capacity limit is set in % to show when the light should be green
Limit for green-yellow light	The capacity limit is set in % to show when the light should be green-yellow
Limit for yellow light	The capacity limit is set in % to show when the light should be yellow

## **Remote maintenance**

Remote maintenance can be done in two different ways. The first possibility is that you as our customer or one of your employees in the same network control the machine from his/her office. The "Short instructions: Remote maintenance of the machine by the customer" informs you about the additional software you have to install on your Windows office PC and how to set it up and use it. (See appendix Remote maintenance of the machine by the customer Remote maintenance of the machine by the customer).

The second possibility of remote maintenance is that remote maintenance is carried out by Neubauer Automation. An Internet connection is required and the machine must be configured for this Internet access which is usually done during commissioning. This type of remote maintenance helps to find errors in your machine. In addition, the service technicians of Neubauer Automation can update the software of your machine, if required.

With the remote maintenance being switched off, nobody can access your machine.

To avoid that unauthorised persons access the machine, an encrypted connection to Neubauer Automation is established when the remote maintenance is started. Access to the software screen is also secured with a password. This password is also required for remote maintenance to be carried out by you and your staff.

You will be requested to activate remote maintenance in your machine to give a staff member access to the machine. Remote maintenance will either be terminated by the staff member or you will be requested to terminate it.



## Important information

- Switch the Espaso Asparagus Sorting Machine on a few days prior to the start of the season and check the machine for proper operation. As a consequence of long standstill times, condense water may collect in the switch cabinet that usually evaporates after a short period in operation.
- If possible, do not completely switch off the Espaso Asparagus Sorting Machine via the main switch during the season; if you have to switch off the machine to save energy, press the black button on the left of the switch cabinet first and wait a moment until the software has closed BEFORE setting the main switch to zero.

## Instructions for creating a sorting chart

When creating a sorting chart, it must be ensured that the good grades are placed at the top of the chart and the lesser grades further down. As the Espaso reads the sorting chart from top to bottom and sorts the spears into the first grade with matching criteria, the chart must be created that way to ensure that the good grades are not left out.

- In particular the parameter for spear thickness should be set in every chart (e.g. 16-22, 22-26, 26+) If this is not done, spears might not meet any of these parameters (e.g. settings: 16-22, 23-26) and spears with a thickness of 22.3 cm will be sent to the waste basin).
- Purple grades should be created exactly like the white grades with the exception of the feature Purple (or purple head and purple spear).

Examples:

Class	Length	Thick-ness	Curvature	S-Curvature	Head curvature	Purple	Rust	Rotten
white	170-300	16-22	8	3	20	30	30	40
purple	170-300	16-22	8	3	20	100	30	40

or above 2 white grades of different thicknesses.

Grade	Length	Thick-ness	Curvature	S-Curvature	Head curvature	Purple	Rust	Rotten
white 16	170-300	16-22	8	3	20	30	30	40
white 22	170-300	22-26	8	3	20	30	30	40
purple	170-300	16-26	8	3	20	100	30	40

In case of overlaps, the figure for the specific characteristics should be bigger from top to bottom in all columns, except for length and thickness.

- The last line in every chart should be a residual grade:

Grade	Length	Thick-ness	Curvature	S-Curvature	Head curvature	Purple	Rust	Rotten
Resi- duals	0-300	0-50	50	10	100	100	100	100

If no residual grade is created, some spears might not be allocated to any category (not allocated spears).

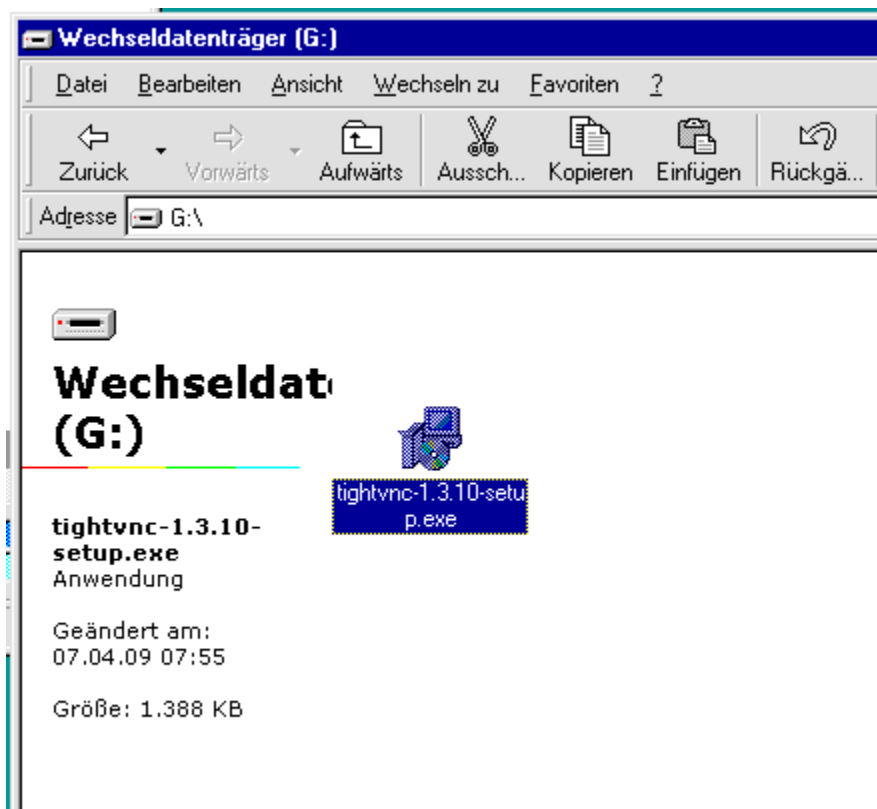
## Remote maintenance of the machine by the customer

Remote maintenance of the Espaso Asparagus Sorting Machine is carried out via Virtual Network Computing (VNC). The screen of the asparagus sorting machine is shown on a PC in a network and can be operated from there. During remote maintenance carried out by Neubauer Automation, an encrypted connection is established to ensure that the machine cannot be operated from outside your or our network. For this intervention we need your authorisation via the respective menu function. Without this setting, no technician of Neubauer Automation will be able to access your asparagus sorting machine. After completed remote maintenance you can remove the authorisation again.

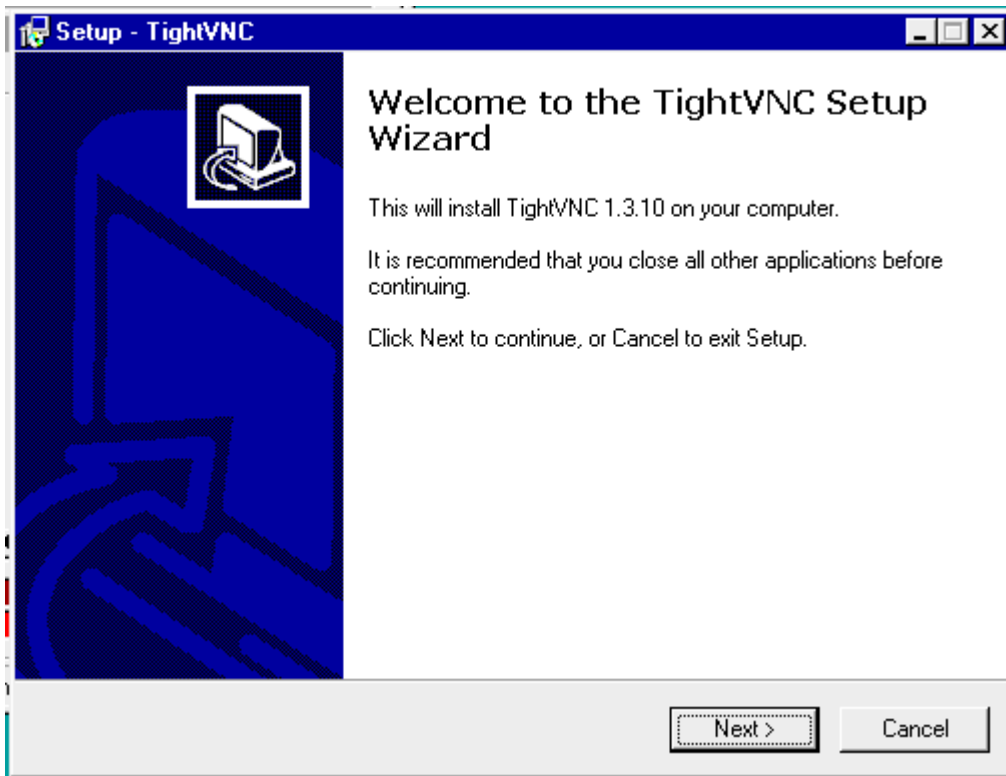
For remote maintenance within your network you need free software that can be downloaded at <http://www.tightvnc.com/download.html>.

### Installation of the remote maintenance software

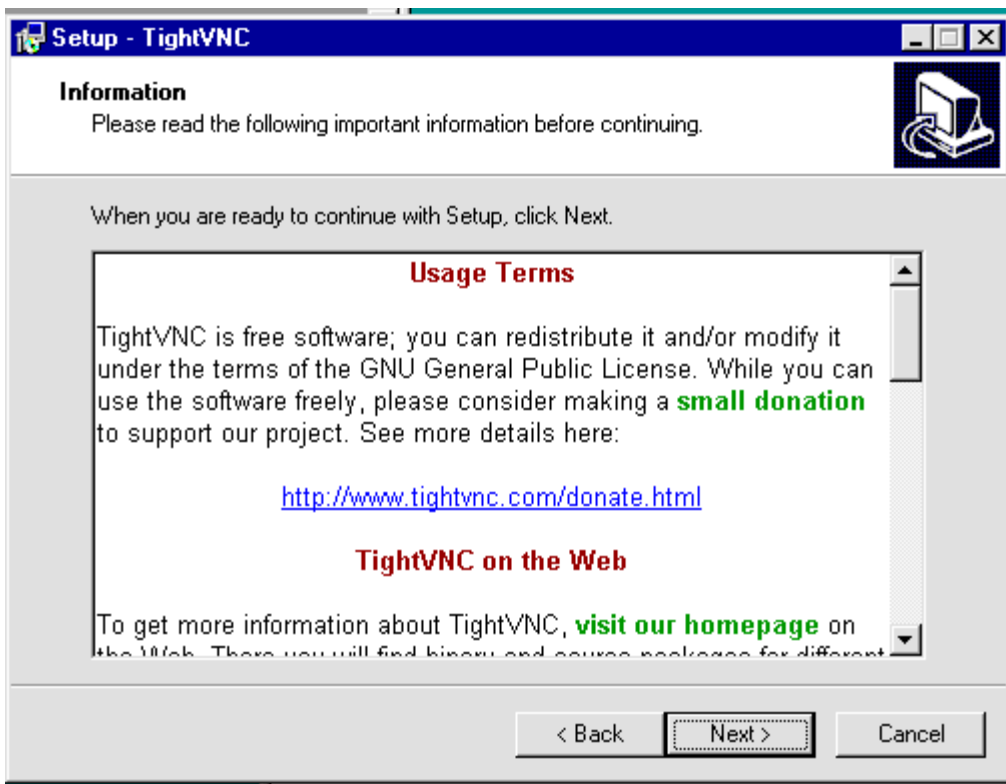
After downloading, the file tightvnc-<Version>-setup.exe will be saved on your PC.



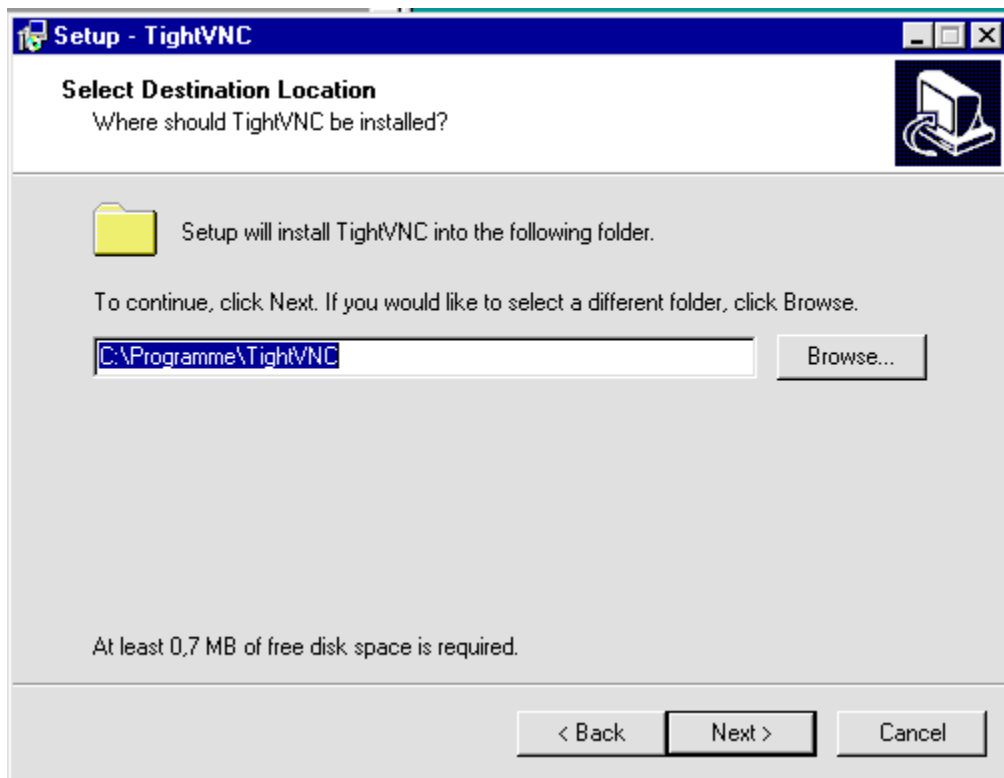
Double click to install the software. A Windows-Typical installation dialogue will open in the first window confirm installation of the software by clicking "Next".



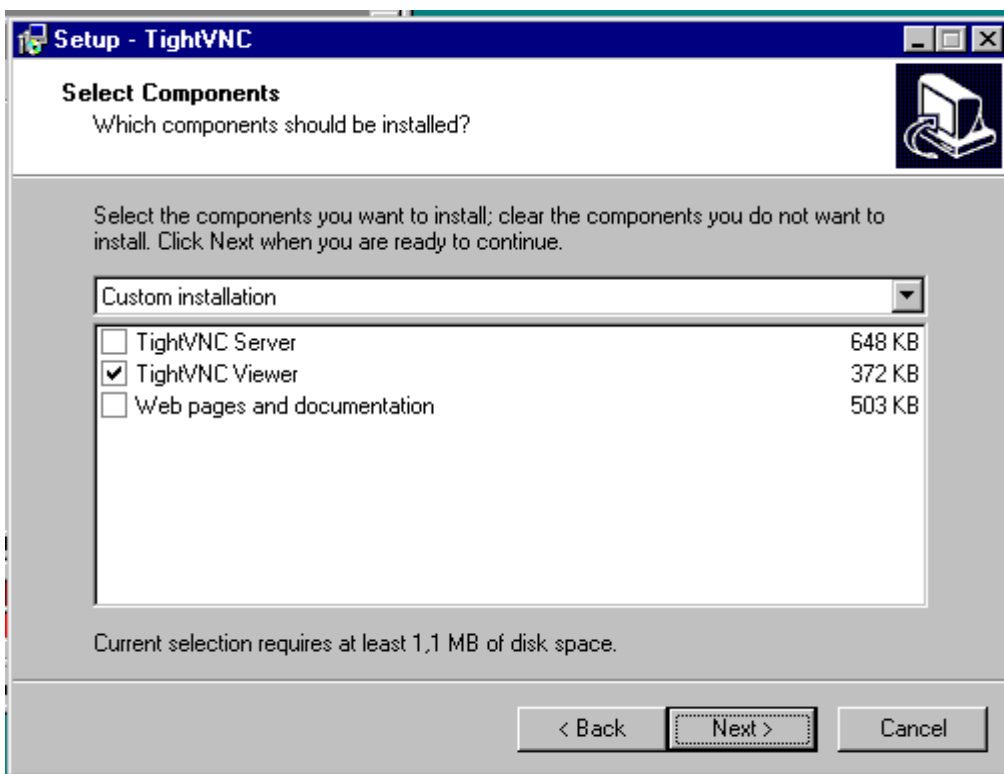
Then accept the licence agreement with the software programmers. As the software is published with an OpenSource GNU General Public Licences, it can be used freely. Click "Next" to select the destination location.



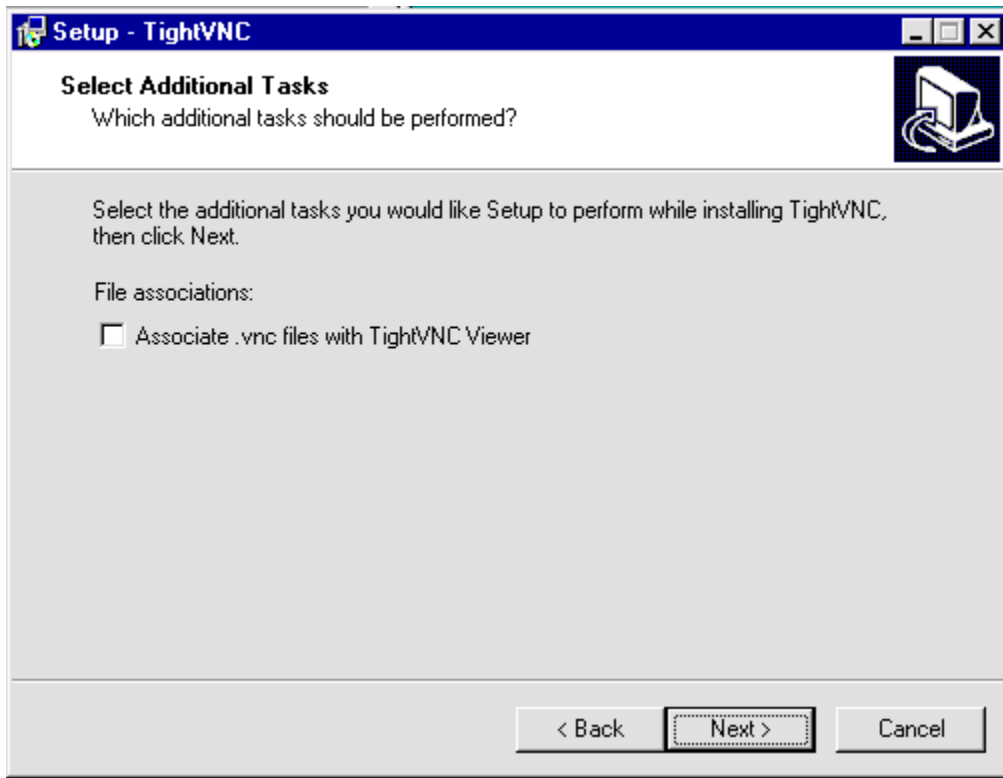
After selecting the folder, click "Next".



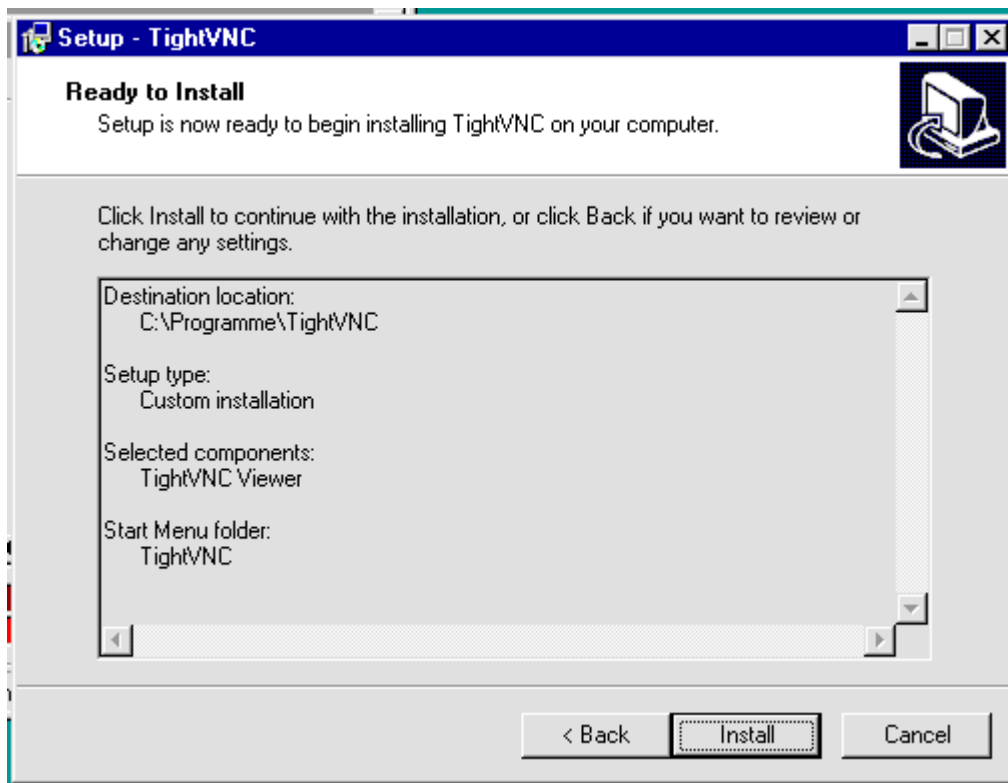
Among the available components, select "TightVNC Viewer" only and click "Next".



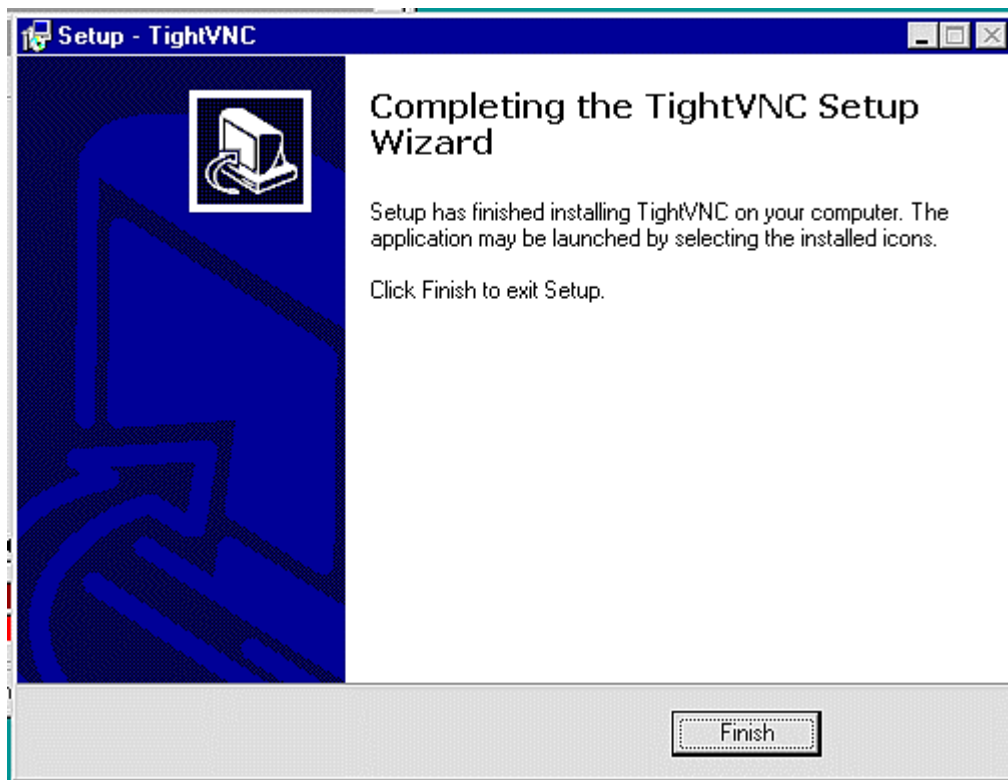
Do not tag the white box below "File associations" and click "Next".



Confirm with "Install". The software will now be installed.



After completion, click "Finish" and your software for remote maintenance of the Espaso Asparagus Sorting Machine has been successfully installed.



### Operation of the remote service software

Click on "Start" in your taskbar and in new programmes select "TightVNC" and "TightVNC Viewer" and start this programme. An input mask will appear where you enter the IP address of your machine. If you use a network dynamically allocating IP addresses (DHCP), enter "espaso" or "espaso\_pc" . This should open an input mask asking for a password. The password is "handtasche".

A screen will open and display the asparagus sorting machine controls. Now the asparagus sorting machine can be controlled using your PC keyboard.

**PLEASE NOTE:** Do **NOT** press the ESC key in the left upper top area of your keyboard. Doing so will cancel the software of the asparagus sorting machine. Then the software can only be restarted after a restart of the Espaso PC. Using the remote service software during operation the machine may have unpredictable results. Please use this function with utmost care.

## Data structure of the Espaso Asparagus Sorting Machine

To export the evaluation data, a specific data interface is used that is able to use other software systems to provide extended evaluation and calculation modules. This data interface was extended in 2009. Not all other software systems implement this interface in their software. However, those external software manufacturers known to Neubauer Automation were notified of the changes. In the Espaso Asparagus Sorting Machine you can choose between the old data format (short) and the new one (long). (See Systems functions 4.4.).

### Short data structure

1;TT.MM.JJJJ;HH:MM:SS;AAAA;BBBB;CC;SSSSSS;KKKKK.KK;FFFF;XXXXXXXX;DD

1	Identification number
TT.MM.JJJJ	Harvesting date, e.g. 02-04-2009
HH.MM.SS	Time, e.g. 12:43:38
AAAA	Cutter number (always four digits)
BBBB	Chart number (always four digits)
CC	Grade number in the chart (always two digits)
SSSSSS	Number of spears
KKKKK.KK	Spear weight in kg with 2 digits behind the comma
FFFF	Field number (always four digits)
XXXXXXXX	Machine serial number (always eight digits)
DD	Producer number

For every grade entered in the current sorting table, one line will be saved. If the current sorting table contains 8 grades, for example, 8 data lines will be created per scanned box - that is one data record. A data record is always saved when the conveyor is stopped, a new scanning code is accepted and the machine has completely worked off the previously scanned asparagus box or if no scanning process has started after 20 minutes. The third possibility mainly occurs in the S12 bilateral, as the standard machine does not have a scanner.

For all data that could not be created, the parameter 9999 will be saved. This mainly applies to cutter and field number in the S12 bilateral or harvest helpers, if the option "scan fields only" is active. A box is only saved, if the minimum quantity of spears for this box was exceeded (also see system functions 4.4.).

### Example:

The asparagus box of harvest helper no. 94 contains 125 asparagus spears. According to the machine calculations, this corresponds to 6.47 kg. The set sorting chart is in second position. The asparagus was cut on the 3<sup>rd</sup> field on 21-05-2009 and was sorted at 8:35, 49 seconds a.m. The sorting customer is no. 4. The machine serial number is 16003309.

In this case, a data record for 8 grades could be as follows:

```
1;21.05.2009;08:35:49;0094;0002;01;0010;00000.52;0003;16003309;0004
1;21.05.2009;08:35:49;0094;0002;02;0017;00000.88;0003;16003309;0004
1;21.05.2009;08:35:49;0094;0002;03;0021;00001.09;0003;16003309;0004
1;21.05.2009;08:35:49;0094;0002;04;0019;00000.98;0003;16003309;0004
1;21.05.2009;08:35:49;0094;0002;05;0012;00000.62;0003;16003309;0004
1;21.05.2009;08:35:49;0094;0002;06;0017;00000.88;0003;16003309;0004
1;21.05.2009;08:35:49;0094;0002;07;0018;00000.93;0003;16003309;0004
1;21.05.2009;08:35:49;0094;0002;08;0011;00000.57;0003;16003309;0004
```

### Long data structure

The new, longer data structure includes more parameters than the old one. Type and time of saving remain the same.

It is extended by:

TT.MM.JJJJ;TT.MM.JJJJ;HH.MM.SS;<Tabellen-Name>;<Sorten-Name>

TT.MM.JJJJ	Date the sorting started
TT.MM.JJJJ	Date the sorting ended
HH.MM.SS	Time the sorting ended
<Tabellen-Name>	Chart name (undefined length)
<Sorten-Name>	Name of asparagus grade (undefined length)

Thus, the data record may change as follows:

```
1;21.05.2009;08:35:49;0094;0002;01;0010;00000.52;0003;16003309;0004;Tabelle 2;l weiss 26+
1;21.05.2009;08:35:49;0094;0002;02;0017;00000.88;0003;16003309;0004;Tabelle 2;l vio 26+
1;21.05.2009;08:35:49;0094;0002;03;0021;00001.09;0003;16003309;0004;Tabelle 2;l weiss 16-26
1;21.05.2009;08:35:49;0094;0002;04;0019;00000.98;0003;16003309;0004;Tabelle 2;l vio 16-26
1;21.05.2009;08:35:49;0094;0002;05;0012;00000.62;0003;16003309;0004;Tabelle 2;ll weiss/vio
1;21.05.2009;08:35:49;0094;0002;06;0017;00000.88;0003;16003309;0004;Tabelle 2;Suppensp.
1;21.05.2009;08:35:49;0094;0002;07;0018;00000.93;0003;16003309;0004;Tabelle 2;Kurze
1;21.05.2009;08:35:49;0094;0002;08;0011;00000.57;0003;16003309;0004;Tabelle 2;Rest
```

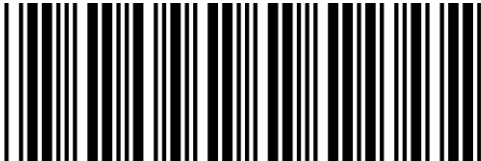
### Use

If a network is used (settings see chapter 4.4), the file cutter.txt is published in the network with the computer name espaso\_pc during export, if no changes were made during commissioning. In addition, the file is copied on an USB stick, if available in an USB slot. For further information see chapter 3.6. Go to chart evaluation directly on the system screen or via overall evaluation, current season, start the evaluation or change to chart evaluation.



Espaso scanner barcodes

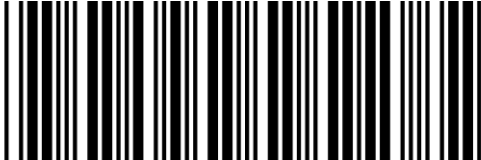
Fields



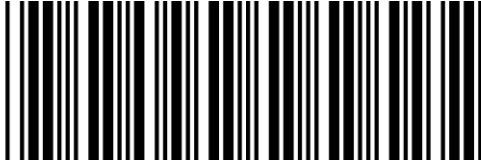
Field 01



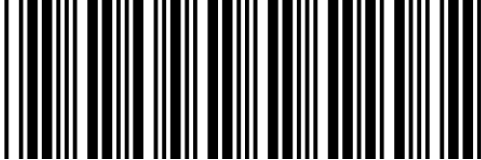
Field 02



Field 03



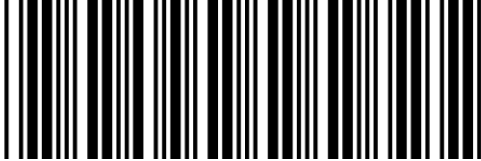
Field 04



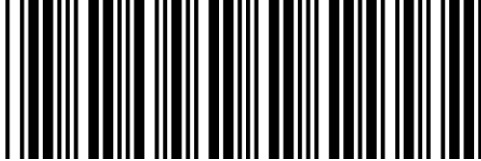
Field 05



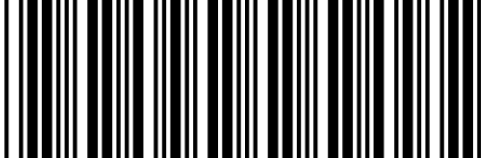
Field 06



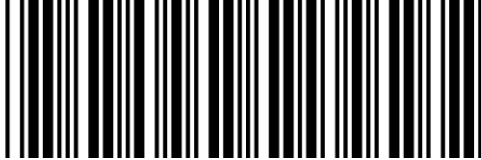
Field 07



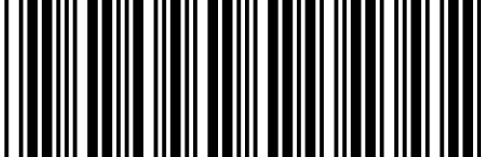
Field 08



Field 09



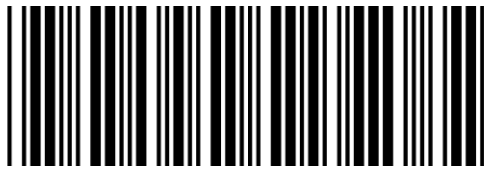
Field 10



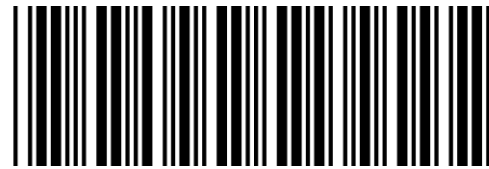
Field 11



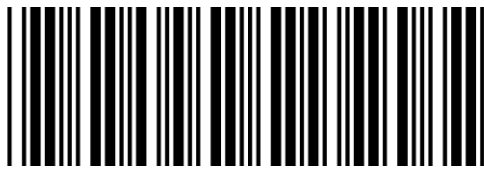
Field 12



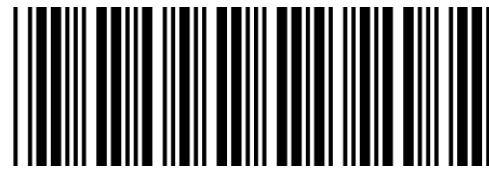
Field 13



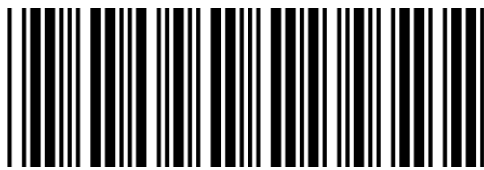
Field 14



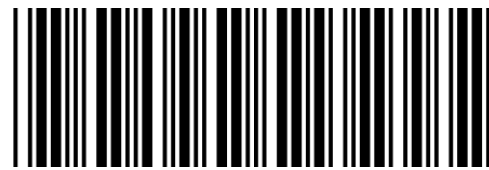
Field 15



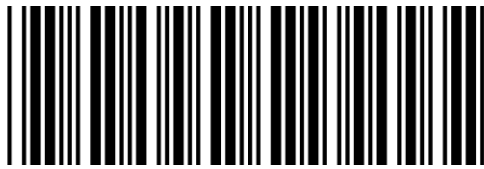
Field 16



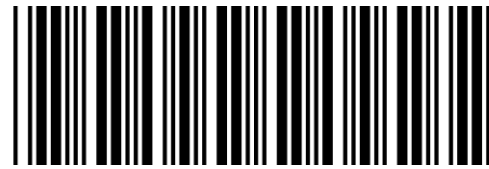
Field 17



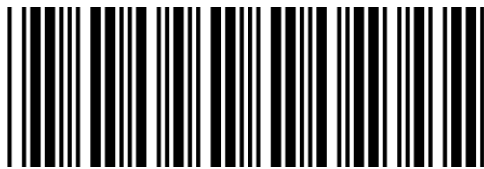
Field 18



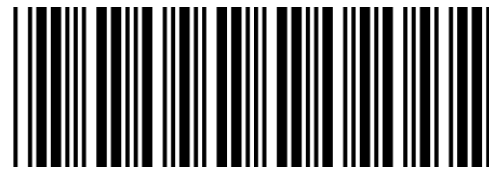
Field 19



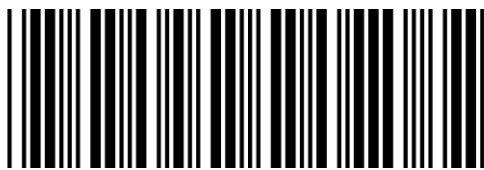
Field 20



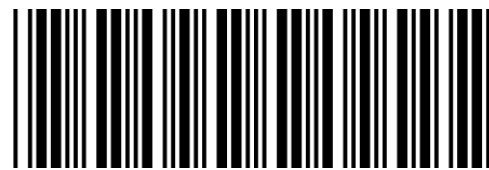
Field 21



Field 22



Field 23



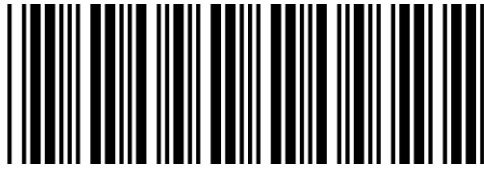
Field 24



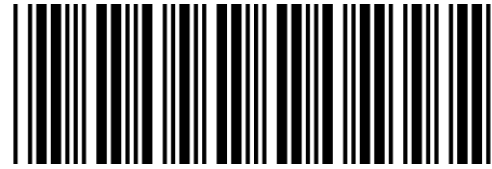
Field 25



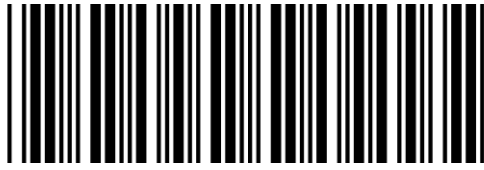
Field 26



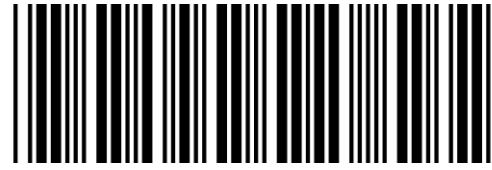
Field 27



Field 28

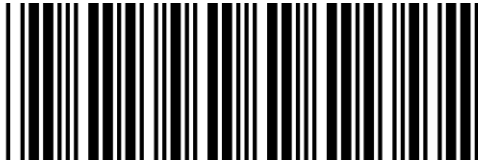


Field 29

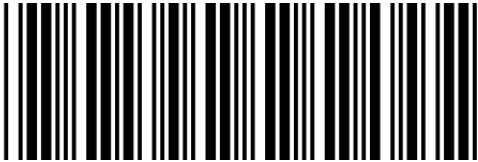


Field 30

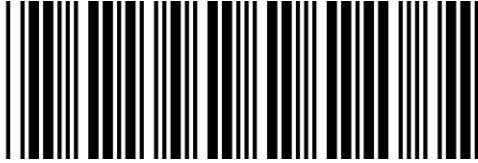
Harvest helpers (Cutters)



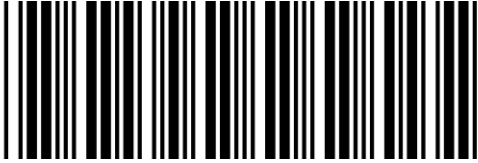
Cutter 01



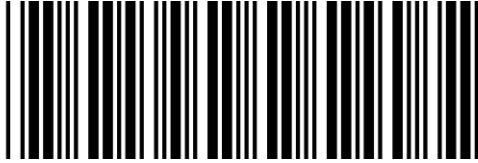
Cutter 02



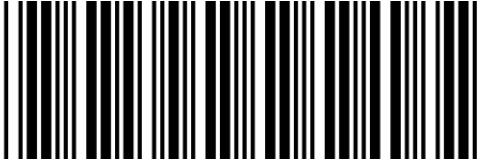
Cutter 03



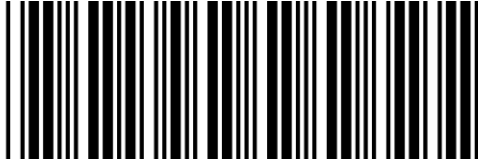
Cutter 04



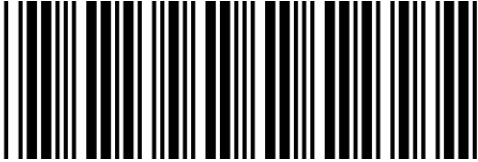
Cutter 05



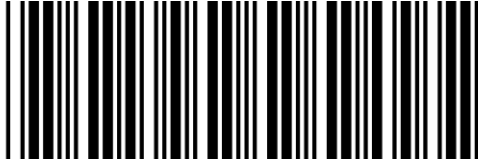
Cutter 06



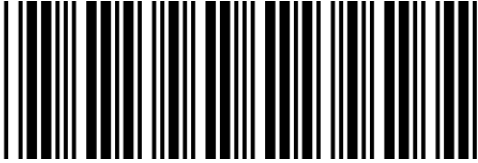
Cutter 07



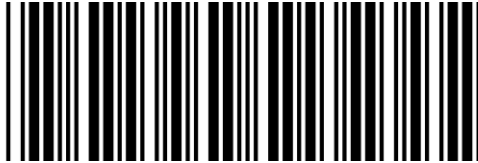
Cutter 08



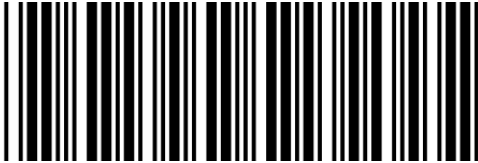
Cutter 09



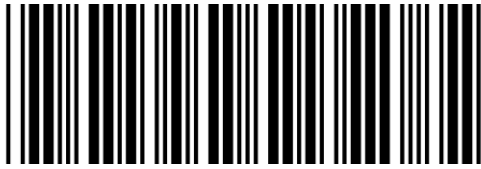
Cutter 10



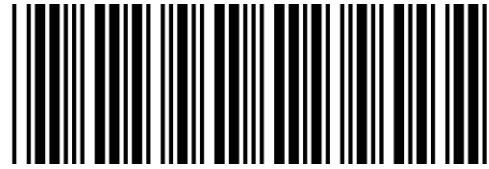
Cutter 11



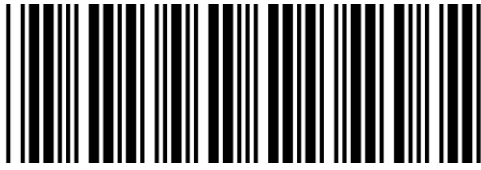
Cutter 12



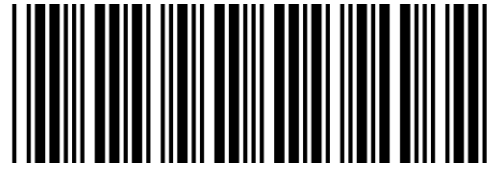
Cutter 13



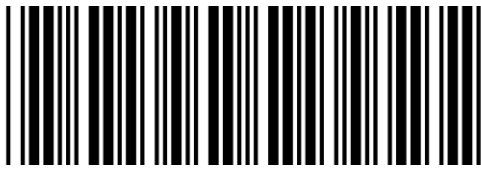
Cutter 14



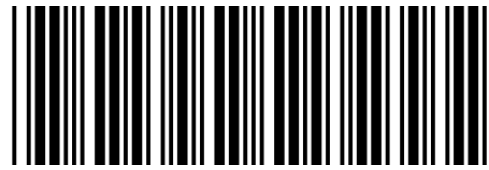
Cutter 15



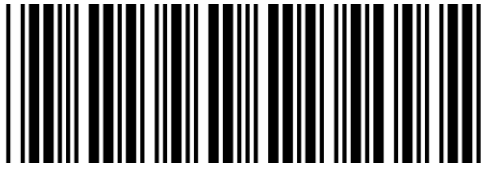
Cutter 16



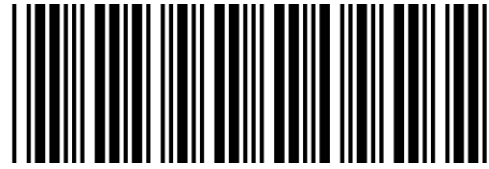
Cutter 17



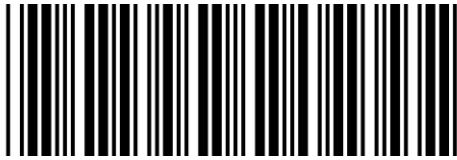
Cutter 18



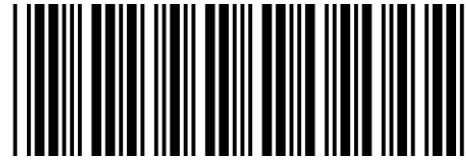
Cutter 19



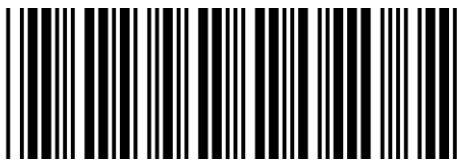
Cutter 20



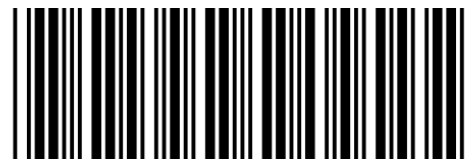
Cutter 21



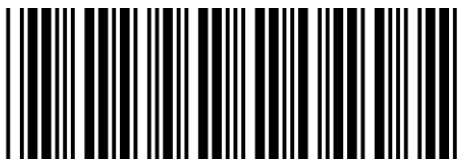
Cutter 22



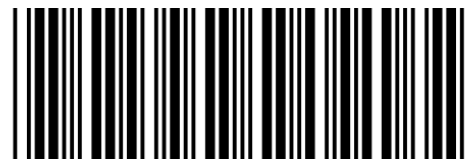
Cutter 23



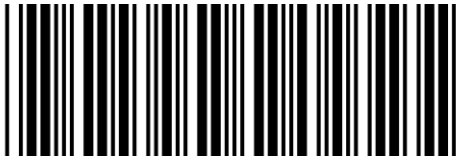
Cutter 24



Cutter 25



Cutter 26



Cutter 27



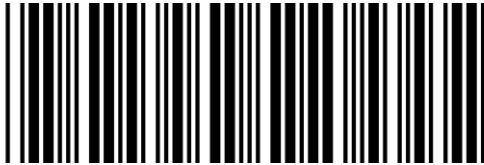
Cutter 28



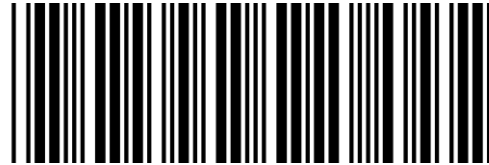
Cutter 29



Cutter 30



Cutter 31



Cutter 32



Cutter 33



Cutter 34



Cutter 35



Cutter 36



Cutter 37



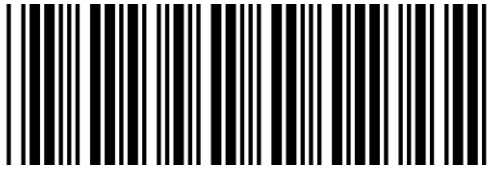
Cutter 38



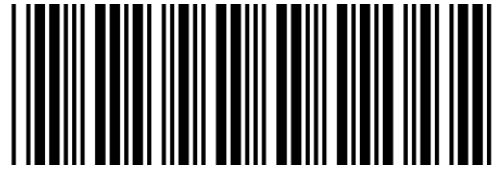
Cutter 39



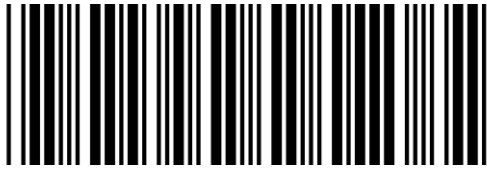
Cutter 40



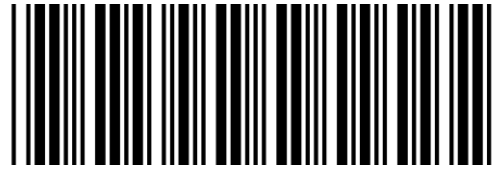
Cutter 41



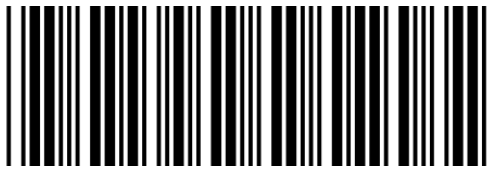
Cutter 42



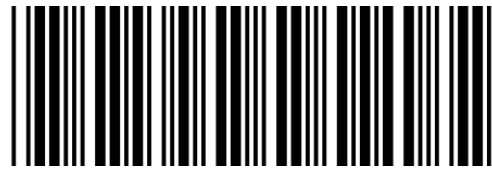
Cutter 43



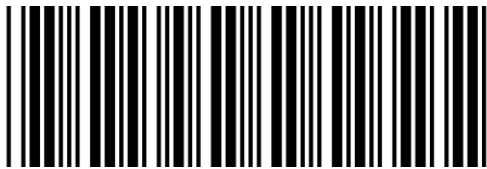
Cutter 44



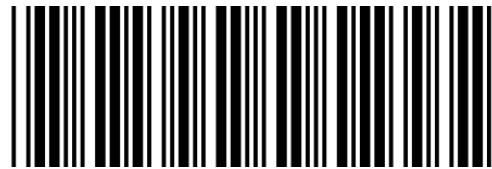
Cutter 45



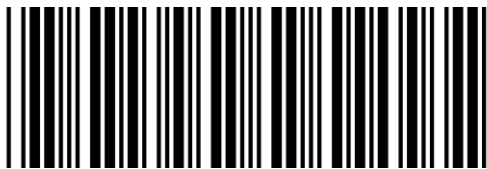
Cutter 46



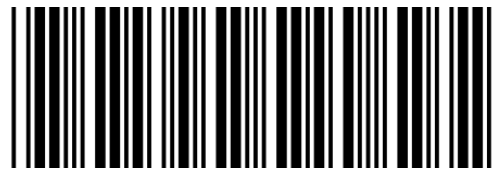
Cutter 47



Cutter 48



Cutter 49



Cutter 50



Cutter 51



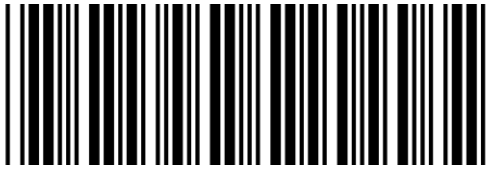
Cutter 52



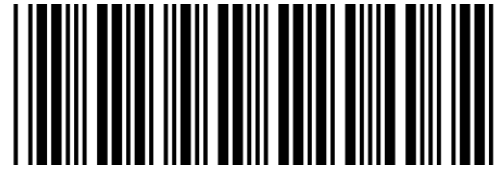
Cutter 53



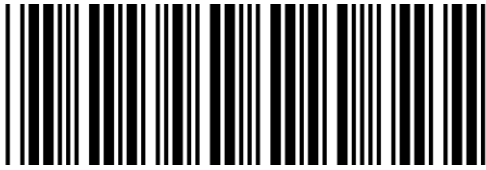
Cutter 54



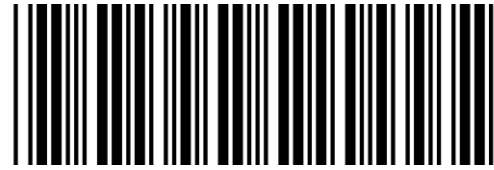
Cutter 55



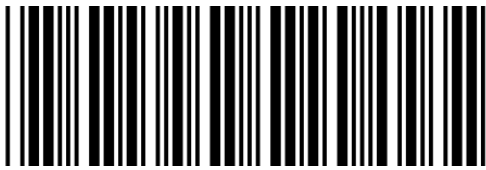
Cutter 56



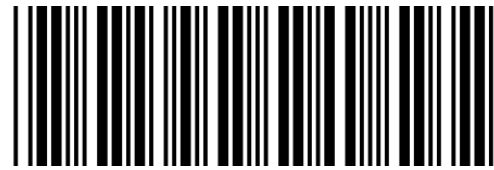
Cutter 57



Cutter 58



Cutter 59



Cutter 60



Reset:



General settings:



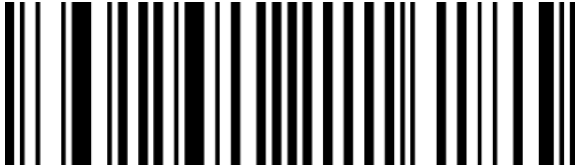
Activate code 128:



Reset



Activate code 128:



Baud rate 9600:



Data bits 7:



Parity even:



Stop bits 2:



Sustained fire:

