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Operating Manual

Application ‚Batching'
for PR 5500*
for PR 5900

* The information in Chapter 1 must be observed!

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Please note

Any information in this document is subject to change without notice and does not represent a commitment on the part of Sartorius unless legally prescribed. This product should be operated only by trained and qualified personnel. In correspondence concerning this product the type, name and release number as well as all license numbers in relation to the product have to be quoted.

Important

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1 Introduction

Important information

This operating manual applies to the following devices:

- Maxxis 4 (PR 5500)
- Maxxis 5 (PR 5900)

This operating manual describes the operation of Maxxis 5 with 4 weighing points.
When operating Maxxis 4 please note that this device has only one weighing point.

Important!

- ▶ Please read all the instructions carefully and completely before using the device.
- ▶ Read the safety precautions carefully.
- ▶ These instructions are part of the product. Keep it in a safe and easily accessible location.

Symbols and Signs

The following symbols are used in this manual:

Warning of dangerous electrical voltage.

DANGER indicates death or severe, irreversible personal injury which will occur if the corresponding safety measures are not observed.

⚠ Danger

Warning of a hazard area.

WARNING indicates that death or severe, irreversible injury may occur if the corresponding safety measures are not observed.

⚠ Warning

Warning of personal injury and/or property damage.

CAUTION indicates that minor, reversible injury or damage to property may occur if the corresponding safety measures are not observed.

⚠ Caution

Note User tips, useful information, and notes.

- ▶ Indicates a required action
- ▷ Describes the result of an action
- - Indicates an item in a list
- [ ] Frame menu items and soft keys

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2 Overview

2.1 General Information

These operating instructions describe the configuration and operation of the "Batching" application.
For installation, basic configuration and calibration, please, refer to the PR 5900 instrument manual.

2.2 Equipment Supplied

2.2.1 Components

The "Batching" product consists of the following components:

- Maxxis 5 basic unit with "BIOS," "firmware," and "Batching" application software
- License for batching E9 (PR 5900/93)
- Manuals in PDF format on CD-ROM

The "Batching" application requires installation of the following programs in the device:

- BIOS
- Firmware
- "Batching" application including license

2.2.2 Accessories (not Included with the Equipment Supplied)

- Plug-in cards for Option-1, Option-2, and Option-FB, see Chapter 2.2.3
- Software (license):
  PR 1792/13 OPC server communication with license PR 5900/92
  PR 1750/60 programming tool
- Scales:
  A maximum of 4 scales can be controlled and displayed.
  PR 5900/10 Internal weighing electronics (max. 2)
  Platform/scale with xBPI protocol (max. 3)
  The digital load cells are connected over up to 2 serial RS-485 interfaces and a digital cable junction box.
  The following weighing functions are **not** supported:
  The totalizing function (tandem scale): WP A + WP B = WP C
  Alibi Memory
  Field bus cards PR 1721/51, PR 1721/54 and PR 1721/55

2.2.3 Plug-in Cards

Product	Description	Position
PR 5900/10 Weighing electronics	Internal weighing electronics for connecting load cells or weighing platforms in non-explosion-hazardous areas. A maximum of two internal weighing electronics units can be inserted. For further information, see PR 5900 instrument manual.	WP A and/or WP B
PR 5900/04 2 x RS-485 serial interfaces	The interface can be configured by software. For further information, see PR 5900 instrument manual.	Option-1 and/or option-2
PR 5900/07 1 analog input 1 analog output	Analog input: internal 14 bits binary = 20,000 parts, @ e.g. 0–20 mA/0–10 V Analog output: internal 16 bits = 65,536 parts, resolution of 20,000 @ 20 mA For further information, see PR 5900 instrument manual.	Option-1 and/or option-2
PR 5900/12 4 digital inputs 4 digital outputs	4 passive opto-decoupled inputs 4 relay outputs with potential-free changeover contacts For further information, see PR 5900 instrument manual.	Option-1 and/or option-2
PR 5900/13 4 digital inputs 4 digital outputs	4 active opto-decoupled inputs 4 relay outputs with potential-free changeover contacts For further information, see PR 5900 instrument manual.	Option-1 and/or option-2

2.3 Functions of the "Batching" Application

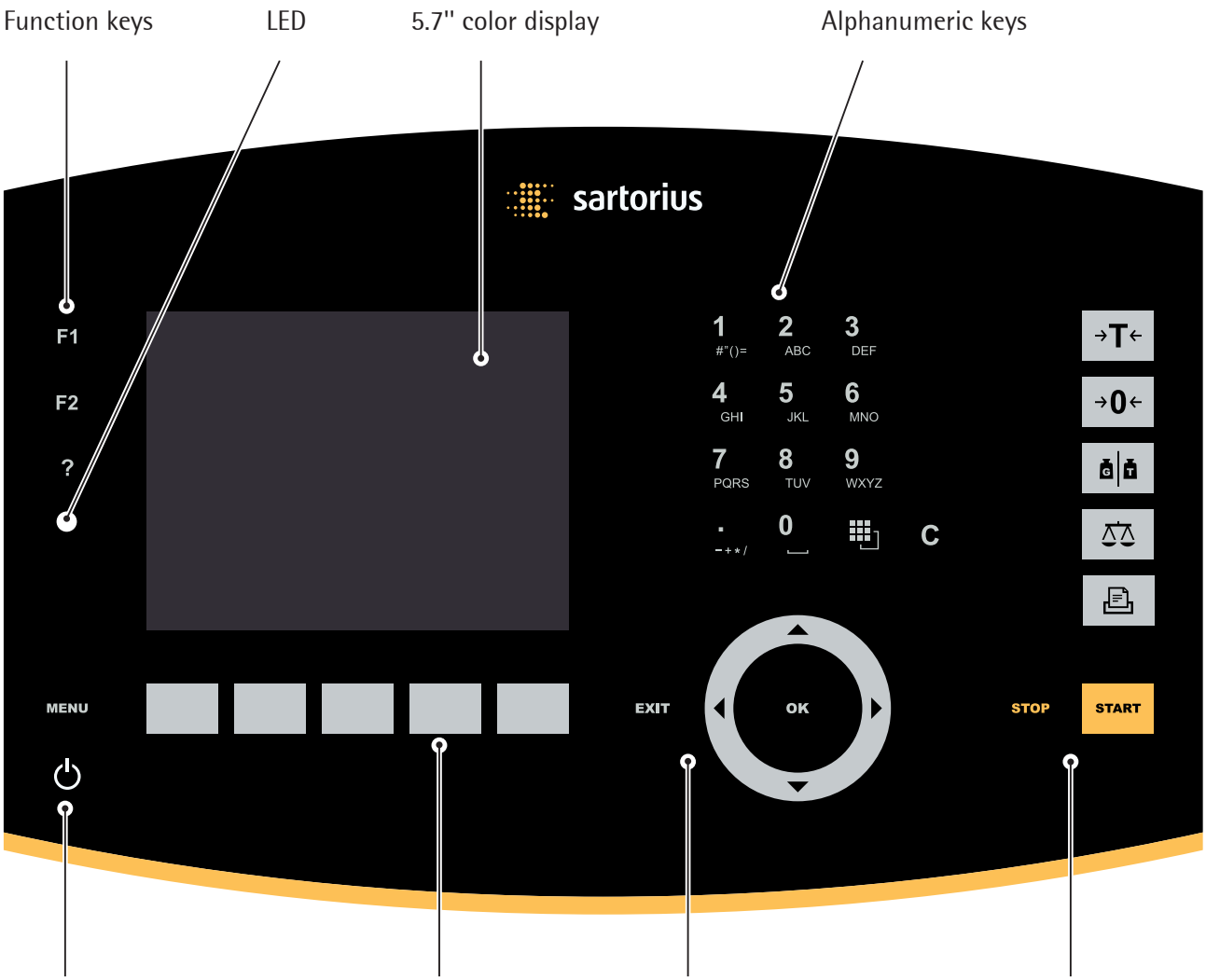
The "Batching" application is used for the batching of complex recipes.

- User management with 3 hierarchy levels, log in using a password (see PR 5900 instrument manual)
- Some operating functions can be configured
- Use of up to 4 scales working in parallel (with xBPI protocol max. 3)
- Start of 8 different recipes with set point via 1 of 8 inputs
- Recipes can run "infinitely"
- Recipes can include materials from 4 scales which work automatically and in parallel
- Recipes can contain "any" number of materials and lines
- For manual batching, the lines of a recipe can be processed as free choice or sequential (fixed order)
- During automatic batching, the scales can work in parallel or in a stipulated order using "sections"
- 19 different "material types"
- Some material types are defined for signals for process control
- Analog signals can be exported and imported
- Production can be carried out on the basis of an order, a recipe or a material
- One order is processed at a time
- Orders for manual recipes can be interrupted during processing
- Separate printer for tickets (40 characters per line) and reports (line printer) possible
- Tickets generated:
  - Per recipe line for manual recipes (can be activated)
  - Once the recipe has been completed (can be activated)
- Tickets and batch reports can be configured by line or can be customized using NLE (Nice Label Express)
- Long batch report printed in the background
- Production report detailing amounts of recipe produced
- Consumption report detailing amounts of materials consumed
- Databases for materials, recipes and orders (with write protection for external access)
- Internal databases are hidden
- Optional PC connection via OPC server (import orders, export reports)
- A simulation (which can be activated) checks the recipe before production
- If the tolerance has been exceeded (or not met due to lack of material), the recipe can be recalculated in order to produce the desired ratio of materials
- Tolerances are defined in % within the material; the values are incorporated into the recipe, but can be overwritten
- Configurable digital and analog inputs and outputs

3 Operation

3.1 Display and Controls

3.1.1 Overview

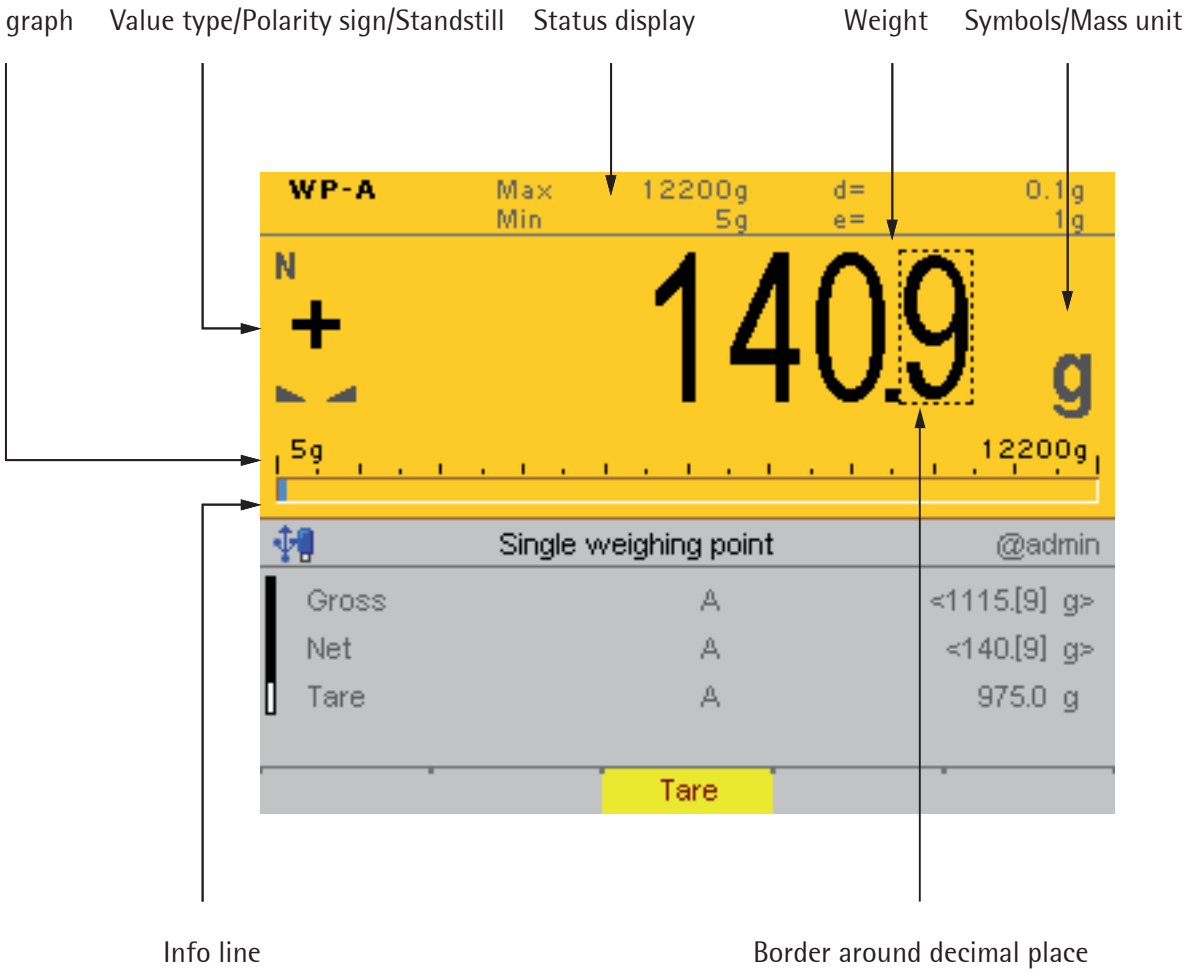


3.1.2 Display

The TFT color graphic display shows weight values of up to 7 digits with decimal point and plus or minus sign. Available mass units are t, kg, g, mg, lb, and oz.

lb and oz units are not permitted for use in legal metrology in the EU and EEA.

Below the weight display, the currently displayed weight is shown as a bar graph in relation to the maximum capacity (Max). At 100% of max, the bar graph is fully to the right.



Value type/Polarity sign		Zero/Standstill/Dosing/Monitor.		Symbols		Mass unit
B	Gross weight		Weight value standstill	⚠	Value not permissible in legal metrology (e.g. 10-fold resolution, deactived load cell)	t
G	Gross weight in NTEP or NSC mode	→0←	The gross weight value is within ±¼ d of zero			kg
N	Net weight (Net = gross - tare)	◇	Filling mode: flashes when filling is "held"; rapid flashing indicates "error"			g
						mg
						lb
						oz
T	Tare weight			**R1**	Range 1	
PT	Preset tare not tared			**R2**	Range 2	
				R3	Range 3	
no indication	- Test value - Gross, not tared		Pendeo load cells: plausibility monitoring; average value deviation of each load cell	**WP-A**	Weighing point A	
				WP-B	Weighing point B	
				Max	Maximum capacity (weighing range)	
				Min	Minimum weight	
User **Setp** **Diff**	additional weight value, application-specific function		Pendeo load cells: Temperature control; 1...n load cells are above/below the permissible temperature	0.9	Only if W&M is selected: Border around inadmissible decimal place.	
+	Positiv value					
–	Negativ value					

Status Icons in the Info Line

Icon	Description
	Remote control via VNC (Virtual Network Computing) is active.
	General warning
	The standby battery is too hot and is not charging. If this does not go away, then the ambient temperature must be checked, see instrument manual.
	- The clock battery is empty. - The standby battery is empty.
	- An unsupported USB device is connected. - The maximum current of i_{max} = 200 mA has been exceeded.
	Check newly connected devices.
	USB-stick found and ready to use.
	Stick is in use and must **not** be removed.
	Conflict in the network settings of the IP address.

3.1.3 Operating Elements

3.1.3.1 Front-Panel Keys

The following table shows the basic meanings of the symbols on the front-panel keys. Depending on the applications, the keys may also have other meanings.

Indicator Keys			
→T←	Taring The current gross weight is stored in the tare memory, provided that - the weight value is stable; - the instrument is not in error status. (Function is dependent on configuration)	⚖	Switching of display between the weighing points: - WP A - WP B - WP C - WP D
→0←	Sets gross weight to zero, provided that - weight value is stable; - weight is within zero setting range. (Function is dependent on configuration)	G|T	Display gross/tare weight. Pressing the key switches to the next weight (only with tared scale). During calibration, pressing this key displays the weight for 5 seconds with 10x resolution.

Application Keys	
🖶	Starts a printout. Configuration is performed in the application menu [Configuration]-[Print layout]-[...].

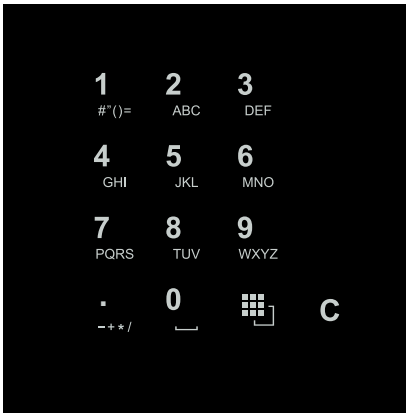
Navigation/Menu Keys			
▲	Scroll up in the menu	**OK**	Confirm input/selection
▼	Scroll down in the menu	**EXIT**	- Cancel entry/selection (after a confirmation prompt) without saving the change - Exit parameters/menu window
◄	- Cursor to the left - Selection - Exit menu window	**C**	Pressing the delete key deletes individual characters or whole strings of characters, see also page 12.
►	- Cursor to the right - Selection - Confirm input/selection	Soft key 1–5	Select appropriate menu function, see also Chapter 3.1.4
		MENU	Switch to the operating menu

Function keys			
F1	Assigned to a defined function ("Operating parameters" menu)	I/⏻	- Turns off the display - Cancels all key presses - LED is red Pressing again will switch the display on again.
F2	Assigned to a defined function ("Operating parameters" menu)	START	No function
?	Displays the relevant help window (not yet implemented for this application)	STOP	Same functions as the indicator key "EXIT"

LED

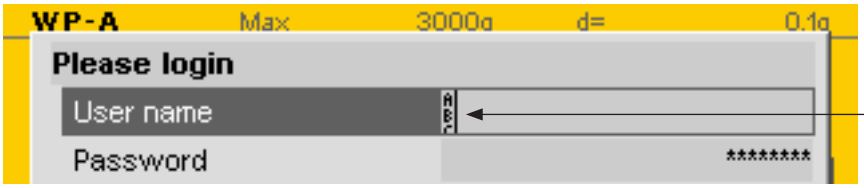
Operating status	Color	LED status
Normal operation		Off
Readiness	Red	Continuous illumination
Power fail	Red	Flashing

Alphanumeric Keypad

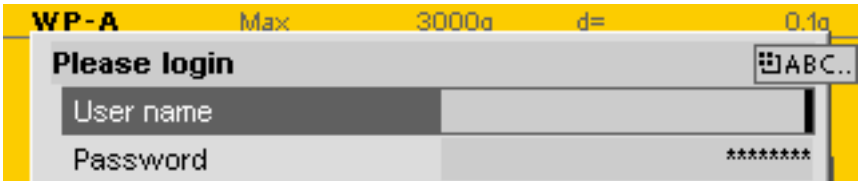


2 ABC	Pressing once displays the corresponding first character, e.g., "A", at the cursor position. After pressing twice, "B" is displayed at the cursor position and after pressing three times, "C" is displayed.
►	The input of a character is completed by pressing the cursor key, a different alphanumeric key, or after 2 seconds. If only numeric values are required for input, letters are not enabled.
◄	Pressing the left cursor key returns to the previous character.
C	- Within an input, pressing the delete key deletes the character to the left of the cursor. - Outside of an input, pressing the delete key deletes the whole string of characters.
⌨	Pressing will switch between the following functions: - Numbers - Uppercase letters - Lowercase letters - Pinyin (current display language for Chinese) - Hiragana (current display language for Japanese)

Input of Alphanumeric Characters



In front of the input field it is indicated whether numeric and/or alphabetical characters can be entered.



The respective options are displayed.

Double-clicking on the key displays the character table.

Only characters authorized for this input are displayed.

Note The switching function is turned off.

Procedure

- ▶ Highlight the desired character with the cursor.
- ▷ The selected character is shown magnified in the field at the top right.
- ▶ Press "OK" to enter the characters in the input field.
- ▶ Another double-click on the toggle key and other characters can be input as described previously.

3.1.3.2 PC Keys

The device can also be operated using a PC keyboard. The corresponding key assignment is shown in the table below:

PC keyboard	Front keypad
F1	F1
F2	F2
F3	?
F4	MENU
F5–F9	Soft key 1–5
F10	
F11	
F12	
Print	
ESC	EXIT
Cursor keys: ↑, ↓, ←, →	▲, ▼, ◀, ▶
ENTER	OK
Backspace	C

3.1.4 Operation Using Soft Keys

The functions of the five soft keys below the graphic display are indicated in the bottommost text line of the display. In the descriptions of operating sequences which entail the use of soft keys, the soft key function to be selected is shown in square brackets; the soft key symbol is not printed in every instance, e.g: [Save].

3.1.5 Selection Using the Navigation Keys

3.1.5.1 Menu

The cursor keys and the OK and EXIT keys are used to navigate through the menus.

3.1.5.2 Parameter

Use the ▼/▲ keys to select the individual parameters.

The required values/texts are entered with the alphanumeric keys.

A checkmark is placed in the checkbox ☑ using the OK key.

If the list of parameters is long, a vertical bar graph on the left (black and gray) shows which part of the list is displayed.

The following arrow ▸ appears when an existing selection list is displayed.

The parameter is selected using the OK key.

4 Application Menu

- Production
  - – Start order. — Produce selected order.
    - – Order — Select order.
    - – Recipe/material — Recipe/material is displayed or can be selected for the new order.
    - – Set point — Recipe/material set point can be altered.
    - – Start — Start production.
    - – New — Create order, see page 17.
    - – Delete — Delete order.
    - – Print
      - – Print the data from order "Order name"
      - – Print a list of all orders
      - – Print the data from all orders
      - – Print last line ticket
      - – Print last order ticket
      - – Print last batch report
  - – Start recipe — Produce selected recipe.
    - – Recipe — Select recipe.
    - – Set point — Recipe set point can be altered.
    - – Repeat — Input: 1–998 times

      Note If 999 is used, the recipe is set to "infinitely".
    - – Start — Start production.
    - – Order — Change to "Start order" in the menu.
    - – Print — Create new product in the database.
      - – Print the data from "Recipe name"
      - – Print a list of all recipes
      - – Print the data from all recipes
      - – Print last line ticket
      - – Print last order ticket
      - – Print last batch report

Production	
— Batch individual material	Produce selected material.
— Material	Select material.
— Set point	Material set point can be altered.
— Start	Start production.
— Print	
— Print the data from "Material name"	
— Print a list of all materials	
— Print the data from all materials	
— Print last line ticket	
— Print last order ticket	
— Print last batch report	
— Remote production	Start production via inputs. The function must be previously activated under [Configuration]-[Parameters].
— SPM address %MX	See SPM table in Chapter 8.5.
— Set ready bit	The corresponding input (rising edge) then starts the assigned recipe. Check the ☑ box to activate this function.
— Recipe name	Select recipe.
— Set point	Recipe set point
— Start	Start production.
— SPM -	Previous SPM address
— SPM +	Next SPM address
Print tickets and reports	
— Print last line ticket	
— Print last order ticket	
— Print last batch report	

Databases

– Create/edit order	Only possible if materials and at least one recipe have been created previously.
– New	Create order.
– Order name	Input: max. 18 alphanumeric characters
– Product name	Input: max. 18 alphanumeric characters If selected under [Configuration]-[Parameters].
– Recipe name	Select recipe.
– Set point	– Recipe/material set point
– Repeat	Input: 1–998 times
	Note If 999 is used, the recipe is set to "infinitely".
– Prompt for order	Input: max. 18 alphanumeric characters If selected under [Configuration]-[Parameters].
– Default	Settings are reset to factory settings.
– Material name	Select material.
– Save	The input is saved.
– Start	Direct start of order
– Delete	Delete order.
– Print	
– Print the data from order "Order name"	
– Print a list of all orders	
– Print the data from all orders	
– Print last line ticket	
– Print last order ticket	
– Print last batch report	

Databases

- Create/edit recipe

Note	When creating the first recipe, the recipe header can be entered directly and saved. After this, when creating each further recipe, the soft key [New] must be pressed.

  - New — Create recipe; parameters are dependent on the recipe type.
    - Recipe name — Input: max. 18 alphanumeric characters
    - Type — Selection: automatic, sequential, free choice
    - Create tidy up process — Only if "automatic" was selected.
    - Enabled by bit — Only if "automatic" was selected.
    - Activate bit — Only if "automatic" was selected.
    - Recalculate — Only if "sequential" or "free choice" was selected.
    - Default — Settings are reset to factory settings.
    - Save — The input of the recipe header is saved. The recipe can then be processed further.
    - Line — Consecutive recipe line numbers in the recipe
    - Section — Only for "automatic"; for manual operation always "1".
    - Material name — Select material.
    - Set point — Set point of the material
    - +Tolerance/-Tolerance — Tolerance above/below set point in %
    - Add to the recipe total — Check the ☑ box to add the relevant set points to the overall recipe total.
    - Relative — Check the ☑ box to qualify (convert) the set points.
    - Insert — Insert recipe line in order to insert the next material.
    - Material — Create a new material.
    - Delete — Delete recipe lines.
    - Line-/Line+ — Change to the previous/next recipe line.
  - Change — Edit recipe, see parameters in the menu item "New".
  - Start — Direct start of recipe
  - Delete — Delete recipe.
  - Print
    - Print the data from recipe "Recipe name"
    - Print a list of all recipes
    - Print the data from all recipes
    - Print last line ticket
    - Print last order ticket
    - Print last batch report

Databases

- Create/edit material

Note	When creating the first material, the material header can be entered directly and saved. After this, when creating each further material, the soft key [New] must be pressed.

  - New — Create material; parameters are dependent on the material type.
    - Material name — Input: max. 18 alphanumeric characters
    - Type — Selection: No function; net filling; net refill; net decrease; gross filling; gross decrease; discharge; register; manual filling; manual, no check; timer; stop; wait for SPM; set SPM; reset SPM; wait + reset SPM; analog out; analog in; dialog; wait for analog input value
    - Scale name — Weighing point A–D
    - Preset — Switch point from coarse to fine
Input: Weight
Adopt unit from the calibration.
    - Overshoot — Switch-off point before reaching the set point
Input: Weight
Adopt unit from the calibration.
    - Material flow — Material flow monitoring
    - Restart mode — Performance when tolerance exceeded, post-batching
Selection: Mode 0–4
    - +Tolerance/-Tolerance — Tolerance above/below set point in %
    - Time to wait — Calming time before determining weight
    - Enabled by bit — Manual: Input address for "ready"
    - Activate bit — Automatic: Input address for the approval of batching
    - Check name — Only applies for the materials "Register" and "Dialog".
Check the ☑ box to activate the function.
    - Dialog data type — Selection: No dialog, message only, text, integer number, real number, weight, yes/no, new set point
    - Output SPM %MW — For analog output only
    - Input SPM %MW — Only for analog input/wait for analog on
    - Unit of set point — Only for analog input/output/wait for analog on
    - Decimal places — Only for wait for analog on
    - Set point 0/4 mA, 20mA — Only for analog input/output/wait for analog on
    - Time limit — For dialog only
    - Duration — Only for wait for analog on
    - +Tolerance/-Tolerance — Only for wait for analog on

Application maintenance

– Reset sequence number? (1)	Input: 1–999999
– Production report	The materials produced for a recipe are added together and displayed.
– Recipe	Select recipe.
– Production	Amount displayed only.
– Delete	The amount produced for the selected recipe is deleted.
– All	The amount produced for all recipes is deleted.
– Print	The amount produced for all recipes are printed one below the other in a report.
– Consumption report	The consumed materials are added together and displayed.
– Material	Select material.
– Consumption	Amount displayed only.
– Delete	The displayed amount is deleted.
– All	The consumed amount of all materials is deleted.
– Print	The consumed amounts for all recipes are printed one below the other in a report.
– Clear database reports? (10)	Requirements: Check the ☑ box in order to activate "Log to database" under [Configuration]-[Parameters]. The number of datasets is given in parentheses. Data is deleted once the security prompt is accepted.
– Clear printer buffer? (20)	The number of datasets is given in parentheses. Data is deleted once the security prompt is accepted.

Configuration	
— Inputs	
— Option	Option-1, Option-2, Built-in
— Type	Display only
— Input	1–4
— SPM address %MX	See SPM table in Chapter 8.5.5.
— Default	Settings are reset to factory settings.
— Input -	Switch to the previous input.
— Input +	Switch to the next input.
— Save	The settings are saved.
— Outputs	
— Option	Option-1, Option-2, Built-in
— Type	Display only
— Output	1–4
— SPM address %MX	See SPM table in Chapter 8.5.5.
— Default	Settings are reset to factory settings.
— Output -	Switch to the previous output.
— Output +	Switch to the next output.
— Save	The settings are saved.
— ModBus-TCP master	
— Communication error	Ignore message, Display message
— ModBus-TCP module	Phoenix1–8
— Activate module	Check ☑ the box to activate the module. The menu expands.
— IP address	IP address of the selected module.
— I/O Type	Digital inputs, digital outputs
— Input	1–16
— SPM address %MX	See SPM table in Chapter 8.5.6.
— Default	Settings are reset to factory settings.
— Input -	Switch to the previous input.
— Input +	Switch to the next input.
— Save	The settings are saved.

Configuration

- Limits
  - Scale — Weighing point A–D
  - Limit 1–2 On — Input: 0–Max (maximum capacity); take unit from calibration.
  - Limit 1–2 Off — Input: 0–Max (maximum capacity); take unit from calibration.
  - Default — Settings are reset to factory settings.
  - Save — The settings are saved.
- Parameters
  - Scale identification — Input: max. 18 alphanumeric characters
  - Start orders — Check the ☑ box to activate this production type.
  - Start recipes — Check the ☑ box to activate this production type. It is only possible to select from recipes that have already been created.
  - Start materials — Check the ☑ box to activate this production type. A single material can be batched.
  - Remote control — Check the ☑ box to start up to 8 recipes via digital inputs.
  - Product name — Check the ☑ box to query the name when creating the order and, if configured, to print it onto the tickets.
  - Fix comment — The text is incorporated directly into the tickets. Input: max. 18 alphanumeric characters
  - Prompt for order — Input: max. 18 alphanumeric characters
  - Prompt for material — Input: max. 18 alphanumeric characters
  - Recalculate — Select rights for the recalculation of a recipe: from standard, advanced, administrator
  - Identification — Select the format of the order, recipe and material names: text, numeric
  - Check recipe — Check the ☑ box to simulate the recipe with the specified recipe set point.
  - Additional printout — Additional printouts are printed for each completed line of the order, provided that a material was transported. Selection: 0, 1 to 10 times
  - Order ticket — Tickets are printed for each order after completion. Selection: 0, 1 to 10 times

Configuration	
— Parameters	
— Batch report	A summary report can be printed at the end of a recipe. This report can be detailed or minimal (one-line report). Selection: 0, 1 to 10 times
— Long report	Check the ☑ box to print out a detailed batch report.
— Ticket printer	Selection: No printer, Printer, Printer 1, Printer 2
— Report printer	Selection: No printer, Printer, Printer 1, Printer 2
— Log to database	Check the ☑ box to log a report in the database after any batching.
— Delimiter	The delimiter is written between automatically generated order names/recipe names and sequence numbers. Selection: „ , #, , ,*, -, /, ^, [blank space], -, ~
— Default	Settings are reset to factory settings.
— Save	The settings are saved.
— Print format	
— Print template	Line ticket, order ticket, report header, report line, report trailer
— Line 1–40	Blank space, -----, form feed, order, recipe, line, material, reply from dialog, set point, actual value, tolerance, status, scale, ordered by, weighed by, start time, final time, recalculated, print time, fix comment, consumption, sequence number
— Default	Settings are reset to factory settings.
— Insert	Insert a blank line [blank] before the selected line.
— Delete	Delete highlighted line.
— Save	The settings are saved.
— Simulation*	
— Weighing point A–D	Check the ☑ box to activate the corresponding weighing point for the simulation.
— Material flow	Only possible if a weighing point has been selected. Applies the weight value from the scale (in this case: g). Enter value for coarse flow: e.g: 100 g/sec
— Default	Settings are reset to factory settings.
— Save	The settings are saved.
— Print	Print out the application calibration.

* Only possible if the batching license has been activated and the "Settings locked" parameter has not been enabled.

5 Commissioning

5.1 Safety Information

It is essential that the safety instructions in Chapter 2 of the PR5900 instrument manual are read before installation and commissioning!

⚠ Warning

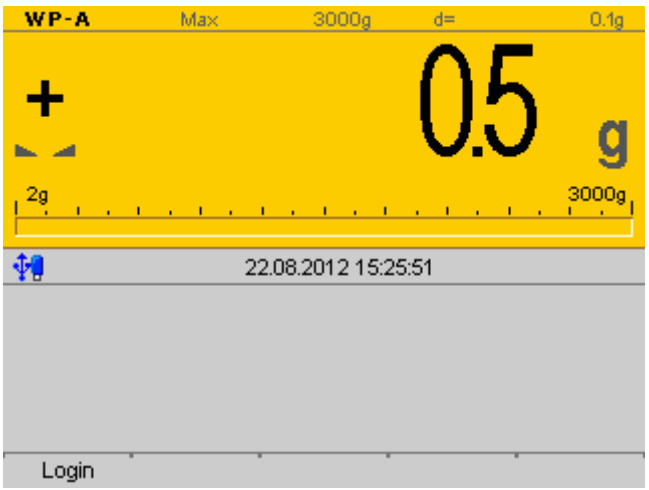
5.2 Switching on the Scale

The device can be set up as follows:

- Via keys on the front of the device
- Via an external PC keyboard
- Via a notebook/PC using the VNC software (included on the CD)
- Via a notebook/PC using an Internet browser

When the device is powered up, the following appears:

PR 5900	Device type (PR 5900)
	BIOS version
	Firmware version
	Automatic display test
	Weight display
No signal	Error message: no load cells connected, see also PR5900 instrument manual.
No values from scale	Error message: no communication with the xBPI scale; see also PR 5900 instrument manual. Error message: unable to read weight values from the ADC (analog-digital converter); see also PR 5900 instrument manual.
Scale not ready	Error message: no load cells or scale connected, see also PR 5900 instrument manual.



▷ The weight display appears.

5.3 User Login

User management is **not** activated by default.

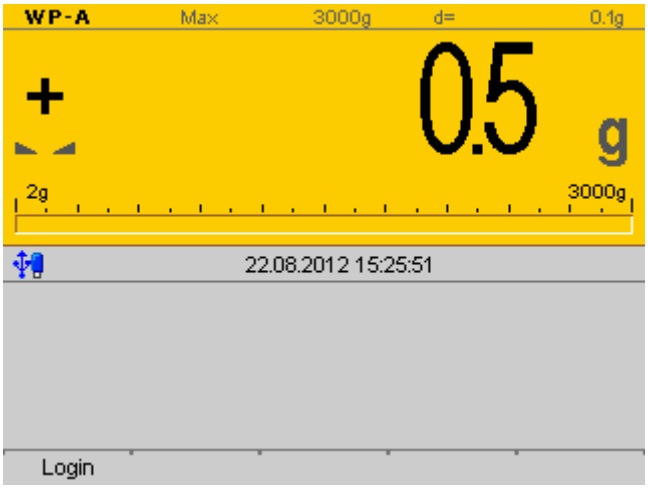
Activate user management with the menu item [System setup]-[User management], see also PR5900 instrument manual.

The "Administrator", "Supervisor" and "Operator" users are created by default.

The following rights are preset for these users:

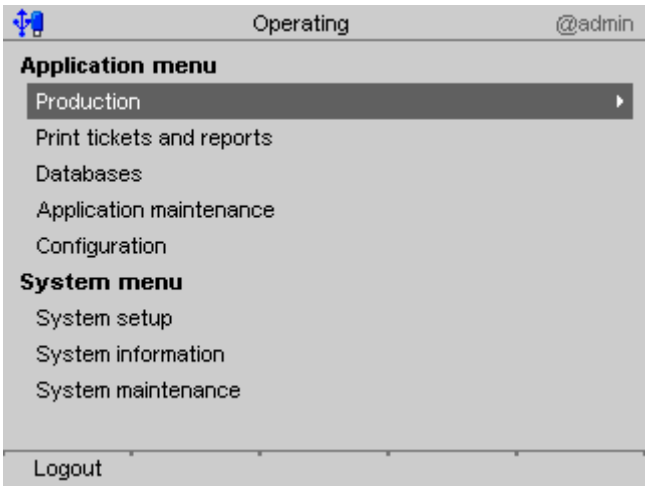
Access privilege	Operator	Supervisor	Administrator
Weighing	x	x	x
Create order	x	x	x
Change order	x	x	x
Delete order	x	x	x
Recalculate	x*	x*	x*
Create material		x	x
Edit material		x	x
Delete material		x	x
Create recipe		x	x
Edit recipe		x	x
Delete recipe		x	x
Change your own password	x	x	x
Create users			x
Edit users			x
Delete users			x
Delete report data		x	x
Delete database report data			x
Clear printer buffer			x
Exit application			x
System setup/Configuration			x
Application maintenance		x	x

* Assign user under [Configuration]-[Parameters]-[Recalculate].



An authorized user must log in to start or configure the application.

- ▶ Press the [Log in] soft key.
- ▶ Enter the password using the keyboard and confirm.

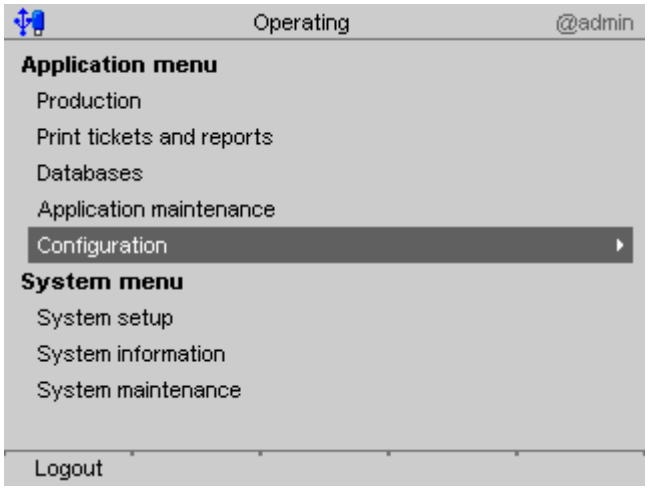


- ▷ The operating menu is displayed.

  The application and system menus are selected here.
- ▶ Select and confirm [Production], for example, using the cursor.

5.4 Configuration

Note	The configuration can only be performed if the "Supervisor" or "Administrator" is logged in.



▶ Select and confirm [Configuration] using the cursor.

5.4.1 Configuring Inputs

This function is required to configure the analog and digital inputs.

When changing the I/O card type, the configuration data remains unchanged. Functions for a non-installed scale can be selected, however, they are without effect.

The free and assigned SPM addresses are documented in Chapter 8.

If several inputs are assigned to an SPM address, the input with the higher number prevails:

Option 1 = No. 1

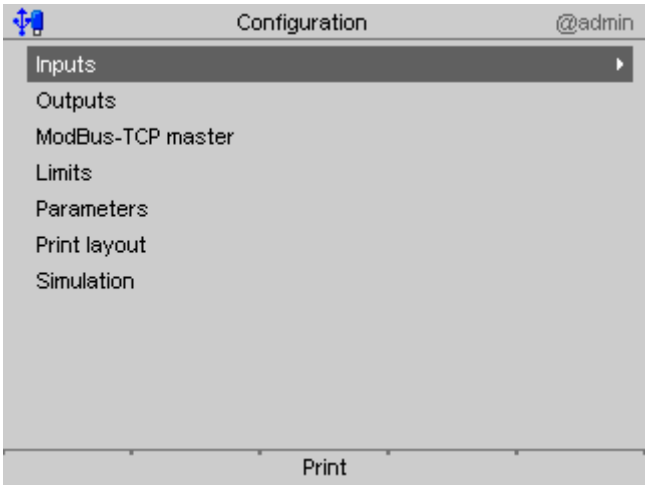
Option 2 = No. 2

Built-in = No. 3

Unused inputs are ignored, see Chapters 5.4.1.1 and 5.4.1.2.

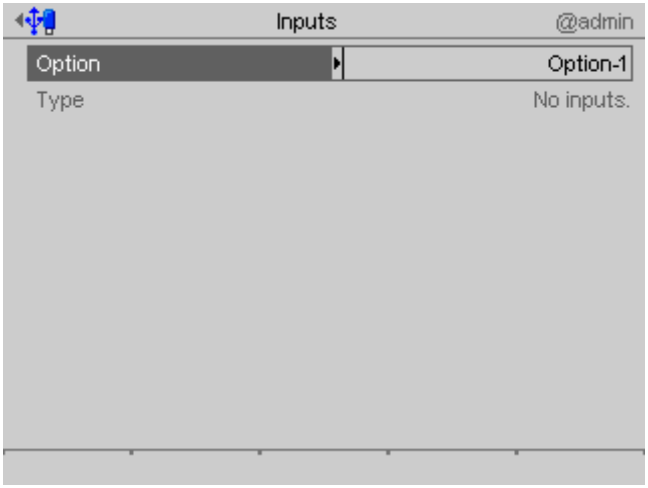
The card type and the available inputs and outputs are detected automatically.

Note	The inputs can be tested, see PR 5900 instrument manual Chapter 8.1.11.3.



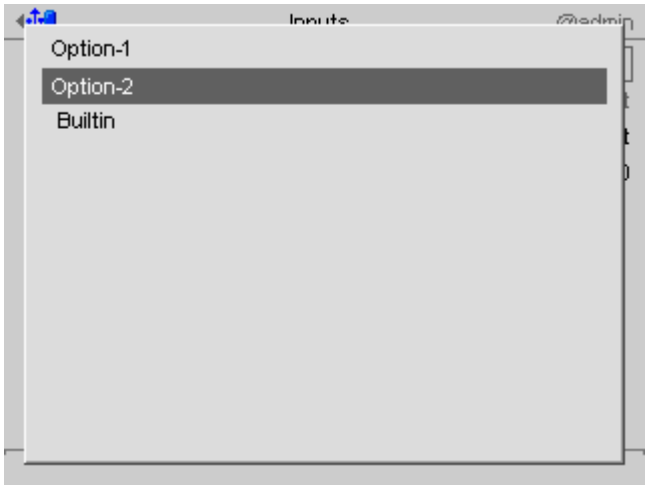
▷ The configuration menu is displayed.

▶ Select and confirm [Inputs] using the cursor.



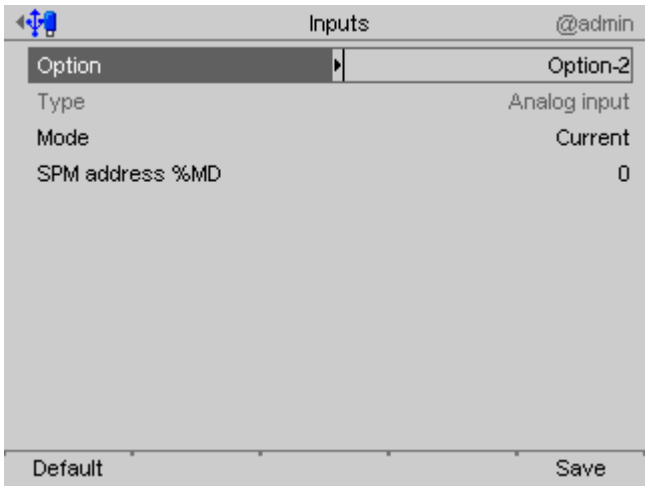
▶ Select and confirm [Option] using the cursor.

5.4.1.1 Analog Input

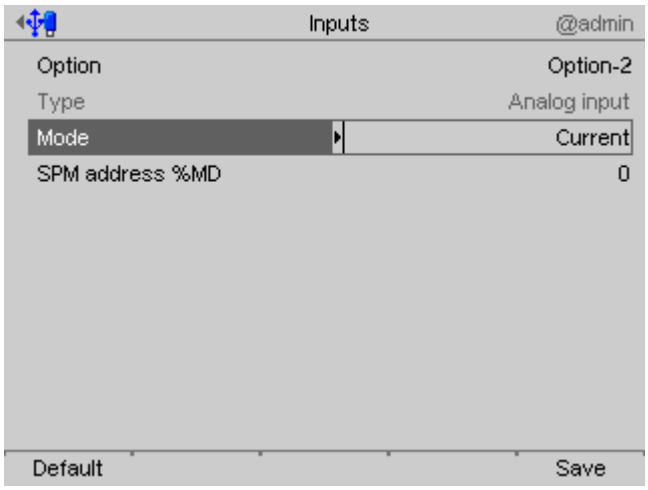


▷ A selection window appears.

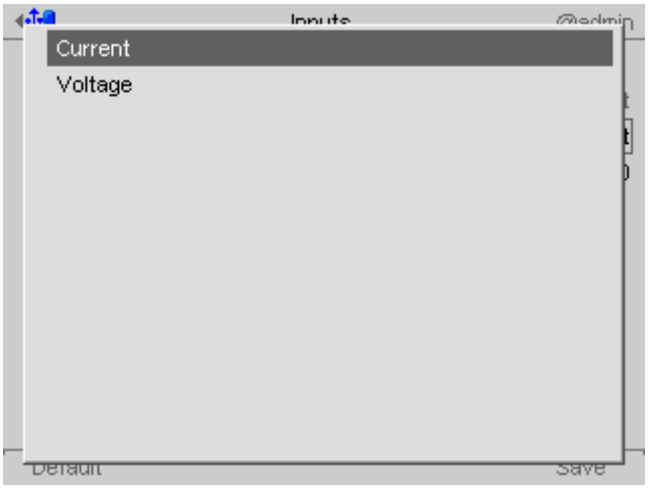
▶ Select and confirm the appropriate interface (in this case "Option-2") using the cursor.



▷ The factory settings are displayed.



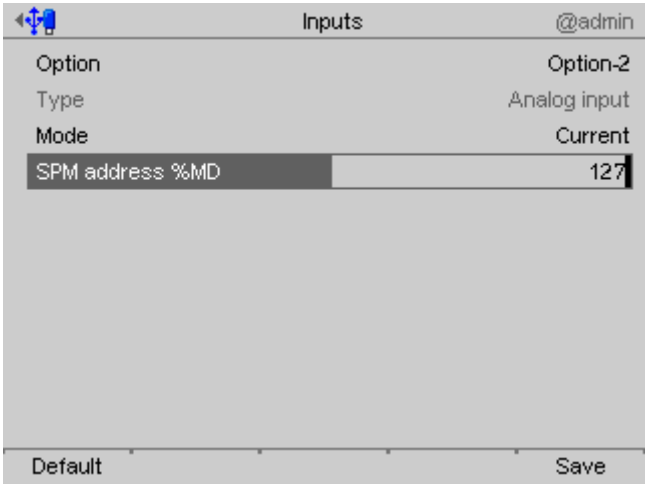
▶ Select and confirm [Mode] using the cursor.



▷ A selection window appears.

▶ Select and confirm the appropriate input type using the cursor (see also PR5900 instrument manual).

▶ Select and confirm [Mode] using the cursor.



▷ A selection window appears.

▶ Select [SPM address %MD] using the cursor.

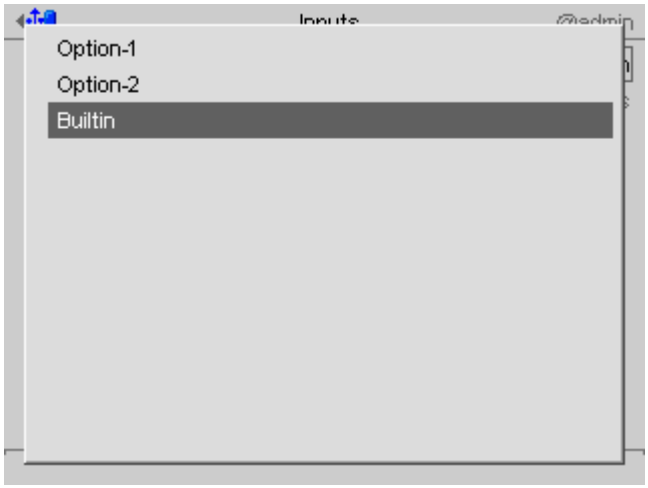
▶ Use the keyboard to enter and confirm a free address %MDxxx.

▶ Press the [Default] soft key to return to the factory settings, if required.

▶ Press the [Save] soft key to save the settings.

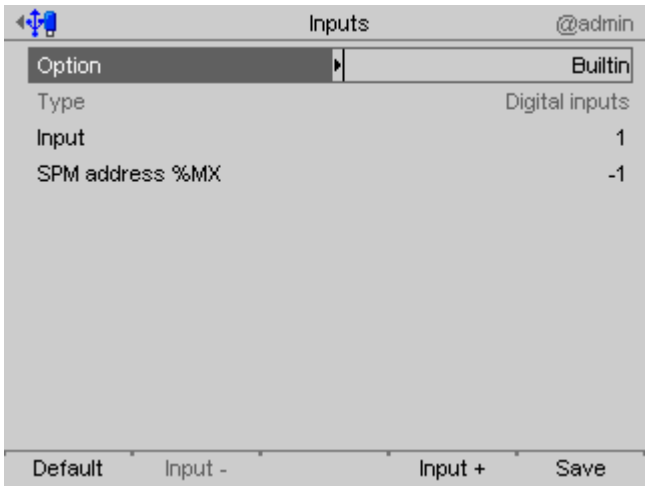
Note	If the SPM address is equal to 0, the analog value is not written to the SPM. **General** No reserved SPM addresses are overwritten by the analog inputs.

5.4.1.2 Digital Inputs

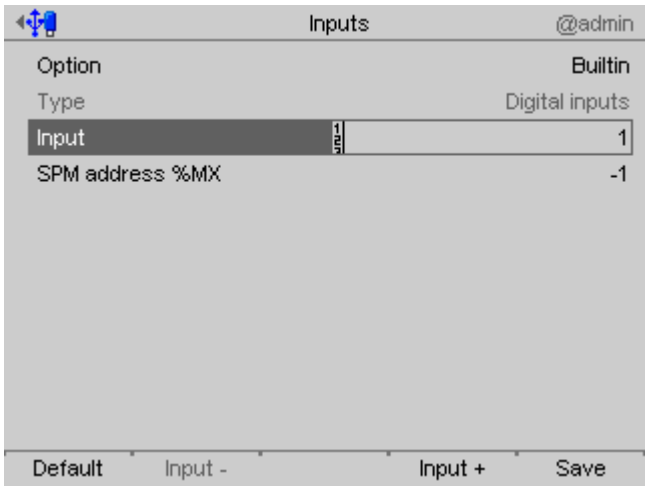


▷ A selection window appears.

▶ Select and confirm the appropriate interface (in this case "Built-in") using the cursor.

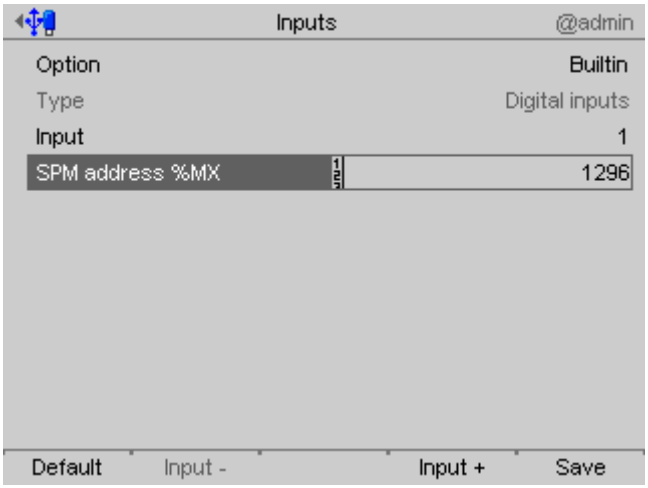


▶ Select and confirm [Option] using the cursor.

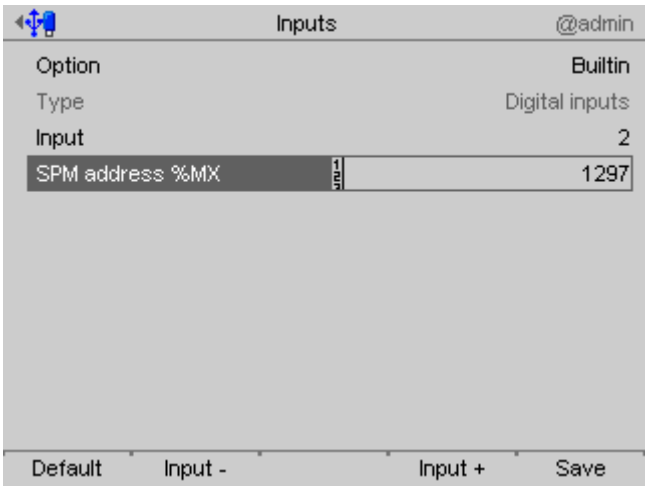


▶ Select [Input] using the cursor.

▶ Confirm input "1".



- Select [SPM address %MX] using the cursor.
- Use the keyboard to enter and confirm a free address %MXxxx.



- Press the [Input +] soft key to configure the next input.
- Select [SPM address %MX] using the cursor.
- Use the keyboard to enter and confirm a free address %MXxxx.
- Configure inputs 3+4 in the same way.
- Press the [Default] soft key to return to the factory settings, if required.
- Finally, press the [Save] soft key to save the settings.

Note	The value of the digital input is not written to the SPM if the address = 0 (inactive).

5.4.2 Configuring Outputs

This function is required to configure the analog and digital outputs.

When changing the I/O card type, the configuration data remains unchanged. Functions for a non-installed scale can be selected, however, they are without effect.

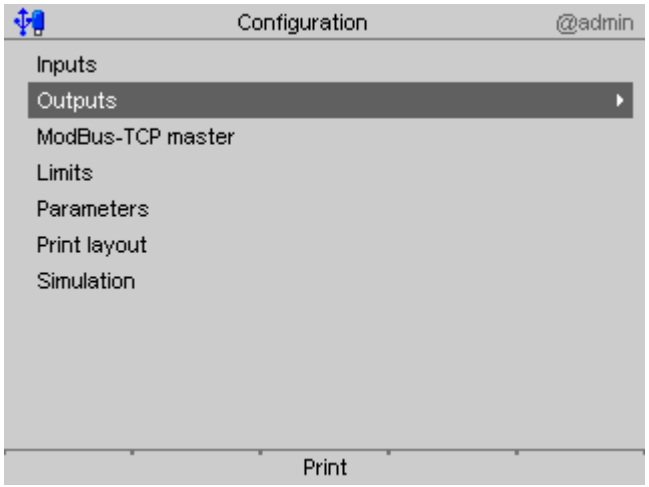
The free and assigned SPM addresses are documented in Chapter 8.

The assignment of SPM addresses to a scale is only valid if the scale exists.

Non-allocated outputs are switched off.

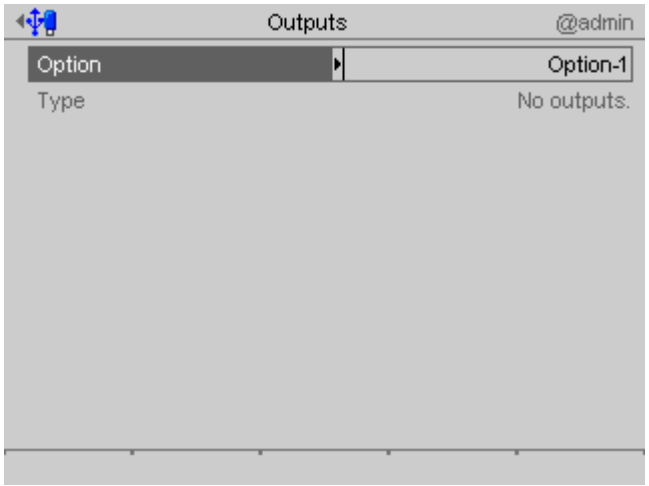
The card type and the available inputs and outputs are detected automatically.

Note	The outputs can be tested, see Chapter 8.1.11.3 in the PR 5900 instrument manual.



▷ The configuration menu is displayed.

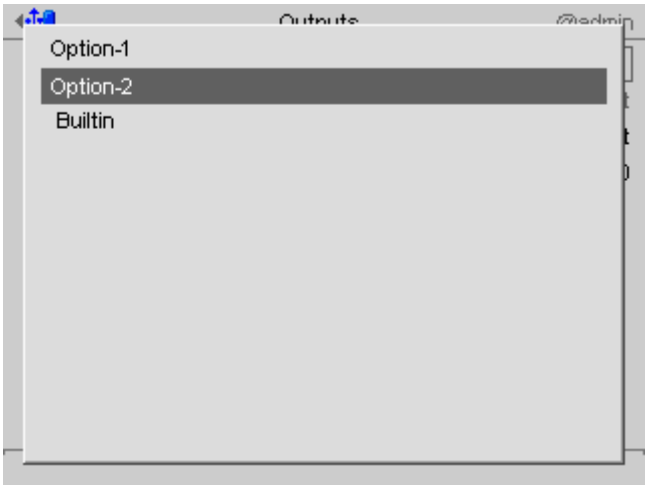
▶ Select and confirm [Outputs] using the cursor.



▶ Select and confirm [Option] using the cursor.

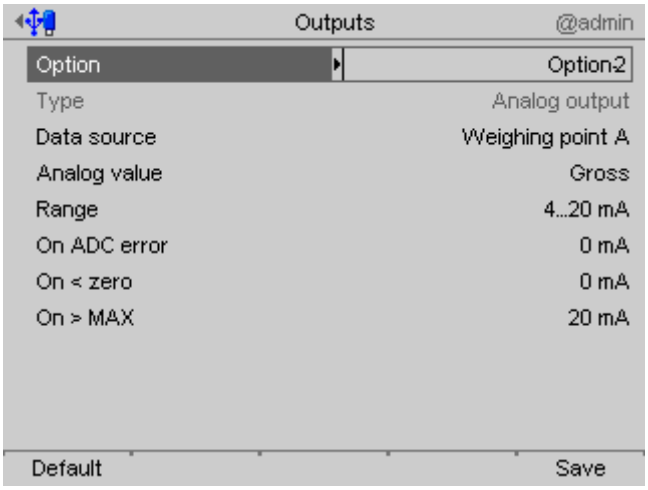
5.4.2.1 Analog Output

The weight value of the selected weighing point is transmitted to the output.



▷ A selection window appears.

▶ Select and confirm the appropriate interface (in this case "Option-2") using the cursor.



▷ The factory settings are displayed.

▶ If necessary, configure the analog output in accordance with the table below.

▶ Press the [Default] soft key to return to the factory settings, if required.

▶ Press the [Save] soft key to save the settings.

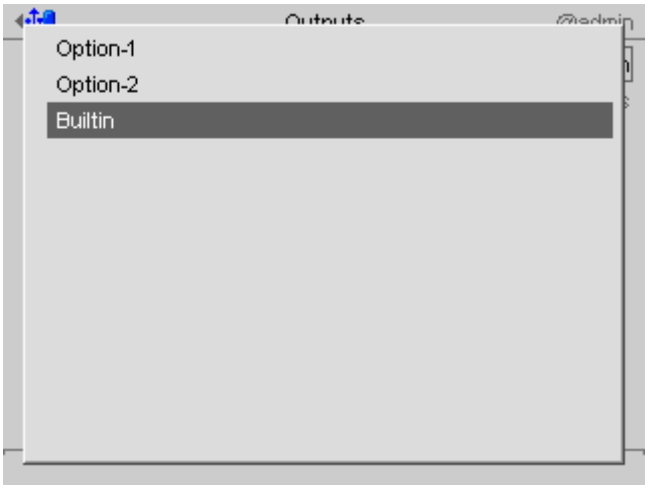
Menu item	Selection	Description
[Data source]	Weighing point A–D	Output of the weight values from scales A, B, C or D. 0–Max are converted into 0/4 mA–20 mA.
[Analog value]	Gross	Output of the gross value.
	Net/gross	Output of the net value, if tared; otherwise gross.
	Net/0 mA	Output of the net value, if tared; otherwise 0 mA.
	Net/4 mA	Output of the net value, if tared; otherwise 4 mA.
	Net/20 mA	Output of the net value, if tared; otherwise 20 mA.
[Range]	0–20 mA	Output of 0–Max as 0–20 mA.
	4–20 mA	Output of 0–Max as 4–20 mA.
[On ADC error]	0 mA	Set output to 0 mA.
	4 mA	Set output to 4 mA.
	20 mA	Set output to 20 mA.
	hold	The last output value is held.
[**On < zero**]	0 mA	Set output to 0 mA
	4 mA	Set output to 4 mA.
	20 mA	Set output to 20 mA.
	hold	The last output value is held.
	linear	Only for [4-20 mA]: output goes below 4 mA until the limit is reached.
[**On > max**]	0 mA	Set output to 0 mA
	4 mA	Set output to 4 mA.
	20 mA	Set output to 20 mA.
	hold	The last output value is held.
	linear	Output increases above 20 mA until the limit is reached.

5.4.2.2 Adjusting the Analog Output

The analog output current on the receiving end (PLC) is generally fed through a resistor, measured as a voltage and then digitized. The output current can be adjusted in small ranges. This is required, if small deviations from the nominal value occur in a connected PLC.

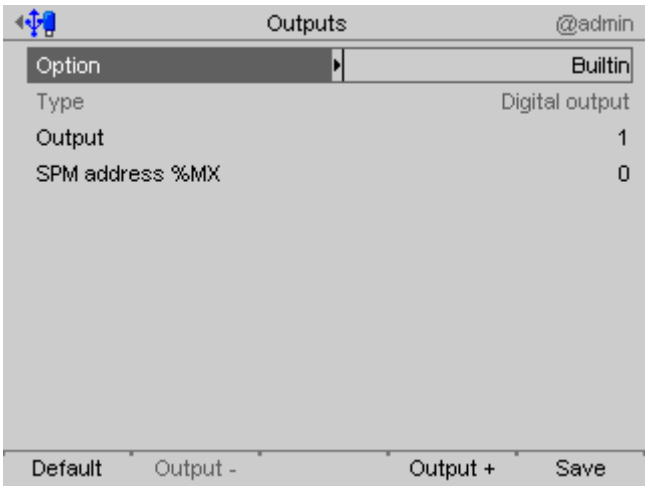
Note	See Chapter 8.1.11.3 in PR 5900 instrument manual.

5.4.2.3 Digital Outputs

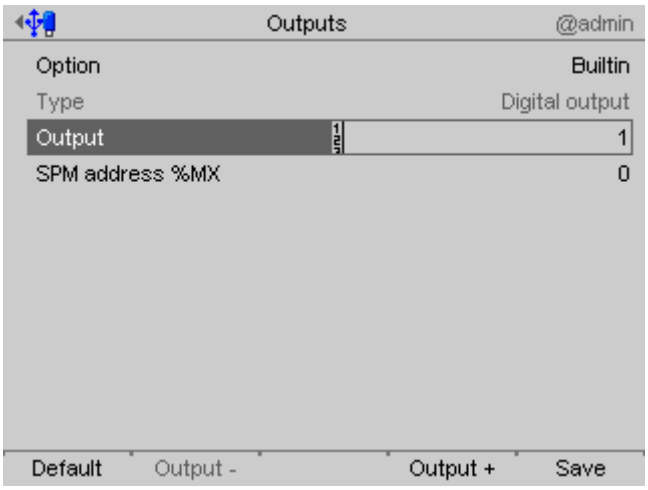


▷ A selection window appears.

▶ Select and confirm the appropriate interface (in this case "Built-in") using the cursor.

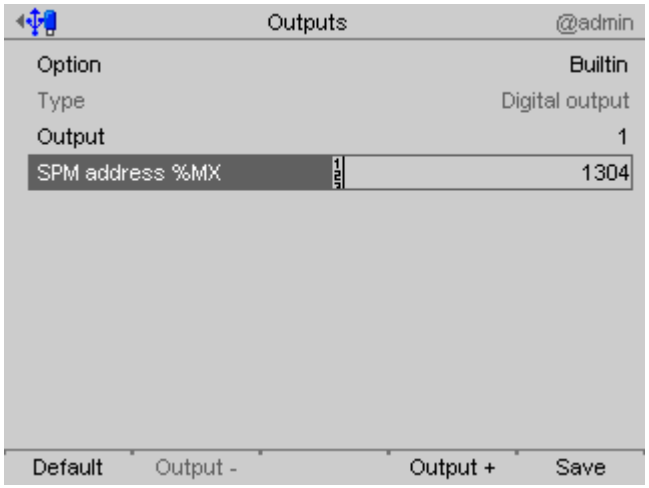


▶ Select and confirm [Option] using the cursor.



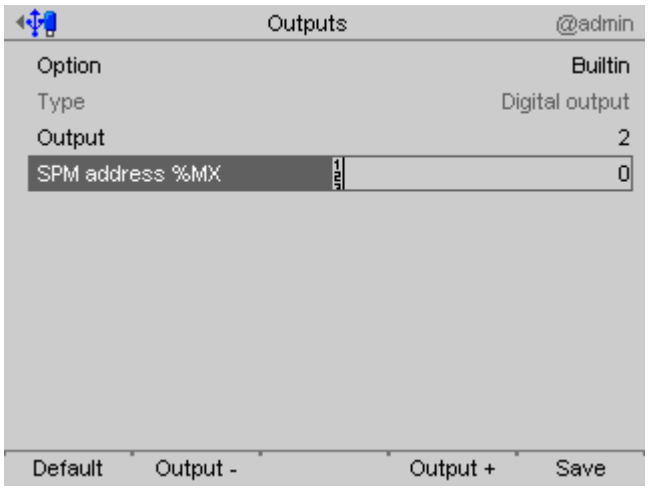
▶ Select [Output] using the cursor.

▶ Confirm output "1".

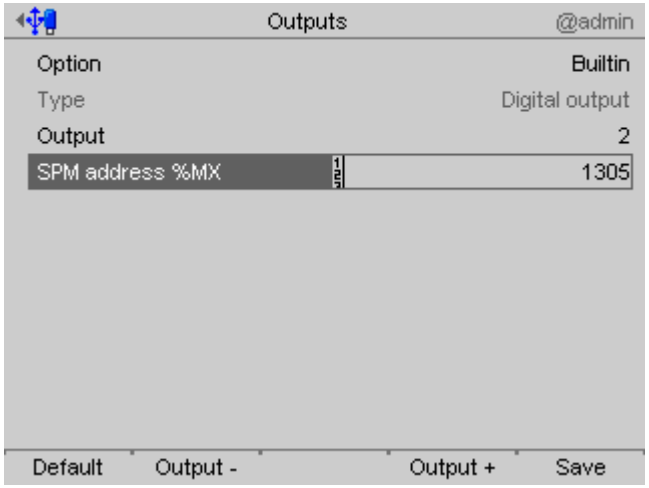


- Select [SPM address %MX] using the cursor.
- Use the keyboard to enter and confirm a free address %MXxxx.

Note	The SPM address %MX for an **unused** digital output = 0.



- Press the [Output +] soft key to configure the next output.



- Select [SPM address %MX] using the cursor.
- Use the keyboard to enter and confirm a free address %MXxxx.
- Configure outputs 3+4 in the same way.
- Press the [Default] soft key to return to the factory settings, if required.
- Finally, press the [Save] soft key to save the settings.

5.4.3 Configuring the ModBus-TCP Master

In this application, the Modbus master supports up to 8 predefined Modbus modules.

5.4.3.1 Supported Modules

Modules 1–4

Modules 1–4 relate in each case to the following module:

Phoenix Contact Inline Block IO (ILB ETH 24 DI16 DIO16-2TX)

They each offer 16 digital inputs and 16 digital outputs.

Modules 5–6

Modules 5–6 relate in each case to the following modules:

- Phoenix Contact Inline Module (IL ETH BK DI8 DO4 2-TX-PAC)
- Phoenix Contact Output Module (IB IL 24 DO16-PAC)
- Phoenix Contact Output Module (IB IL 24 DO16-PAC)

They offer a total of 8 digital inputs and 36 digital outputs.

Modules 7–8

Modules 7–8 relate in each case to the following modules:

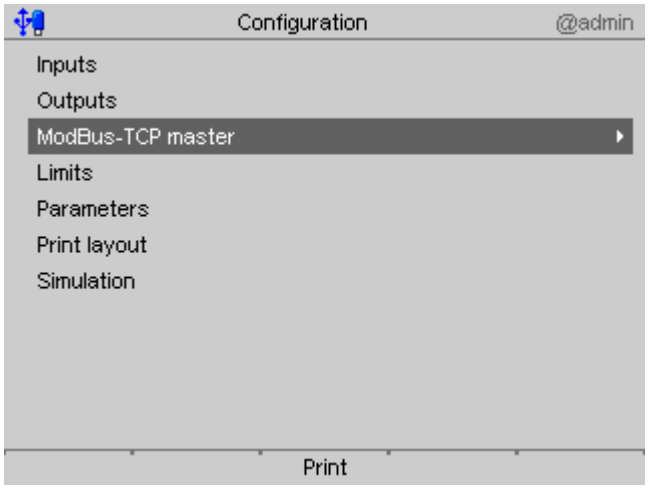
- Phoenix Contact Inline Module (IL ETH BK DI8 DO4 2-TX-PAC)
- Phoenix Contact Output Module (IB IL 24 DO16-PAC)
- Phoenix Contact Output Module (IB IL 24 DO16-PAC)
- Phoenix Contact Power Supply (IB IL 24 PWR IN-PAC)
- Phoenix Contact Output Module (IB IL 24 DO16-PAC)

They offer a total of 8 digital inputs and a total of 52 digital outputs.

5.4.3.2 Configuration Tool

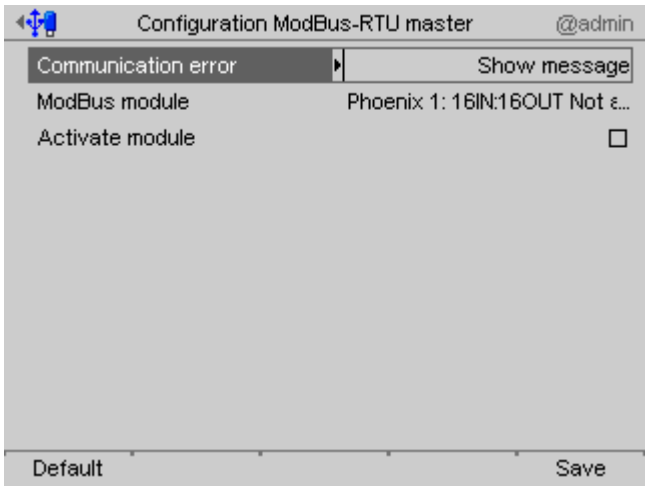
The modules must be configured in terms of hardware according to the Phoenix instructions. In addition, an IP address must be assigned to each terminal. Phoenix provides the "IPAssign.exe" tool for that purpose.

5.4.3.3 Configuration on the Device



▷ The configuration menu is displayed.

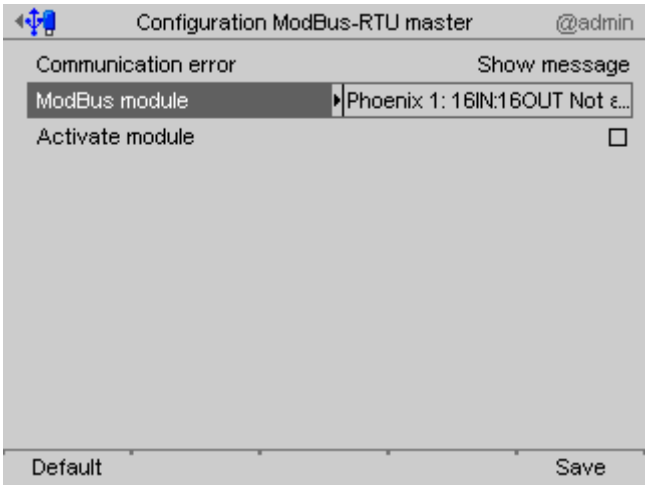
▶ Select and confirm [ModBus-TCP master] using the cursor.



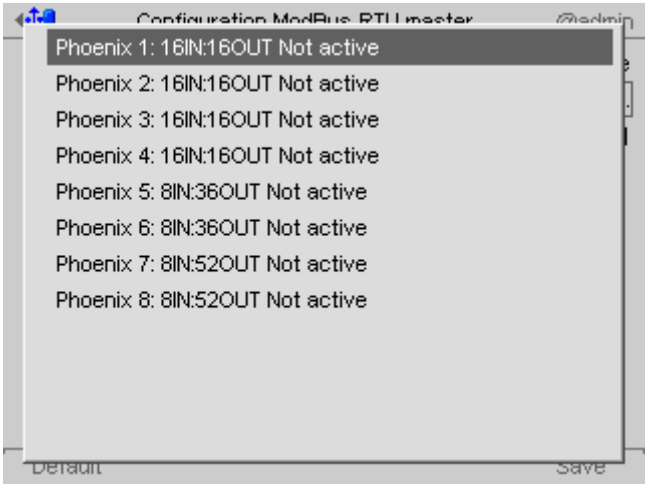
▶ Select and confirm [Communication error] using the cursor.

▷ A selection window appears.

▶ Select and confirm the appropriate function (in this case "Show message") using the cursor.

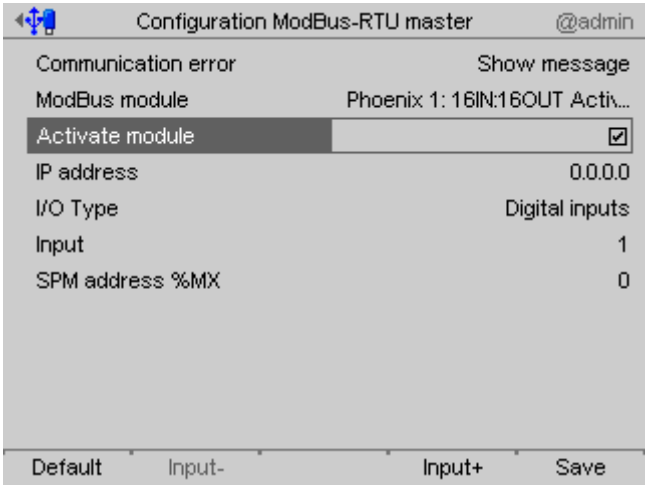


▶ Select and confirm [ModBus-TCP module] using the cursor.



▷ A selection window appears.

▶ Select and confirm the appropriate module (in this case "Phoenix 1...") using the cursor.



▶ Check the ☑ box to activate the module.

▶ Select and confirm the individual settings.

[IP address]

Selection:
Speak with the responsible system administrator.

[I/O Type]

Selection:
Digital inputs, digital outputs

[Input]/[Output]

Selection:
Input+/Output+ (higher)
Input-/Output- (lower)

[SPM address %MX]

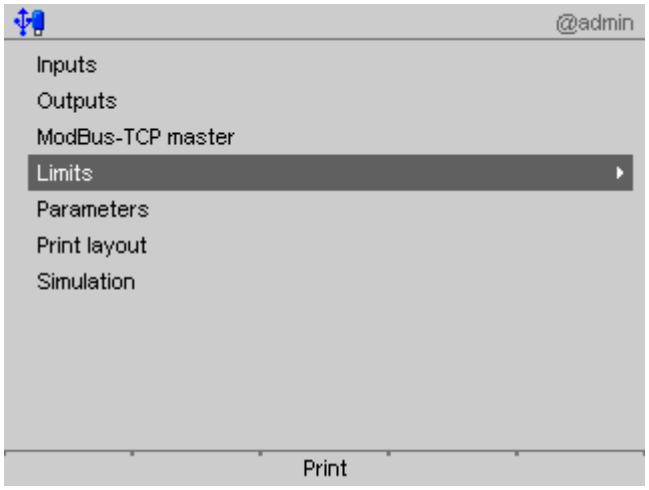
Input:
Fixed SPM address, see Chapter 8.

▶ Press the [Default] soft key to return to the factory settings, if required.

▶ Finally, press the [Save] soft key to save the settings.

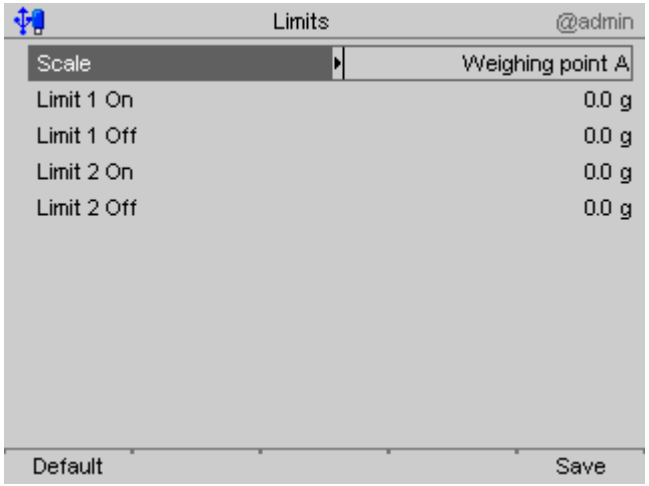
5.4.4 Configuring Limit Values

Each limit value consists of a switch-on and a switch-off point in order to define a hysteresis. The 4 values for each weighing point are entered according to the same pattern. The values may be within -0.01 x Max and 1.01 x Max for the related scale. For the SPM addresses for the limits, see Chapter 8.5. They do not have a function for batching.

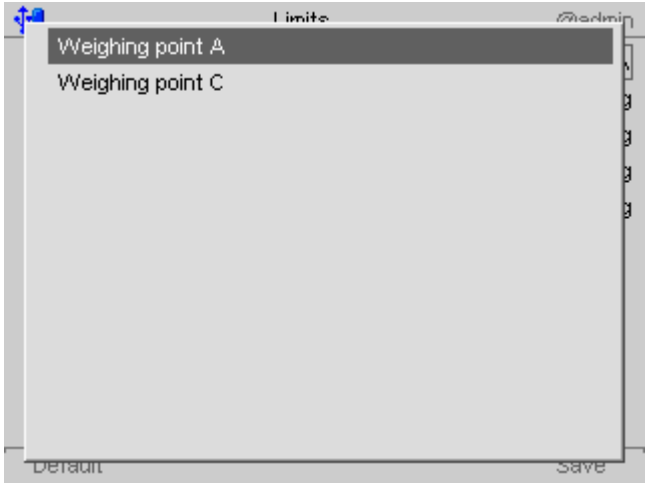


▶ Select and confirm [Limits] using the cursor.

1. Select Weighing Point



▶ Select and confirm [Weighing point] using the cursor.

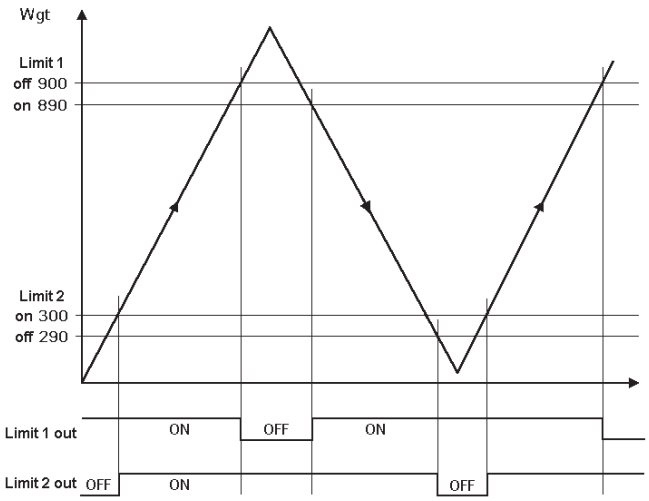


▷ A selection window appears.

▶ Select and confirm the appropriate weighing point using the cursor.

2. Define Limits

Example 1:

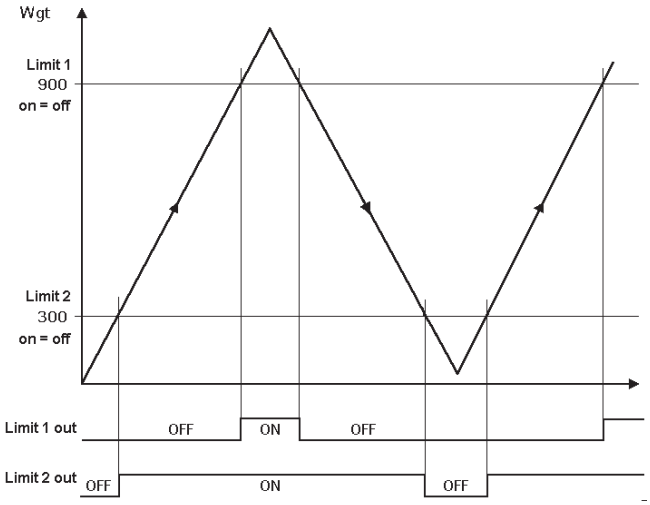


The output signal (Limit 1 out) of limit 1 switches OFF above a weight (Wgt) of 900 g.

Limit 2 switches OFF below 290 g.

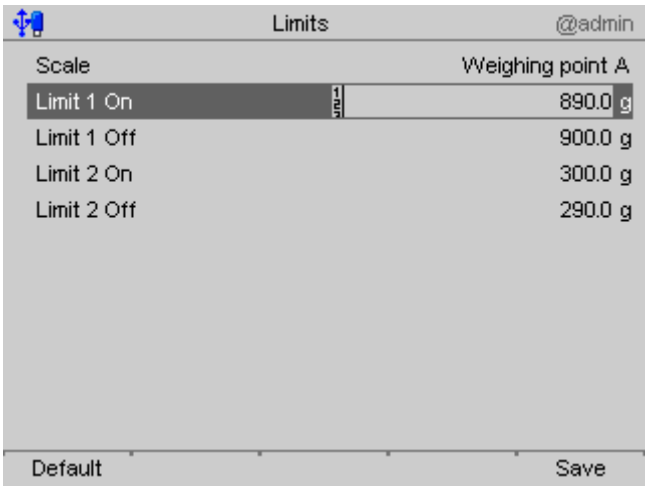
The two limits have a hysteresis of 10 g. In the event of a power failure, the two outputs go to OFF, thus indicating underfill and overfill at the same time.

Example 2:



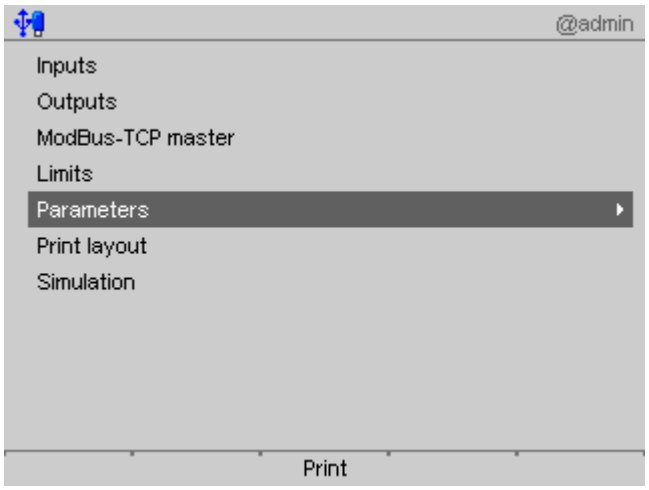
If limits 1 + 2 are the same for "On" and "Off" (on = off):

- output 1 (Limit 1 out) switches ON if the weight (Wgt) exceeds the value;
- output 2 (Limit 2 out) switches OFF if the weight falls below the value.

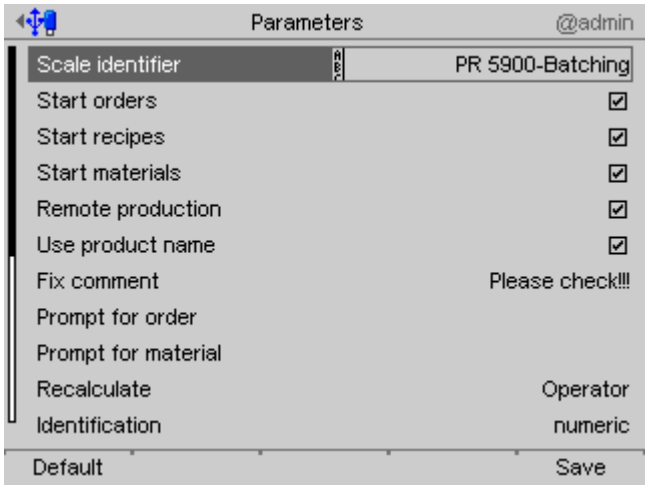


- ▶ Select the appropriate lines using the cursor.
- ▶ Use the keyboard to enter and confirm the desired values (in this case: see example 1).
- ▶ Press the [Default] soft key to return to the factory settings, if required.
- ▶ Finally, press the [Save] soft key to save the settings.

5.4.5 Parameters



▶ Select and confirm [Parameters] using the cursor.



▷ A selection window appears.

▶ Select and confirm the individual settings.

[Scale identifier]

Input:

Max. 18 alphanumeric characters via keyboard

[Start orders]

If activated, it is possible to work with orders. At least one of the options (Start orders/recipes/materials) must be activated. Start options that have been switched off will not be offered. If only one of the three options is still active then the selection dialog will be skipped and only the specified production type will be able to be carried out.

[Start recipes]

If activated, it is possible to work with recipes. An order is automatically created so that the recipe can be batched. It is only possible to select from recipes that have already been created. The order will be given the recipe's name (max. 18 characters) with the sequence number added (sequence number is at least three characters plus separator). The recipe name is then abbreviated accordingly.

[Start materials]

If activated, a single material can be batched. The material must already have been created. A one-line recipe and an order are automatically created. The recipe and order will be given the material's name (max. 18 characters) with the sequence number added (sequence number is at least three characters plus separator). The material name is then abbreviated accordingly.

[Remote production]

If activated, up to 8 recipes can be started via digital inputs, for details see Chapter 7.5.

[Use product name]

If activated, the name will be queried when creating the order and, if configured, printed in tickets. The product name will be printed on the tickets under "Product". This name refers to the result of production. The product name is not significant for the production process.

[Fix comment]

The text entered here is incorporated directly into the tickets. If the corresponding text is left empty then the corresponding line is not printed.

[Prompt for order], [Prompt for material]

There is a prompt for the coefficients when creating an order or material. The significance of a coefficient may vary.

The prompt text that is used is entered here. If this text is left empty then there is no prompt.

[Recalculate]

An order for a free choice recipe can be recalculated in the case of batching outside of the tolerance. The settings determine whether or not this function is available for the user and which rights are necessary for this purpose:

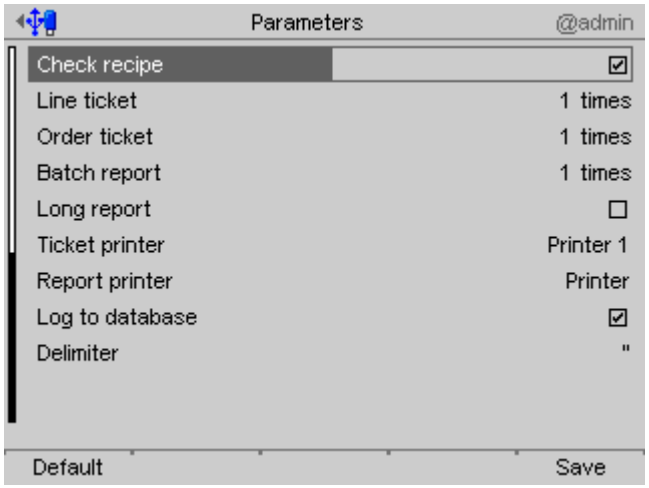
[Off]	No recalculation
[Operator]	Recalculation possible for operator, supervisor and administrator
[Supervisor]	Recalculation possible for supervisor and administrator
[Administrator]	Recalculation only possible for administrator

[Identification]

The input format for the order, recipe and material names can be chosen from [numeric] and [Text].

The definition influences the input format. The identification is always saved as a string.

The  button can be used to switch to the other type. In the case of [Text], it is recommended that a PC keyboard should be connected. As the identification is saved as text, the operation can also be mixed (e.g.: material and recipe as text due to better legibility, but orders as numbers).



[Check recipe]

If activated, the selected recipe is checked with the specified recipe set point. The scales are considered separately. In this case, the weight to be checked should not fall below the relevant max. of the scale or be negative. As the connections between the scales in the recipe are not visible, the test run cannot identify when one scale is discharged into another one. Overloading of the scale cannot be recognized. In cases where material is removed without being added to the recipe, the test run could report overloading that will not occur in the actual process. In this case and in similar cases, the test run must remain switched off.

Calculations Using the Recipe Test Run:

		Tare	Set point	Test run
Net filling	B1	B	T + SP	SIM + SP
Net refill	B2	T	T + SP	T + SP
Gross filling	B3	0	SP	SP
Net decrease	B4	B	T - SP	T - SP
Gross decrease	B6	B	SP	SP
Discharge	B8	B	0	0
Manual filling	D1	B	T + SP	SIM + SP
Manual, no check	D2	B	T + SP	SIM + SP

B: Gross, T: Tare, SP: Set point, SIM: weight to be checked

[Line ticket]

The [Ticket printer] interface is used to set a printout for each completed line of the recipe (e.g. self-adhesive tickets), provided that a material has been transported. This function is activated by the input of the ticket number.

n ≥ 1 time: For each line of the recipe, n tickets are printed.

n = 0 times: A ticket is created but not printed; access with the  button.

No line tickets are printed in the case of automatic recipes. This specification also applies for NLE.

For print layouts see Chapter 5.4.6.

[Order ticket]

Tickets can be printed after completion for each order via the [Ticket printer] interface. This function is activated by the input of the ticket number.

n ≥ 1 time: For each order, n tickets are printed.

n = 0 times:A ticket is created but not printed; access with the button.

The ticket is not issued if only one material was batched. This specification also applies for NLE.

For print layouts see Chapter 5.4.6.

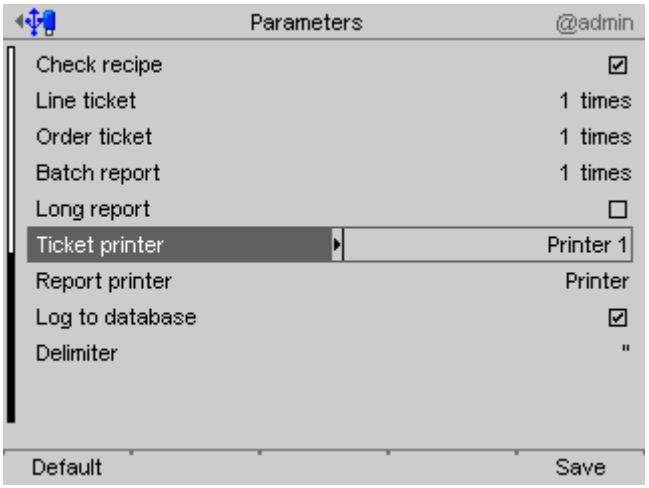
[Batch report]

The [Report printer] interface can be used to print a summary report at the end of a recipe. This report can be detailed or minimal.

[Long report]

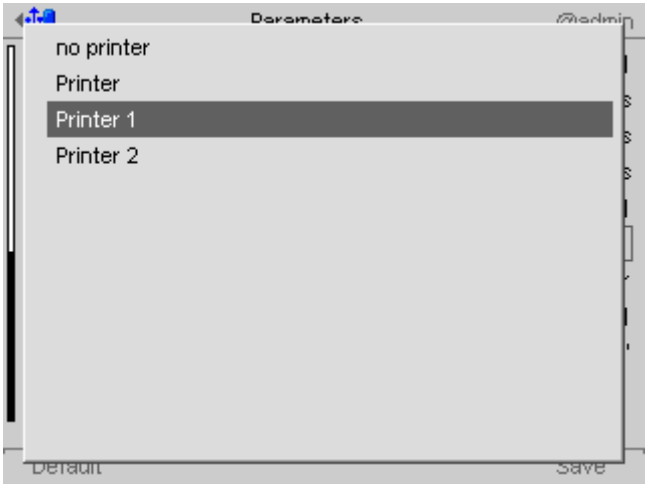
If activated, a long report (header and line information in one printout) is printed via the [Report printer] interface. This report can be configured with NLE.

If not activated, a one-line report will be printed comprising date/time, order, recipe and amount produced.



[Ticket printer], [Report printer]

▶ Select and confirm [Ticket printer], for example, using the cursor:



▷ A selection window appears.

▶ Select and confirm the appropriate printer using the cursor.

Selection:
No printer, Printer, Printer 1, Printer 2

Prerequisite for this is that these have been set up in the system menu under
[System setup]-[Connected devices].

Ticket printer:

This printer is used for printing all tickets. The print width is limited to 40 characters per line.

Report printer:

This line printer is used for printing all reports. The print width is limited to 80 characters per line.

[Log to database]

If activated, all batching will be logged in the REPORT database. After each batching process, a record is made in the database. An input with line number 0 is created as a summary for the recipe. If they cannot be collected, the inputs must be deleted, see Chapter 6.5.5.

[Delimiter]

In a batch report, the delimiter is always written between automatically produced order names/recipe names and the sequence number.

Selection: " ,#, [Comma] ,*, -, /, ^, [Space], -, ~

Example:

A material (flour) needs to be batched for a created recipe.

An order is automatically created. The order number consists of the recipe name + delimiter + sequence number preceded with zeros. This is followed by the material name and set point.

06.03.2013 14:55:17	R-Mehl~014	R-Mehl	500.0 g

Example:

A material needs to be batched without a created recipe.

An order is automatically created. The order number consists of the recipe name + delimiter + sequence number preceded with zeros. This is followed by the automatically created recipe name (identical to the order name) and the set point of the material.

06.03.2013 14:09:48	Mehl~001	Mehl~001	500.0 g

- ▶ Press the [Default] soft key to return to the factory settings, if required.
- ▶ Finally, press the [Save] soft key to save the settings.

5.4.6 Print layout

The arrangement of the tickets and batch reports is defined in a separate configuration module. Printouts from databases, such as those for materials or recipes, are fixed and cannot be changed.

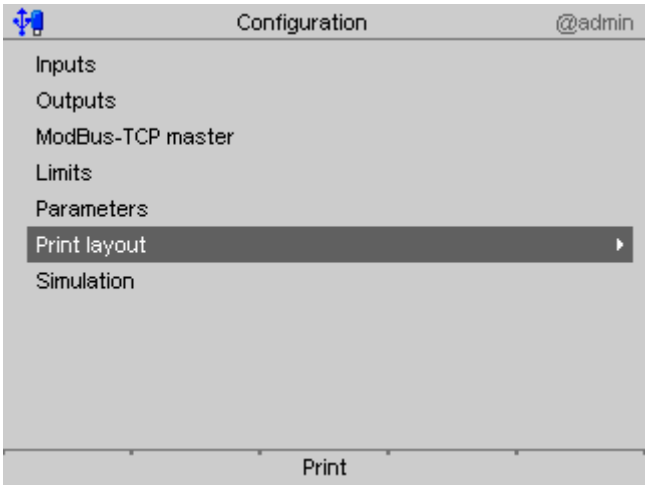
There are different ranges:

- Tickets that document a batching process are defined by lines.
  A line contains up to 39 characters. NLE (NiceLabelExpress) name: "TLine.lbl"
- Tickets that document an order/recipe are defined by lines.
  A line contains up to 39 characters. NLE name: "TOrder.lbl"
- Header and trailer information for a batch report are defined by lines.
  A line contains up to 39 characters. NLE name: "RHeader.lbl" and "RTrailer.lbl"
- The lines of a batch report are defined by columns. The print width is determined by the total columns. The number of lines is determined by the recipe*. NLE name: "RLine.lbl"

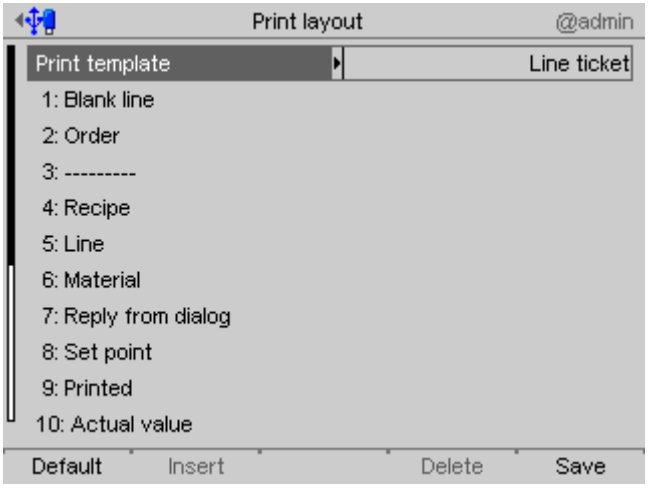
* Materials with ID checking generate an additional line with the corresponding layout.
Materials with a preceding dialog also generate an additional line with the corresponding layout.

Only the permissible line contents for a range can be selected for it. For the possible functions, see Chapters 10.3 and 10.4.

Note	As soon as an NLE ticket is available for a range, the subsequent configuration is no longer significant. The printout is then completely determined by NLE.

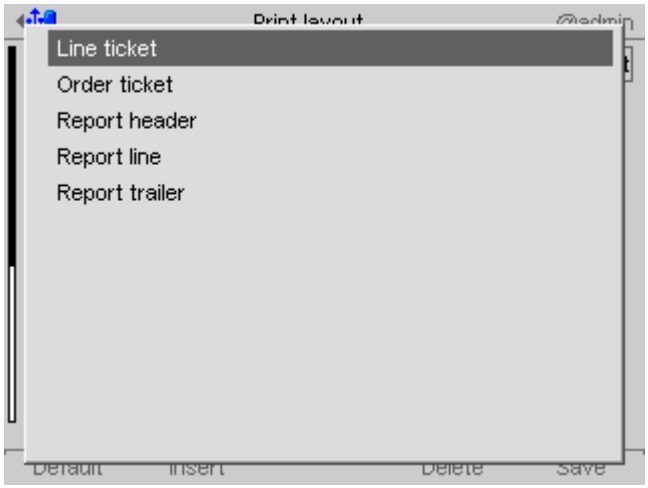


▶ Select and confirm [Print layout] using the cursor.



▷ A selection window appears.

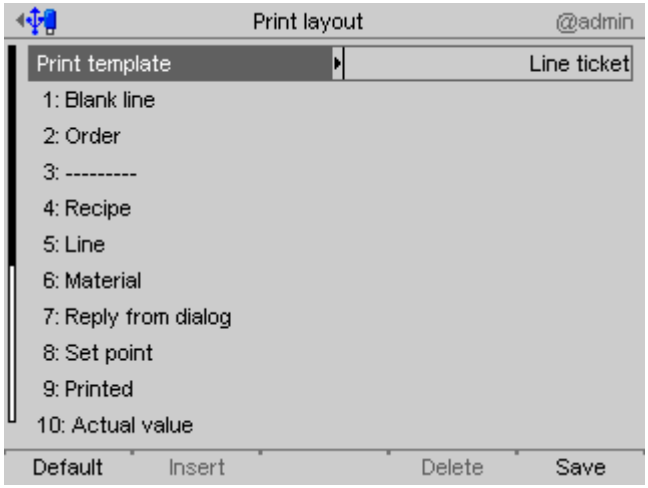
▶ Confirm the line.



▷ A selection window appears.

▶ Select and confirm the corresponding print layout using the cursor.

Selection:
Line ticket (see Chapter 10.3.2), Order ticket (see Chapter 10.3.3), Report headers (see Chapter 10.4), Report lines (see Chapter 10.4), Report trailers (see chapter 10.4)



▶ Select and confirm the individual settings.

▶ Press the [Insert] soft key to insert a new line below the highlighted line. Up to 40 lines can be defined.

▶ Press the [Delete] soft key to delete the highlighted line.

[Line 1– 40]

Selection:
Blank, -------, Form feed, Order name, Product name, Recipe name, Recipe line number, Material name, Reply from dialog, Set point, Actual value, Tolerance (Ticket), Batch status, -Tolerance, +Tolerance, Scale name, Ordered by, Weighed by, Start time, Final time, Recalculated, Print time, Fix comment, Act. mat. cons., Tidy up, Sequence number, see also the following table.

▶ Press the [Default] soft key to return to the factory settings, if required.

▶ Finally, press the [Save] soft key to save the settings.

The following table shows the items that can be shown on the printouts.

Item	Ticket		Batch report		
	Lines	Order	Headers	(Columns in a) line	Trailers
[Blank line]	x	x	x	---	x
[-------]	x	x	x	---	x
[Form feed]	x	x	x	---	x
[Order name]	x	x	x	---	x
[Product name]	x	x	x	---	x
[Recipe name]	x	x	x	---	x
[Recipe line number]	x	---	---	x	---
[Material name]	x	---	---	x	---
[Reply from dialog]	x	---	---	x	---
[Set point]	x	x	x	x	x
[Actual value]	x	x	x	x	x
[Tolerance] (2 lines)	x	---	---	---	---
[Batch status]; Characters: "#" = tolerance "*" = aborted "-" = skipped	x	x	x	x	x
[-Tolerance]	---	---	---	x	---
[+ Tolerance]	---	---	---	x	---
[Scale name]	x	x	x	---	x
[Ordered by]	x	x	x	---	x
[Weighed by]	x	x	x	---	x
[Start time]	x	x	x	---	x
[Final time]	x	x	x	---	x
[Recalculated]; character: "%"	x	x	x	x	x
[Print time]	x	x	x	---	x
[Fix comment]	x	x	x	---	x
[Act. mat. cons.]	---	---	---	x	---
[Tidy up process]; character: "="	---	---	---	x	---
[Sequence number]	x	x	x	---	---

5.4.7 Simulation

This function is needed in order to simulate the material flow of an automatic recipe without real materials.

It is possible to test whether the settings/links of the digital inputs and outputs have been parameterized correctly.

In a test structure, the process can be simulated in advance so that any necessary changes can be made before installation.

The batching signals for coarse, fine and discharge are also operated in the simulation. The speed of the coarse flow to be simulated is adjustable in units/minutes (e.g. 10 kg/min for a scale with kg graduations).

The fine flow is carried out at approx. 1/5 of the speed of the coarse flow. The discharge is carried out at 5 times the speed of the coarse flow.

⚠ Warning

Risk due to uncontrolled material flow!

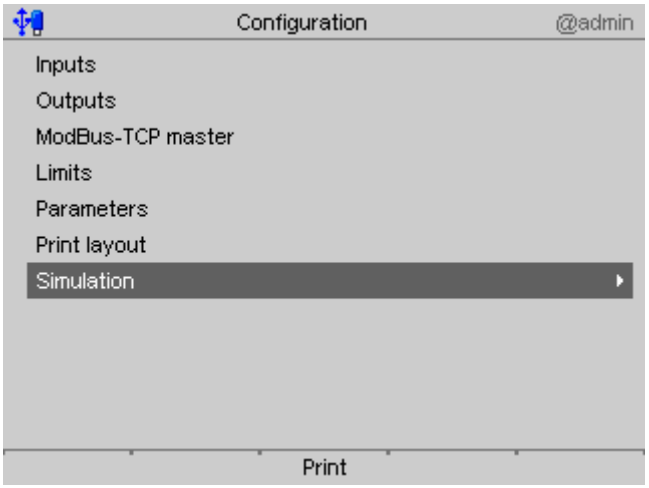
All signals are operated for real when the function is activated.

The simulation may only be carried out in a test structure!

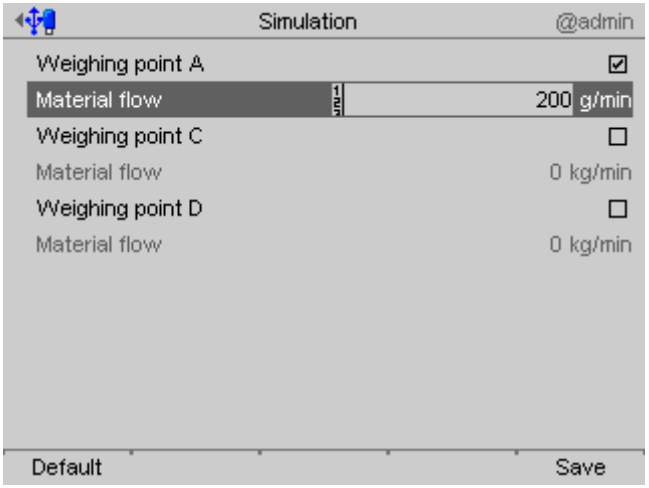
Note

A scale can only be simulated if the "Settings locked" parameter has not been activated under [System setup]-[Weighing points]-[Parameters].

- ▶ After exiting the simulation, go to the menu [System setup]-[Weighing points]-[Parameters] and set the parameter "Settings locked" to reactivate overwrite protection via the software.



▶ Select and confirm [Simulation] using the cursor.



▶ Check ☑ the box to activate the simulation mode for the corresponding weighing point.

▶ Enter the coarse flow speed.

▶ Press the [Default] soft key to return to the factory settings, if required.

▶ Press the [Save] soft key to save the settings for the simulation.

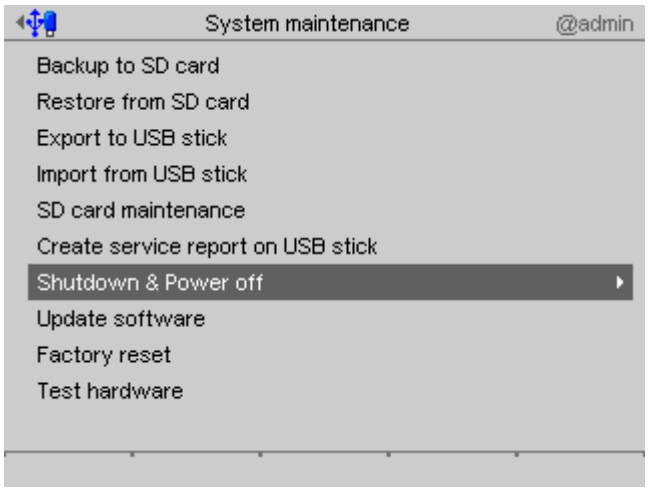
▶ To start the recipe, see Chapter 7.3.

▶ After the end of the test phase, deactivate the simulation and carry out a cold start (see PR 5900 Instrument Manual) in order to switch off the simulation.

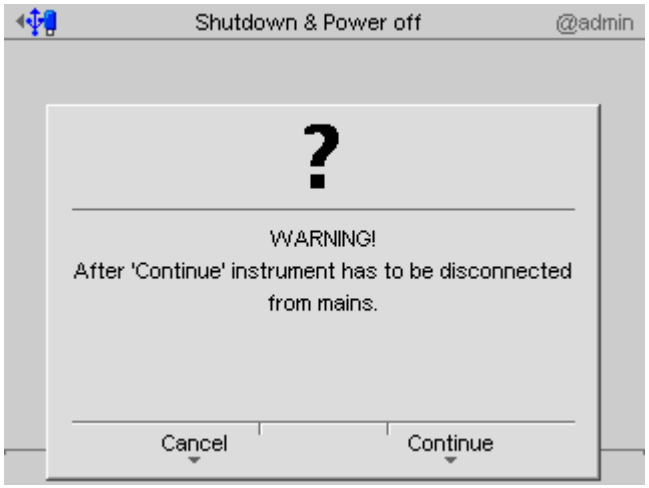
5.5 Switching Off the Device

This function is required to disconnect the device from the power immediately, e.g. to install an option card. The rechargeable battery is immediately deactivated.

Note	With a menu-driven shutdown, **not** all the content of the SD-RAM will be saved to a NAND flash memory. A cold start is forced during reactivation. E.g. database entries are no long available. It is recommended to first make a backup on the SD card and/or export the data to a USB stick, see PR 5900 instrument manual.



▶ Select and confirm [System maintenance]-[Shutdown & Power off].



▷ A prompt window appears.

▶ Press the [Continue] soft key.

▶ Disconnect the power plug.

6 Application

6.1 General Information

Operation takes place via the application menu, see also Chapter 4.

The following functions are available:

- Production (see Chapter 7)
- Print tickets and reports (see Chapters 5.4.5, 5.4.6, 10.3, 10.4 and 10.5)
- Databases (see Chapter 9)
- Application maintenance (see Chapter 6.5)
- Configuration (see Chapter 5.4)

6.2 Material

6.2.1 General Information

Before a recipe or an order can be created, the materials listed in it must be defined. Material in this sense is not only a product to be weighed, but also instructions which control the process. Materials can be created, edited, deleted and printed. They can be listed in recipes.

Orders can be issued on the basis of a material and materials can be started directly without previously issuing an order.

6.2.2 Use of Materials

All control components are carried out precisely once, including in manual recipes, and are not activated again even after recalculation. Therefore if a recipe line e.g. for switching off a machine is "used", then this machine can no longer be switched off if it is later switched on by another line in the recipe.

Another example:

In a sequential recipe, mixing is carried out for a certain time using [Timer]. At the end of the recipe, post-batching is carried out after recalculation. The mixing time cannot be used again because it has been "used".

It is therefore highly recommended that, if possible, no control of the process should be included in manual recipes. It is better for these functions to be carried out by external components.

6.2.3 Material Types

There are 20 different material types.

Material type	Internal index[1]	Mode[2]	Batch report	Ticket	Autom. recipe	Tidy up process	Manual recipe seq.	Manual recipe free	Order, direct	Consumption[3]	Select WP
NOP (no function)	0	---			x	x	x	x			
Net filling	1	B1	x	x	x	x	x	x	x	x	
Net refill	2	B2	x	x	x					x	
Net decrease	3	B4	x	x	x		x**		x	x	
Gross filling	4	B3	x	x	x	x	x	x	x	x	
Gross decrease	5	B6	x	x	x	x	x	x**	x	x	
Discharge	6	B8			x	x	x	x**			
Register	7	Register	x	x			x	x	x	x	x
Manual filling	8	D1	x	x	x	x	x	x	x	x	x
Manual, no check	9	D2	x	x	x	x	x	x	x	x	x
Timer	10	D3	x		x	x	x	x			
Stop	11	D4			x	x					
Wait for SPM	12	D5			x	x	x**	x**			
Set SPM	13	D6			x	x	x*				
Reset SPM	14	D7			x	x	x*				
Wait + reset	15	D8			x	x					
Analog Output	16	A1	x		x	x	x	x*			
Analog Input	17	A2	x		x	x	x				
Dialog	18	Dialog	x		x	x	x	x			
Wait for Analog Input	19	A3	x		x	x	x				

* These "materials" must only be implemented with extreme caution when used in manual recipes, in particular free choice recipes.

** When used in manual recipes, in particular free choice recipes, these "materials" can only be used if certain conditions are met concerning mechanical/electrical equipment.

1) Mode index: used in the material and report database.

2) Designations as in the X series.

3) The material actually transported is recorded.

6.2.4 Material Parameters

6.2.4.1 Table

The following table shows which parameters are assigned to the different material types.

Material type	Internal index[4]	Set point[5]	Tolerance	Total	Relative/Recalc.	Scale	Preset	Overshoot	Restart mode	Tolerance	Time to wait in s	SPM In	SPM Out	Unit	Scaling	Coefficient	Recording ID	Dialog	Range	Decimal places	SPM In tare
		Recipe editor				Material editor															
NOP (no function)	0					x															
Net Filling	1	kg	x	x	x	x	x	x	x	x	x	x	x			x		x			
Net refill	2	kg	x	x	x	x	x	x	x	x	x	x	x			x		x			
Net decrease	3	kg	x	x	x	x	x	x	x	x	x	x	x			x		x			
Gross filling	4	kg	x	x	x	x	x	x	x	x	x	x	x			x		x			
Gross decrease	5	kg	x	x	x	x	x	x	x	x	x	x	x			x		x			
Discharge	6					x	x				x	x	x								
Register	7			x		x							x			x	x	x			
Man. filling	8	kg	x	x	x	x				x		x[6]	x			x	x	x			x
Man. filling, no check	9	kg		x	x	x						x	x			x	x	x			x
Timer	10	s				x						x	x								
Stop	11					x							x								
Wait for SPM	12					x						x	x								
Set SPM	13					x							x								
Reset SPM	14					x							x								
Wait + reset	15					x						x	x								
Analog Output	17	+[7]				x							x[8]	x	x						
Analog Input	16					x						x[9]		x	x						
Dialog	18					x							x					x			
Wait for Analog Input	19	x	x			x				x	x	x	x	x	x				x	x	x

4) Mode index: used in the material and report database.

5) This unit is also used for preset point, overshoot, etc.

6) Confirms the batching of the manual components.

7) The unit for the set points can be t, kg, lb, etc; however if there are several scales they must all belong to the same group (e.g. metric).

8) The set point is logged to this WORD address.

9) The value is read from this WORD address.

Note	The common parameters for automatic batching are explained under the material [Net filling] in Chapter 6.2.4.3.

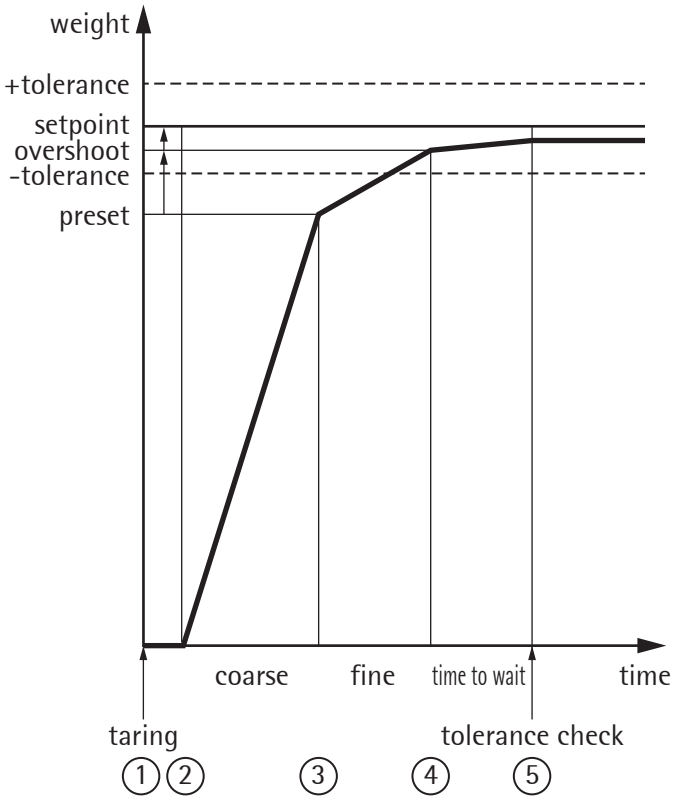
6.2.4.2 NOP

This material type ("no operation") does not do anything; it is simply used as a placeholder for a new recipe line. The minimum execution time for a line with this material is 200 ms.

6.2.4.3 Net Filling

The scale is tared and then the amount listed in the recipe line is automatically (coarse/fine) added. The overshoot can be automatically tracked in order to achieve optimum accuracy.

Process [Net filling]



① Taring:
The gross weight is saved as tare weight and the net weight starts at zero.

② Coarse:
A coarse flow (coarse and fine) is batched until the preset value is reached.

③ Fine:
A fine flow is batched until the switch-off point (overshoot) is reached.

④ Calming:
Wait time during which the overshoot is effective and scale vibrations may settle.

⑤ Tolerance Checking:
The weight is determined and checked against the tolerance values.

[Preset]

The preset value determines the time (set point – overshoot – preset) for switching from coarse to fine flow (coarse flow valve closes) during the batching cycle.

⚠ **Caution**

The fine flow signal is also active during the "coarse flow" phase.

Use **only** the fine-flow signal, if only one batching speed is required.

[**Overshoot**]

All the material filled into the container after the fine-flow valve has closed is known as overshoot. When entering the start value for the overshoot, the "in-flight" material which is still on its way into the container must be taken into account. To prevent the set point from being exceeded due to overshoot when starting for the first time, the initial overshoot setting should be higher than expected.

Only the portion of the overshoot that flows in once the calming time has elapsed is recorded.

Overshoot calculation/correction only takes place if tolerance checking has been enabled.

[**Material flow**]

The parameter is used to monitor the material flow. If the specified value (in weight/mm) is not reached then a warning (Bit in the SPM is set, see Chapter 8.5) is issued. In order to ensure that a warning is not received as soon as the coarse flow is switched on, the monitoring starts after 10 s. The monitoring is switched off if 0.0 is entered.

The specified value (in weight/mm) refers to the coarse flow; for the fine flow 1/8 of the value is valid.

[**Time to wait**]

As the time to wait starts straight after the fine flow valve has closed, the time for the overshoot must be taken into account. The weighing system can be put into vibration by dynamic effects. To determine the weight correctly, a corresponding time in seconds must be selected for calming. Before starting a system for the first time, set a higher value for the time to wait in order to permit settling of the weight value before the tolerance check is performed.

The time to wait to be set depends primarily on the following characteristics:

- Time for the overshoot after the fine-flow valve has closed
- Consistency of the material
- Properties and delays in the infeed system

Tolerance Checking

The tolerance is specified as a percentage of the set point for each material and can be determined with +Tolerance for weight above set point and with –Tolerance for weight below set point.

Note	In the event of automatic batching, the tolerance settings should be sufficiently large to ensure that overshoot optimization is executed. A smaller tolerance does not improve the batching result.

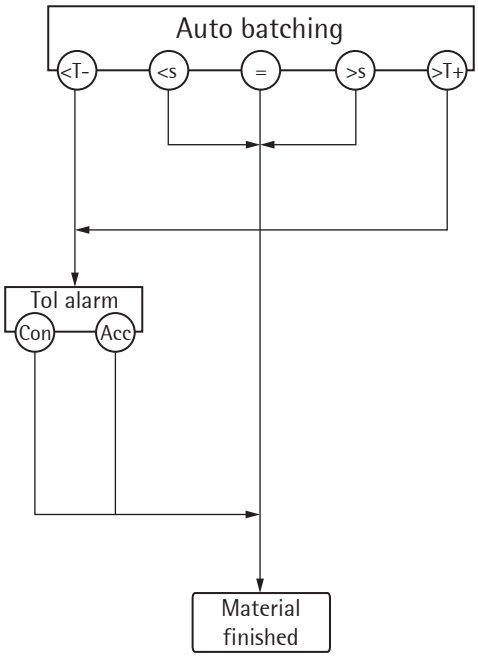
Tolerance errors cause generation of a tolerance alarm that must be acknowledged. If a set point tolerance is exceeded then there is a production stop for a process step.

Note	If +Tolerance and –Tolerance are set to 0, tolerance checking is omitted. Overshoot correction and/or post-batching are not performed. The overshoot value remains unchanged.

Restart mode (RST Mode 0)

No post-batching and no overshoot correction.

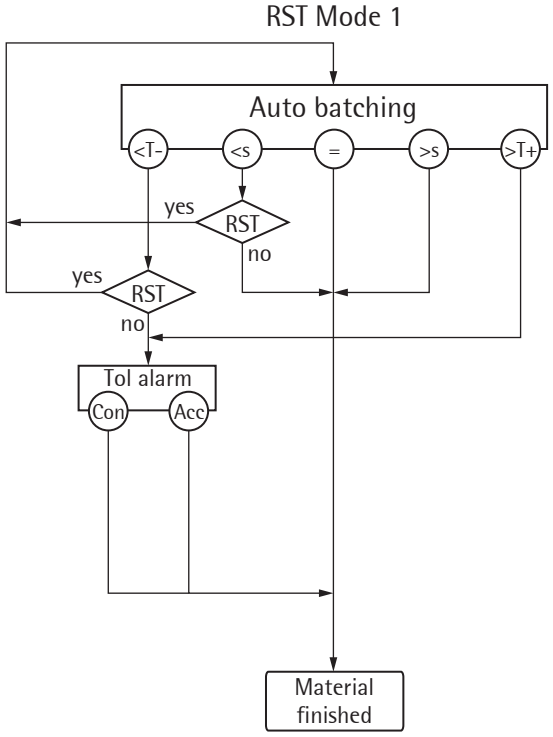
RST Mode 0



Symbol/abbreviation	Description
<T-	Below -tolerance limit
<s	Below set point
=	Set point reached exactly
<s	Above set point
>T+	Above +tolerance limit
Tol alarm	Tolerance alarm
Con	[Continue], accept over/under-batching
Acc	[Accept], accept over/under-batching
Material complete	Batching for the material is complete

Restart mode (RST Mode 1)

Post-batching but no overshoot correction.

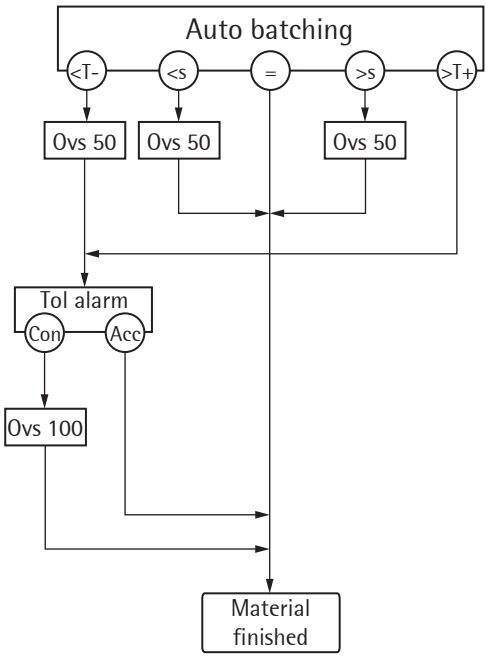


Symbol/abbreviation	Description
<T-	Below -tolerance limit
<s	Below set point
=	Set point reached exactly
<s	Above set point
>T+	Above +tolerance limit
RST	Post-batching
Yes/No	Yes (overshoot smaller than difference)/no
Tol alarm	Tolerance alarm
Con	[Continue], accept over/under-batching
Acc	[Accept], accept over/under-batching
Material complete	Batching for the material is complete

Restart mode (RST Mode 2)

Overshoot correction but no post-batching.

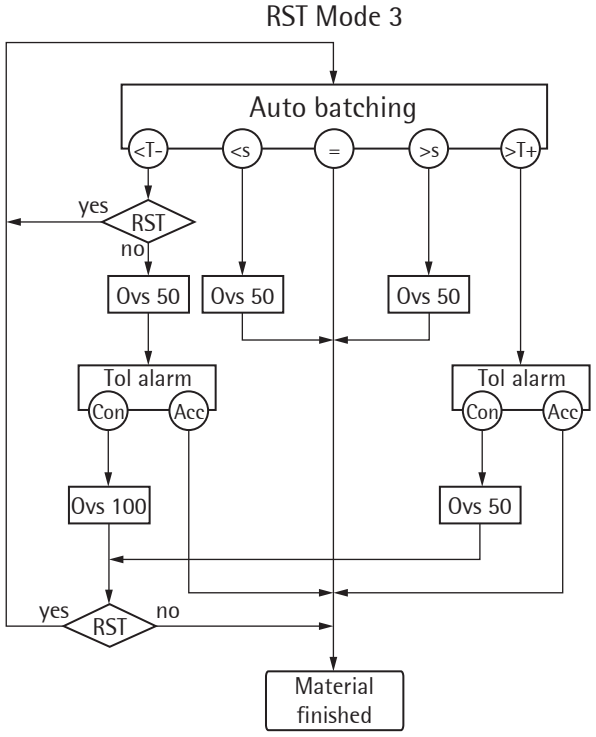
RST Mode 2



Symbol/abbreviation	Description
<T-	Below -tolerance limit
<s	Below set point
=	Set point reached exactly
<s	Above set point
>T+	Above +tolerance limit
OVS 50	Overshoot 50: Old overshoot – (set point - weight on tolerance check)/2
OVS 100	Overshoot 100: Old overshoot – (set point - current weight)
Tol alarm	Tolerance alarm
Con	[Continue], Set overshoot 100.
Acc	[Accept], accept over/under-batching
Material complete	Batching for the material is complete

Restart mode (RST Mode 3)

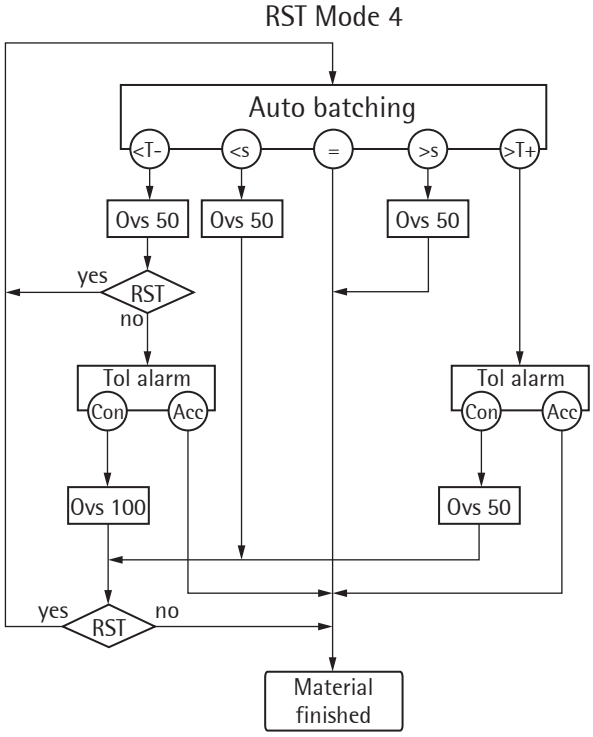
First post-batching and then overshoot correction.



Symbol/abbreviation	Description
<T-	Below -tolerance limit
<s	Below set point
=	Set point reached exactly
<s	Above set point
>T+	Above +tolerance limit
OVS 50	Overshoot 50: Old overshoot – (set point - weight on tolerance check)/2
OVS 100	Overshoot 100: Old overshoot – (set point - current weight)
RST	Post-batching
Yes/No	Yes (overshoot smaller than difference)/no
Tol alarm	Tolerance alarm
Con	[Continue], change overshoot, post-batch if applicable
Acc	[Accept], accept over/under-batching
Material complete	Batching for the material is complete

Restart mode (RST Mode 4)

First overshoot correction and then post-batching.



Symbol/abbreviation	Description
<T-	Below -tolerance limit
<s	Below set point
=	Set point reached exactly
<s	Above set point
>T+	Above +tolerance limit
OVS 50	Overshoot 50: Old overshoot – (set point - weight on tolerance check)/2
OVS 100	Overshoot 100: Old overshoot – (set point - current weight)
RST	Post-batching
Yes/No	Yes (overshoot smaller than difference)/no
Tol alarm	Tolerance alarm
Con	[Continue], change overshoot, post-batch if applicable
Acc	[Accept], accept over/under-batching
Material complete	Batching for the material is complete

[**Enabled by bit**]

SPM address %MX, see Chapter 8.5. The SPM address is entered when creating a material (may not be occupied by another function). An input is then assigned the same address during the input configuration. A non-active input blocks the batching. The input can be used e.g. as feedback for the connected path.

If the SPM address is set to 0, the material is released immediately.

[**Activate bit**]

SPM address %MX, see Chapter 8.5. The SPM address is entered when creating a material (may not be occupied by another function). An output is then assigned the same address during the output configuration.

The corresponding bit is set as soon as the material is active. The status is independent of Enabled by bit.

[**Dialog data type**]

This parameter is only used if a dialog is configured. The dialog can either take place before the batching or as a separate recipe line. There are 8 different settings. The data recorded during batching (2–7) is only significant for the report. In the case of 8, a query is started for set point change:

No.	Selection	Description
1	No dialog	Dialog is switched off.
2	Message only	The message must be acknowledged or it will be displayed for a defined time.
3	Text	Enter free text.
4	Integer number	Enter integer, if necessary with dimension.
5	Real number	Enter floating point number, if necessary with dimension.
6	Weight	Enter weight value.
7	Yes/No	Prompt only.
8	New set point	Set point change, see Chapter 7.7.7.

6.2.4.4 Net Refill

The scale is not tared and is refilled to the specified net weight. A material of this type follows e.g. a line with a material which is hard to batch due to its consistency. With the refill function, the same substance but with a better consistency is automatically brought to the precise set point.

- In the recipe the initial material does need to be qualified, but does not need to be included in the total for the recipe.
- This material type cannot be used in manual recipes because in each case it must be ensured that the tare value (from the previous batching) matches the desired result.

The other parameters and the process correspond to the type [Net filling], see Chapter 6.2.4.3.

6.2.4.5 Gross Filling

The scale is automatically refilled to the specified gross weight.

The other parameters and the process correspond to the type [Net filling], see Chapter 6.2.4.3.

6.2.4.6 Gross Decrease

The scale is automatically discharged up to the specified value.

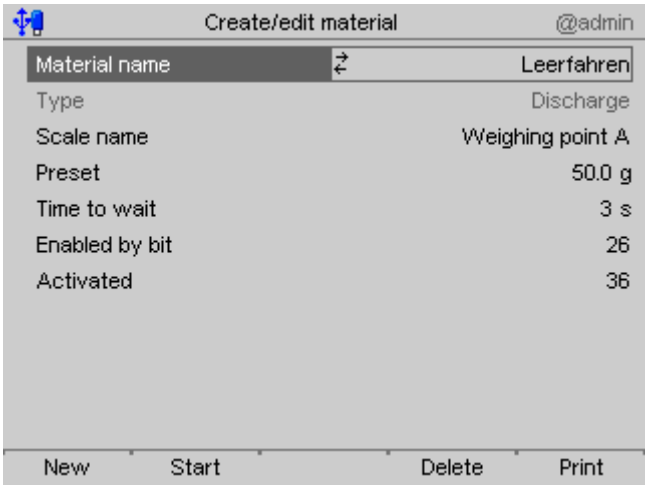
Note	The use of this material type is only effective at precisely defined points in a recipe. Use in free choice recipes is therefore dubious. In addition, suitable mechanical/electrical equipment is needed.

The other parameters and the process correspond to the type [Net filling], see Chapter 6.2.4.3.

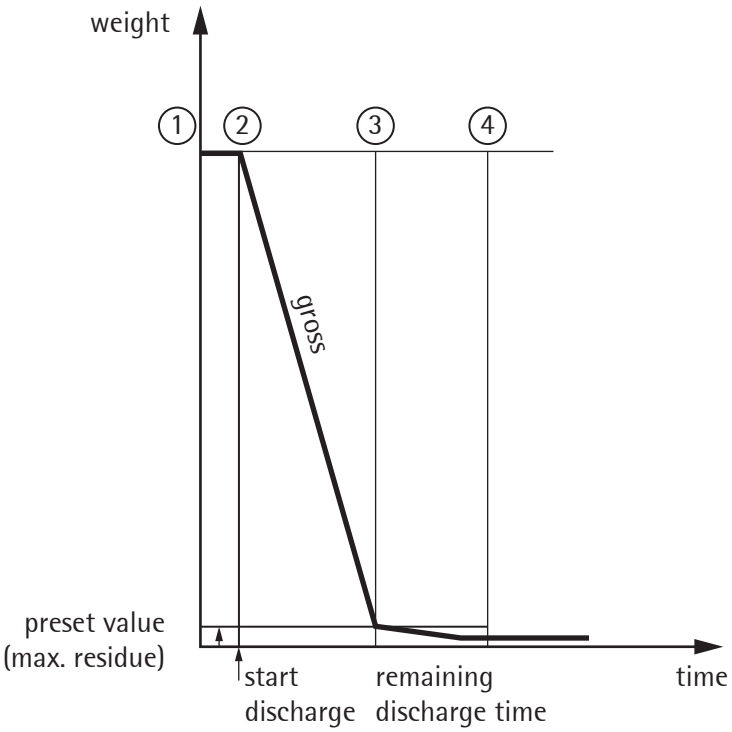
6.2.4.7 Discharge

The aim here is to discharge the scale automatically and completely. The output stipulated under [Activate bit] is set up to the maximum remainder specified under [Preset] Once the remainder is reached, the time specified under [Time to wait] is waited in order to discharge the last remainder from the scale. The remainder must be larger than the expected remaining quantity.

Note	The use of this material type is only effective at precisely defined points in a recipe. Use in free choice recipes is therefore dubious. In addition, suitable mechanical/electrical equipment is needed.



Example for the "Empty running" material



① Scale set to "Gross".

② Output discharge signal [Activate bit].

③ Maximum remainder reached [Preset].

④ Remainder discharge time [Time to wait] expires. Output [Activate bit] is reset.

6.2.4.8 Register

This material type can only be used in manual recipes. It is tared and then the material is placed on the scale. The weighed amount is then included in the report. There is no set point during registration.

6.2.4.9 Manual Filling

A material is manually assigned; the amount is weighed and then checked for tolerance.

Manual additions apply the actual value amount (no consideration of the plus/minus sign). This means that it is possible both to fill a container on the scale and to remove material from a weighed container.

[Set ready bit]

SPM address %MX, see Chapter 8.5. The address is entered when creating a material (may not be occupied by another function). An input is then assigned the same address during the input configuration. An activated input signals that the batching is complete.

If the address is set to 0 then the ready signal must be issued via the keypad.

[**Activate bit**]

SPM address %MX, see Chapter 8.5. A signal is given to the operator via an output that the material is active.

6.2.4.10 Manual, No Check

A material is added manually and the specified set point is used as the actual value.

Manual additions apply the actual value amount (no consideration of the plus/minus sign).

The parameters correspond to those of "Manual filling", only the tolerance specification is omitted,

6.2.4.11 Timer

SPM address %MX, see Chapter 8.5. The timer is set for a specified time. The time starts when the input for the "Activate bit" is activated.

Note	This material type should be used with caution in manual recipes. Recipes which can be recalculated should not contain this material type.

6.2.4.12 Stop

An automatic recipe is held and the specific output is activated. The recipe is continued by the user. The function can be used, for example, to take samples.

6.2.4.13 Wait for SPM

The material sets the "Activate bit" until the specified SPM address "Set ready bit" has been set.

Note	Use in manual recipes requires appropriate mechanical/electric equipment. Use in free choice recipes is dubious because there may be a waiting period at any point in the recipe. Sequential recipes which can be recalculated should not contain this material type.

6.2.4.14 Reset SPM

An SPM address %MX (see Chapter 8.5) is reset. This means that conveyor belts, heating, suction systems, etc. can be switched off again.

Note	[Reset SPM] and [Set SPM] must be viewed together. Recipes which can be recalculated should not contain this material type.

6.2.4.15 Wait + Reset

This is used as a "handshake" function with internal functions.

6.2.4.16 Analog Output

The set point is specified in the SPM, scaled using a linear function in the format "WORD";
SPM addresses %MW see Chapter 8.

The range is 0–20 mA. The analog output value between 0/4 mA (Min) and 20 mA (Max) is scaled with a specified unit (e.g. "rpm") to the set point at 0/4 mA (Setp04mA) and the set point at 20 mA (Setp20mA). The set point from the recipe line is transferred into the batch report.

The scaling is adapted to the analog output card.

$$SPM_{out} = \frac{20000 \bullet (\text{set point} - \text{Setp04mA})}{\text{Setp20mA}}$$

Application

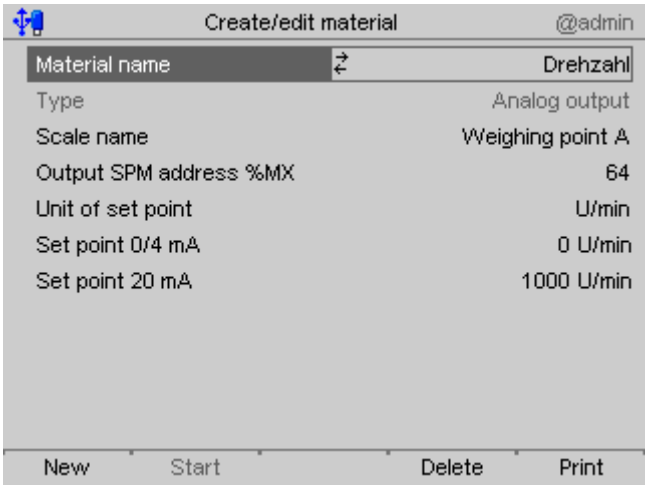
Set point specification e.g. for an external temperature regulator or determination of the speed of a mixer.

Apart from for scaling, the parameters [Set point ...] are also used as a permitted input range for the set point in the recipe line.

⚠ Caution

These components should be used with caution in manual recipes.

If for instance they are used to set the speed of a mixer, it must be ensured that a corresponding component that switches the mixer off again can still be carried out at the end of the recipe. Recipes which can be recalculated should not contain these components.



Example for the material "Speed"

6.2.4.17 Analog Input

An analog input signal is imported and provided to the SPM in "WORD" format.

The range is 0–20 mA. The analog input value between 0/4 mA (Min) and 20 mA (Max) is scaled with a specified unit (e.g. "°C") to the set point at 0/4 mA (Setp04mA) and the set point at 20 mA (Setp20mA). The current value is transferred into the batch report.

The scaling is adapted to the analog input card.

$$SPM_{in} = \frac{20000 \bullet \text{analog input}}{20\ \text{mA}}$$

$$\text{Current} = \frac{(\text{Setp20mA} - \text{Setp04mA}) \bullet \text{analog input}}{20\ \text{mA}} + \text{Setp04mA}$$

Application

Read a value from the SPM which stands for a process parameter, e.g. a temperature.

Under-control or over-control of the input set the recipe line in [Held].

6.2.4.18 Wait for Analog Input Value

An analog input signal is imported and provided to the SPM in "WORD" format. A linear function is used to scale the value to the application. The scaling is adapted to the analog input card.

This "material" waits until the condition for the agreed period is met. The range can be selected to be 0–20 mA or 4–20 mA. The analog input value is scaled with a specified unit (e.g. "°C") to the set point at 0/4 mA (Setp04mA) and the set point at 20 mA (Setp20mA). The scaled current value is displayed on the device during the current recipe. The set point and the tolerance ranges are shown in the bar graph until the material ends or is canceled. The current value is incorporated into the batch report.

$$SPM_{in} = \frac{20000 \bullet \text{analog input}}{20\ \text{mA}}$$

$$\text{Current} = \frac{(\text{Analog input} - \text{Min}) \bullet (\text{Setp20mA} - \text{Setp04mA})}{\text{Max} - \text{Min}} + \text{Setp04mA}$$

Min = 0/4 mA, Max = 20 mA

Application

Wait for an analog value which shows a process parameter, e.g. a temperature value during a specified condition within a period of time.

The recipe line goes to [Held] in the event of an input value

under 0 mA/over 20 mA for 0-20 mA

or

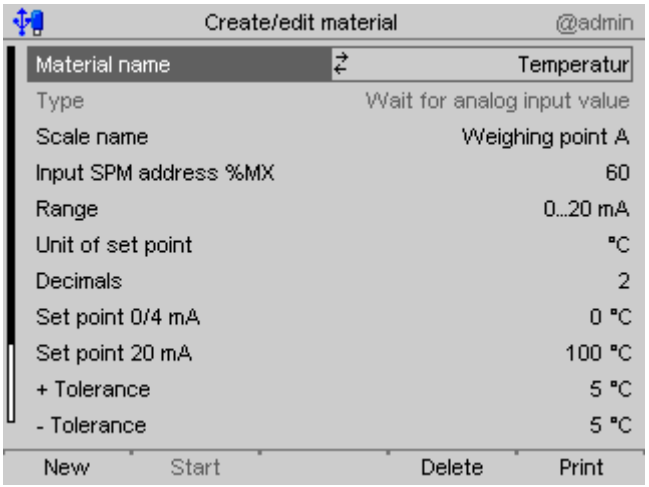
under 2 mA/over 20 mA for 4-20mA.

The recipe also goes to [Held] if:

max – min < 10^{-6}

or

(set point + pos. tolerance) – (set point– neg. tolerance) < (max - min) • 0.01.



Example for the material "Temperature"

Coarse and Fine

This material works in a similar way to net filling. It is possible to use the [Activate bit] to determine the status. The SPM logic function must be used for this purpose, see Chapter 8.5.

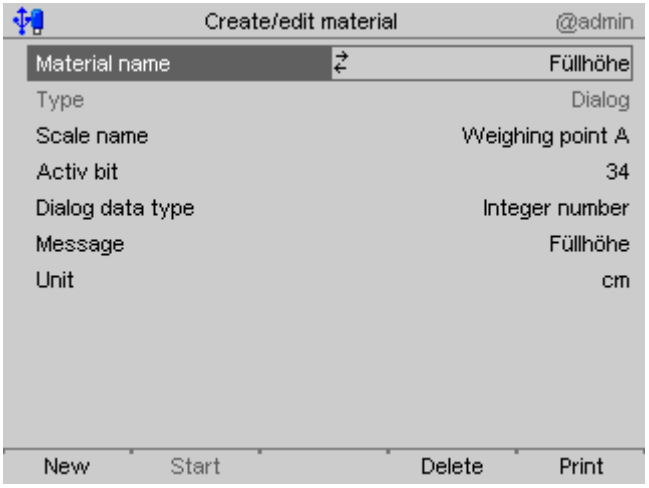
Coarse and fine are also valid for this material:

Coarse is true as long as the material is active AND the analog input value is valid.

Fine is true as long as the material is active AND the analog input value is within the tolerance.

6.2.4.19 Dialog

This type is used to hold a dialog with the user.



Example for the material "Filling level"

[**Dialog data type**]

Selection:
[No dialog], [Message only], [Text], [Integer number], [Real number], [Weight], [Yes/no]

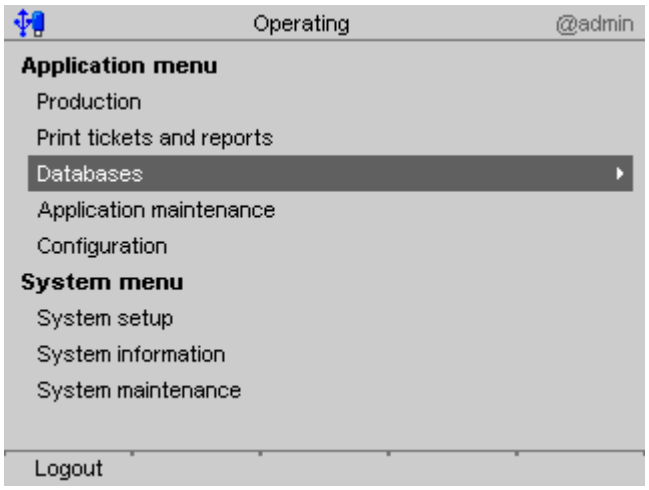
[**Unit**]

Only in the case of [Integer number] and [Real number].

[**Time out**]

Only in the case of [Message only].

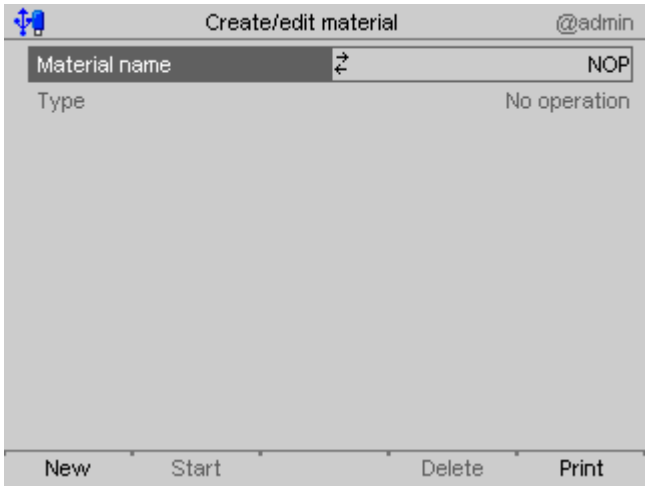
6.2.5 Creating a Material



▶ Select and confirm [Databases] using the cursor.

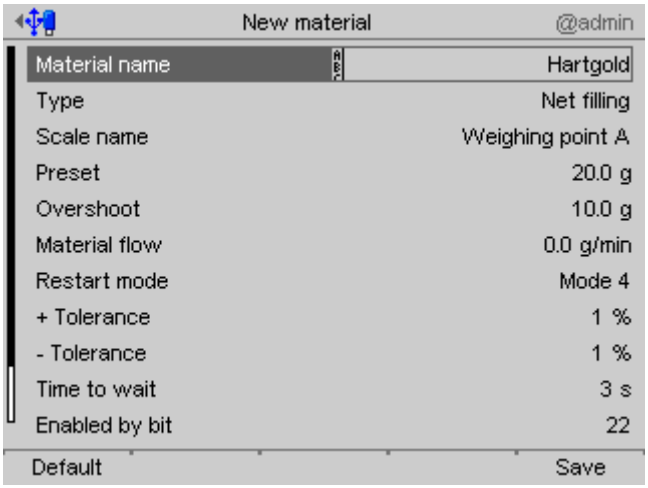
▷ A selection window appears.

▶ Select and confirm [Create/edit material] using the cursor.



▷ A selection window appears.
The placeholder "NOP" will be displayed.

▶ Press the [New] soft key to create a new entry.



▶ Select and confirm the individual parameters using the cursor.

[Material name]

Input: max. 18 alphanumeric characters

Note	The field must not be left "empty" and must not include any control commands or quotation marks. When making the entry it must be considered that the last characters may be abbreviated by the sequence number (min. 4) (e.g. in the event of the direct start of a material).

[Type]

Selection: see Chapter 6.2.3

[Scale name]

Selection: weighing point A–D

[Preset]

Input: weight; adopt unit from the calibration

[Overshoot]

Input: weight; adopt unit from the calibration

[Material flow]

Material flow monitoring: monitoring is switched off if "0" is used

Entry: in g/min, kg/min, etc. depending on the unit in the adjustment

[Restart mode]

Performance when tolerance exceeded, post-batching

Selection: mode 0–4, (see Chapter 6.2.4.3)

[+ Tolerance/- Tolerance]

Input: in % above/below set point

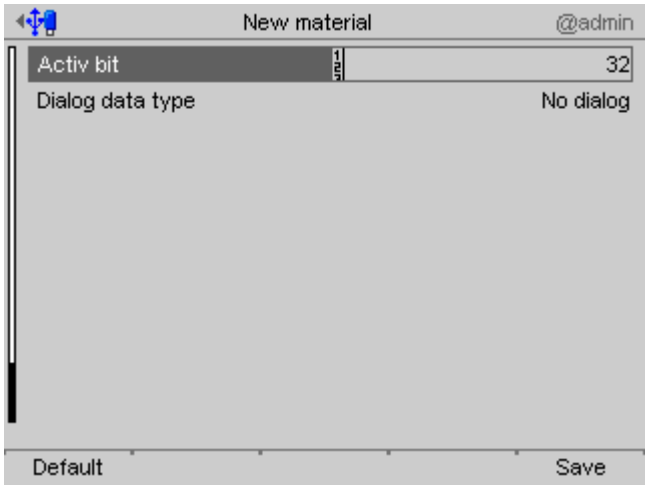
[Time to wait]

Calming time before determining weight

Input: in s

[Enabled by bit]

Input: SPM address %MX; input address for "ready", see Chapter 8.



[Activate bit]

Input: SPM address %MX; input address for the release of batching, see Chapter 8.5.

[Dialog data type]

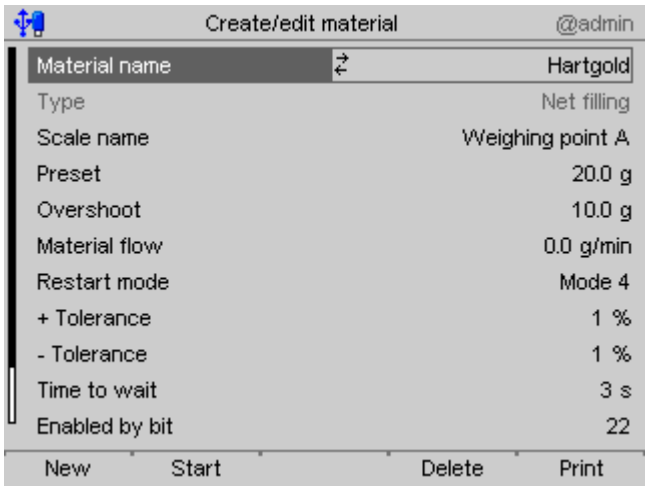
Selection:
No dialog, message only, text, integer number, real number, weight, yes/no, new set point

- ▶ Press the [Default] soft key to return to the factory settings, if required.
- ▶ Finally, press the [Save] soft key to save the settings.

6.2.6 Editing a Material

If parameters are changed in the material, this will influence (with the exception of tolerance) existing recipes and orders (if they have not yet been started).

A material can be selected. The display varies according to the configuration or the mode of batching. The tables of the characteristics and parameters of the different materials are listed in Chapters 6.2.3 and 6.2.4.

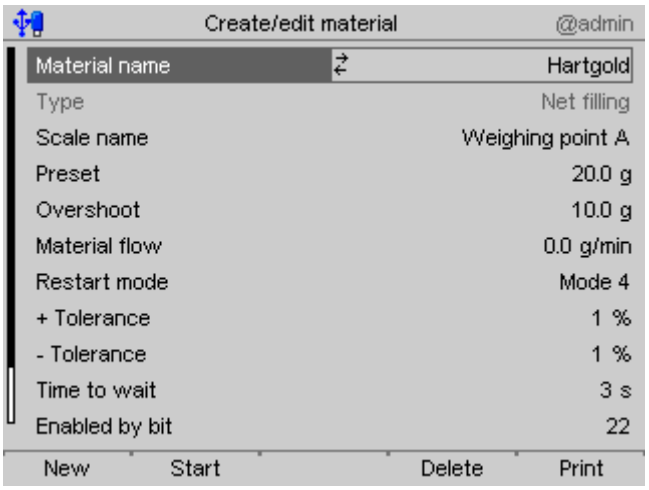


- ▶ Select and confirm [Create/edit material] using the cursor.
- ▶ Select the appropriate material name using the cursor.
- ▶ Select, change and confirm the individual parameters using the cursor.

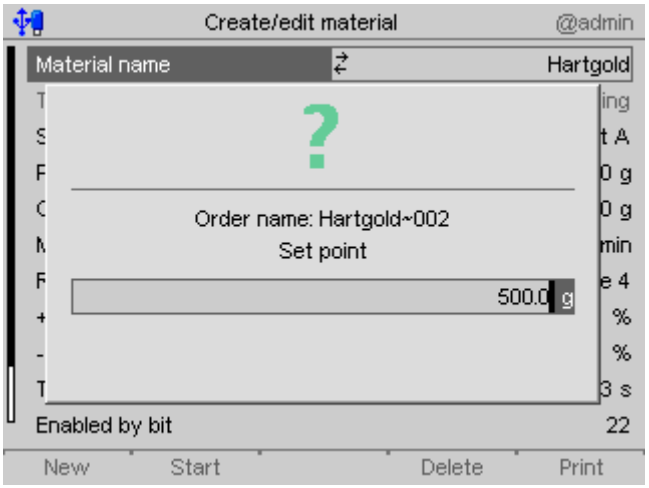
Note	Apart from [Type], all the parameters of a material can be changed.

- ▶ Finally, press the [Save] soft key to save the settings.

6.2.7 Batching a Material



▶ Press the [Start] soft key.



▷ An input window appears.

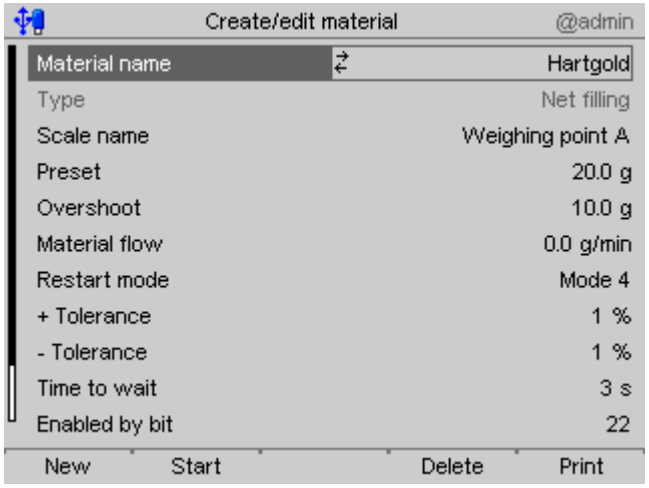
The material name is expanded to include the separator and the current sequence number (in this case, ~002).

▶ Use the keyboard to enter and confirm the set point.

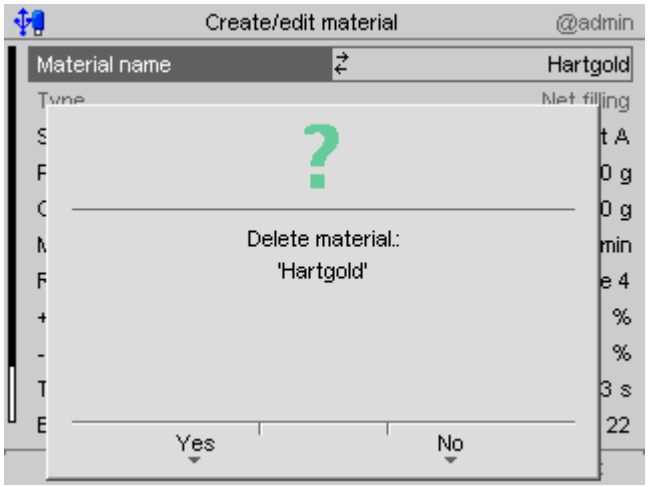
▷ The entered set point is saved in the material database and is used as the suggested value in the event of a subsequent start.

6.2.8 Deleting a material

A material cannot be deleted if it is listed in an order or recipe.



▶ Press the [Delete] soft key.



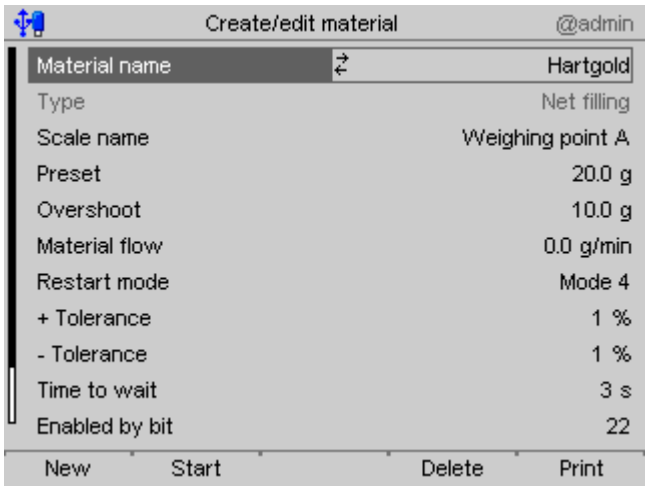
▷ A prompt window appears.

▶ Press the [No] soft key, if necessary, in order to return to the menu.

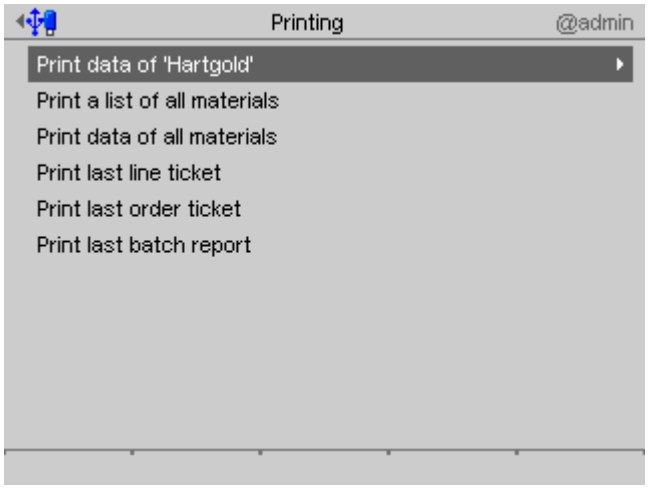
▶ Press the [Yes] soft key to delete the entry.

▷ The material is permanently deleted and the next database entry is displayed.

6.2.9 Printing a material



▶ Press the [Print] soft key.



▷ A selection window appears.

▶ Select and confirm the appropriate line using the cursor (here: print the data from "Material name").

Prerequisite for this is that the printer is selected under [Configuration]-[Parameters]-[Report printer] and set up in the system menu under [System setup]-[Connected devices].

```
Hartgold              17.05.2013 10:01:53
Changed by                         admin
Changed at            17.05.2013 10:01:49
---------------------------------------
Act. mat. cons.                     0.0 g
Type                           Net filling
Scale name                Weighing point A
Preset                              20.0 g
Overshoot                           10.0 g
Restart mode                        Mode 4
+ Tolerance                            1 %
- Tolerance                            1 %
Time to wait                           3 s
Flow                           0.0 g/min
Enabled by bit                        22
Activ bit                             32
Dialog data type                No dialog
```

6.3 Recipe

6.3.1 General Information

The recipe describes the steps for the execution of an order. When starting an order, the recipe is automatically expanded. In this case, the parameters of the order are transferred from the recipe (line by line) into a production instruction. The instructions are saved as a docket in the database.

6.3.2 Recipe Structure

A recipe consists of a number of lines that is only limited by the memory size. Each line contains a reference to a material (raw material or control instruction). During the expansion, the parameters of the material are added to the parameters of the recipe line. The parameters of a line, together with the parameters of the material, produce a complete dataset to control a process step. Therefore there is less call to refer back to the recipe or the material database during production.

Exception: Consumed amount and overshoot are updated.

Changes to the recipe or to the materials have no influence on the production following the expansion (important for manual recipes which are interrupted). For structure of the recipe database, see Chapter 9.3.2.

Each line also contains the header information of the recipe:

- Recipe name
- Recipe type (free choice, sequential, automatic)
- Production start total (used at the start of an order)
- Total amount produced
- Internal characteristics

The remaining values describe the lines of the recipe:

- Section
- Recipe line number
- Weighing point
- Material name
- Set point for the line
- Permitted tolerance
- Last change (by which user and when)
- Internal characteristics

Properties

Parameter	Free choice	Sequential	Automatic
Line ticket	(x)	(x)	
Order ticket	(x)	(x)	(x)
Batch report	(x)	(x)	(x)
Recipe name	x	x	x
Tidy up process			x
Recipe type	x	x	x
Recipe set point	x	x	x
Recipe line	x	x	x
Section	always 1	always 1	x
Material	x	x	x
Set point for the line	(x)	(x)	(x)
+ Tolerance, - Tolerance	(x)	(x)	(x)
Add to the total	x	x	x
Qualification/recalculation	(x)	(x)	(x)

( ) Can be switched on via configuration/not for all materials

The database is sorted according to the key fields "Name," "Clean" and "Line".

At the end of each line, the batching results are recorded in the docket and the line is marked as "completed". The overshoot is updated in the material database and the transported amount is recorded.

At the end of the recipe, the amount of the recipe produced is calculated, and the report is prepared and forwarded to the printer buffer (to be printed out in the background).

6.3.3 Recipe Parameters

6.3.3.1 Recipe Header

Recipe Name

Name of the recipe. The name must be unique because it is used as a key field in the database. It is always saved as text and can be entered as numbers or text according to the configuration. Text form is recommended.

Recipe Type

The type for the production of the recipe is selected from a list (see also Chapter 6.3.4):
[free choice] or [sequential] or [automatic].

Recalculate

Only for manual recipes [sequential] or [free choice]. This determines whether the recipe can be qualified again, see also Chapter 6.3.11.

Set Point

Total of all recipe lines (without tidy up part, [Add to total] must be activated) after a change to the recipe. Otherwise, last produced set point.

Create/Edit Tidy Up Process

Only with [automatic]. This controls the editor in terms of switching between the editing of the normal recipe and the tidy up for the recipe, see Chapter 6.3.8.

Enabled by Bit

Only with [automatic]. This specifies the bit in the SPM for which the recipe waits as the enable signal before editing the first line. If bit "0" is set, there is no wait.

Activate Bit

Only with [automatic]. This specifies the bit in the SPM that is set as long as the recipe is active. If bit "0" is set, no bit is set in the SPM.

6.3.3.2 Recipe Lines

Recipe line number (L)

Number (e.g. 2/3) of the line. The line number can be increased or decreased using the soft keys [Line +] and [Line -] or can be entered directly.

Section (S)

Number of the recipe section in automatic recipes. The numbering should be ascending and without gaps in the range of 1–100 (gaps increase the runtime by around 0.2 s/section).

Material name

The name is used to select the material from the material database. The database entry determines the scale and the parameters linked to the material.

Set Point

Depending on the type of material, this value may be missing or have its own dimension:

- Weight in kg, lb, etc. (according to the associated WP)
- Time in s
- Defined by the material (e.g. rpm)

+ Tolerance, - Tolerance

The values specified in the recipe apply. For a new line the values are generated from the material database but can be changed in the recipe editor. The absolute tolerance is at least 1 d. If 0.0% is specified then no check is carried out, see also page 86.

Add to Total

This parameter determines whether the set point should be added to the recipe total.

Relative

This parameter determines whether the set point should be qualified during the calculation of the current set points. Once set, this line may also be recalculated in the case of manual recipes.

Type

The material type is specified during creation and is saved in the material database. It cannot be subsequently changed.

Scale name

The scale (weighing point A–D) is identified from the material database. The line cannot be edited here.

6.3.4 Recipe Types

6.3.4.1 Free Choice Recipes [Free Choice]

A recipe is processed step by step under the user's direct control. The user can pick the next steps from the recipe.

A free choice recipe can be interrupted and continued again later. Other orders can be processed in the meantime. Once configured, free choice recipes can be recalculated in the event of batching errors, see Chapter 6.3.11.

The recipe can use several scales. However, only one scale is ever used at a time.

6.3.4.2 Sequential Recipes [Sequential]

Sequential recipes are edited in a similar way to free choice recipes. Unlike in the case of free choice recipes, the order (ascending line numbers) must be followed in the case of sequential recipes. This is usually due to technical production-related requirements. A sequential recipe can be interrupted and continued later. Other orders can be processed in the meantime.

Sequential recipes can be recalculated, but this means that the order will not be followed. If necessary, recalculation will have to be switched off for these recipes.

The recipe can use several scales. However, only one scale is ever used at a time.

6.3.4.3 Automatic Recipes [Automatic]

Recipes are processed in sections. A section must be completed before the next one can begin. The order of the individual production instructions, including the parallel actions, is strictly governed by the recipe. If several scales are available, batching will be carried out in parallel within the section.

An automatic recipe can be discontinued, but not interrupted to be continued again later.

An automatic recipe cannot be recalculated. For details on the recipe controller, see Chapter 6.3.12.

Example

Line no.	Section	Scale name	Material name	Set point	+ Tolerance	- Tolerance
1	1	Weighing point A	Batching material 1	10 kg	0.5 %	0.5 %
2	1	Weighing point A	Batching material 2	1.2 kg	0.5 %	0.5 %
3	1	Weighing point B	Batching material 3	1345 kg	1.0 %	1.0 %
4	2	Weighing point A	Discharging A into B			
5	2	Weighing point B	Mixing in B	600 s		
6	3	Weighing point B	Discharging B			
1	1**	Weighing point A	Discharging A into B			
2	2**	Weighing point B	Discharging B			

** = "Tidy up"

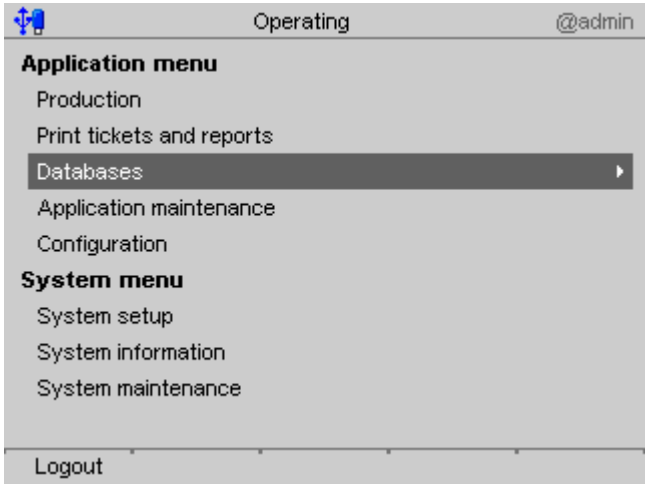
Procedure

Line	Description
1	10 kg of material 1 is batched in scale A.
2	1.2 kg of material 2 is batched in scale A, after batching of material 1 has been completed.
3	1345 kg of material 3 is batched in scale B, at the same time as material 1 and/or material 2 are batched in scale A.
4	Scale A is discharged into scale B, after the batching of lines 1, 2 and 3 has been completed.
5	In parallel to the discharging of A into B, the mixer in scale B is switched on for 10 minutes.
6	B is discharged after the end of the mixing time. The recipe is completed as normal.
1**	This line is only edited if the recipe has been interrupted and "tidy up" has been requested. A is discharged after B.
2**	This line is only edited if the recipe has been interrupted and "tidy up" has been requested. B is discharged after A has been discharged into B.

6.3.5 Recipe Editor

The recipe editor is used to create, edit, delete and print recipes. The header and the lines can be edited. A tidy up process (lines) can also be created for automatic recipes. Material types not available for the current recipe type are not available for selection.

6.3.6 Creating a recipe



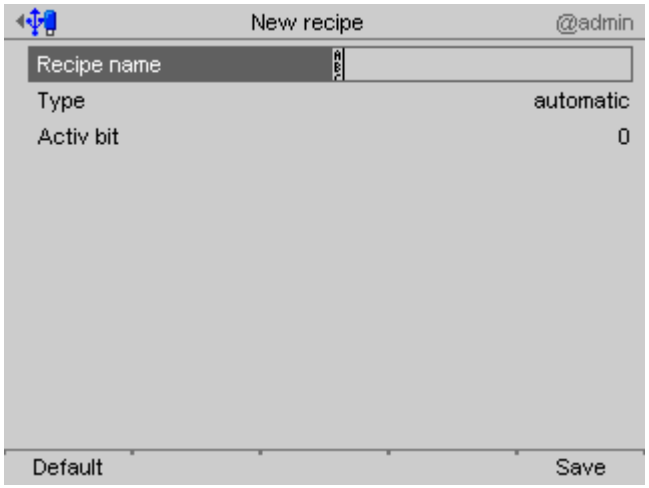
▶ Select and confirm [Databases] using the cursor.

▷ A selection window appears.

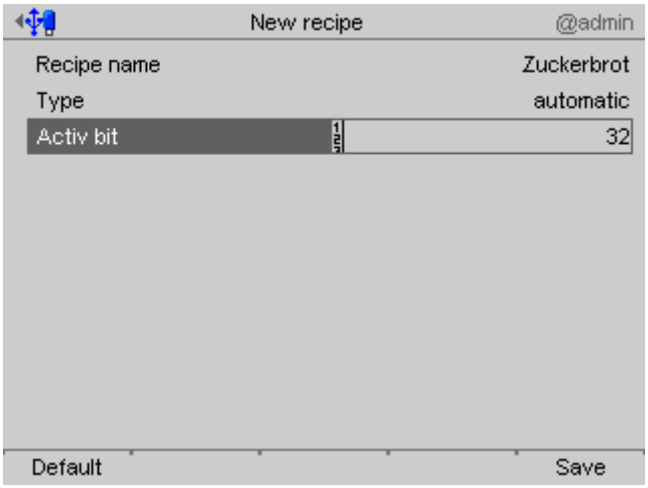
▶ Select and confirm [Create/edit recipe] using the cursor.

▷ A selection window will appear with the last recipe created.

▶ Press the [New] soft key in order to create a new recipe.



▷ A selection window appears.



▶ Select and confirm the individual parameters using the cursor.

[Recipe name]

Input: max. 18 alphanumeric characters

Note	The field must not be left "empty" and must not include any control commands or quotation marks. When making the entry it must be considered that the last characters may be abbreviated by the sequence number (min. 4) (e.g. in the event of the direct start of a recipe).

[Type]

Selection: see Chapter 6.3.4.

Note	A recalculation can be activated in the case of [sequential] and [free choice], see Chapter 6.3.11.

[Activate bit]

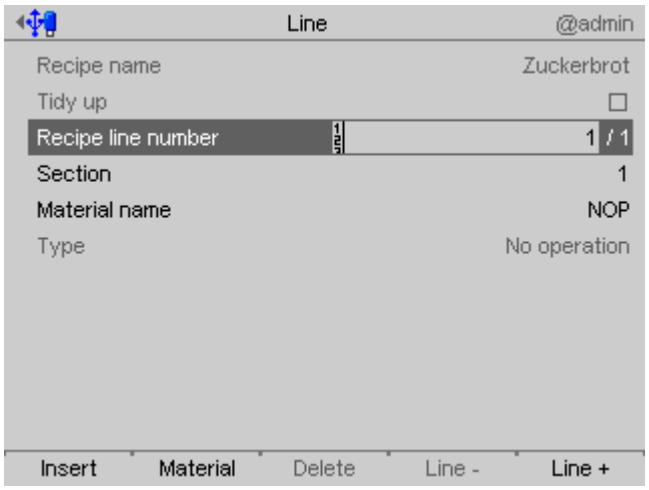
In the case of automatic recipes, the SPM address for the hardware control of the recipe can still be entered, see Chapter 8.5.

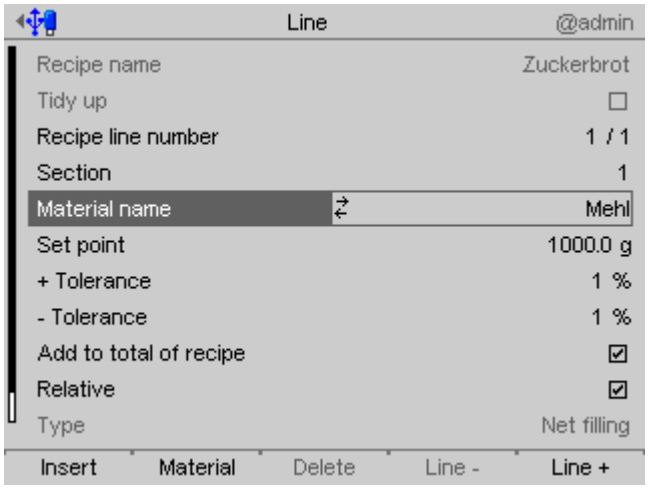
▶ Press the [Default] soft key to return to the factory settings, if required.

▶ Finally, press the [Save] soft key to save the settings.

▷ The recipe header is created and the recipe can be directly edited.

6.3.7 Editing a Recipe





▷ Once the recipe has been created (see Chapter 6.3.6), a selection window appears.

▶ Select and confirm the individual parameters using the cursor.

[Recipe name]

This line cannot be edited.

[Tidy up process]

These parameters are only available for automatic recipes. This line displays the current part of the recipe in the case of automatic recipes.

This function is deactivated in the case of manual recipes.

[Recipe line number]

This line shows the current line number/number of lines in the recipe. The production and tidy up process are counted separately.

[Section]

This function is only available for automatic recipes. For manual recipes, "Section" is set to 1.

[Material name]

The material is selected from the material database. The selection of the material starts for new lines with the first entry in the material database "NOP". A change in the material may result in other parameters being displayed.

[Set point]

Input: corresponding weight

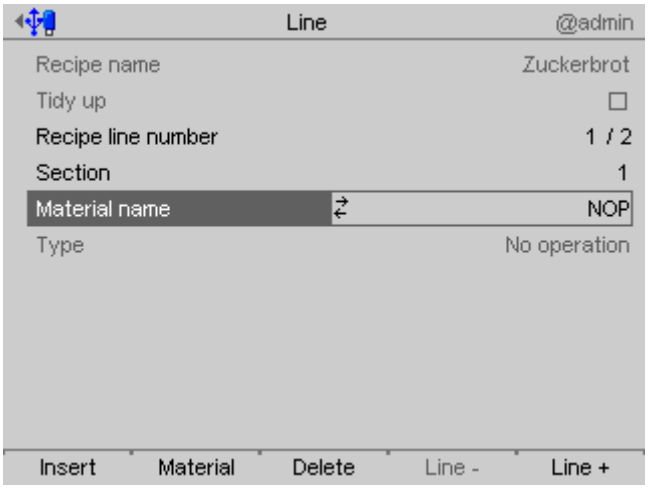
[+Tolerance/-Tolerance]

The permitted tolerances are initially copied from the material database and can be overwritten.

The selection of a new material sets the tolerance back to the value from the material database if 0% is listed in the recipe.

[Type/Scale name]

The values of the lines "Type" and "Scale" are taken from the material database; they provide information and cannot be edited.



[Insert]

Insert a new line in order to select an available material or create a new one.

[Material]

Create a new material without leaving the recipe editor.

[Delete]

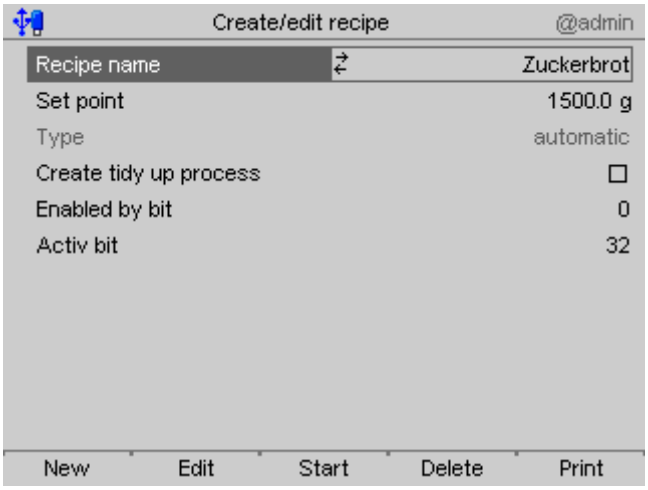
Delete a recipe line.

[Line-/Line+]

Flick backwards/forwards through the recipe.

When the end of the recipe is reached, the soft key [Line+] will automatically add a new line with material name [NOP] as a placeholder.

▶ Press the ESC/EXIT key to finish editing. The changes are saved.



[Create tidy up process]

Check the ☑ box to activate the function. Whenever the tidy up process is edited, the box must be checked first. Only then will "Editing" of the tidy up process be possible. For tidying up a recipe, see Chapter 6.3.8.

[Enabled by bit]

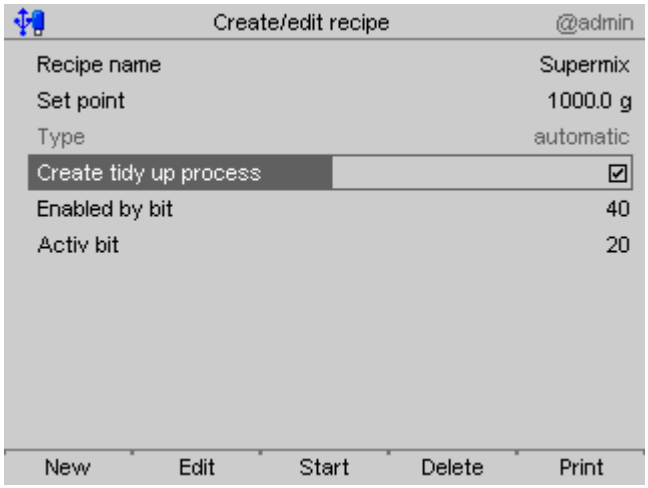
In the case of automatic recipes, the SPM address for the hardware control of the recipe can still be entered, see Chapter 8.5.

▶ Press the ESC/EXIT key to leave the menu. The changes are saved.

6.3.8 Tidying up a Recipe (Tidy Up Process)

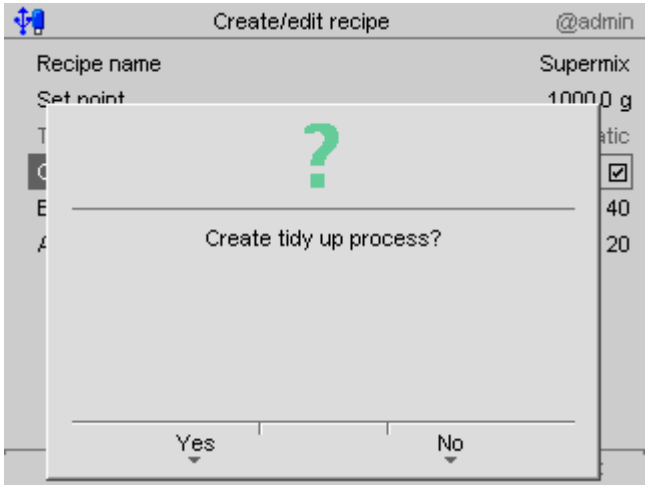
The "Tidy up process" part of the recipe is carried out on request if a recipe has been discontinued. The recipe then consists of two parts which can both be edited.

When a recipe is discontinued, an unknown amount of material is still available in the container. This must be properly discharged. If necessary, the container must be cleaned using a rinsing recipe.



▶ Select and confirm the line [Create tidy up process] in order to activate the parameter.

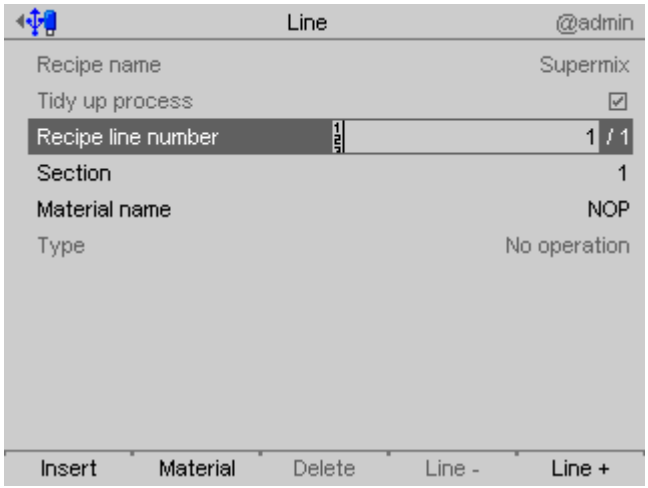
▶ Press the [Edit] soft key.



▷ A prompt window appears.

▶ Press the [No] soft key, if necessary, in order to return to the menu.

▶ Press the [Yes] soft key in order to create a new "Tidy up process" recipe part.



▷ The box is checked and the "Tidy up process" line is grayed out to indicate that this recipe part is being edited.

▶ Select and confirm the material.

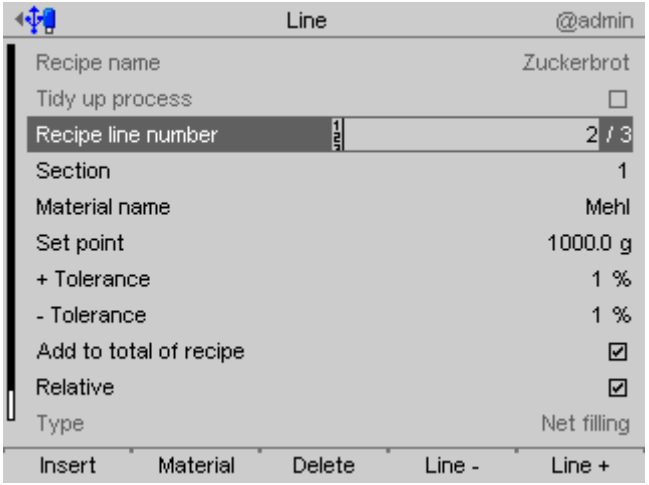
The tidy up process starts after the recipe has been discontinued.

Each working recipe can include a tidy up process and will remain saved.

Tidy up does not generate its own report.

The material used during the tidy up process is included in the report, but is not added to the amount produced and is not recorded in the production report.

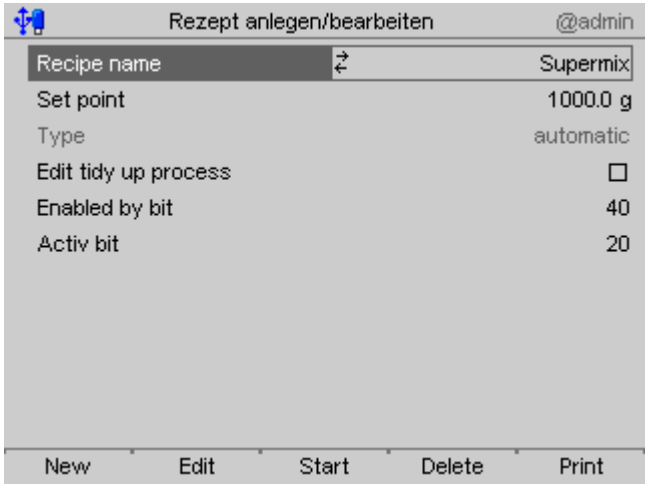
6.3.9 Deleting Recipe Lines



- ▶ Use the cursor to select [Recipe line number] and select the line to be deleted.
- ▶ Press the [Delete] soft key. In this example, the 2nd of 3 lines is deleted. The following lines automatically move up by one line. The last and therefore only line of a recipe cannot be deleted.
- ▶ Press the ESC/EXIT key to save the changes.

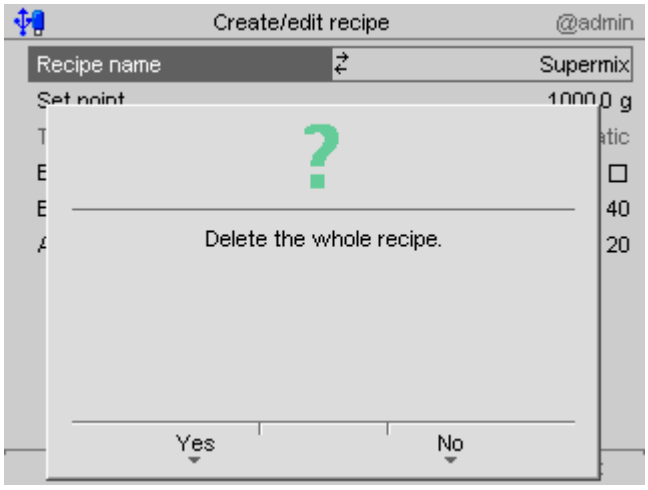
6.3.10 Deleting a recipe

Note	Recipes for which an order exists cannot be deleted.



▶ Use the cursor to select [Recipe name] and select the recipe to be deleted.

▶ Press the [Delete] soft key.



▷ A prompt window appears.

▶ Press the [No] soft key, if necessary, in order to return to the menu.

▶ Press the [Yes] soft key to delete the entry.

▶ The recipe is permanently deleted and the next database entry is displayed.

▶ Press the ESC/EXIT key to leave the menu.

6.3.11 Recalculation for Manual Recipes

Recalculation is only possible for manual recipes. The function is activated for the relevant user category under [Configuration]-[Parameter]-[Recalculate]. If the material cannot be taken out of the scale again in the event of over-batching (e.g. liquid or small amounts together with other substances), it is sensible to recalculate the recipe in order to restore the proportions.

An order which is in production can be recalculated at any time, however at the latest when the last line is ready.

For operation before the end of the recipe, see Chapter 7.6.

Example

Line	Set point	Actual value	Tolerance	Factor	Set point corr	Set point diff	Batching
1	10.00	10.90	1.00	1.000	12.46	1.56	yes
2	5.00	6.23	0.20	1.246	6.23	0.00	no
3	6.00	7.00	0.50	1.167	7.48	0.48	no
4	15.00	14.50	0.20	1.000	18.69	4.19	yes
5	10.00	13.00	3.00	1.000	12.46	-0.54	no
	46.00		Max.: 1.246	57.32			

Procedure

- For values above the tolerance, the deviation is calculated as a factor for the recipe lines. Within the tolerance the factor is 1.
- The line with the biggest relative deviation is determined as a factor (here line 2 = max. = 1.246). Lines which do not have any +Tolerance specification are not considered.
- All set points are multiplied by this factor. Lines which do not have any -Tolerance specification are not changed.
- The difference from the set point is calculated for each line in consideration of the previously batched amount.
- If the deviation is bigger than the permitted tolerance then the line will be labeled as not having been completely edited. The set point for the correction is the calculated difference.
- All lines that are not complete can be selected for editing (here lines 1 and 4).
- During batching, the batched net weight is added to the current actual value.

This procedure allows for any number of corrections. In the event of over-batching, the total amount of the recipe is enlarged by the appropriate factor on every correction. Only the operator can decide whether a correction is possible and sensible.

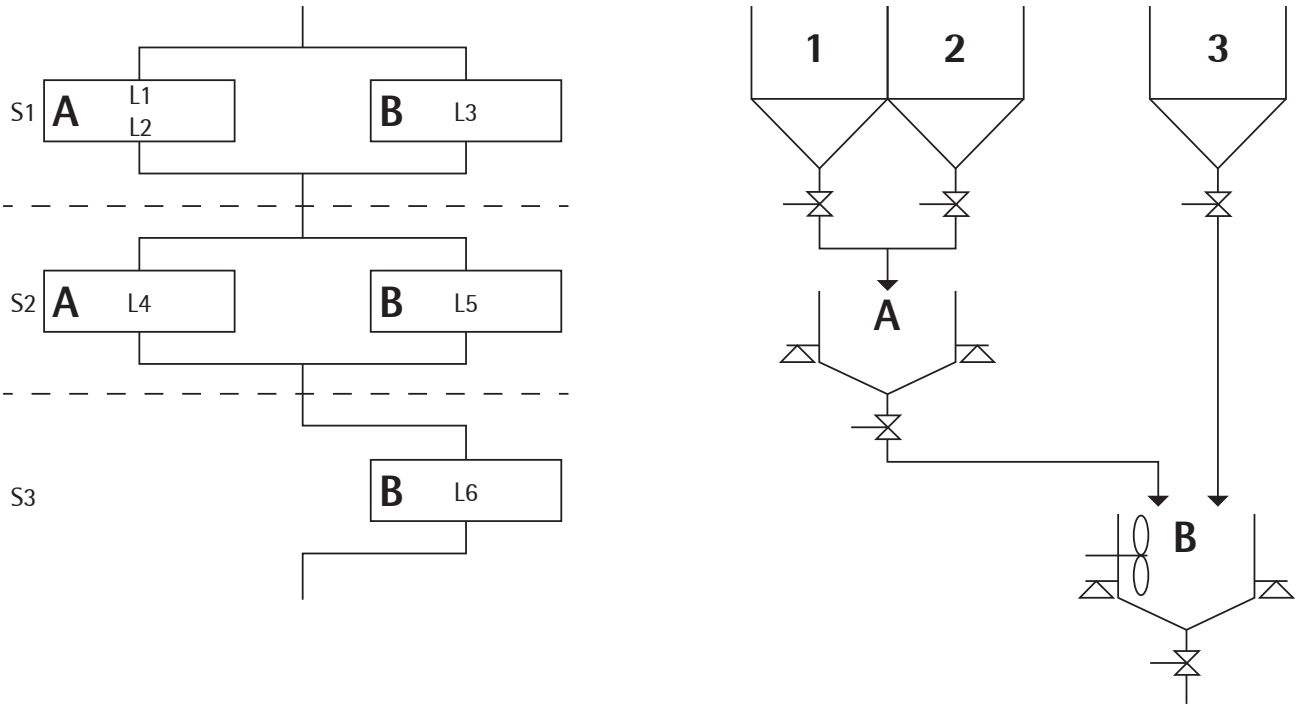
The ticket for the post-batching is labeled as [Recalculated]. It contains the total of all batching for this line along with the batch number of the last material taken.

It is assumed that in the case of line tickets individual drums are filled and that the correction is carried out in the original container. The new ticket therefore contains the new set point and actual value, and can replace the previous ticket. The operator who carried out the correction will be entered as the operator. The start date will be retained. In all cases an entry is made in the report database using the data from the ticket (if configured).

It is assumed that the order ticket is printed when a batch is produced in a container. The correction is carried out in this container. The new ticket therefore contains the new set point and actual value, and can replace the previous ticket. The start date will be retained.

6.3.12 Recipe Controller for Automatic Recipes

Example



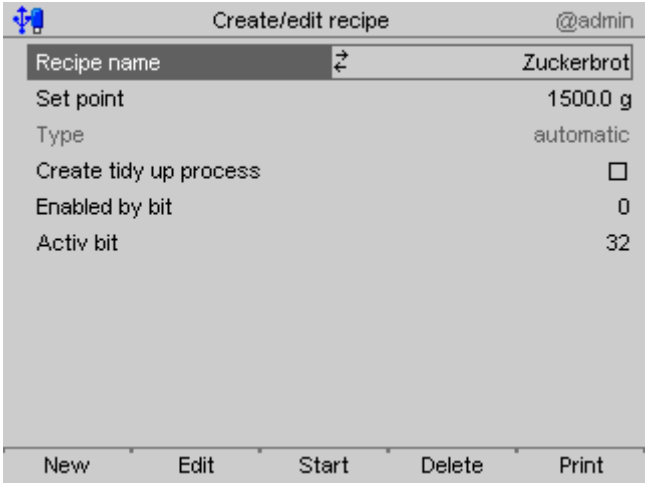

```
Example Sections      2013.03.25 14:05
Type                         automatic
Total                          4500 kg
Changed by                       Admin
Changed at            2013.03.25 14:05

  L  S  # Material      +    Set point %        + Tol.         - Tol.
-------------------------------------------------------------------
  1  1  A Product 1     +    1000 kg %            2 %            2 %
  2  1  A Product 2     +    1500 kg %            2 %            2 %
  3  1  B Product 3     +    2000 kg %          1.5 %          1.5 %
  4  2  A Discharging A
  5  2  B Mixing              65 s
  6  3  B Discharging B
```

The editing order for the lines of a recipe is as follows:

Section (S)	Sequentially in the recipe, i.e. all lines in a section need to be processed before the next section can be started.
Scales (A/B)	Within a section, the scales are processed in parallel so batching is carried out simultaneously.
Line (L)	If there are several lines for the same scale within one section then the lines are processed in ascending order one after the other.

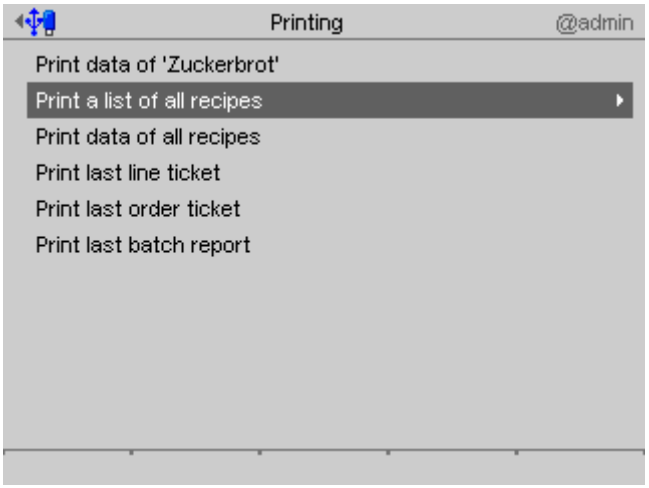
The minimum time for the execution of a recipe line (NPO) is around 200 ms. An empty section will require around 200 ms. If there are several weighing points, the times will not extend as a result of simultaneous processing.

6.3.13 Printing a recipe



- ▶ Use the cursor to select and confirm [Recipe name] and the recipe to be printed.
- ▶ Press the [Print] soft key.

6.3.13.1 Example: List of All Recipes



- ▷ A selection window appears.
- ▶ Select and confirm the appropriate line using the cursor (here: print the list of all recipes).

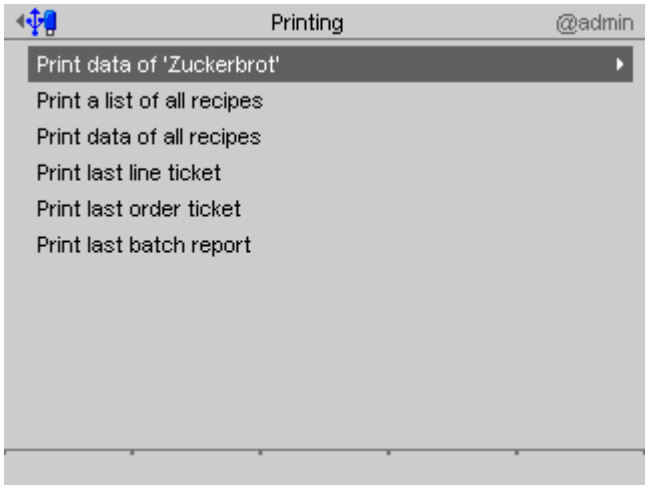
  Prerequisite for this is that the printer is selected under [Configuration]-[Parameters]-[Report printer] and set up in the system menu under [System setup]-[Connected devices].

```
Recipe name          2013-03-25-14:48:26.13          Set point                Total
-------------------------------------------------------------------------------
Mandelkuchen           sequential                      300.0 g                0.0 g
Nusskranz              automatic                      1000.0 g                0.0 g
Supermix             = automatic                      1000.0 g                0.0 g
Zuckerbrot           = automatic                      1500.0 g                0.0 g
```

All recipes are listed with their type, the last set point used and the previously produced amount.

Note	The "=" before the type specification marks recipes which have at least one "Tidy up" recipe part.

6.3.13.2 Example: Individual Ticket



▷ A selection window appears.

▶ Select and confirm the appropriate line using the cursor (here: print the data from "Recipe name").

Prerequisite for this is that the printer is selected under [Configuration]-[Parameters]-[Report printer] and set up in the system menu under [System setup]-[Connected devices].

```
Zuckerbrot            25.03.2013 16:10:59
Type                              automatic
Total                              1500.0 g
Changed by                          Admin
Changed at         25.03.2013 11:30:41*

  L  S  #Material name      +          Set point %          + Tol.         - Tol.
-------------------------------------------------------------------------------
  1  1  A Sanella            +           500.0 g %            1 %            1 %
  2  1  A Mehl               +          1000.0 g %            1 %            1 %
  3  1  A Zucker             +             0.0 g %            1 %            1 %
  4  2  B Discharging B
  5  3  D Mixing D                          5 s
  6  3  C Discharging C
  7  3  D Discharging D

Execute after aborting:
  1  1  B Discharging B
  2  1  C Discharging C
  3  2  D Discharging D
```

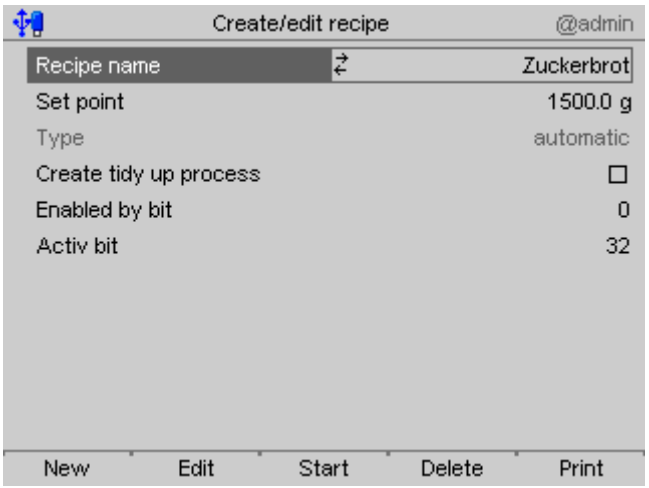
* The change information relates to the most recent line in the recipe. Date/time represent the status of the recipe to which this printout corresponds and the user who produced this status.

The printing date is next to the recipe name in the header of the printout. The header also contains information about the type, the last set point, the user who last changed the recipe and when this was. Manual recipes also have information about whether recalculation is possible in the header.

Each line contains:

- the line number (L)
- the section (S) – always 1 for manual recipes
- the scale name (#)
- the material
- the specification (+) whether the recipe line is added to the recipe total during qualification
- the set point for this line
- the specification (%) whether the set point needs to be qualified
- the specification of the permitted tolerance (if possible)

6.3.14 Testing a recipe



▶ Use the cursor to select and confirm the recipe to be tested in the"Recipe name" line.

▶ Press the [Start] soft key.

Note	The proposed set point displayed is the total of all line set points entered.

6.4 Order

6.4.1 General Information

An order contains a reference to a recipe or material. In addition a material name, comments and the user name are saved according to the configuration. Parameters that are not checked in the configuration will be faded out in the forms. An order can specify a different target amount than the total materials in the recipe.

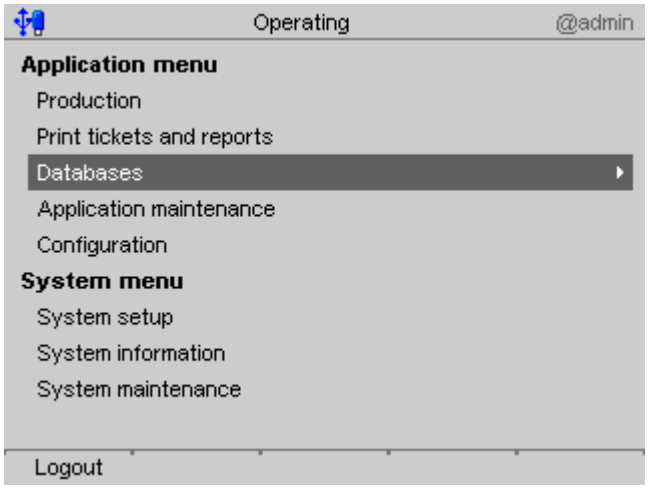
Several orders can refer to the same recipe. If an order has already been started then changes that are subsequently made will no longer have any effect on the recipe.

If they have not been completed, orders will be saved in a database.

For the structure of the ORDER database, see Chapter 9.2.1.

6.4.2 Creating an order

An order is needed in order to batch a material with or without a recipe. If necessary, the order is automatically created with an internal identification. This identification is the recipe or material name with the sequence number added, see also Chapter 7.2.



▶ Select and confirm [Databases] using the cursor.

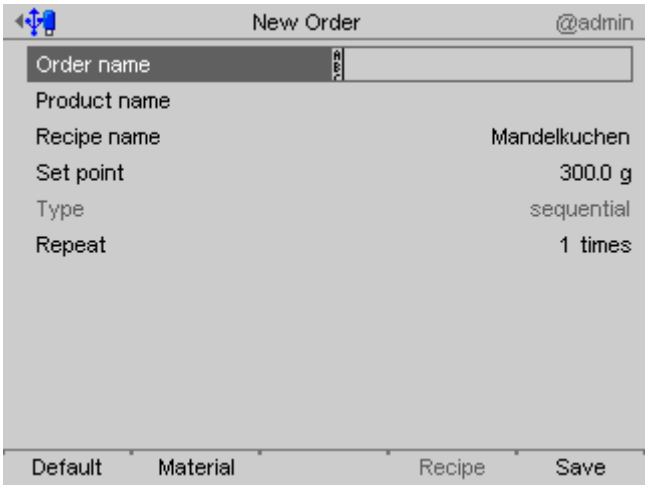
▷ A selection window appears.

▶ Select and confirm [Create/edit order] using the cursor.

▷ A selection window will appear with the last order created.

▶ Press the [New] soft key to create a new order.

Note	If no order has been saved then the "New order" menu will appear automatically.



▷ A selection window appears.

▶ Select and confirm the individual parameters using the cursor.

[Order name]

Input: max. 18 alphanumeric characters

Note	The field must not be left "empty" and must not include any control commands or quotation marks. When making the entry it must be considered that the last characters may be abbreviated by the sequence number (min. 4) (e.g. in the event of the direct start of a recipe).

[Product name/Prompt for order]

Input: max. 18 alphanumeric characters

Note	This is only possible if selected under [Configuration]-[Parameters].

[Recipe name]

The recipe is selected from the recipe database.

Note	An order can be created on the basis of a recipe or a material. Switch between these options using the soft keys [Material] and [Recipe].

[Set point]

Input: recipe/material weight

[Repeat]

Input: 1–998 times

Note	If 999 is used, the recipe is set to "infinitely".

[Material]

The material is selected from the material database.

Note	An order can be created on the basis of a recipe or a material. Switch between these options using the soft keys [Material] and [Recipe]. If an order is created on the basis of a material, then the selection of the material types is restricted to "Weighing materials" exclusively for [Discharge] and [Net filling], see also table in Chapter 6.2.3.

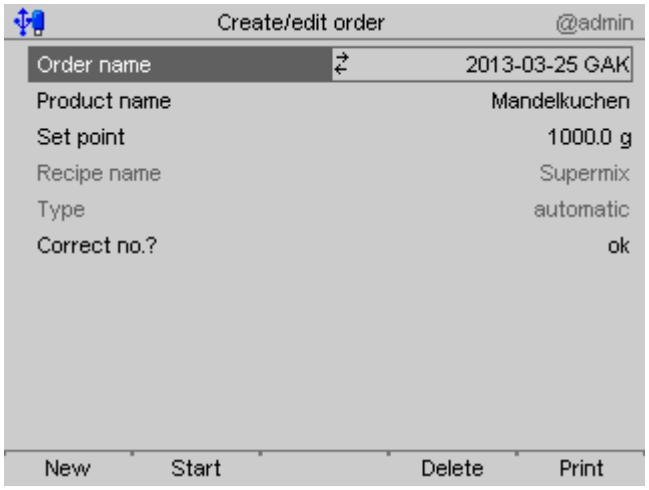
▶ Press the [Default] soft key to return to the factory settings, if required.

▶ Finally, press the [Save] soft key to save the settings.

▷ The recipe header is created and the recipe can be directly edited.

6.4.3 Editing an Order

Only created orders which have not yet been started can be edited.



▷ A selection window appears.

▶ Select and confirm the individual parameters using the cursor.

[Product name/Prompt for order]

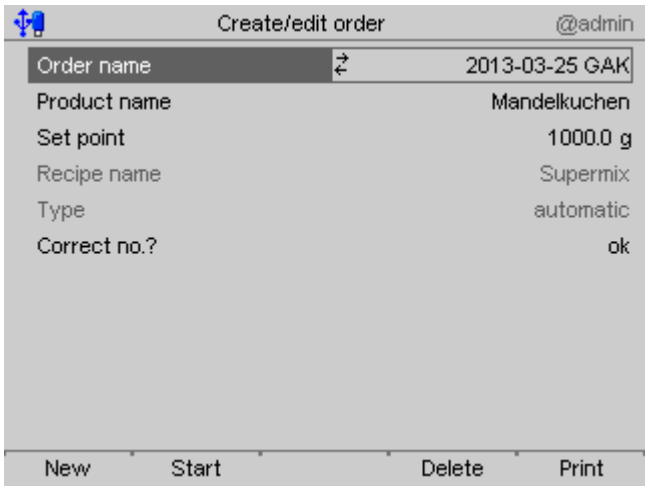
Input: max. 18 alphanumeric characters

Note	This is only possible if selected under [Configuration]-[Parameter].

[Set point]

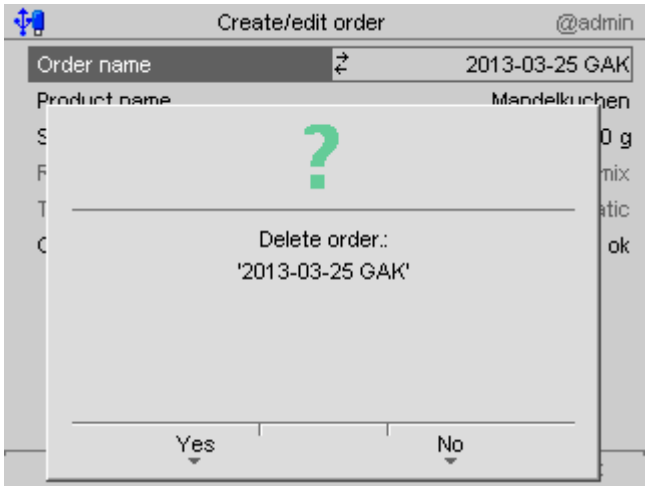
Input: recipe/material weight

6.4.4 Deleting an Order



▶ Use the cursor to select [Order name] and select the order to be deleted.

▶ Press the [Delete] soft key.



▷ A prompt window appears.

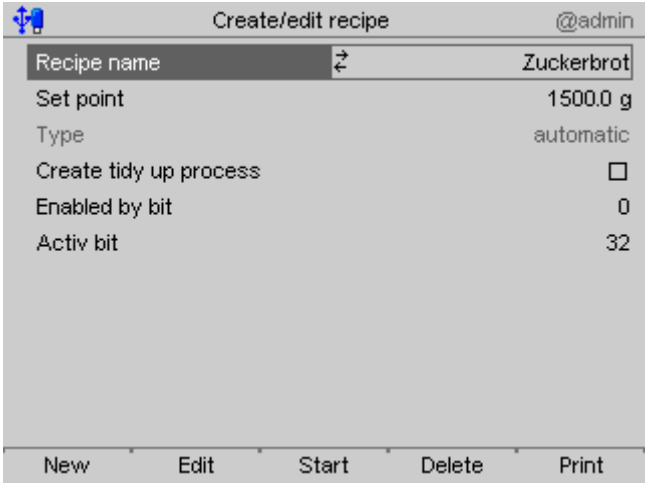
▶ Press the [No] soft key, if necessary, in order to return to the menu.

▶ Press the [Yes] soft key to delete the entry.

▶ The recipe is permanently deleted and the next database entry is displayed.

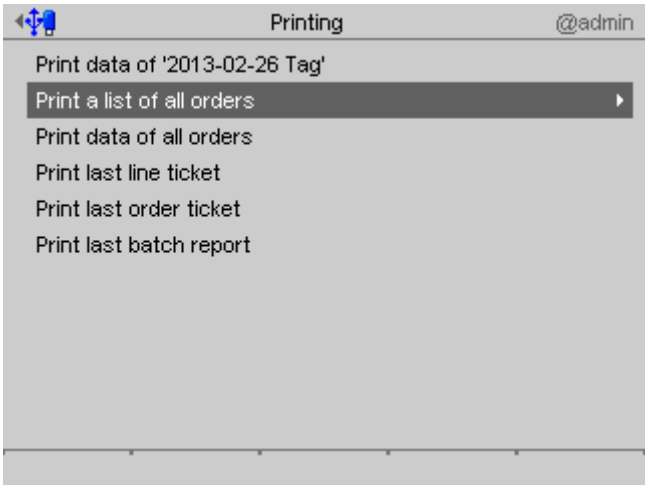
▶ Press the ESC/EXIT key to leave the menu.

6.4.5 Printing an Order



- ▶ Use the cursor to select and confirm [Recipe name] and the recipe to be printed.
- ▶ Press the [Print] soft key.

6.4.5.1 Example: List of All Orders



- ▷ A selection window appears.
- ▶ Select and confirm the appropriate line using the cursor (here: print the list of all orders).

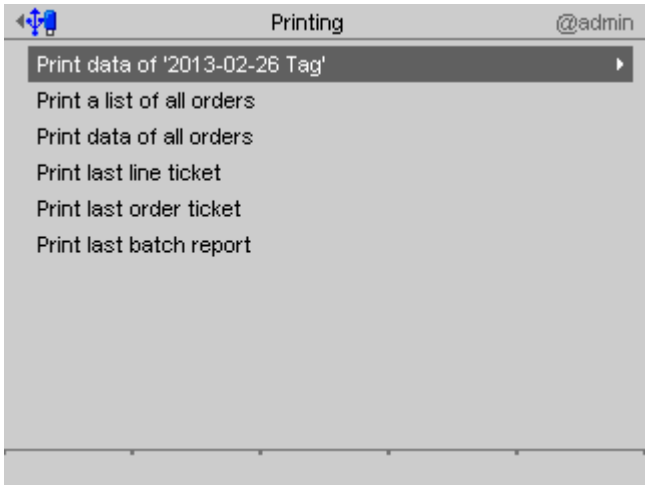
  Prerequisite for this is that the printer is selected under [Configuration]-[Parameter]-[Report printer] and set up in the system menu under [System setup]-[Connected devices].

```
* Order name          26.03.2013 12:52:28
---------------------------------------
  2013-02-26 Abend               1000.0 g
  2013-02-26 Morgen              1000.0 g
  2013-02-26 Tag                  300.0 g
  2013-03-25 GAK                 1000.0 g
```

All available orders are listed with the date they were created and set point.

Note	* The asterisk indicates that an order has already been started but is not yet complete.

6.4.5.2 Example: Individual Ticket



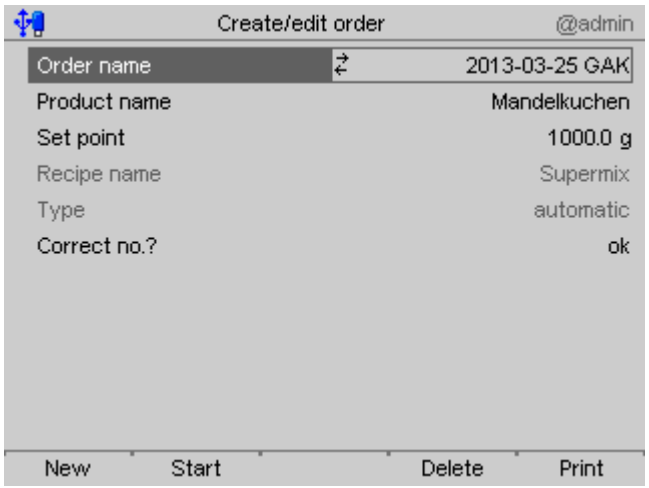
▷ A selection window appears.

▶ Select and confirm the appropriate line using the cursor (in this case, print the data from "Order name").

Prerequisite for this is that the printer is selected under [Configuration]-[Parameters]-[Report printer] and set up in the system menu under [System setup]-[Connected devices].

```
2013-02-26 Tag      26.03.2013 13:04:37
Changed by                       Admin
Changed at          26.02.2013 09:54:58
-------------------------------------
Material name                   Zucker
Product name
Set point                     300.0 g
In progress...                     No
```

6.4.6 Testing an order



▶ Use the cursor to select and confirm the order to be tested in the "Order name" line.

▶ Press the [Start] soft key.

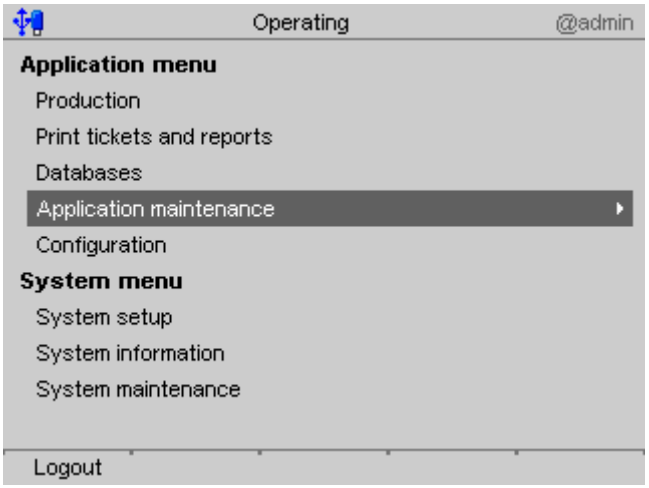
6.5 Application Maintenance

Note	Application maintenance can only be performed if the "Supervisor" or "Administrator" is logged in.

6.5.1 General Information

Material movements are recorded in the production and consumption report.

According to the configuration, database entries are created after each order is processed. They are intended for transfer to AccessIt and, if necessary, will have to be deleted manually. This also applies for printing data which cannot be transferred to the printer.

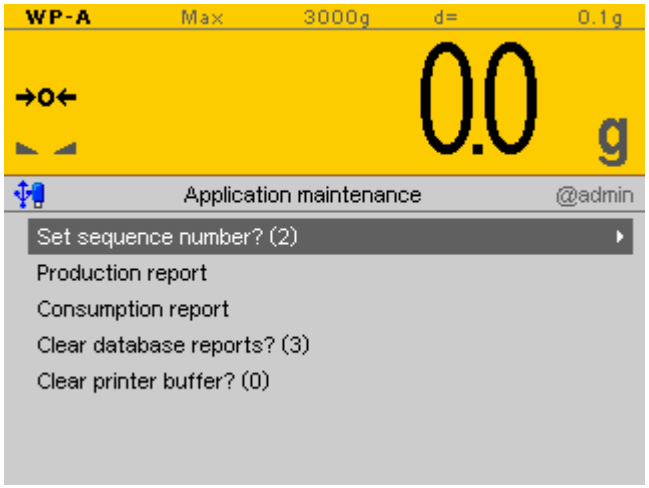


▶ Select and confirm [Application maintenance] using the cursor.

6.5.2 Set Sequence Number

The sequence number is increased by each process (processing of an order). The number to be entered can be between 1 and 100000; during production the sequence number can go to a maximum of 999999.

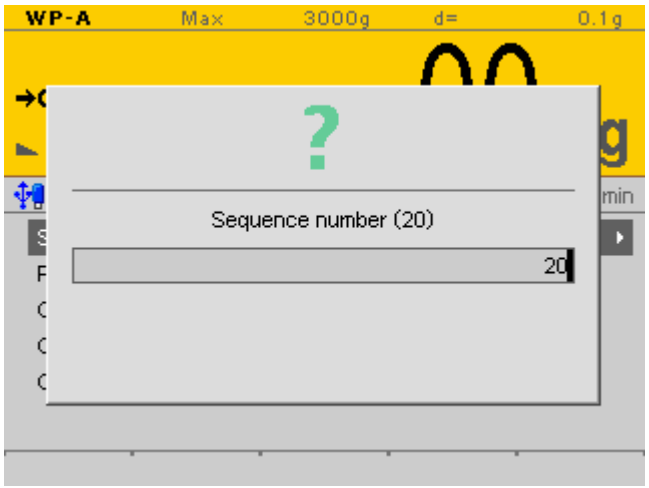
When this function is called up, the highest sequence number is searched for in the databases. The value to be entered must be greater than this in order to ensure unique database entries.



▷ A selection window appears.

The current sequence number is shown in brackets.

▶ Select and confirm [Set sequence number?] using the cursor.



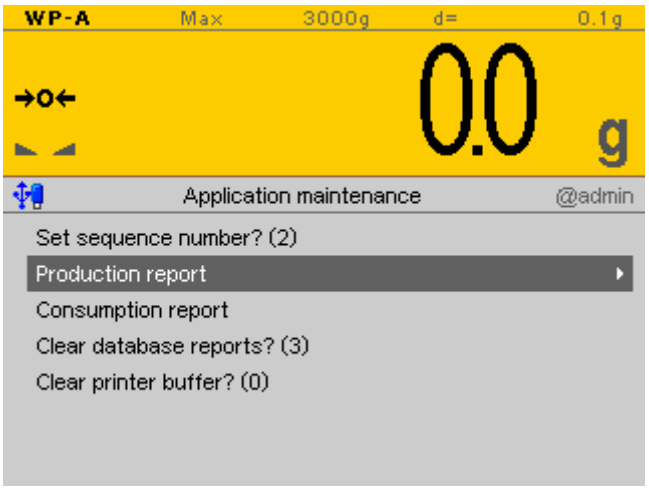
▷ An input window appears.

▶ Enter and confirm a number between 1 and 999999 using the keyboard.

▷ After confirmation, the new number will be displayed and the next process will be labeled with this.

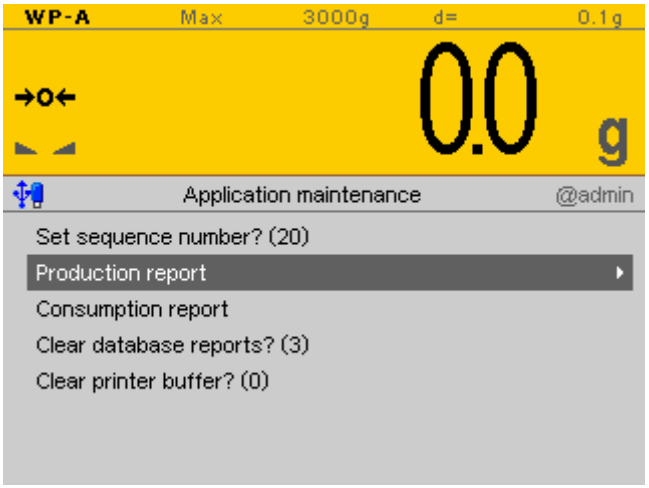
Only if there is no pre-existing order, the database REPORT is empty and no printout is waiting on the printer can the sequence number be set to 1.

6.5.3 Production Report



▷ A selection window appears.

▶ Select and confirm [Production report] using the cursor.



▷ A selection window appears.

[Delete]

The amount of the recipe displayed under "Production" is deleted.

[All]

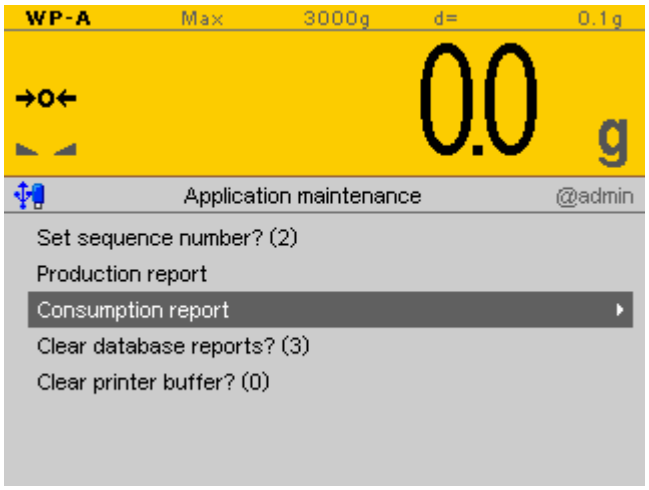
After a security prompt, the amounts for all recipes produced are deleted.

[Print]

A printout will be produced via the "Report printer".

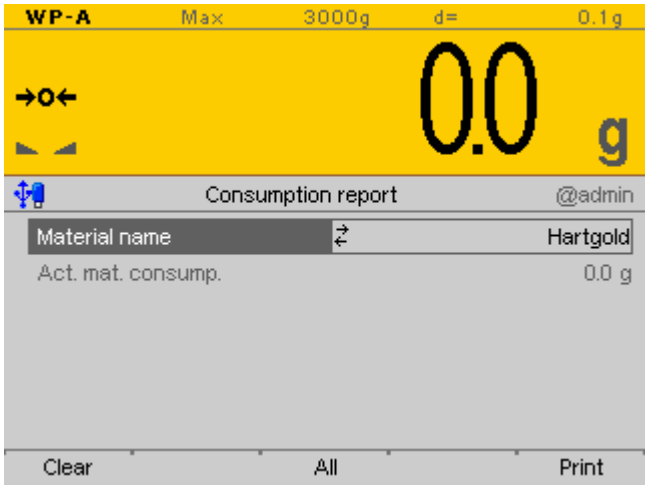
```
Production              26.03.2013 14:25:30

Recipe name                    Production
-------------------------------------
Mandelkuchen                          0.0 g
Nusskranz                             0.0 g
Supermix                              0.0 g
Zuckerbrot                            0.0 g
```

6.5.4 Consumption report



▷ A selection window appears.

▶ Select and confirm [Consumption report] using the cursor.



▷ A selection window appears.

[Delete]

The amount displayed under "Consumption" is deleted.

[All]

After a security prompt, the amounts of all materials consumed are deleted.

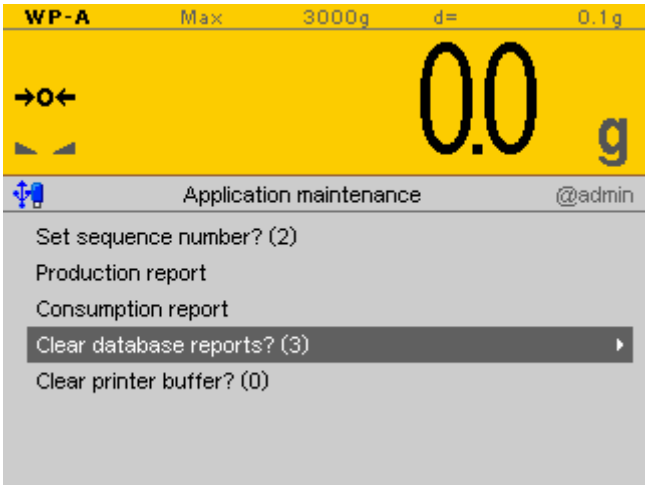
[Print]

A printout will be produced via the "Report printer".

```
Act. mat. cons.     26.03.2013 14:51:27

Material name         Act. mat. cons.
--------------------------------------
Hartgold                        0.0 g
Mehl                            0.0 g
Sanella                         0.0 g
Zucker                          0.0 g
```

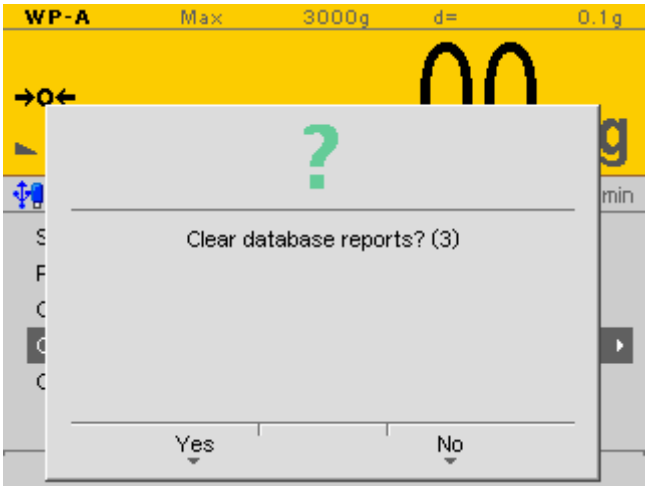
6.5.5 Deleting Database Reports

The "Administrator" can delete the relevant database (REPORT). If necessary, the function will have to be deactivated under [Configuration]-[Parameters]-[Log to database].



▷ A selection window appears.
The number of datasets is given in parentheses.

▶ Select and confirm [Clear database reports?] using the cursor.



▷ A prompt window appears.

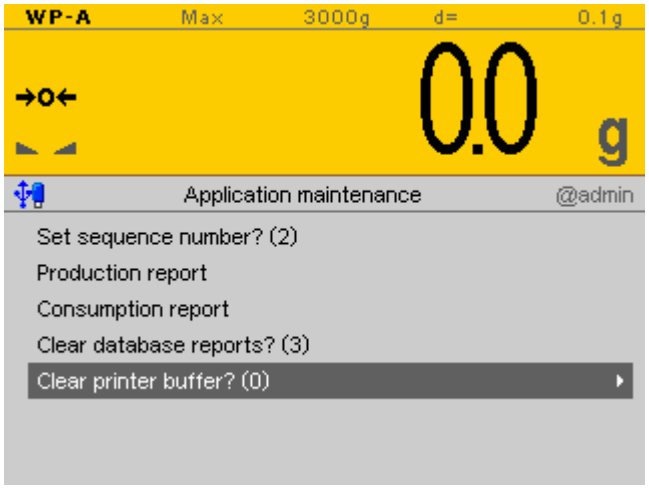
▶ Press the [No] soft key, if necessary, in order to return to the menu.

▶ Press the [Yes] soft key to delete the entry.

▶ The reports are permanently deleted.

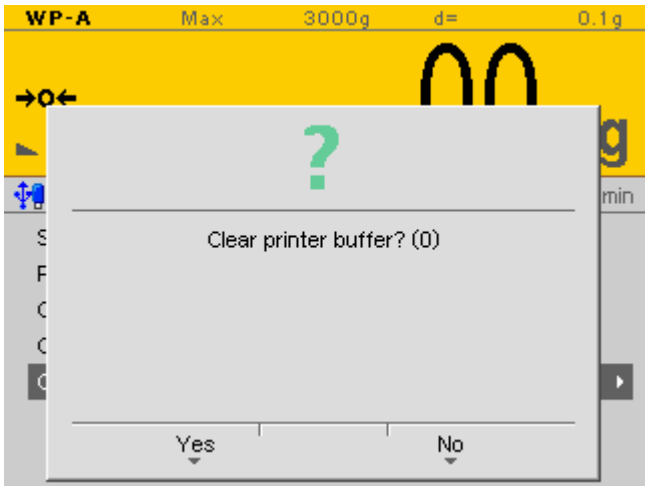
6.5.6 Clearing the Printer Buffer

Batch reports are initially entered into a database (SPL) ready to be sent to the printer as part of a background process. An attempt is made by the printer buffer to start printing every second, without a time limit. If the printer buffer is not able to print due to incorrect configuration of the interface, the reports build up and fill the memory unnecessarily. The "Administrator" can clear the printer buffer.



▷ A selection window appears.
The number of datasets is given in parentheses.

▶ Select and confirm [Clear printer buffer?] using the cursor.



▷ A prompt window appears.

▶ Press the [No] soft key, if necessary, in order to return to the menu.

▶ Press the [Yes] soft key to delete the entry.

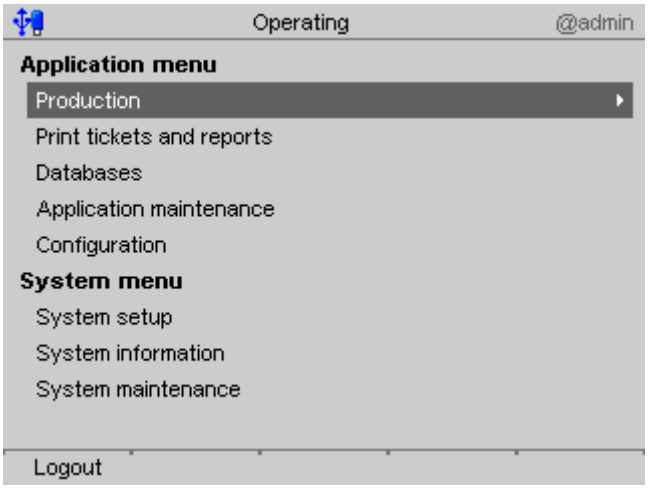
▶ The datasets are permanently deleted.

7 Production

7.1 General Information

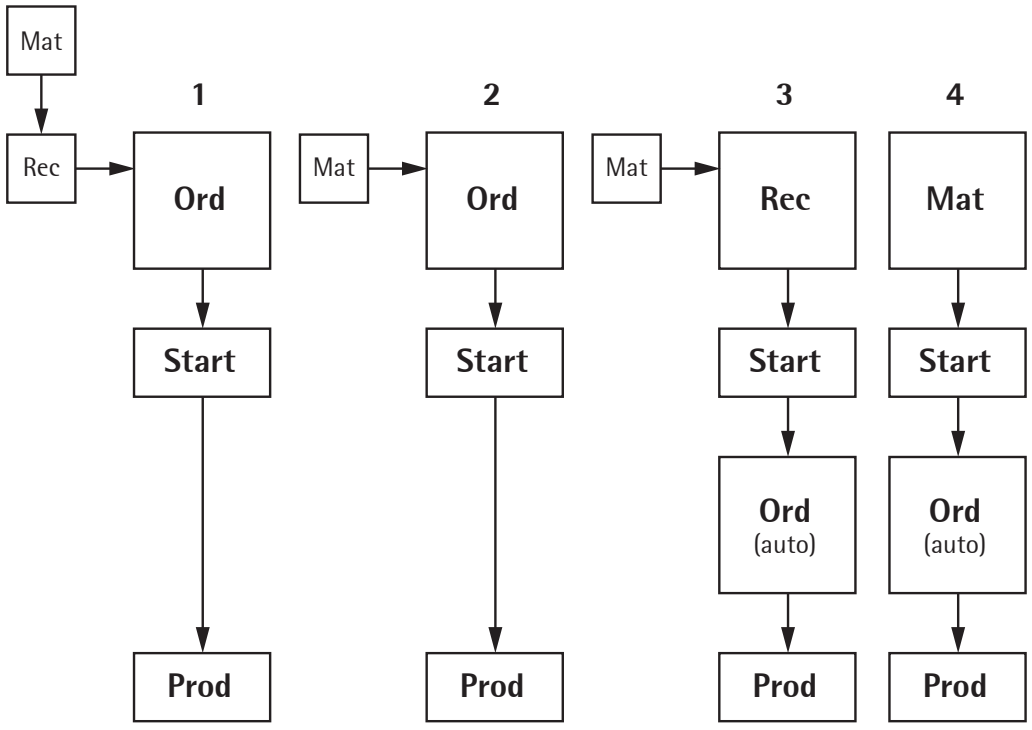
The following production modes are available:

- Start order (see Chapter 7.2)
- Start recipe(see Chapter 7.3)
- Start single material (see Chapter 7.4)
- Start remote (see the chapter7.5)

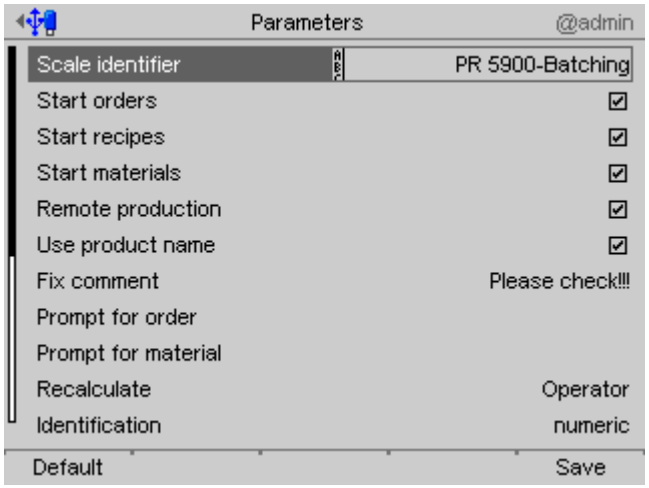


▶ Select and confirm [Production] using the cursor.

An order can be generated and started on the basis of a recipe (1) or material (2).
A recipe (3) or material (4) can also be started directly. An order is then created automatically.



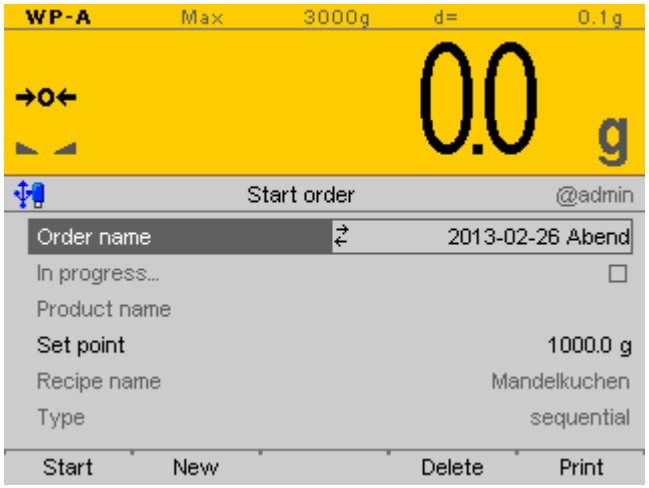
Mat	Material
Rec	Recipe
Ord (auto)	Order (autom.)
Start	Start
Prd	Production



The methods for starting can be activated under [Configuration]-[Parameters], see Chapter 5.4.5.

7.2 Start Order

▶ Select and confirm [Production]-[Start order] using the cursor.



▷ A selection window appears.

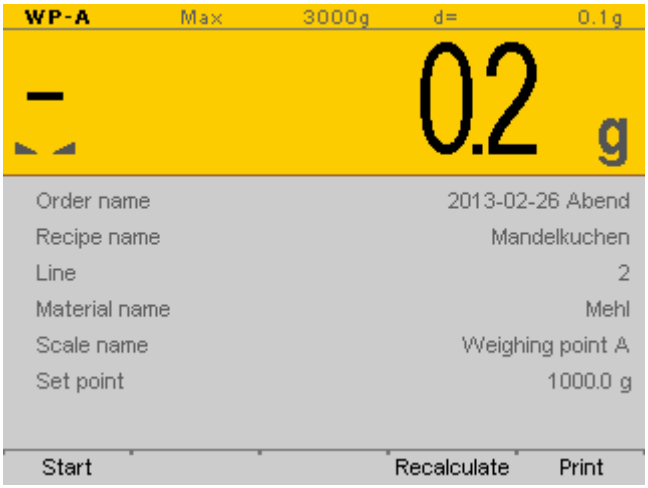
▶ Select and confirm the relevant order (see also Chapter 6.4.2/6.4.3) using the cursor.

▶ If necessary, press the [New] soft key in order to create a new order. For entries see Chapter 6.4.2/6.4.3.

▶ If necessary, change the set point.

▶ If necessary, press the [Delete] soft key in order to delete the order.

▶ Press the [Start] soft key in order to start the order processing.

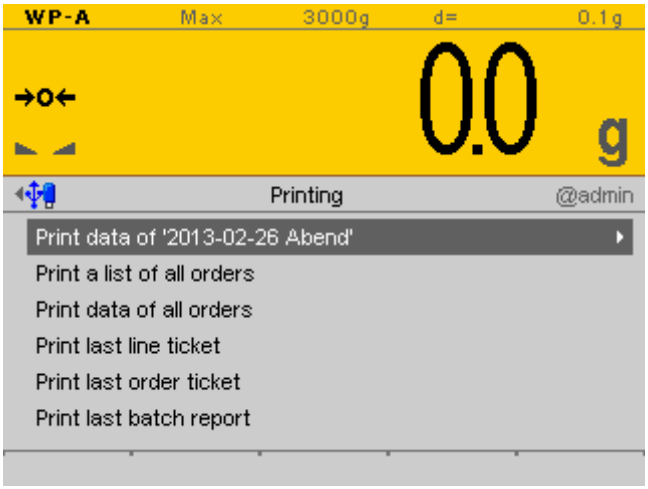


▷ The order window is displayed.

▶ Press the [Start] soft key in order to start the order processing.

▶ If necessary, press the [Recalc.] soft key in order to carry out a recalculation, see Chapter 6.3.11.

▶ If necessary, press the [Print] soft key.



▷ A selection window appears.

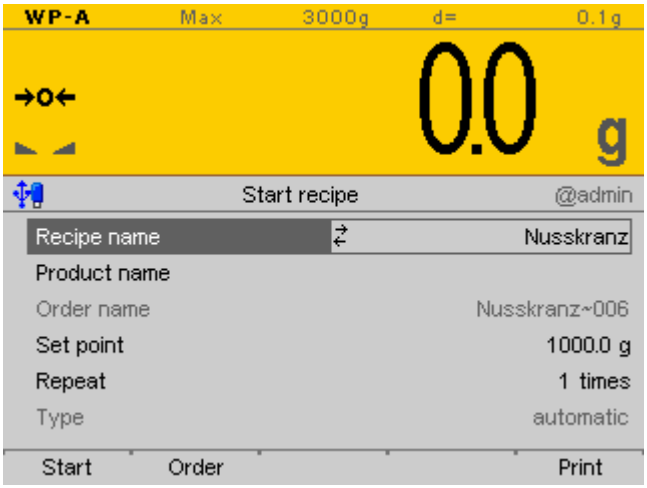
▶ Select and confirm the relevant printout using the cursor, see also Chapter 6.4.5.

Prerequisite for this is that the printer is selected and set up in the system menu under [System setup]-[Connected devices].

7.3 Start Recipe

A recipe can be started without an order previously having been produced on the basis of this recipe.

▶ Select and confirm [Production]-[Start recipe] using the cursor.



▷ A selection window appears.

▶ Select and confirm the relevant recipe (see also Chapter 6.3.6/6.3.7) using the cursor.

The type is determined by the recipe.

▷ The name of the order is formed from the recipe name and the sequence number (here: 020).

▶ If necessary, change the set point.

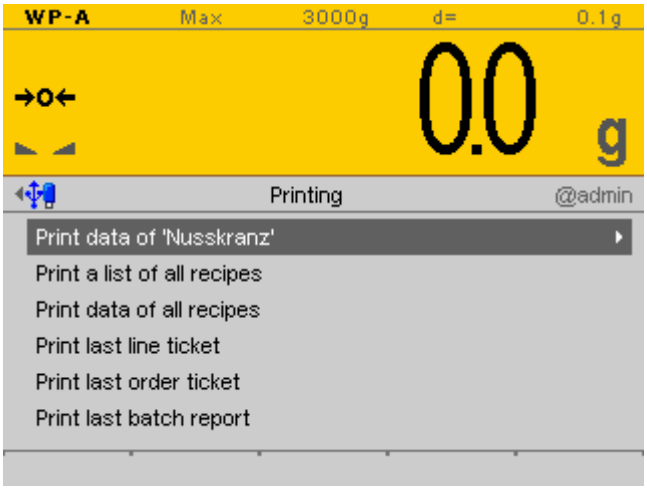
▶ If necessary, change the number of repetitions.

For automatic recipes, there can be 1–998 entries. If 999 is used, the recipe is set to "infinitely". There will be a prompt for the "Enabled by bit" before the start of each batch.

▶ Press the [Start] soft key in order to start the order processing.

▶ If necessary, press the [Order] soft key in order to start an order.

▶ If necessary, press the [Print] soft key.



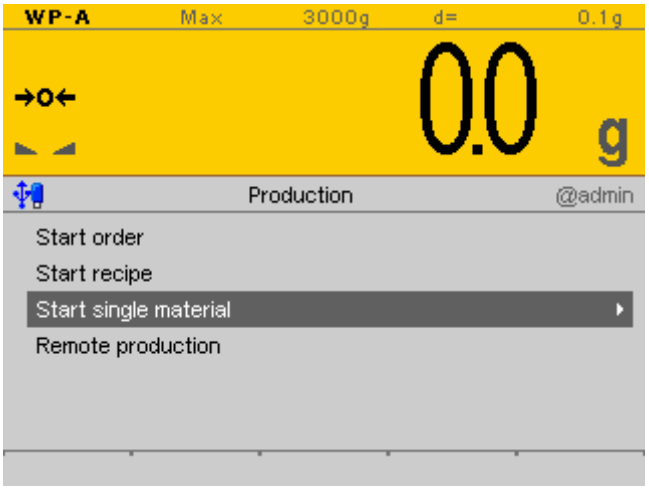
▷ A selection window appears.

▶ Select and confirm the relevant printout using the cursor, see also Chapter 6.3.13.

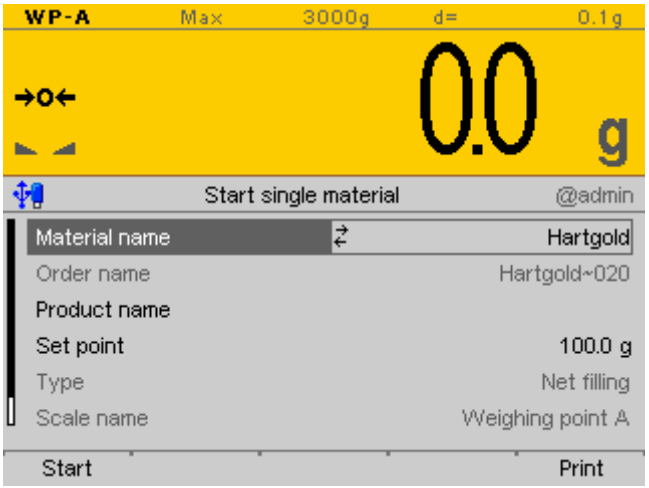
Prerequisite for this is that the printer is selected and set up in the system menu under [System setup]-[Connected devices].

7.4 Start Material

A single material can be started without a recipe or an order previously having been produced on the basis of this material. The function is limited to materials which are batched according to the set point, for table see Chapter 6.2.3. A temporary recipe and a temporary order are created. Both of them are given the name of the material with the sequence number added.



▶ Select and confirm [Production]-[Start single material] using the cursor.



▷ A selection window appears.

▶ Select and confirm the relevant material (see also Chapter 6.2.5/6.2.6) using the cursor.

The type and the scale name are determined by the material.

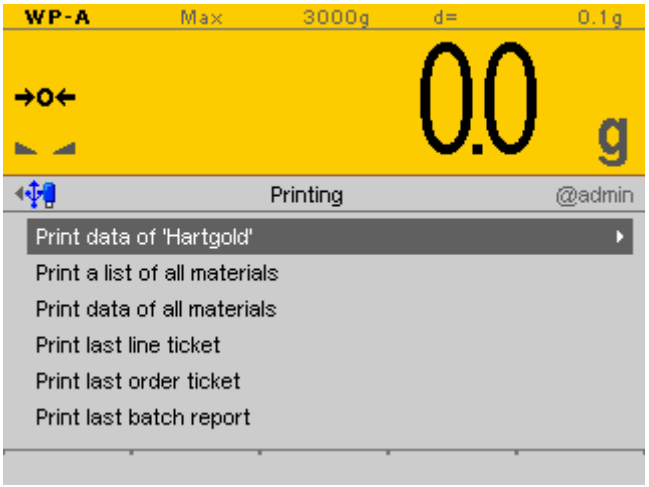
▷ The name of the order is formed from the material name and the sequence number (here: 020).

▶ If necessary, change the set point.

If the material has already been directly started once before, then the previous value is displayed as a suggestion. If a change is made then the new value is stored in the material database.

▶ Press the [Start] soft key in order to start the order processing.

▶ If necessary, press the [Print] soft key.



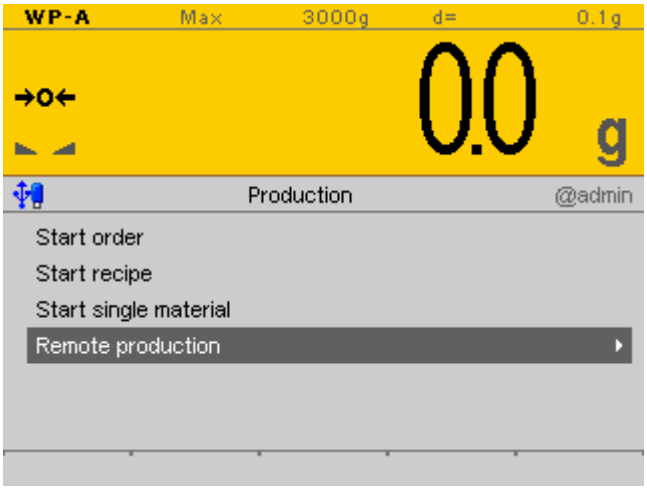
▷ A selection window appears.

▶ Select and confirm the relevant printout using the cursor, see also Chapter 6.2.9.

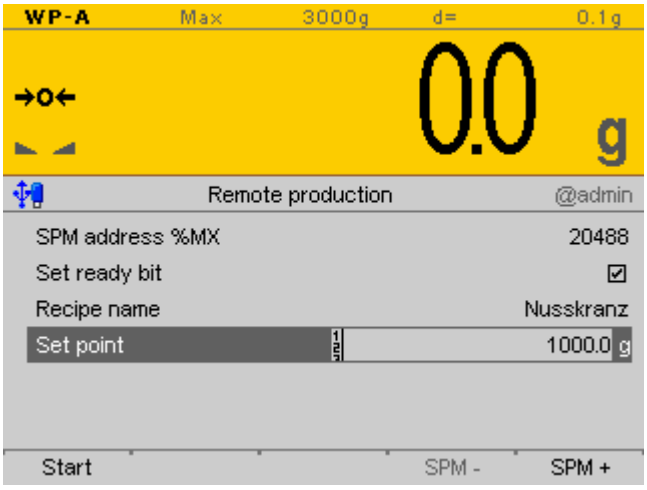
Prerequisite for this is that the printer is selected and set up in the system menu under [System setup]-[Connected devices].

7.5 Start remote

Eight different recipes (or the same one with different set points) can each be assigned an input. This input (rising edge) then starts the assigned recipe. This function must be previously activated under [Configuration]-[Parameters].



▶ Select and confirm [Production]-[Remote production] using the cursor.



▷ A selection window appears.

▶ Select and confirm the relevant recipe (see also Chapter 6.3.6/6.3.7) using the cursor.

▶ Select [SPM address %MX] using the cursor and use the keyboard to enter a free choice SPM address for the start of the corresponding recipe, see Chapter 8.5.

▶ Select and confirm [Set ready bit] using the cursor in order to activate the bit.

▶ If necessary, change the set point.

▶ Press the [SPM +]/[SPM -] soft key in order to change to the next/previous SPM address.

▶ Press the [Start] soft key in order to start the recipe processing.

7.6 Operation and Visualization of the Recipes

7.6.1 General Information

There are two types of visualization:

- Recipe view for automatically running recipes
- Scale view for the batching of individual materials in automatic and manual recipes.

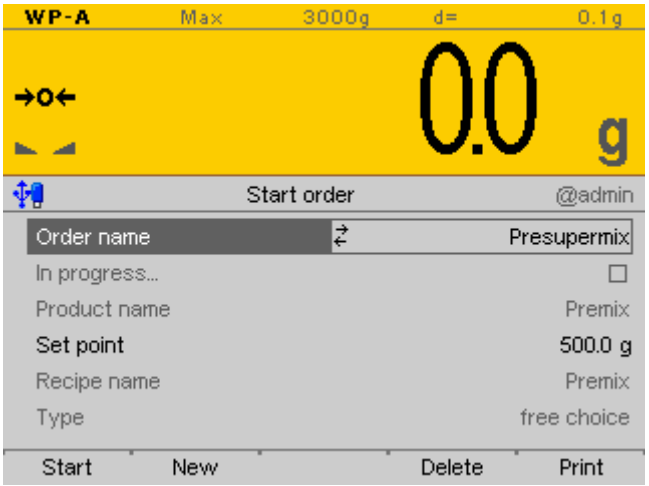
The different types require a different operation.

While production is running, the last batch report can be printed using the  button.

7.6.2 Free Choice Recipes

A free choice recipe allows the user to process the lines of the recipe in any order. The user selects each line individually. One line of the recipe is processed at a time. The processing can be interrupted at any point. Interrupted orders will be labeled as "In progress". An interrupted order can be continued later on, even if other orders have been processed in the meantime (see also Chapter 6.3.4.1).

▶ Select and confirm [Production]-[Start order] using the cursor.



▷ A selection window appears.

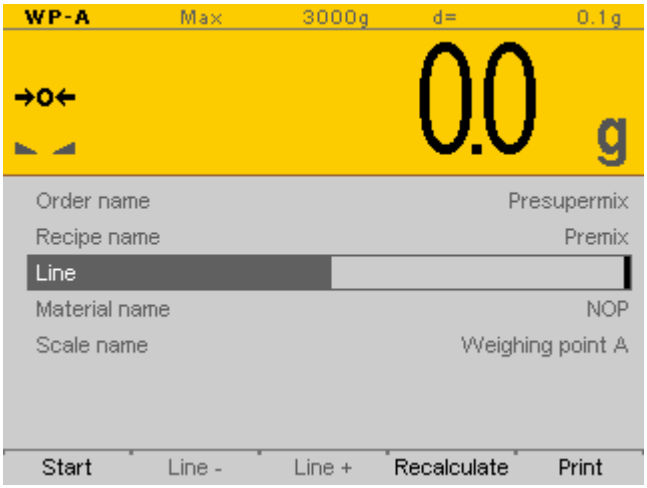
▶ Select and confirm the relevant order (see also Chapter 6.4.2/6.4.3) using the cursor.

▶ Press the [New] soft key if necessary in order to create a new order. For entries see Chapter 6.4.2/6.4.3.

▶ If necessary, change the set point.

▶ If necessary, press the [Delete] soft key in order to delete the order.

▶ Press the [Start] soft key.



▷ A selection window appears.

▶ Press the [Line +]/[Line -] soft key in order to select the line to be processed.

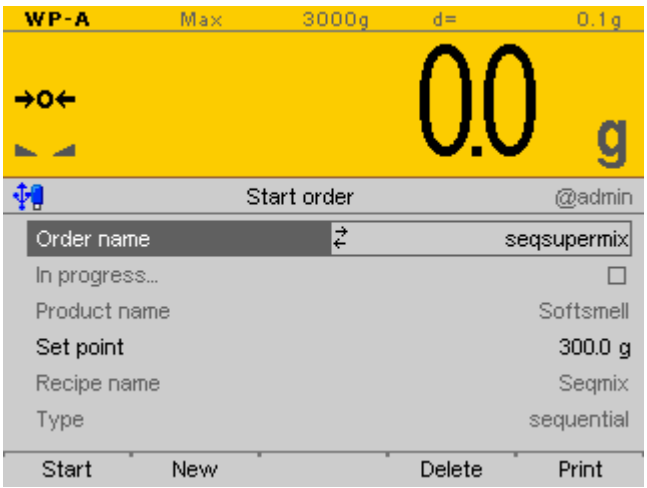
▶ Press the [Start] soft key in order to carry out batching line by line.

▶ If necessary, press the [Recalc.] soft key in order to carry out a recalculation, see Chapter 6.3.11.

7.6.3 Sequential Recipes

A sequential recipe forces the user to process the lines in the specified order. The user must also approve each line for processing. One line of the recipe is processed at a time. The processing can be interrupted at any point. Interrupted orders will be labeled as "In progress". An interrupted order can be continued later on, even if other orders have been processed in the meantime (see also Chapter 6.3.4.2).

▶ Select and confirm [Production]-[Start order] using the cursor.



▷ A selection window appears.

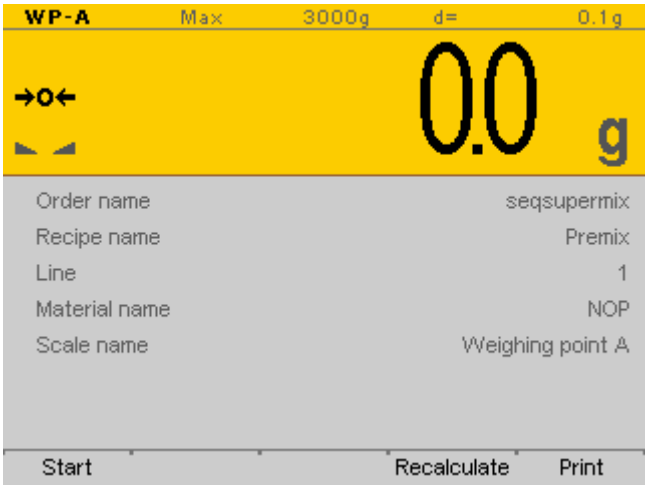
▶ Select and confirm the relevant order (see also Chapter 6.4.2/6.4.3) using the cursor.

▶ Press the [New] soft key if necessary in order to create a new order. For entries see Chapter 6.4.2/6.4.3.

▶ If necessary, change the set point.

▶ If necessary, press the [Delete] soft key in order to delete the order.

▶ Press the [Start] soft key.



▷ A selection window appears.

▶ If necessary, press the [Recalc.] soft key in order to carry out a recalculation, see Chapter 6.3.11.

▶ Press the [Start] soft key in order to carry out processing from line 1 to line n.

Note

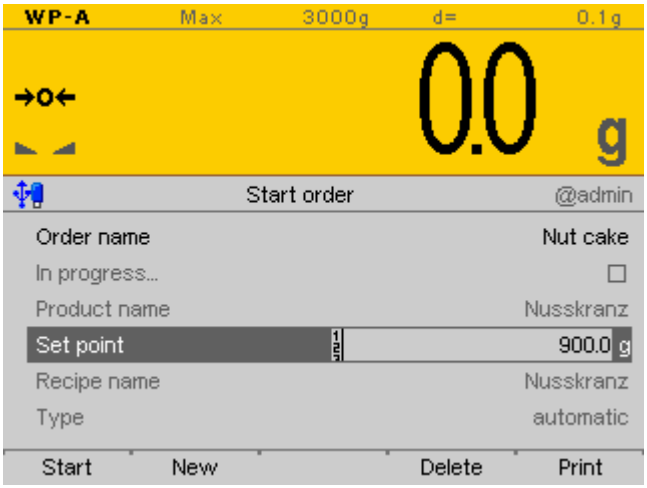
If it has been defined that the scale can be selected for the material, the ⚖ key can be used to switch between options.

7.6.4 Automatic Recipes

An automatic recipe is processed in the order of the recipe. If necessary, interaction with the operator can take place during processing for "control materials" and release signals. The order and the dependencies of the production steps are saved in the recipe. The operator can hold, continue or prematurely terminate the recipe. It is not possible to continue an order that has been interrupted at a later date. The **STOP** key is used to stop all scales irrespective of the current operation (see also Chapter 6.3.4.3). For details on the recipes, see Chapter 6.3.

In the recipe view, the last batch report can be printed using the ⚖ key.

▶ Select and confirm [Production]-[Start order] using the cursor.



▷ A selection window appears.

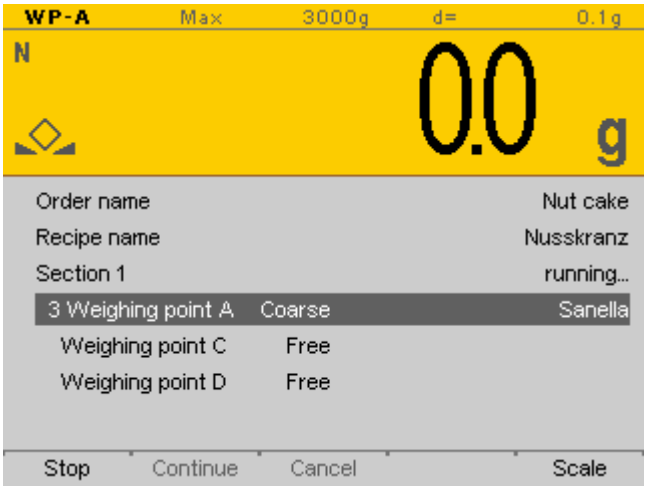
▶ Select and confirm the relevant order (see also Chapter 6.4.2/6.4.3) using the cursor.

▶ Press the [New] soft key if necessary in order to create a new order. For entries see Chapter 6.4.2/6.4.3.

▶ If necessary, change the set point.

▶ If necessary, press the [Delete] soft key in order to delete the order.

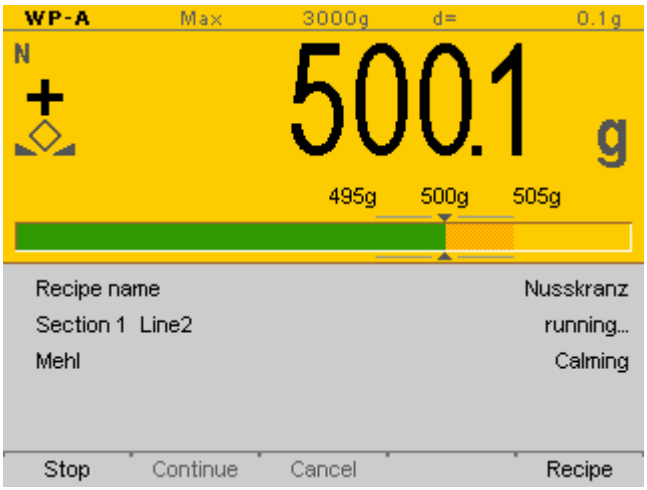
▶ Press the [Start] soft key.



▶ Press the [Start] soft key.

▷ The recipe display appears.

▶ Press the [Scale] soft key.



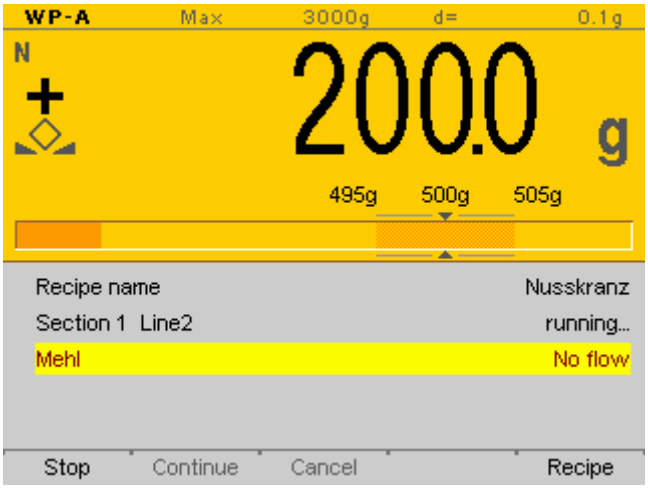
▷ Only the current scale is visualized.

The bar graph shows the set point with tolerance limits.

When within the tolerance, the bar turns green. The diamond under the plus or minus sign for the current weight indicates batching operation.

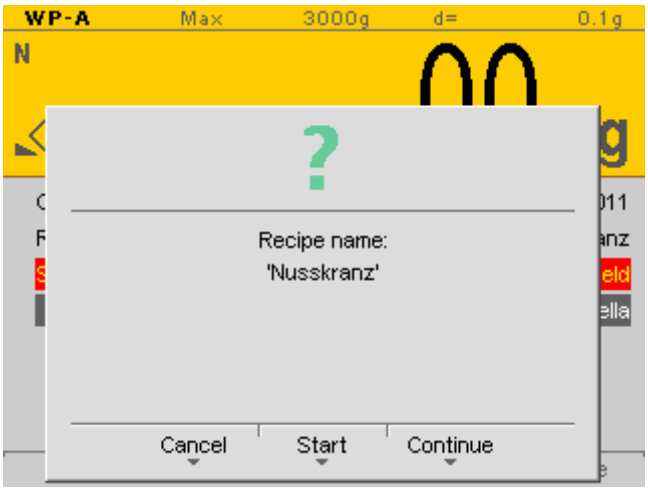
7.6.4.1 Material Flow Monitoring

If the flow monitoring for a material under [Database]-[Create/edit material]-[Flow] is not equal to 0 (activated), the row will be marked in yellow if the value specified for the corresponding scale is not met. The signals for the coarse/fine control continue to be pending (batching continues) (see also Chapter 6.2.4.3).



▷ The line is marked in yellow.

7.6.4.2 Tidy Up Process



If an automatic recipe is interrupted by the tidy up process (see Chapter 6.3.8) (e.g. via [Stop] and [Cancel]), then this message will appear.

[Cancel]

The recipe and the tidy up process will be canceled.

[Start]

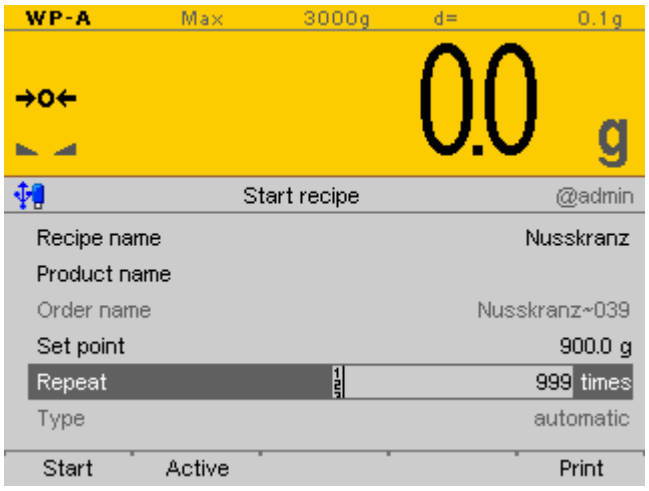
The tidy up process will be started.

[Continue]

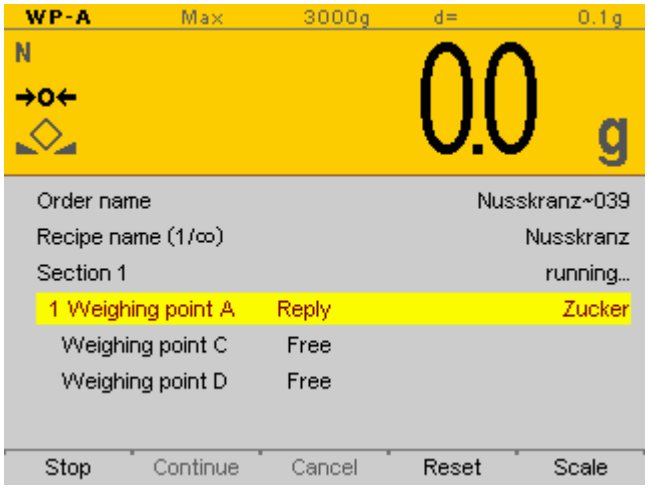
The tidy up process will not be started and the recipe will be continued.

7.6.4.3 Recipe Repetition

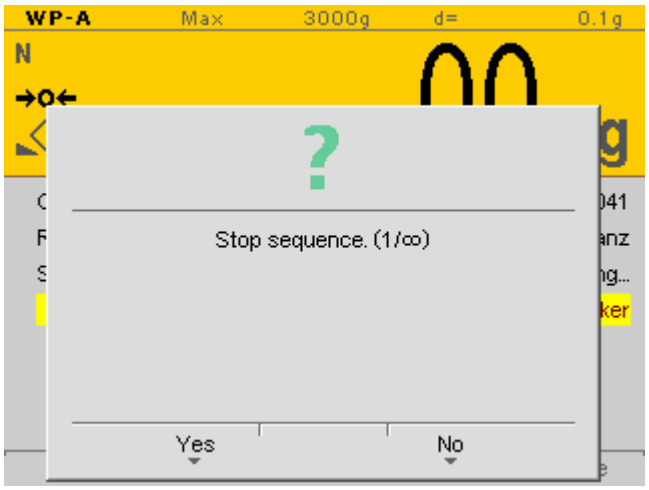
Automatic recipes can be repeated automatically up to 998 times. If 999 is entered, the recipe will run "infinitely".



- ▶ Select and confirm the relevant recipe (see also Chapter 6.3.6/6.3.7) using the cursor.
- ▶ If necessary, press the [New] soft key in order to create a new recipe. For entries see Chapter 6.3.6/6.3.7.
- ▶ If necessary, change the set point.
- ▶ Select repeat using the cursor, and use the keyboard to enter and confirm "1–999".
- ▶ Press the [Start] soft key.



- ▷ The recipe display appears.
- ▶ Press the [Reset] soft key if the number entered is not the number of repetitions.



- ▷ A prompt window appears.
- ▶ Press the [Yes] soft key in order to reset the number of repetitions. No action will be carried out if [No] is selected.
- ▶ If necessary, press the [Stop] soft key in order to stop the batching process.
- ▶ Press the [Continue] soft key to continue the batching process.

7.7 Operation and Visualization of the Scale

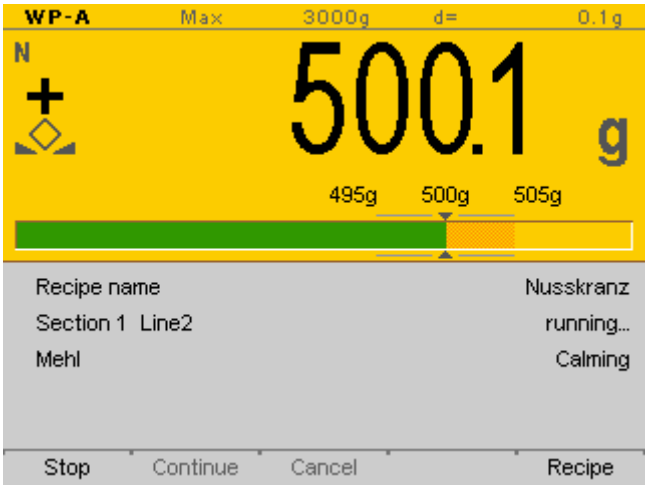
The visualization of the scale is not dependent on the type of recipe produced. In the case of automatically processed recipes, the [Recipe] soft key can be used to switch to the recipe view and the [Scale] soft key can be used to switch back to the scale view.

The visualized data and the possible/necessary operation depend on the current process. There are 5 basic types. Information on the materials can be found in Chapter 6.2.3.

While production is running, the last batch report can be printed using the  button in the scale view.

7.7.1 Bar Graph and Tolerance Field

In the case of both automatic and manual batching, a bar graph appears over the weight display, which is always scaled to the set point for the current material. The tolerance field is labeled and is always the same width irrespective of the absolute value. The set point is marked using 2 triangles and is always (even if the tolerance is not symmetrical) in the middle of the field.



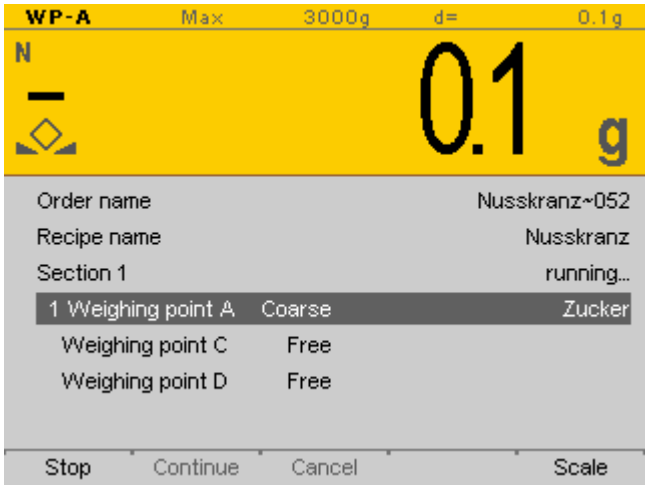
▷ As soon as the tolerance field is reached, the color changes from orange to green, and when the field is exceeded the bar graph turns red. If both tolerance values are set to 0, then no tolerance field is displayed and the bar graph changes from green to red when the set point is exceeded.

7.7.2 No Operation and Visualization (NOP)

The material [NOP] is only intended as a placeholder, but if it is used then it does not require any operation and is also not visualized. After approx. 200 ms the system switches to the next material.

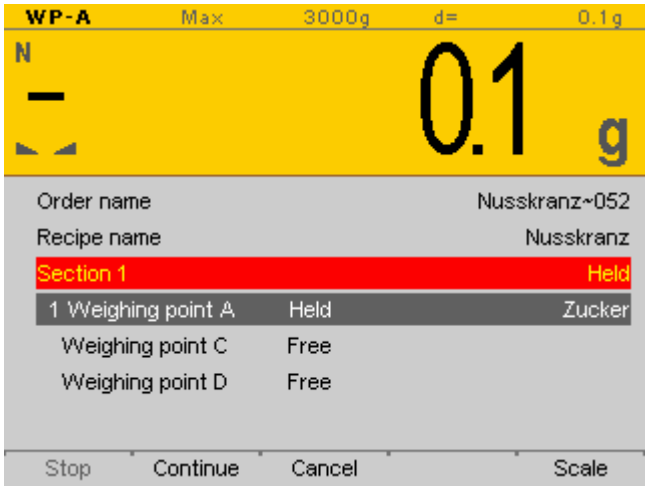
7.7.3 Automatic Materials

Automatic batching is valid for the material types [Net filling], [Net refill], [Net decrease], [Gross filling] and [Gross decrease].



▶ Press the [Recipe] soft key to change to the recipe view.

The statuses coarse, followed by fine, calming, ready and free, are displayed here.



▶ If [Stop] is pressed, the notification "Held" appears; likewise the "Tolerance alarm" appears when the tolerance is exceeded.

If several scales are batching at the same time, only this recipe line will be held and the others will continue. The material displays the status "Held" or "Tolerance alarm". The signals "Coarse"/"Fine" are reset.

[Continue] can be used to continue the batching or accept the tolerance/re-batch (dependent on the restart mode), see also Chapter 6.2.4.3.

If [Cancel] is selected, the material recorded up until that point will be registered and the next line of the recipe will be started.

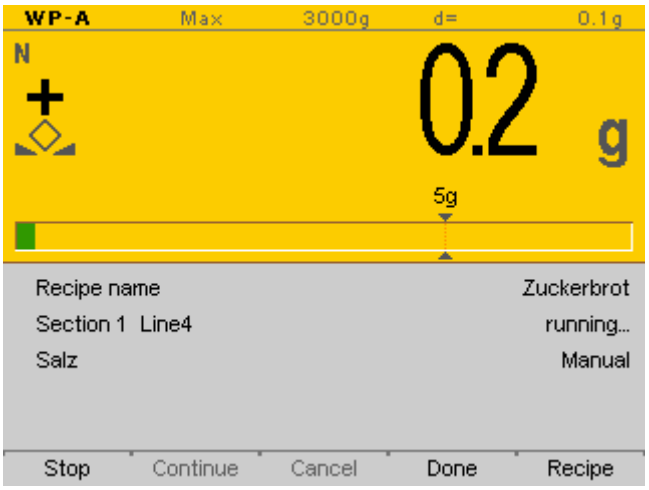
If a material [Timer] is held using [Stop] then the time will be frozen. If [Continue] is selected, the time that had not previously expired will be caught up. If [Cancel] is selected, the [Timer] will be prematurely ended.

If the material flow monitoring is activated, then a warning will appear that cannot be acknowledged. Batching will continue, see also Chapter 7.6.4.1.

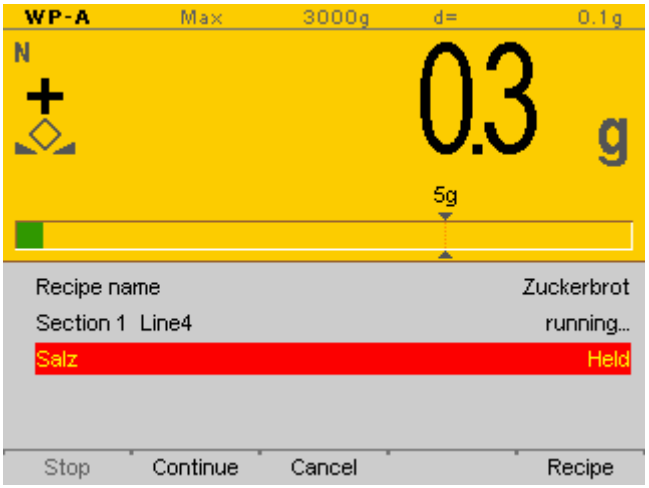
7.7.4 Manual Materials

In the case of manual materials [Manual filling] and [Manual, no check], it is assumed in automatic recipes that the scale is tared at the time of display.

In the case of the manual recipe types [sequential] and [free choice], taring is carried out at the start of the recipe line.



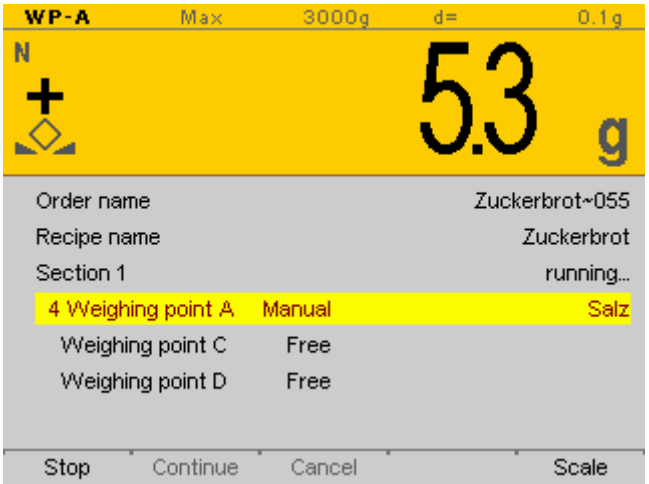
▶ Press the [Stop] soft key to hold the batching.



▷ The message "Held" appears. The line is marked in red.

Material can be removed and [Continue] can be used to continue. The line is ended if [Cancel] is used.

▶ If necessary, press the [Recipe] soft key to switch to the recipe view.



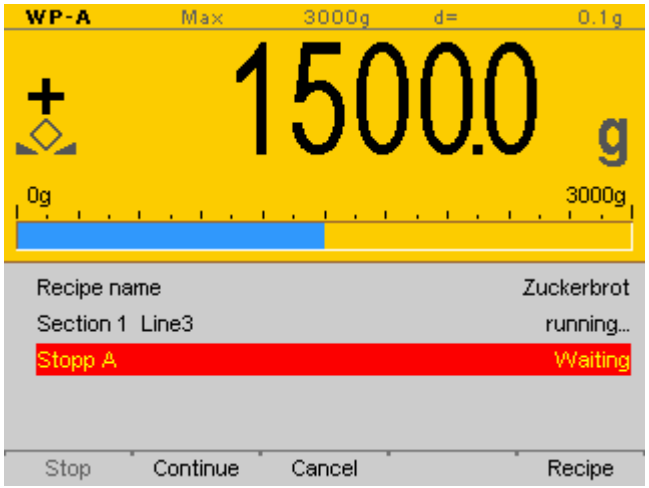
▷ The line highlighted in yellow is then displayed if operator intervention is required. Depending on the material and the configuration, at this point it is possible e.g. to check identification or hold a dialog.

▶ Press the [Scale] soft key in order to switch to the Scale view.

▶ Press the [Done] soft key in order to confirm that batching is complete.

7.7.5 Components for the Control of the Process Sequence

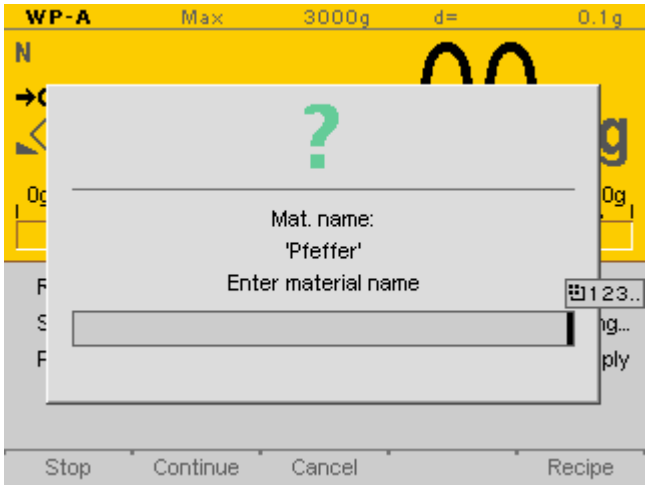
For the material types [Stop], [Wait for SPM], [Set SPM], [Reset SPM], [Wait + reset SPM] [Analog input] and [Analog output], no/few parameters are displayed, e.g. no set point or no tolerance. These material types are components which control the process.



- ▶ Press the [Start] soft key to start the batching.
- ▷ The automatic batching stops (here: material "Stop"). The line is marked in red.
- ▶ Press the [Continue] soft key to continue the batching.

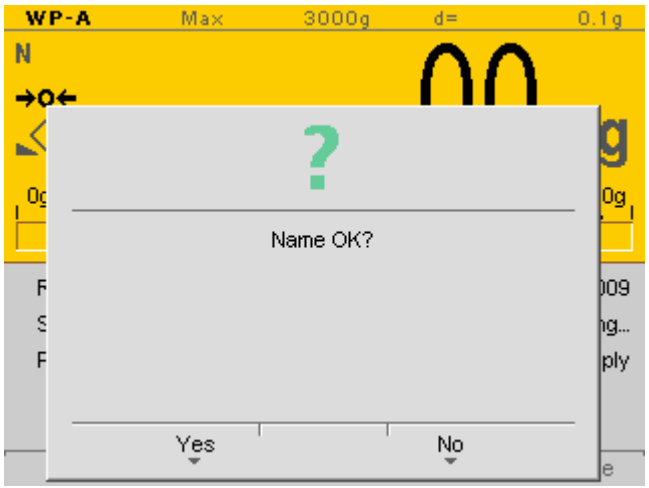
7.7.6 Dialog

This parameter is used for the material types [Register] and [Dialog].

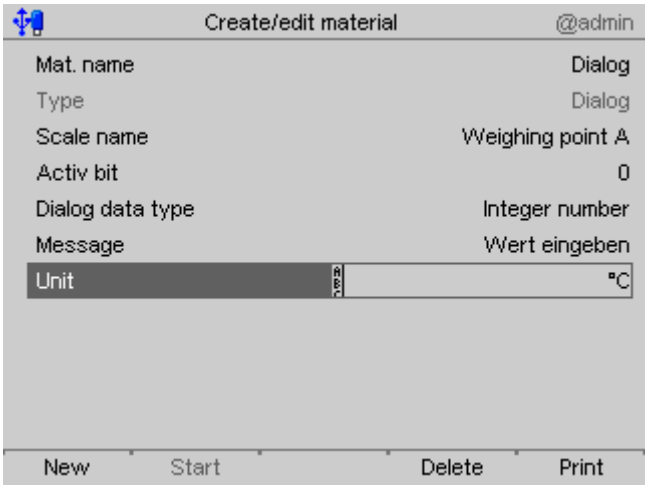


If "Check ident" was activated when creating the material, an input window appears.

- ▶ Enter/scan in the material name/ID and confirm.

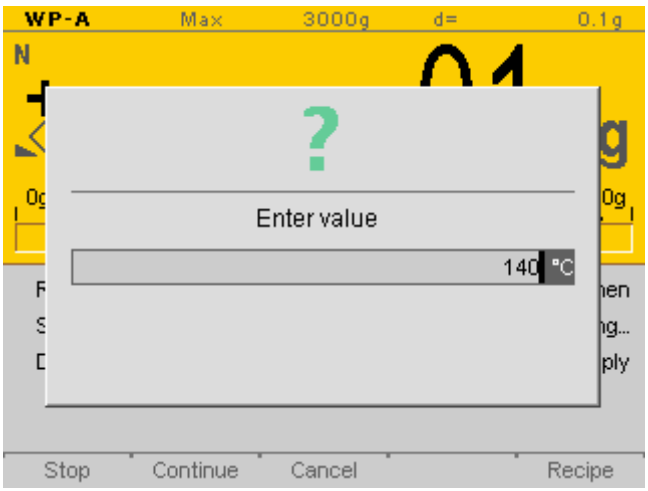


- ▷ A prompt window will appear if there is an incorrect entry.
- ▶ Press the soft key [Yes] in order to include the incorrect entry in the report.
- ▶ Press the soft key [No] in order to query the material name again.
- ▶ Perform the weighing operation.



The "Dialog data type" parameter has several options, see page 19.

- ▶ E.g. select and confirm [Integer number].
- ▶ Enter and confirm the text under [Message].
- ▶ Select and confirm the relevant unit under [Unit].



The dialog appears in the recipe cycle.

- ▶ Enter the value using the keyboard and confirm.

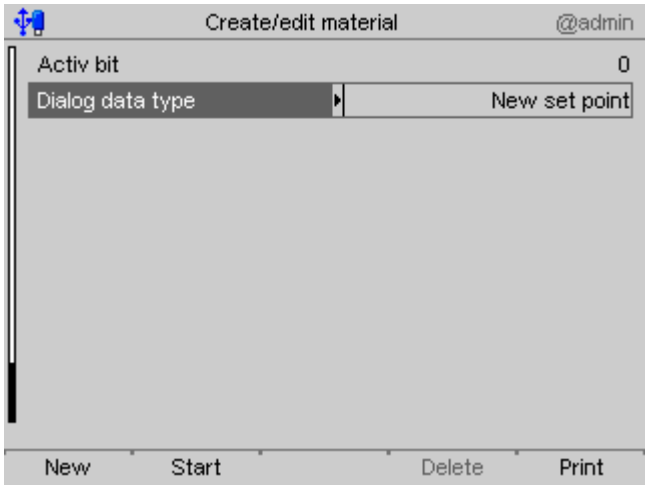
If the display is set to another scale in a dialog function, then the [Recipe] soft key is highlighted in yellow in order to signal to the operator that the [Recipe] soft key must be used to switch to the recipe view or that the ⚖ button must be used to switch scale.

The result of a dialog is entered in the report database. If there is more than one result (e.g. ID and dialog), they will be separated using a semicolon. They will then be presented in separate lines in the batch report.

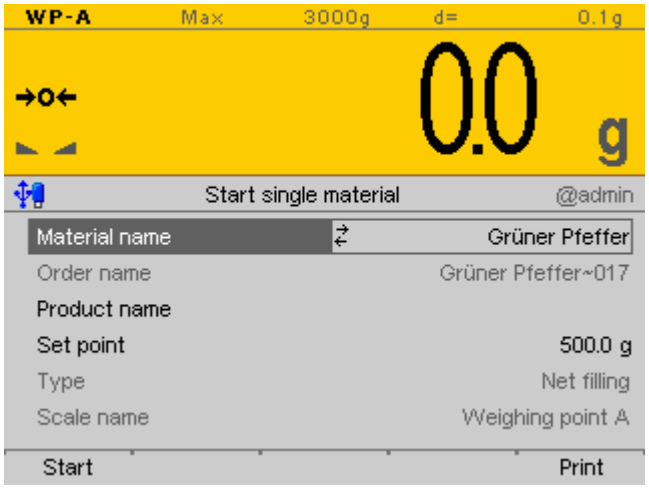
7.7.7 Change Set Point

This option exists for the following material types:

- Net filling
- Net refill
- Gross filling
- Manual filling
- Timer
- Analog output

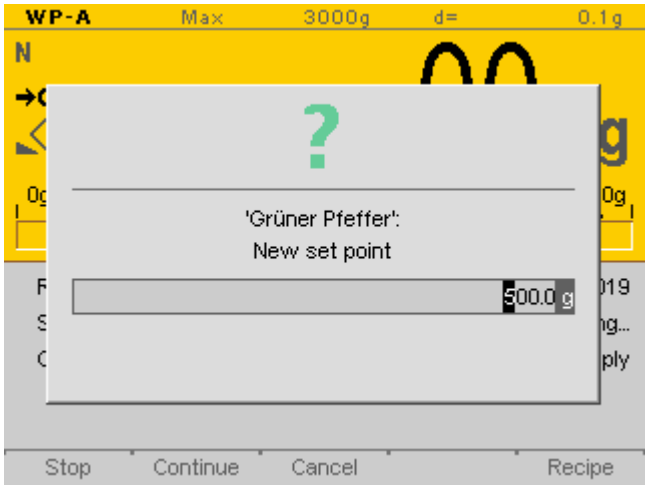


Prerequisite for this function is that the set point change has been specified for the material under [Dialog data type] under [Database]-[Create/edit material].



▶ Select and confirm the relevant material in the production menu.

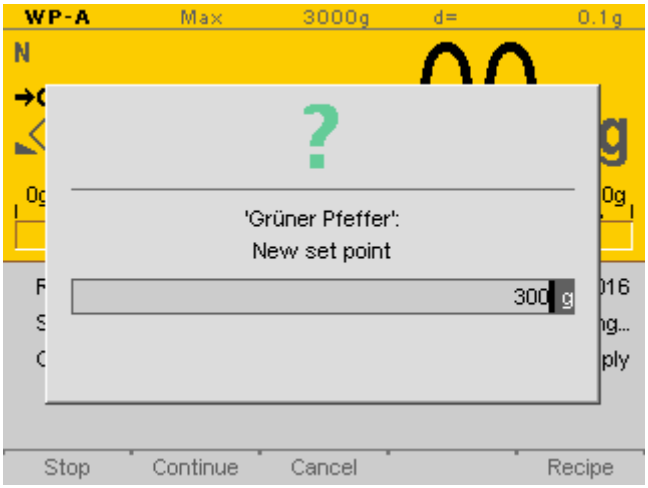
▶ Press the [Start] soft key.



▷ This will automatically switch to the scale view.

▷ The input window is displayed. The set point saved in the database is displayed (here: 500.0 g).

▶ Press the OK/ENTER key in order to keep the value.



- ▶ Or enter the new set point using the keyboard and confirm using the OK/ENTER key.
- ▷ Production is continued and the tolerance check is carried out on the basis of the new set point. The new set point is included in the report; the recipe total is not changed.

8 SPM

8.1 General Information

The memory accessible to the user is the SPM (**S**cratch **P**ad **M**emory) for fixed addressing from base address 0000 and above.

For communication via OPC, fieldbus interfaces, etc., variables are available from the following ranges:

- Firmware range (see Chapter 8.4)
- Application range (see Chapter 8.5)
- Freely assigned ranges (see Chapter 8.3)

8.2 Elementary data types

The elementary data types are characterized by their bit width and possible value range.

Keyword	Data type	Value range
BOOL	bool	0 (FALSE) or 1 (TRUE)
SINT	short integer	-128 to 127
INT	integer	-32768 to 32767
DINT	double integer	-231 to 231-1
USINT	unsigned short integer	0 to 255
UINT	unsigned integer	0 to 65535
UDINT	unsigned double integer	0 to 232-1
REAL	real number	±1,18E-38 to 3,4E38 (with about 7 significant digits)
TIME	time duration	1 ms to ±247 ms
DATE	date (only)	1.1.1900 to 31.12.2099
TIME_OF_DAY	time of day (only)	00:00:00.00 to 23:59:59.99
DATE_AND_TIME	Date and time of day	see DATE and TIME_OF_DAY
STRING	variable-long character string	max. 255 characters (ISO)
WSTRING	variable-long wide character string	max. 255 wide characters (Unicode)
BYTE	bit-sequence 8	---
WORD	bit-sequence 16	---
DWORD	bit-sequence 32	---
LWORD	bit-sequence 64	---

Note	STRING holds characters for "ISO-8859-1 Latin page." WSTRING holds characters from "Unicode Basic Multilingual Plane." WSTRING is only supported by Unicode-enabled devices.

8.3 Freely Assigned Ranges

8.3.1 General Information

Code	Keyword	Addresses, example
%ML	LWORD	L20
%MD	DINT	D40–41
%MW	WORD	W80–83
%MB	BYTE	B160–167
%MX	BOOL (Bit)	X1280–1343

8.3.2 Weighing point A

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
20	40	80	160	1280	1281	1282	1283	1284	1285	1286	1287
			161	1288	1289	1290	1291	1292	1293	1294	1295
		81	162	1296	1297	1298	1299	1300	1301	1302	1303
			163	1304	1305	1306	1307	1308	1309	1310	1311
	41	82	164	1312	1313	1314	1315	1316	1317	1318	1319
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		83	166	1328	1329	1330	1331	1332	1333	1334	1335
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		85	170	1360	1361	1362	1363	1364	1365	1366	1367
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	43	86	172	1376	1377	1378	1379	1380	1381	1382	1383
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		87	174	1392	1393	1394	1395	1396	1397	1398	1399
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		91	182	1456	1457	1458	1459	1460	1461	1462	1463
			183	1464	1465	1466	1467	1468	1469	1470	1471
23	46	92	184	1472	1473	1474	1475	1476	1477	1478	1479
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		93	186	1488	1489	1490	1491	1492	1493	1494	1495
			187	1496	1497	1498	1499	1500	1501	1502	1503
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		97	194	1552	1553	1554	1555	1556	1557	1558	1559
			195	1560	1561	1562	1563	1564	1565	1566	1567
	49	98	196	1568	1569	1570	1571	1572	1573	1574	1575
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		99	198	1584	1585	1586	1587	1588	1589	1590	1591
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25	50	100	200	1600	1601	1602	1603	1604	1605	1606	1607
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		101	202	1616	1617	1618	1619	1620	1621	1622	1623
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	51	102	204	1632	1633	1634	1635	1636	1637	1638	1639
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		103	206	1648	1649	1650	1651	1652	1653	1654	1655
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		105	210	1680	1681	1682	1683	1684	1685	1686	1687
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	53	106	212	1696	1697	1698	1699	1700	1701	1702	1703
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		107	214	1712	1713	1714	1715	1716	1717	1718	1719
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27	54	108	216	1728	1729	1730	1731	1732	1733	1734	1735
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		109	218	1744	1745	1746	1747	1748	1749	1750	1751
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	55	110	220	1760	1761	1762	1763	1764	1765	1766	1767
			221	1768	1769	1770	1771	1772	1773	1774	1775
		111	222	1776	1777	1778	1779	1780	1781	1782	1783
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28	56	112	224	1792	1793	1794	1795	1796	1797	1798	1799
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		113	226	1808	1809	1810	1811	1812	1813	1814	1815
			227	1816	1817	1818	1819	1820	1821	1822	1823
	57	114	228	1824	1825	1826	1827	1828	1829	1830	1831
			229	1832	1833	1834	1835	1836	1837	1838	1839
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		117	234	1872	1873	1874	1875	1876	1877	1878	1879
			235	1880	1881	1882	1883	1884	1885	1886	1887
	59	118	236	1888	1889	1890	1891	1892	1893	1894	1895
			237	1896	1897	1898	1899	1900	1901	1902	1903
		119	238	1904	1905	1906	1907	1908	1909	1910	1911
			239	1912	1913	1914	1915	1916	1917	1918	1919
30	60	120	240	1920	1921	1922	1923	1924	1925	1926	1927
			241	1928	1929	1930	1931	1932	1933	1934	1935
		121	242	1936	1937	1938	1939	1940	1941	1942	1943
			243	1944	1945	1946	1947	1948	1949	1950	1951
	61	122	244	1952	1953	1954	1955	1956	1957	1958	1959
			245	1960	1961	1962	1963	1964	1965	1966	1967
		123	246	1968	1969	1970	1971	1972	1973	1974	1975
			247	1976	1977	1978	1979	1980	1981	1982	1983
31	62	124	248	1984	1985	1986	1987	1988	1989	1990	1991
			249	1992	1993	1994	1995	1996	1997	1998	1999
		125	250	2000	2001	2002	2003	2004	2005	2006	2007
			251	2008	2009	2010	2011	2012	2013	2014	2015
	63	126	252	2016	2017	2018	2019	2020	2021	2022	2023
			253	2024	2025	2026	2027	2028	2029	2030	2031
		127	254	2032	2033	2034	2035	2036	2037	2038	2039
			255	2040	2041	2042	2043	2044	2045	2046	2047
32	64	128	256	2048	2049	2050	2051	2052	2053	2054	2055
			257	2056	2057	2058	2059	2060	2061	2062	2063
		129	258	2064	2065	2066	2067	2068	2069	2070	2071
			259	2072	2073	2074	2075	2076	2077	2078	2079
	65	130	260	2080	2081	2082	2083	2084	2085	2086	2087
			261	2088	2089	2090	2091	2092	2093	2094	2095
		131	262	2096	2097	2098	2099	2100	2101	2102	2103
			263	2104	2105	2106	2107	2108	2109	2110	2111
33	66	132	264	2112	2113	2114	2115	2116	2117	2118	2119
			265	2120	2121	2122	2123	2124	2125	2126	2127
		133	266	2128	2129	2130	2131	2132	2133	2134	2135
			267	2136	2137	2138	2139	2140	2141	2142	2143
	67	134	268	2144	2145	2146	2147	2148	2149	2150	2151
			269	2152	2153	2154	2155	2156	2157	2158	2159
		135	270	2160	2161	2162	2163	2164	2165	2166	2167
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			273	2184	2185	2186	2187	2188	2189	2190	2191
		137	274	2192	2193	2194	2195	2196	2197	2198	2199
			275	2200	2201	2202	2203	2204	2205	2206	2207
	69	138	276	2208	2209	2210	2211	2212	2213	2214	2215
			277	2216	2217	2218	2219	2220	2221	2222	2223
		139	278	2224	2225	2226	2227	2228	2229	2230	2231
			279	2232	2233	2234	2235	2236	2237	2238	2239
35	70	140	280	2240	2241	2242	2243	2244	2245	2246	2247
			281	2248	2249	2250	2251	2252	2253	2254	2255
		141	282	2256	2257	2258	2259	2260	2261	2262	2263
			283	2264	2265	2266	2267	2268	2269	2270	2271
	71	142	284	2272	2273	2274	2275	2276	2277	2278	2279
			285	2280	2281	2282	2283	2284	2285	2286	2287
		143	286	2288	2289	2290	2291	2292	2293	2294	2295
			287	2296	2297	2298	2299	2300	2301	2302	2303
36	72	144	288	2304	2305	2306	2307	2308	2309	2310	2311
			289	2312	2313	2314	2315	2316	2317	2318	2319
		145	290	2320	2321	2322	2323	2324	2325	2326	2327
			291	2328	2329	2330	2331	2332	2333	2334	2335
	73	146	292	2336	2337	2338	2339	2340	2341	2342	2343
			293	2344	2345	2346	2347	2348	2349	2350	2351
		147	294	2352	2353	2354	2355	2356	2357	2358	2359
			295	2360	2361	2362	2363	2364	2365	2366	2367
37	74	148	296	2368	2369	2370	2371	2372	2373	2374	2375
			297	2376	2377	2378	2379	2380	2381	2382	2383
		149	298	2384	2385	2386	2387	2388	2389	2390	2391
			299	2392	2393	2394	2395	2396	2397	2398	2399
	75	150	300	2400	2401	2402	2403	2404	2405	2406	2407
			301	2408	2409	2410	2411	2412	2413	2414	2415
		151	302	2416	2417	2418	2419	2420	2421	2422	2423
			303	2424	2425	2426	2427	2428	2429	2430	2431
38	76	152	304	2432	2433	2434	2435	2436	2437	2438	2439
			305	2440	2441	2442	2443	2444	2445	2446	2447
		153	306	2448	2449	2450	2451	2452	2453	2454	2455
			307	2456	2457	2458	2459	2460	2461	2462	2463
	77	154	308	2464	2465	2466	2467	2468	2469	2470	2471
			309	2472	2473	2474	2475	2476	2477	2478	2479
		155	310	2480	2481	2482	2483	2484	2485	2486	2487
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		157	314	2512	2513	2514	2515	2516	2517	2518	2519
			315	2520	2521	2522	2523	2524	2525	2526	2527
	79	158	316	2528	2529	2530	2531	2532	2533	2534	2535
			317	2536	2537	2538	2539	2540	2541	2542	2543
		159	318	2544	2545	2546	2547	2548	2549	2550	2551
			319	2552	2553	2554	2555	2556	2557	2558	2559
40	80	160	320	2560	2561	2562	2563	2564	2565	2566	2567
			321	2568	2569	2570	2571	2572	2573	2574	2575
		161	322	2576	2577	2578	2579	2580	2581	2582	2583
			323	2584	2585	2586	2587	2588	2589	2590	2591
	81	162	324	2592	2593	2594	2595	2596	2597	2598	2599
			325	2600	2601	2602	2603	2604	2605	2606	2607
		163	326	2608	2609	2610	2611	2612	2613	2614	2615
			327	2616	2617	2618	2619	2620	2621	2622	2623
41	82	164	328	2624	2625	2626	2627	2628	2629	2630	2631
			329	2632	2633	2634	2635	2636	2637	2638	2639
		165	330	2640	2641	2642	2643	2644	2645	2646	2647
			331	2648	2649	2650	2651	2652	2653	2654	2655
	83	166	332	2656	2657	2658	2659	2660	2661	2662	2663
			333	2664	2665	2666	2667	2668	2669	2670	2671
		167	334	2672	2673	2674	2675	2676	2677	2678	2679
			335	2680	2681	2682	2683	2684	2685	2686	2687
42	84	168	336	2688	2689	2690	2691	2692	2693	2694	2695
			337	2696	2697	2698	2699	2700	2701	2702	2703
		169	338	2704	2705	2706	2707	2708	2709	2710	2711
			339	2712	2713	2714	2715	2716	2717	2718	2719
	85	170	340	2720	2721	2722	2723	2724	2725	2726	2727
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		171	342	2736	2737	2738	2739	2740	2741	2742	2743
			343	2744	2745	2746	2747	2748	2749	2750	2751
43	86	172	344	2752	2753	2754	2755	2756	2757	2758	2759
			345	2760	2761	2762	2763	2764	2765	2766	2767
		173	346	2768	2769	2770	2771	2772	2773	2774	2775
			347	2776	2777	2778	2779	2780	2781	2782	2783
	87	174	348	2784	2785	2786	2787	2788	2789	2790	2791
			349	2792	2793	2794	2795	2796	2797	2798	2799
		175	350	2800	2801	2802	2803	2804	2805	2806	2807
			351	2808	2809	2810	2811	2812	2813	2814	2815

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		177	354	2832	2833	2834	2835	2836	2837	2838	2839
			355	2840	2841	2842	2843	2844	2845	2846	2847
	89	178	356	2848	2849	2850	2851	2852	2853	2854	2855
			357	2856	2857	2858	2859	2860	2861	2862	2863
		179	358	2864	2865	2866	2867	2868	2869	2870	2871
			359	2872	2873	2874	2875	2876	2877	2878	2879
45	90	180	360	2880	2881	2882	2883	2884	2885	2886	2887
			361	2888	2889	2890	2891	2892	2893	2894	2895
		181	362	2896	2897	2898	2899	2900	2901	2902	2903
			363	2904	2905	2906	2907	2908	2909	2910	2911
	91	182	364	2912	2913	2914	2915	2916	2917	2918	2919
			365	2920	2921	2922	2923	2924	2925	2926	2927
		183	366	2928	2929	2930	2931	2932	2933	2934	2935
			367	2936	2937	2938	2939	2940	2941	2942	2943
46	92	184	368	2944	2945	2946	2947	2948	2949	2950	2951
			369	2952	2953	2954	2955	2956	2957	2958	2959
		185	370	2960	2961	2962	2963	2964	2965	2966	2967
			371	2968	2969	2970	2971	2972	2973	2974	2975
	93	186	372	2976	2977	2978	2979	2980	2981	2982	2983
			373	2984	2985	2986	2987	2988	2989	2990	2991
		187	374	2992	2993	2994	2995	2996	2997	2998	2999
			375	3000	3001	3002	3003	3004	3005	3006	3007
47	94	188	376	3008	3009	3010	3011	3012	3013	3014	3015
			377	3016	3017	3018	3019	3020	3021	3022	3023
		189	378	3024	3025	3026	3027	3028	3029	3030	3031
			379	3032	3033	3034	3035	3036	3037	3038	3039
	95	190	380	3040	3041	3042	3043	3044	3045	3046	3047
			381	3048	3049	3050	3051	3052	3053	3054	3055
		191	382	3056	3057	3058	3059	3060	3061	3062	3063
			383	3064	3065	3066	3067	3068	3069	3070	3071
48	96	192	384	3072	3073	3074	3075	3076	3077	3078	3079
			385	3080	3081	3082	3083	3084	3085	3086	3087
		193	386	3088	3089	3090	3091	3092	3093	3094	3095
			387	3096	3097	3098	3099	3100	3101	3102	3103
	97	194	388	3104	3105	3106	3107	3108	3109	3110	3111
			389	3112	3113	3114	3115	3116	3117	3118	3119
		195	390	3120	3121	3122	3123	3124	3125	3126	3127
			391	3128	3129	3130	3131	3132	3133	3134	3135

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		197	394	3152	3153	3154	3155	3156	3157	3158	3159
			395	3160	3161	3162	3163	3164	3165	3166	3167
	99	198	396	3168	3169	3170	3171	3172	3173	3174	3175
			397	3176	3177	3178	3179	3180	3181	3182	3183
		199	398	3184	3185	3186	3187	3188	3189	3190	3191
			399	3192	3193	3194	3195	3196	3197	3198	3199
50	100	200	400	3200	3201	3202	3203	3204	3205	3206	3207
			401	3208	3209	3210	3211	3212	3213	3214	3215
		201	402	3216	3217	3218	3219	3220	3221	3222	3223
			403	3224	3225	3226	3227	3228	3229	3230	3231
	101	202	404	3232	3233	3234	3235	3236	3237	3238	3239
			405	3240	3241	3242	3243	3244	3245	3246	3247
		203	406	3248	3249	3250	3251	3252	3253	3254	3255
			407	3256	3257	3258	3259	3260	3261	3262	3263
51	102	204	408	3264	3265	3266	3267	3268	3269	3270	3271
			409	3272	3273	3274	3275	3276	3277	3278	3279
		205	410	3280	3281	3282	3283	3284	3285	3286	3287
			411	3288	3289	3290	3291	3292	3293	3294	3295
	103	206	412	3296	3297	3298	3299	3300	3301	3302	3303
			413	3304	3305	3306	3307	3308	3309	3310	3311
		207	414	3312	3313	3314	3315	3316	3317	3318	3319
			415	3320	3321	3322	3323	3324	3325	3326	3327
52	104	208	416	3328	3329	3330	3331	3332	3333	3334	3335
			417	3336	3337	3338	3339	3340	3341	3342	3343
		209	418	3344	3345	3346	3347	3348	3349	3350	3351
			419	3352	3353	3354	3355	3356	3357	3358	3359
	105	210	420	3360	3361	3362	3363	3364	3365	3366	3367
			421	3368	3369	3370	3371	3372	3373	3374	3375
		211	422	3376	3377	3378	3379	3380	3381	3382	3383
			423	3384	3385	3386	3387	3388	3389	3390	3391
53	106	212	424	3392	3393	3394	3395	3396	3397	3398	3399
			425	3400	3401	3402	3403	3404	3405	3406	3407
		213	426	3408	3409	3410	3411	3412	3413	3414	3415
			427	3416	3417	3418	3419	3420	3421	3422	3423
	107	214	428	3424	3425	3426	3427	3428	3429	3430	3431
			429	3432	3433	3434	3435	3436	3437	3438	3439
		215	430	3440	3441	3442	3443	3444	3445	3446	3447
			431	3448	3449	3450	3451	3452	3453	3454	3455

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
54	108	216	432	3456	3457	3458	3459	3460	3461	3462	3463
			433	3464	3465	3466	3467	3468	3469	3470	3471
		217	434	3472	3473	3474	3475	3476	3477	3478	3479
			435	3480	3481	3482	3483	3484	3485	3486	3487
	109	218	436	3488	3489	3490	3491	3492	3493	3494	3495
			437	3496	3497	3498	3499	3500	3501	3502	3503
		219	438	3504	3505	3506	3507	3508	3509	3510	3511
			439	3512	3513	3514	3515	3516	3517	3518	3519
55	110	220	440	3520	3521	3522	3523	3524	3525	3526	3527
			441	3528	3529	3530	3531	3532	3533	3534	3535
		221	442	3536	3537	3538	3539	3540	3541	3542	3543
			443	3544	3545	3546	3547	3548	3549	3550	3551
	111	222	444	3552	3553	3554	3555	3556	3557	3558	3559
			445	3560	3561	3562	3563	3564	3565	3566	3567
		223	446	3568	3569	3570	3571	3572	3573	3574	3575
			447	3576	3577	3578	3579	3580	3581	3582	3583
56	112	224	448	3584	3585	3586	3587	3588	3589	3590	3591
			449	3592	3593	3594	3595	3596	3597	3598	3599
		225	450	3600	3601	3602	3603	3604	3605	3606	3607
			451	3608	3609	3610	3611	3612	3613	3614	3615
	113	226	452	3616	3617	3618	3619	3620	3621	3622	3623
			453	3624	3625	3626	3627	3628	3629	3630	3631
		227	454	3632	3633	3634	3635	3636	3637	3638	3639
			455	3640	3641	3642	3643	3644	3645	3646	3647
57	114	228	456	3648	3649	3650	3651	3652	3653	3654	3655
			457	3656	3657	3658	3659	3660	3661	3662	3663
		229	458	3664	3665	3666	3667	3668	3669	3670	3671
			459	3672	3673	3674	3675	3676	3677	3678	3679
	115	230	460	3680	3681	3682	3683	3684	3685	3686	3687
			461	3688	3689	3690	3691	3692	3693	3694	3695
		231	462	3696	3697	3698	3699	3700	3701	3702	3703
			463	3704	3705	3706	3707	3708	3709	3710	3711
58	116	232	464	3712	3713	3714	3715	3716	3717	3718	3719
			465	3720	3721	3722	3723	3724	3725	3726	3727
		233	466	3728	3729	3730	3731	3732	3733	3734	3735
			467	3736	3737	3738	3739	3740	3741	3742	3743
	117	234	468	3744	3745	3746	3747	3748	3749	3750	3751
			469	3752	3753	3754	3755	3756	3757	3758	3759
		235	470	3760	3761	3762	3763	3764	3765	3766	3767
			471	3768	3769	3770	3771	3772	3773	3774	3775

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
59	118	236	472	3776	3777	3778	3779	3780	3781	3782	3783
			473	3784	3785	3786	3787	3788	3789	3790	3791
		237	474	3792	3793	3794	3795	3796	3797	3798	3799
			475	3800	3801	3802	3803	3804	3805	3806	3807
	119	238	476	3808	3809	3810	3811	3812	3813	3814	3815
			477	3816	3817	3818	3819	3820	3821	3822	3823
		239	478	3824	3825	3826	3827	3828	3829	3830	3831
			479	3832	3833	3834	3835	3836	3837	3838	3839
60	120	240	480	3840	3841	3842	3843	3844	3845	3846	3847
			481	3848	3849	3850	3851	3852	3853	3854	3855
		241	482	3856	3857	3858	3859	3860	3861	3862	3863
			483	3864	3865	3866	3867	3868	3869	3870	3871
	121	242	484	3872	3873	3874	3875	3876	3877	3878	3879
			485	3880	3881	3882	3883	3884	3885	3886	3887
		243	486	3888	3889	3890	3891	3892	3893	3894	3895
			487	3896	3897	3898	3899	3900	3901	3902	3903
61	122	244	488	3904	3905	3906	3907	3908	3909	3910	3911
			489	3912	3913	3914	3915	3916	3917	3918	3919
		245	490	3920	3921	3922	3923	3924	3925	3926	3927
			491	3928	3929	3930	3931	3932	3933	3934	3935
	123	246	492	3936	3937	3938	3939	3940	3941	3942	3943
			493	3944	3945	3946	3947	3948	3949	3950	3951
		247	494	3952	3953	3954	3955	3956	3957	3958	3959
			495	3960	3961	3962	3963	3964	3965	3966	3967
62	124	248	496	3968	3969	3970	3971	3972	3973	3974	3975
			497	3976	3977	3978	3979	3980	3981	3982	3983
		249	498	3984	3985	3986	3987	3988	3989	3990	3991
			499	3992	3993	3994	3995	3996	3997	3998	3999
	125	250	500	4000	4001	4002	4003	4004	4005	4006	4007
			501	4008	4009	4010	4011	4012	4013	4014	4015
		251	502	4016	4017	4018	4019	4020	4021	4022	4023
			503	4024	4025	4026	4027	4028	4029	4030	4031
63	126	252	504	4032	4033	4034	4035	4036	4037	4038	4039
			505	4040	4041	4042	4043	4044	4045	4046	4047
		253	506	4048	4049	4050	4051	4052	4053	4054	4055
			507	4056	4057	4058	4059	4060	4061	4062	4063
	127	254	508	4064	4065	4066	4067	4068	4069	4070	4071
			509	4072	4073	4074	4075	4076	4077	4078	4079
		255	510	4080	4081	4082	4083	4084	4085	4086	4087
			511	4088	4089	4090	4091	4092	4093	4094	4095

8.3.3 Weighing point B

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
84	168	336	672	5376	5377	5378	5379	5380	5381	5382	5383
			673	5384	5385	5386	5387	5388	5389	5390	5391
		337	674	5392	5393	5394	5395	5396	5397	5398	5399
			675	5400	5401	5402	5403	5404	5405	5406	5407
	169	338	676	5408	5409	5410	5411	5412	5413	5414	5415
			677	5416	5417	5418	5419	5420	5421	5422	5423
		339	678	5424	5425	5426	5427	5428	5429	5430	5431
			679	5432	5433	5434	5435	5436	5437	5438	5439
85	170	340	680	5440	5441	5442	5443	5444	5445	5446	5447
			681	5448	5449	5450	5451	5452	5453	5454	5455
		341	682	5456	5457	5458	5459	5460	5461	5462	5463
			683	5464	5465	5466	5467	5468	5469	5470	5471
	171	342	684	5472	5473	5474	5475	5476	5477	5478	5479
			685	5480	5481	5482	5483	5484	5485	5486	5487
		343	686	5488	5489	5490	5491	5492	5493	5494	5495
			687	5496	5497	5498	5499	5500	5501	5502	5503
86	172	344	688	5504	5505	5506	5507	5508	5509	5510	5511
			689	5512	5513	5514	5515	5516	5517	5518	5519
		345	690	5520	5521	5522	5523	5524	5525	5526	5527
			691	5528	5529	5530	5531	5532	5533	5534	5535
	173	346	692	5536	5537	5538	5539	5540	5541	5542	5543
			693	5544	5545	5546	5547	5548	5549	5550	5551
		347	694	5552	5553	5554	5555	5556	5557	5558	5559
			695	5560	5561	5562	5563	5564	5565	5566	5567
87	174	348	696	5568	5569	5570	5571	5572	5573	5574	5575
			697	5576	5577	5578	5579	5580	5581	5582	5583
		349	698	5584	5585	5586	5587	5588	5589	5590	5591
			699	5592	5593	5594	5595	5596	5597	5598	5599
	175	350	700	5600	5601	5602	5603	5604	5605	5606	5607
			701	5608	5609	5610	5611	5612	5613	5614	5615
		351	702	5616	5617	5618	5619	5620	5621	5622	5623
			703	5624	5625	5626	5627	5628	5629	5630	5631
88	176	352	704	5632	5633	5634	5635	5636	5637	5638	5639
			705	5640	5641	5642	5643	5644	5645	5646	5647
		353	706	5648	5649	5650	5651	5652	5653	5654	5655
			707	5656	5657	5658	5659	5660	5661	5662	5663
	177	354	708	5664	5665	5666	5667	5668	5669	5670	5671
			709	5672	5673	5674	5675	5676	5677	5678	5679
		355	710	5680	5681	5682	5683	5684	5685	5686	5687
			711	5688	5689	5690	5691	5692	5693	5694	5695

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
89	178	356	712	5696	5697	5698	5699	5700	5701	5702	5703
			713	5704	5705	5706	5707	5708	5709	5710	5711
		357	714	5712	5713	5714	5715	5716	5717	5718	5719
			715	5720	5721	5722	5723	5724	5725	5726	5727
	179	358	716	5728	5729	5730	5731	5732	5733	5734	5735
			717	5736	5737	5738	5739	5740	5741	5742	5743
		359	718	5744	5745	5746	5747	5748	5749	5750	5751
			719	5752	5753	5754	5755	5756	5757	5758	5759
90	180	360	720	5760	5761	5762	5763	5764	5765	5766	5767
			721	5768	5769	5770	5771	5772	5773	5774	5775
		361	722	5776	5777	5778	5779	5780	5781	5782	5783
			723	5784	5785	5786	5787	5788	5789	5790	5791
	181	362	724	5792	5793	5794	5795	5796	5797	5798	5799
			725	5800	5801	5802	5803	5804	5805	5806	5807
		363	726	5808	5809	5810	5811	5812	5813	5814	5815
			727	5816	5817	5818	5819	5820	5821	5822	5823
91	182	364	728	5824	5825	5826	5827	5828	5829	5830	5831
			729	5832	5833	5834	5835	5836	5837	5838	5839
		365	730	5840	5841	5842	5843	5844	5845	5846	5847
			731	5848	5849	5850	5851	5852	5853	5854	5855
	183	366	732	5856	5857	5858	5859	5860	5861	5862	5863
			733	5864	5865	5866	5867	5868	5869	5870	5871
		367	734	5872	5873	5874	5875	5876	5877	5878	5879
			735	5880	5881	5882	5883	5884	5885	5886	5887
92	184	368	736	5888	5889	5890	5891	5892	5893	5894	5895
			737	5896	5897	5898	5899	5900	5901	5902	5903
		369	738	5904	5905	5906	5907	5908	5909	5910	5911
			739	5912	5913	5914	5915	5916	5917	5918	5919
	185	370	740	5920	5921	5922	5923	5924	5925	5926	5927
			741	5928	5929	5930	5931	5932	5933	5934	5935
		371	742	5936	5937	5938	5939	5940	5941	5942	5943
			743	5944	5945	5946	5947	5948	5949	5950	5951
93	186	372	744	5952	5953	5954	5955	5956	5957	5958	5959
			745	5960	5961	5962	5963	5964	5965	5966	5967
		373	746	5968	5969	5970	5971	5972	5973	5974	5975
			747	5976	5977	5978	5979	5980	5981	5982	5983
	187	374	748	5984	5985	5986	5987	5988	5989	5990	5991
			749	5992	5993	5994	5995	5996	5997	5998	5999
		375	750	6000	6001	6002	6003	6004	6005	6006	6007
			751	6008	6009	6010	6011	6012	6013	6014	6015

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
94	188	376	752	6016	6017	6018	6019	6020	6021	6022	6023
			753	6024	6025	6026	6027	6028	6029	6030	6031
		377	754	6032	6033	6034	6035	6036	6037	6038	6039
			755	6040	6041	6042	6043	6044	6045	6046	6047
	189	378	756	6048	6049	6050	6051	6052	6053	6054	6055
			757	6056	6057	6058	6059	6060	6061	6062	6063
		379	758	6064	6065	6066	6067	6068	6069	6070	6071
			759	6072	6073	6074	6075	6076	6077	6078	6079
95	190	380	760	6080	6081	6082	6083	6084	6085	6086	6087
			761	6088	6089	6090	6091	6092	6093	6094	6095
		381	762	6096	6097	6098	6099	6100	6101	6102	6103
			763	6104	6105	6106	6107	6108	6109	6110	6111
	191	382	764	6112	6113	6114	6115	6116	6117	6118	6119
			765	6120	6121	6122	6123	6124	6125	6126	6127
		383	766	6128	6129	6130	6131	6132	6133	6134	6135
			767	6136	6137	6138	6139	6140	6141	6142	6143
96	192	384	768	6144	6145	6146	6147	6148	6149	6150	6151
			769	6152	6153	6154	6155	6156	6157	6158	6159
		385	770	6160	6161	6162	6163	6164	6165	6166	6167
			771	6168	6169	6170	6171	6172	6173	6174	6175
	193	386	772	6176	6177	6178	6179	6180	6181	6182	6183
			773	6184	6185	6186	6187	6188	6189	6190	6191
		387	774	6192	6193	6194	6195	6196	6197	6198	6199
			775	6200	6201	6202	6203	6204	6205	6206	6207
97	194	388	776	6208	6209	6210	6211	6212	6213	6214	6215
			777	6216	6217	6218	6219	6220	6221	6222	6223
		389	778	6224	6225	6226	6227	6228	6229	6230	6231
			779	6232	6233	6234	6235	6236	6237	6238	6239
	195	390	780	6240	6241	6242	6243	6244	6245	6246	6247
			781	6248	6249	6250	6251	6252	6253	6254	6255
		391	782	6256	6257	6258	6259	6260	6261	6262	6263
			783	6264	6265	6266	6267	6268	6269	6270	6271
98	196	392	784	6272	6273	6274	6275	6276	6277	6278	6279
			785	6280	6281	6282	6283	6284	6285	6286	6287
		393	786	6288	6289	6290	6291	6292	6293	6294	6295
			787	6296	6297	6298	6299	6300	6301	6302	6303
	197	394	788	6304	6305	6306	6307	6308	6309	6310	6311
			789	6312	6313	6314	6315	6316	6317	6318	6319
		395	790	6320	6321	6322	6323	6324	6325	6326	6327
			791	6328	6329	6330	6331	6332	6333	6334	6335

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
99	198	396	792	6336	6337	6338	6339	6340	6341	6342	6343
			793	6344	6345	6346	6347	6348	6349	6350	6351
		397	794	6352	6353	6354	6355	6356	6357	6358	6359
			795	6360	6361	6362	6363	6364	6365	6366	6367
	199	398	796	6368	6369	6370	6371	6372	6373	6374	6375
			797	6376	6377	6378	6379	6380	6381	6382	6383
		399	798	6384	6385	6386	6387	6388	6389	6390	6391
			799	6392	6393	6394	6395	6396	6397	6398	6399
100	200	400	800	6400	6401	6402	6403	6404	6405	6406	6407
			801	6408	6409	6410	6411	6412	6413	6414	6415
		401	802	6416	6417	6418	6419	6420	6421	6422	6423
			803	6424	6425	6426	6427	6428	6429	6430	6431
	201	402	804	6432	6433	6434	6435	6436	6437	6438	6439
			805	6440	6441	6442	6443	6444	6445	6446	6447
		403	806	6448	6449	6450	6451	6452	6453	6454	6455
			807	6456	6457	6458	6459	6460	6461	6462	6463
101	202	404	808	6464	6465	6466	6467	6468	6469	6470	6471
			809	6472	6473	6474	6475	6476	6477	6478	6479
		405	810	6480	6481	6482	6483	6484	6485	6486	6487
			811	6488	6489	6490	6491	6492	6493	6494	6495
	203	406	812	6496	6497	6498	6499	6500	6501	6502	6503
			813	6504	6505	6506	6507	6508	6509	6510	6511
		407	814	6512	6513	6514	6515	6516	6517	6518	6519
			815	6520	6521	6522	6523	6524	6525	6526	6527
102	204	408	816	6528	6529	6530	6531	6532	6533	6534	6535
			817	6536	6537	6538	6539	6540	6541	6542	6543
		409	818	6544	6545	6546	6547	6548	6549	6550	6551
			819	6552	6553	6554	6555	6556	6557	6558	6559
	205	410	820	6560	6561	6562	6563	6564	6565	6566	6567
			821	6568	6569	6570	6571	6572	6573	6574	6575
		411	822	6576	6577	6578	6579	6580	6581	6582	6583
			823	6584	6585	6586	6587	6588	6589	6590	6591
103	206	412	824	6592	6593	6594	6595	6596	6597	6598	6599
			825	6600	6601	6602	6603	6604	6605	6606	6607
		413	826	6608	6609	6610	6611	6612	6613	6614	6615
			827	6616	6617	6618	6619	6620	6621	6622	6623
	207	414	828	6624	6625	6626	6627	6628	6629	6630	6631
			829	6632	6633	6634	6635	6636	6637	6638	6639
		415	830	6640	6641	6642	6643	6644	6645	6646	6647
			831	6648	6649	6650	6651	6652	6653	6654	6655

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
104	208	416	832	6656	6657	6658	6659	6660	6661	6662	6663
			833	6664	6665	6666	6667	6668	6669	6670	6671
		417	834	6672	6673	6674	6675	6676	6677	6678	6679
			835	6680	6681	6682	6683	6684	6685	6686	6687
	209	418	836	6688	6689	6690	6691	6692	6693	6694	6695
			837	6696	6697	6698	6699	6700	6701	6702	6703
		419	838	6704	6705	6706	6707	6708	6709	6710	6711
			839	6712	6713	6714	6715	6716	6717	6718	6719
105	210	420	840	6720	6721	6722	6723	6724	6725	6726	6727
			841	6728	6729	6730	6731	6732	6733	6734	6735
		421	842	6736	6737	6738	6739	6740	6741	6742	6743
			843	6744	6745	6746	6747	6748	6749	6750	6751
	211	422	844	6752	6753	6754	6755	6756	6757	6758	6759
			845	6760	6761	6762	6763	6764	6765	6766	6767
		423	846	6768	6769	6770	6771	6772	6773	6774	6775
			847	6776	6777	6778	6779	6780	6781	6782	6783
106	212	424	848	6784	6785	6786	6787	6788	6789	6790	6791
			849	6792	6793	6794	6795	6796	6797	6798	6799
		425	850	6800	6801	6802	6803	6804	6805	6806	6807
			851	6808	6809	6810	6811	6812	6813	6814	6815
	213	426	852	6816	6817	6818	6819	6820	6821	6822	6823
			853	6824	6825	6826	6827	6828	6829	6830	6831
		427	854	6832	6833	6834	6835	6836	6837	6838	6839
			855	6840	6841	6842	6843	6844	6845	6846	6847
107	214	428	856	6848	6849	6850	6851	6852	6853	6854	6855
			857	6856	6857	6858	6859	6860	6861	6862	6863
		429	858	6864	6865	6866	6867	6868	6869	6870	6871
			859	6872	6873	6874	6875	6876	6877	6878	6879
	215	430	860	6880	6881	6882	6883	6884	6885	6886	6887
			861	6888	6889	6890	6891	6892	6893	6894	6895
		431	862	6896	6897	6898	6899	6900	6901	6902	6903
			863	6904	6905	6906	6907	6908	6909	6910	6911
108	216	432	864	6912	6913	6914	6915	6916	6917	6918	6919
			865	6920	6921	6922	6923	6924	6925	6926	6927
		433	866	6928	6929	6930	6931	6932	6933	6934	6935
			867	6936	6937	6938	6939	6940	6941	6942	6943
	217	434	868	6944	6945	6946	6947	6948	6949	6950	6951
			869	6952	6953	6954	6955	6956	6957	6958	6959
		435	870	6960	6961	6962	6963	6964	6965	6966	6967
			871	6968	6969	6970	6971	6972	6973	6974	6975

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
109	218	436	872	6976	6977	6978	6979	6980	6981	6982	6983
			873	6984	6985	6986	6987	6988	6989	6990	6991
		437	874	6992	6993	6994	6995	6996	6997	6998	6999
			875	7000	7001	7002	7003	7004	7005	7006	7007
	219	438	876	7008	7009	7010	7011	7012	7013	7014	7015
			877	7016	7017	7018	7019	7020	7021	7022	7023
		439	878	7024	7025	7026	7027	7028	7029	7030	7031
			879	7032	7033	7034	7035	7036	7037	7038	7039
110	220	440	880	7040	7041	7042	7043	7044	7045	7046	7047
			881	7048	7049	7050	7051	7052	7053	7054	7055
		441	882	7056	7057	7058	7059	7060	7061	7062	7063
			883	7064	7065	7066	7067	7068	7069	7070	7071
	221	442	884	7072	7073	7074	7075	7076	7077	7078	7079
			885	7080	7081	7082	7083	7084	7085	7086	7087
		443	886	7088	7089	7090	7091	7092	7093	7094	7095
			887	7096	7097	7098	7099	7100	7101	7102	7103
111	222	444	888	7104	7105	7106	7107	7108	7109	7110	7111
			889	7112	7113	7114	7115	7116	7117	7118	7119
		445	890	7120	7121	7122	7123	7124	7125	7126	7127
			891	7128	7129	7130	7131	7132	7133	7134	7135
	223	446	892	7136	7137	7138	7139	7140	7141	7142	7143
			893	7144	7145	7146	7147	7148	7149	7150	7151
		447	894	7152	7153	7154	7155	7156	7157	7158	7159
			895	7160	7161	7162	7163	7164	7165	7166	7167
112	224	448	896	7168	7169	7170	7171	7172	7173	7174	7175
			897	7176	7177	7178	7179	7180	7181	7182	7183
		449	898	7184	7185	7186	7187	7188	7189	7190	7191
			899	7192	7193	7194	7195	7196	7197	7198	7199
	225	450	900	7200	7201	7202	7203	7204	7205	7206	7207
			901	7208	7209	7210	7211	7212	7213	7214	7215
		451	902	7216	7217	7218	7219	7220	7221	7222	7223
			903	7224	7225	7226	7227	7228	7229	7230	7231
113	226	452	904	7232	7233	7234	7235	7236	7237	7238	7239
			905	7240	7241	7242	7243	7244	7245	7246	7247
		453	906	7248	7249	7250	7251	7252	7253	7254	7255
			907	7256	7257	7258	7259	7260	7261	7262	7263
	227	454	908	7264	7265	7266	7267	7268	7269	7270	7271
			909	7272	7273	7274	7275	7276	7277	7278	7279
		455	910	7280	7281	7282	7283	7284	7285	7286	7287
			911	7288	7289	7290	7291	7292	7293	7294	7295

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
114	228	456	912	7296	7297	7298	7299	7300	7301	7302	7303
			913	7304	7305	7306	7307	7308	7309	7310	7311
		457	914	7312	7313	7314	7315	7316	7317	7318	7319
			915	7320	7321	7322	7323	7324	7325	7326	7327
	229	458	916	7328	7329	7330	7331	7332	7333	7334	7335
			917	7336	7337	7338	7339	7340	7341	7342	7343
		459	918	7344	7345	7346	7347	7348	7349	7350	7351
			919	7352	7353	7354	7355	7356	7357	7358	7359
115	230	460	920	7360	7361	7362	7363	7364	7365	7366	7367
			921	7368	7369	7370	7371	7372	7373	7374	7375
		461	922	7376	7377	7378	7379	7380	7381	7382	7383
			923	7384	7385	7386	7387	7388	7389	7390	7391
	231	462	924	7392	7393	7394	7395	7396	7397	7398	7399
			925	7400	7401	7402	7403	7404	7405	7406	7407
		463	926	7408	7409	7410	7411	7412	7413	7414	7415
			927	7416	7417	7418	7419	7420	7421	7422	7423
116	232	464	928	7424	7425	7426	7427	7428	7429	7430	7431
			929	7432	7433	7434	7435	7436	7437	7438	7439
		465	930	7440	7441	7442	7443	7444	7445	7446	7447
			931	7448	7449	7450	7451	7452	7453	7454	7455
	233	466	932	7456	7457	7458	7459	7460	7461	7462	7463
			933	7464	7465	7466	7467	7468	7469	7470	7471
		467	934	7472	7473	7474	7475	7476	7477	7478	7479
			935	7480	7481	7482	7483	7484	7485	7486	7487
117	234	468	936	7488	7489	7490	7491	7492	7493	7494	7495
			937	7496	7497	7498	7499	7500	7501	7502	7503
		469	938	7504	7505	7506	7507	7508	7509	7510	7511
			939	7512	7513	7514	7515	7516	7517	7518	7519
	235	470	940	7520	7521	7522	7523	7524	7525	7526	7527
			941	7528	7529	7530	7531	7532	7533	7534	7535
		471	942	7536	7537	7538	7539	7540	7541	7542	7543
			943	7544	7545	7546	7547	7548	7549	7550	7551
118	236	472	944	7552	7553	7554	7555	7556	7557	7558	7559
			945	7560	7561	7562	7563	7564	7565	7566	7567
		473	946	7568	7569	7570	7571	7572	7573	7574	7575
			947	7576	7577	7578	7579	7580	7581	7582	7583
	237	474	948	7584	7585	7586	7587	7588	7589	7590	7591
			949	7592	7593	7594	7595	7596	7597	7598	7599
		475	950	7600	7601	7602	7603	7604	7605	7606	7607
			951	7608	7609	7610	7611	7612	7613	7614	7615

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
119	238	476	952	7616	7617	7618	7619	7620	7621	7622	7623
			953	7624	7625	7626	7627	7628	7629	7630	7631
		477	954	7632	7633	7634	7635	7636	7637	7638	7639
			955	7640	7641	7642	7643	7644	7645	7646	7647
	239	478	956	7648	7649	7650	7651	7652	7653	7654	7655
			957	7656	7657	7658	7659	7660	7661	7662	7663
		479	958	7664	7665	7666	7667	7668	7669	7670	7671
			959	7672	7673	7674	7675	7676	7677	7678	7679
120	240	480	960	7680	7681	7682	7683	7684	7685	7686	7687
			961	7688	7689	7690	7691	7692	7693	7694	7695
		481	962	7696	7697	7698	7699	7700	7701	7702	7703
			963	7704	7705	7706	7707	7708	7709	7710	7711
	241	482	964	7712	7713	7714	7715	7716	7717	7718	7719
			965	7720	7721	7722	7723	7724	7725	7726	7727
		483	966	7728	7729	7730	7731	7732	7733	7734	7735
			967	7736	7737	7738	7739	7740	7741	7742	7743
121	242	484	968	7744	7745	7746	7747	7748	7749	7750	7751
			969	7752	7753	7754	7755	7756	7757	7758	7759
		485	970	7760	7761	7762	7763	7764	7765	7766	7767
			971	7768	7769	7770	7771	7772	7773	7774	7775
	243	486	972	7776	7777	7778	7779	7780	7781	7782	7783
			973	7784	7785	7786	7787	7788	7789	7790	7791
		487	974	7792	7793	7794	7795	7796	7797	7798	7799
			975	7800	7801	7802	7803	7804	7805	7806	7807
122	244	488	976	7808	7809	7810	7811	7812	7813	7814	7815
			977	7816	7817	7818	7819	7820	7821	7822	7823
		489	978	7824	7825	7826	7827	7828	7829	7830	7831
			979	7832	7833	7834	7835	7836	7837	7838	7839
	245	490	980	7840	7841	7842	7843	7844	7845	7846	7847
			981	7848	7849	7850	7851	7852	7853	7854	7855
		491	982	7856	7857	7858	7859	7860	7861	7862	7863
			983	7864	7865	7866	7867	7868	7869	7870	7871
123	246	492	984	7872	7873	7874	7875	7876	7877	7878	7879
			985	7880	7881	7882	7883	7884	7885	7886	7887
		493	986	7888	7889	7890	7891	7892	7893	7894	7895
			987	7896	7897	7898	7899	7900	7901	7902	7903
	247	494	988	7904	7905	7906	7907	7908	7909	7910	7911
			989	7912	7913	7914	7915	7916	7917	7918	7919
		495	990	7920	7921	7922	7923	7924	7925	7926	7927
			991	7928	7929	7930	7931	7932	7933	7934	7935

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
124	248	496	992	7936	7937	7938	7939	7940	7941	7942	7943
			993	7944	7945	7946	7947	7948	7949	7950	7951
		497	994	7952	7953	7954	7955	7956	7957	7958	7959
			995	7960	7961	7962	7963	7964	7965	7966	7967
	249	498	996	7968	7969	7970	7971	7972	7973	7974	7975
			997	7976	7977	7978	7979	7980	7981	7982	7983
		499	998	7984	7985	7986	7987	7988	7989	7990	7991
			999	7992	7993	7994	7995	7996	7997	7998	7999
125	250	500	1000	8000	8001	8002	8003	8004	8005	8006	8007
			1001	8008	8009	8010	8011	8012	8013	8014	8015
		501	1002	8016	8017	8018	8019	8020	8021	8022	8023
			1003	8024	8025	8026	8027	8028	8029	8030	8031
	251	502	1004	8032	8033	8034	8035	8036	8037	8038	8039
			1005	8040	8041	8042	8043	8044	8045	8046	8047
		503	1006	8048	8049	8050	8051	8052	8053	8054	8055
			1007	8056	8057	8058	8059	8060	8061	8062	8063
126	252	504	1008	8064	8065	8066	8067	8068	8069	8070	8071
			1009	8072	8073	8074	8075	8076	8077	8078	8079
		505	1010	8080	8081	8082	8083	8084	8085	8086	8087
			1011	8088	8089	8090	8091	8092	8093	8094	8095
	253	506	1012	8096	8097	8098	8099	8100	8101	8102	8103
			1013	8104	8105	8106	8107	8108	8109	8110	8111
		507	1014	8112	8113	8114	8115	8116	8117	8118	8119
			1015	8120	8121	8122	8123	8124	8125	8126	8127
127	254	508	1016	8128	8129	8130	8131	8132	8133	8134	8135
			1017	8136	8137	8138	8139	8140	8141	8142	8143
		509	1018	8144	8145	8146	8147	8148	8149	8150	8151
			1019	8152	8153	8154	8155	8156	8157	8158	8159
	255	510	1020	8160	8161	8162	8163	8164	8165	8166	8167
			1021	8168	8169	8170	8171	8172	8173	8174	8175
		511	1022	8176	8177	8178	8179	8180	8181	8182	8183
			1023	8184	8185	8186	8187	8188	8189	8190	8191

8.3.4 Weighing point C

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
148	296	592	1184	9472	9473	9474	9475	9476	9477	9478	9479
			1185	9480	9481	9482	9483	9484	9485	9486	9487
		593	1186	9488	9489	9490	9491	9492	9493	9494	9495
			1187	9496	9497	9498	9499	9500	9501	9502	9503
	297	594	1188	9504	9505	9506	9507	9508	9509	9510	9511
			1189	9512	9513	9514	9515	9516	9517	9518	9519
		595	1190	9520	9521	9522	9523	9524	9525	9526	9527
			1191	9528	9529	9530	9531	9532	9533	9534	9535
149	298	596	1192	9536	9537	9538	9539	9540	9541	9542	9543
			1193	9544	9545	9546	9547	9548	9549	9550	9551
		597	1194	9552	9553	9554	9555	9556	9557	9558	9559
			1195	9560	9561	9562	9563	9564	9565	9566	9567
	299	598	1196	9568	9569	9570	9571	9572	9573	9574	9575
			1197	9576	9577	9578	9579	9580	9581	9582	9583
		599	1198	9584	9585	9586	9587	9588	9589	9590	9591
			1199	9592	9593	9594	9595	9596	9597	9598	9599
150	300	600	1200	9600	9601	9602	9603	9604	9605	9606	9607
			1201	9608	9609	9610	9611	9612	9613	9614	9615
		601	1202	9616	9617	9618	9619	9620	9621	9622	9623
			1203	9624	9625	9626	9627	9628	9629	9630	9631
	301	602	1204	9632	9633	9634	9635	9636	9637	9638	9639
			1205	9640	9641	9642	9643	9644	9645	9646	9647
		603	1206	9648	9649	9650	9651	9652	9653	9654	9655
			1207	9656	9657	9658	9659	9660	9661	9662	9663
151	302	604	1208	9664	9665	9666	9667	9668	9669	9670	9671
			1209	9672	9673	9674	9675	9676	9677	9678	9679
		605	1210	9680	9681	9682	9683	9684	9685	9686	9687
			1211	9688	9689	9690	9691	9692	9693	9694	9695
	303	606	1212	9696	9697	9698	9699	9700	9701	9702	9703
			1213	9704	9705	9706	9707	9708	9709	9710	9711
		607	1214	9712	9713	9714	9715	9716	9717	9718	9719
			1215	9720	9721	9722	9723	9724	9725	9726	9727
152	304	608	1216	9728	9729	9730	9731	9732	9733	9734	9735
			1217	9736	9737	9738	9739	9740	9741	9742	9743
		609	1218	9744	9745	9746	9747	9748	9749	9750	9751
			1219	9752	9753	9754	9755	9756	9757	9758	9759
	305	610	1220	9760	9761	9762	9763	9764	9765	9766	9767
			1221	9768	9769	9770	9771	9772	9773	9774	9775
		611	1222	9776	9777	9778	9779	9780	9781	9782	9783
			1223	9784	9785	9786	9787	9788	9789	9790	9791

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
153	306	612	1224	9792	9793	9794	9795	9796	9797	9798	9799
			1225	9800	9801	9802	9803	9804	9805	9806	9807
		613	1226	9808	9809	9810	9811	9812	9813	9814	9815
			1227	9816	9817	9818	9819	9820	9821	9822	9823
	307	614	1228	9824	9825	9826	9827	9828	9829	9830	9831
			1229	9832	9833	9834	9835	9836	9837	9838	9839
		615	1230	9840	9841	9842	9843	9844	9845	9846	9847
			1231	9848	9849	9850	9851	9852	9853	9854	9855
154	308	616	1232	9856	9857	9858	9859	9860	9861	9862	9863
			1233	9864	9865	9866	9867	9868	9869	9870	9871
		617	1234	9872	9873	9874	9875	9876	9877	9878	9879
			1235	9880	9881	9882	9883	9884	9885	9886	9887
	309	618	1236	9888	9889	9890	9891	9892	9893	9894	9895
			1237	9896	9897	9898	9899	9900	9901	9902	9903
		619	1238	9904	9905	9906	9907	9908	9909	9910	9911
			1239	9912	9913	9914	9915	9916	9917	9918	9919
155	310	620	1240	9920	9921	9922	9923	9924	9925	9926	9927
			1241	9928	9929	9930	9931	9932	9933	9934	9935
		621	1242	9936	9937	9938	9939	9940	9941	9942	9943
			1243	9944	9945	9946	9947	9948	9949	9950	9951
	311	622	1244	9952	9953	9954	9955	9956	9957	9958	9959
			1245	9960	9961	9962	9963	9964	9965	9966	9967
		623	1246	9968	9969	9970	9971	9972	9973	9974	9975
			1247	9976	9977	9978	9979	9980	9981	9982	9983
156	312	624	1248	9984	9985	9986	9987	9988	9989	9990	9991
			1249	9992	9993	9994	9995	9996	9997	9998	9999
		625	1250	10000	10001	10002	10003	10004	10005	10006	10007
			1251	10008	10009	10010	10011	10012	10013	10014	10015
	313	626	1252	10016	10017	10018	10019	10020	10021	10022	10023
			1253	10024	10025	10026	10027	10028	10029	10030	10031
		627	1254	10032	10033	10034	10035	10036	10037	10038	10039
			1255	10040	10041	10042	10043	10044	10045	10046	10047
157	314	628	1256	10048	10049	10050	10051	10052	10053	10054	10055
			1257	10056	10057	10058	10059	10060	10061	10062	10063
		629	1258	10064	10065	10066	10067	10068	10069	10070	10071
			1259	10072	10073	10074	10075	10076	10077	10078	10079
	315	630	1260	10080	10081	10082	10083	10084	10085	10086	10087
			1261	10088	10089	10090	10091	10092	10093	10094	10095
		631	1262	10096	10097	10098	10099	10100	10101	10102	10103
			1263	10104	10105	10106	10107	10108	10109	10110	10111

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		633	1266	10128	10129	10130	10131	10132	10133	10134	10135
			1267	10136	10137	10138	10139	10140	10141	10142	10143
	317	634	1268	10144	10145	10146	10147	10148	10149	10150	10151
			1269	10152	10153	10154	10155	10156	10157	10158	10159
		635	1270	10160	10161	10162	10163	10164	10165	10166	10167
			1271	10168	10169	10170	10171	10172	10173	10174	10175
159	318	636	1272	10176	10177	10178	10179	10180	10181	10182	10183
			1273	10184	10185	10186	10187	10188	10189	10190	10191
		637	1274	10192	10193	10194	10195	10196	10197	10198	10199
			1275	10200	10201	10202	10203	10204	10205	10206	10207
	319	638	1276	10208	10209	10210	10211	10212	10213	10214	10215
			1277	10216	10217	10218	10219	10220	10221	10222	10223
		639	1278	10224	10225	10226	10227	10228	10229	10230	10231
			1279	10232	10233	10234	10235	10236	10237	10238	10239
160	320	640	1280	10240	10241	10242	10243	10244	10245	10246	10247
			1281	10248	10249	10250	10251	10252	10253	10254	10255
		641	1282	10256	10257	10258	10259	10260	10261	10262	10263
			1283	10264	10265	10266	10267	10268	10269	10270	10271
	321	642	1284	10272	10273	10274	10275	10276	10277	10278	10279
			1285	10280	10281	10282	10283	10284	10285	10286	10287
		643	1286	10288	10289	10290	10291	10292	10293	10294	10295
			1287	10296	10297	10298	10299	10300	10301	10302	10303
161	322	644	1288	10304	10305	10306	10307	10308	10309	10310	10311
			1289	10312	10313	10314	10315	10316	10317	10318	10319
		645	1290	10320	10321	10322	10323	10324	10325	10326	10327
			1291	10328	10329	10330	10331	10332	10333	10334	10335
	323	646	1292	10336	10337	10338	10339	10340	10341	10342	10343
			1293	10344	10345	10346	10347	10348	10349	10350	10351
		647	1294	10352	10353	10354	10355	10356	10357	10358	10359
			1295	10360	10361	10362	10363	10364	10365	10366	10367
162	324	648	1296	10368	10369	10370	10371	10372	10373	10374	10375
			1297	10376	10377	10378	10379	10380	10381	10382	10383
		649	1298	10384	10385	10386	10387	10388	10389	10390	10391
			1299	10392	10393	10394	10395	10396	10397	10398	10399
	325	650	1300	10400	10401	10402	10403	10404	10405	10406	10407
			1301	10408	10409	10410	10411	10412	10413	10414	10415
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			1303	10424	10425	10426	10427	10428	10429	10430	10431

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		653	1306	10448	10449	10450	10451	10452	10453	10454	10455
			1307	10456	10457	10458	10459	10460	10461	10462	10463
	327	654	1308	10464	10465	10466	10467	10468	10469	10470	10471
			1309	10472	10473	10474	10475	10476	10477	10478	10479
		655	1310	10480	10481	10482	10483	10484	10485	10486	10487
			1311	10488	10489	10490	10491	10492	10493	10494	10495
164	328	656	1312	10496	10497	10498	10499	10500	10501	10502	10503
			1313	10504	10505	10506	10507	10508	10509	10510	10511
		657	1314	10512	10513	10514	10515	10516	10517	10518	10519
			1315	10520	10521	10522	10523	10524	10525	10526	10527
	329	658	1316	10528	10529	10530	10531	10532	10533	10534	10535
			1317	10536	10537	10538	10539	10540	10541	10542	10543
		659	1318	10544	10545	10546	10547	10548	10549	10550	10551
			1319	10552	10553	10554	10555	10556	10557	10558	10559
165	330	660	1320	10560	10561	10562	10563	10564	10565	10566	10567
			1321	10568	10569	10570	10571	10572	10573	10574	10575
		661	1322	10576	10577	10578	10579	10580	10581	10582	10583
			1323	10584	10585	10586	10587	10588	10589	10590	10591
	331	662	1324	10592	10593	10594	10595	10596	10597	10598	10599
			1325	10600	10601	10602	10603	10604	10605	10606	10607
		663	1326	10608	10609	10610	10611	10612	10613	10614	10615
			1327	10616	10617	10618	10619	10620	10621	10622	10623
166	332	664	1328	10624	10625	10626	10627	10628	10629	10630	10631
			1329	10632	10633	10634	10635	10636	10637	10638	10639
		665	1330	10640	10641	10642	10643	10644	10645	10646	10647
			1331	10648	10649	10650	10651	10652	10653	10654	10655
	333	666	1332	10656	10657	10658	10659	10660	10661	10662	10663
			1333	10664	10665	10666	10667	10668	10669	10670	10671
		667	1334	10672	10673	10674	10675	10676	10677	10678	10679
			1335	10680	10681	10682	10683	10684	10685	10686	10687
167	334	668	1336	10688	10689	10690	10691	10692	10693	10694	10695
			1337	10696	10697	10698	10699	10700	10701	10702	10703
		669	1338	10704	10705	10706	10707	10708	10709	10710	10711
			1339	10712	10713	10714	10715	10716	10717	10718	10719
	335	670	1340	10720	10721	10722	10723	10724	10725	10726	10727
			1341	10728	10729	10730	10731	10732	10733	10734	10735
		671	1342	10736	10737	10738	10739	10740	10741	10742	10743
			1343	10744	10745	10746	10747	10748	10749	10750	10751

%ML	%MD	%MW	%MB	%MX							
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			1345	10760	10761	10762	10763	10764	10765	10766	10767
		673	1346	10768	10769	10770	10771	10772	10773	10774	10775
			1347	10776	10777	10778	10779	10780	10781	10782	10783
	337	674	1348	10784	10785	10786	10787	10788	10789	10790	10791
			1349	10792	10793	10794	10795	10796	10797	10798	10799
		675	1350	10800	10801	10802	10803	10804	10805	10806	10807
			1351	10808	10809	10810	10811	10812	10813	10814	10815
169	338	676	1352	10816	10817	10818	10819	10820	10821	10822	10823
			1353	10824	10825	10826	10827	10828	10829	10830	10831
		677	1354	10832	10833	10834	10835	10836	10837	10838	10839
			1355	10840	10841	10842	10843	10844	10845	10846	10847
	339	678	1356	10848	10849	10850	10851	10852	10853	10854	10855
			1357	10856	10857	10858	10859	10860	10861	10862	10863
		679	1358	10864	10865	10866	10867	10868	10869	10870	10871
			1359	10872	10873	10874	10875	10876	10877	10878	10879
170	340	680	1360	10880	10881	10882	10883	10884	10885	10886	10887
			1361	10888	10889	10890	10891	10892	10893	10894	10895
		681	1362	10896	10897	10898	10899	10900	10901	10902	10903
			1363	10904	10905	10906	10907	10908	10909	10910	10911
	341	682	1364	10912	10913	10914	10915	10916	10917	10918	10919
			1365	10920	10921	10922	10923	10924	10925	10926	10927
		683	1366	10928	10929	10930	10931	10932	10933	10934	10935
			1367	10936	10937	10938	10939	10940	10941	10942	10943
171	342	684	1368	10944	10945	10946	10947	10948	10949	10950	10951
			1369	10952	10953	10954	10955	10956	10957	10958	10959
		685	1370	10960	10961	10962	10963	10964	10965	10966	10967
			1371	10968	10969	10970	10971	10972	10973	10974	10975
	343	686	1372	10976	10977	10978	10979	10980	10981	10982	10983
			1373	10984	10985	10986	10987	10988	10989	10990	10991
		687	1374	10992	10993	10994	10995	10996	10997	10998	10999
			1375	11000	11001	11002	11003	11004	11005	11006	11007
172	344	688	1376	11008	11009	11010	11011	11012	11013	11014	11015
			1377	11016	11017	11018	11019	11020	11021	11022	11023
		689	1378	11024	11025	11026	11027	11028	11029	11030	11031
			1379	11032	11033	11034	11035	11036	11037	11038	11039
	345	690	1380	11040	11041	11042	11043	11044	11045	11046	11047
			1381	11048	11049	11050	11051	11052	11053	11054	11055
		691	1382	11056	11057	11058	11059	11060	11061	11062	11063
			1383	11064	11065	11066	11067	11068	11069	11070	11071

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		693	1386	11088	11089	11090	11091	11092	11093	11094	11095
			1387	11096	11097	11098	11099	11100	11101	11102	11103
	347	694	1388	11104	11105	11106	11107	11108	11109	11110	11111
			1389	11112	11113	11114	11115	11116	11117	11118	11119
		695	1390	11120	11121	11122	11123	11124	11125	11126	11127
			1391	11128	11129	11130	11131	11132	11133	11134	11135
174	348	696	1392	11136	11137	11138	11139	11140	11141	11142	11143
			1393	11144	11145	11146	11147	11148	11149	11150	11151
		697	1394	11152	11153	11154	11155	11156	11157	11158	11159
			1395	11160	11161	11162	11163	11164	11165	11166	11167
	349	698	1396	11168	11169	11170	11171	11172	11173	11174	11175
			1397	11176	11177	11178	11179	11180	11181	11182	11183
		699	1398	11184	11185	11186	11187	11188	11189	11190	11191
			1399	11192	11193	11194	11195	11196	11197	11198	11199
175	350	700	1400	11200	11201	11202	11203	11204	11205	11206	11207
			1401	11208	11209	11210	11211	11212	11213	11214	11215
		701	1402	11216	11217	11218	11219	11220	11221	11222	11223
			1403	11224	11225	11226	11227	11228	11229	11230	11231
	351	702	1404	11232	11233	11234	11235	11236	11237	11238	11239
			1405	11240	11241	11242	11243	11244	11245	11246	11247
		703	1406	11248	11249	11250	11251	11252	11253	11254	11255
			1407	11256	11257	11258	11259	11260	11261	11262	11263
176	352	704	1408	11264	11265	11266	11267	11268	11269	11270	11271
			1409	11272	11273	11274	11275	11276	11277	11278	11279
		705	1410	11280	11281	11282	11283	11284	11285	11286	11287
			1411	11288	11289	11290	11291	11292	11293	11294	11295
	353	706	1412	11296	11297	11298	11299	11300	11301	11302	11303
			1413	11304	11305	11306	11307	11308	11309	11310	11311
		707	1414	11312	11313	11314	11315	11316	11317	11318	11319
			1415	11320	11321	11322	11323	11324	11325	11326	11327
177	354	708	1416	11328	11329	11330	11331	11332	11333	11334	11335
			1417	11336	11337	11338	11339	11340	11341	11342	11343
		709	1418	11344	11345	11346	11347	11348	11349	11350	11351
			1419	11352	11353	11354	11355	11356	11357	11358	11359
	355	710	1420	11360	11361	11362	11363	11364	11365	11366	11367
			1421	11368	11369	11370	11371	11372	11373	11374	11375
		711	1422	11376	11377	11378	11379	11380	11381	11382	11383
			1423	11384	11385	11386	11387	11388	11389	11390	11391

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		713	1426	11408	11409	11410	11411	11412	11413	11414	11415
			1427	11416	11417	11418	11419	11420	11421	11422	11423
	357	714	1428	11424	11425	11426	11427	11428	11429	11430	11431
			1429	11432	11433	11434	11435	11436	11437	11438	11439
		715	1430	11440	11441	11442	11443	11444	11445	11446	11447
			1431	11448	11449	11450	11451	11452	11453	11454	11455
179	358	716	1432	11456	11457	11458	11459	11460	11461	11462	11463
			1433	11464	11465	11466	11467	11468	11469	11470	11471
		717	1434	11472	11473	11474	11475	11476	11477	11478	11479
			1435	11480	11481	11482	11483	11484	11485	11486	11487
	359	718	1436	11488	11489	11490	11491	11492	11493	11494	11495
			1437	11496	11497	11498	11499	11500	11501	11502	11503
		719	1438	11504	11505	11506	11507	11508	11509	11510	11511
			1439	11512	11513	11514	11515	11516	11517	11518	11519
180	360	720	1440	11520	11521	11522	11523	11524	11525	11526	11527
			1441	11528	11529	11530	11531	11532	11533	11534	11535
		721	1442	11536	11537	11538	11539	11540	11541	11542	11543
			1443	11544	11545	11546	11547	11548	11549	11550	11551
	361	722	1444	11552	11553	11554	11555	11556	11557	11558	11559
			1445	11560	11561	11562	11563	11564	11565	11566	11567
		723	1446	11568	11569	11570	11571	11572	11573	11574	11575
			1447	11576	11577	11578	11579	11580	11581	11582	11583
181	362	724	1448	11584	11585	11586	11587	11588	11589	11590	11591
			1449	11592	11593	11594	11595	11596	11597	11598	11599
		725	1450	11600	11601	11602	11603	11604	11605	11606	11607
			1451	11608	11609	11610	11611	11612	11613	11614	11615
	363	726	1452	11616	11617	11618	11619	11620	11621	11622	11623
			1453	11624	11625	11626	11627	11628	11629	11630	11631
		727	1454	11632	11633	11634	11635	11636	11637	11638	11639
			1455	11640	11641	11642	11643	11644	11645	11646	11647
182	364	728	1456	11648	11649	11650	11651	11652	11653	11654	11655
			1457	11656	11657	11658	11659	11660	11661	11662	11663
		729	1458	11664	11665	11666	11667	11668	11669	11670	11671
			1459	11672	11673	11674	11675	11676	11677	11678	11679
	365	730	1460	11680	11681	11682	11683	11684	11685	11686	11687
			1461	11688	11689	11690	11691	11692	11693	11694	11695
		731	1462	11696	11697	11698	11699	11700	11701	11702	11703
			1463	11704	11705	11706	11707	11708	11709	11710	11711

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		733	1466	11728	11729	11730	11731	11732	11733	11734	11735
			1467	11736	11737	11738	11739	11740	11741	11742	11743
	367	734	1468	11744	11745	11746	11747	11748	11749	11750	11751
			1469	11752	11753	11754	11755	11756	11757	11758	11759
		735	1470	11760	11761	11762	11763	11764	11765	11766	11767
			1471	11768	11769	11770	11771	11772	11773	11774	11775
184	368	736	1472	11776	11777	11778	11779	11780	11781	11782	11783
			1473	11784	11785	11786	11787	11788	11789	11790	11791
		737	1474	11792	11793	11794	11795	11796	11797	11798	11799
			1475	11800	11801	11802	11803	11804	11805	11806	11807
	369	738	1476	11808	11809	11810	11811	11812	11813	11814	11815
			1477	11816	11817	11818	11819	11820	11821	11822	11823
		739	1478	11824	11825	11826	11827	11828	11829	11830	11831
			1479	11832	11833	11834	11835	11836	11837	11838	11839
185	370	740	1480	11840	11841	11842	11843	11844	11845	11846	11847
			1481	11848	11849	11850	11851	11852	11853	11854	11855
		741	1482	11856	11857	11858	11859	11860	11861	11862	11863
			1483	11864	11865	11866	11867	11868	11869	11870	11871
	371	742	1484	11872	11873	11874	11875	11876	11877	11878	11879
			1485	11880	11881	11882	11883	11884	11885	11886	11887
		743	1486	11888	11889	11890	11891	11892	11893	11894	11895
			1487	11896	11897	11898	11899	11900	11901	11902	11903
186	372	744	1488	11904	11905	11906	11907	11908	11909	11910	11911
			1489	11912	11913	11914	11915	11916	11917	11918	11919
		745	1490	11920	11921	11922	11923	11924	11925	11926	11927
			1491	11928	11929	11930	11931	11932	11933	11934	11935
	373	746	1492	11936	11937	11938	11939	11940	11941	11942	11943
			1493	11944	11945	11946	11947	11948	11949	11950	11951
		747	1494	11952	11953	11954	11955	11956	11957	11958	11959
			1495	11960	11961	11962	11963	11964	11965	11966	11967
187	374	748	1496	11968	11969	11970	11971	11972	11973	11974	11975
			1497	11976	11977	11978	11979	11980	11981	11982	11983
		749	1498	11984	11985	11986	11987	11988	11989	11990	11991
			1499	11992	11993	11994	11995	11996	11997	11998	11999
	375	750	1500	12000	12001	12002	12003	12004	12005	12006	12007
			1501	12008	12009	12010	12011	12012	12013	12014	12015
		751	1502	12016	12017	12018	12019	12020	12021	12022	12023
			1503	12024	12025	12026	12027	12028	12029	12030	12031

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			1505	12040	12041	12042	12043	12044	12045	12046	12047
		753	1506	12048	12049	12050	12051	12052	12053	12054	12055
			1507	12056	12057	12058	12059	12060	12061	12062	12063
	377	754	1508	12064	12065	12066	12067	12068	12069	12070	12071
			1509	12072	12073	12074	12075	12076	12077	12078	12079
		755	1510	12080	12081	12082	12083	12084	12085	12086	12087
			1511	12088	12089	12090	12091	12092	12093	12094	12095
189	378	756	1512	12096	12097	12098	12099	12100	12101	12102	12103
			1513	12104	12105	12106	12107	12108	12109	12110	12111
		757	1514	12112	12113	12114	12115	12116	12117	12118	12119
			1515	12120	12121	12122	12123	12124	12125	12126	12127
	379	758	1516	12128	12129	12130	12131	12132	12133	12134	12135
			1517	12136	12137	12138	12139	12140	12141	12142	12143
		759	1518	12144	12145	12146	12147	12148	12149	12150	12151
			1519	12152	12153	12154	12155	12156	12157	12158	12159
190	380	760	1520	12160	12161	12162	12163	12164	12165	12166	12167
			1521	12168	12169	12170	12171	12172	12173	12174	12175
		761	1522	12176	12177	12178	12179	12180	12181	12182	12183
			1523	12184	12185	12186	12187	12188	12189	12190	12191
	381	762	1524	12192	12193	12194	12195	12196	12197	12198	12199
			1525	12200	12201	12202	12203	12204	12205	12206	12207
		763	1526	12208	12209	12210	12211	12212	12213	12214	12215
			1527	12216	12217	12218	12219	12220	12221	12222	12223
191	382	764	1528	12224	12225	12226	12227	12228	12229	12230	12231
			1529	12232	12233	12234	12235	12236	12237	12238	12239
		765	1530	12240	12241	12242	12243	12244	12245	12246	12247
			1531	12248	12249	12250	12251	12252	12253	12254	12255
	383	766	1532	12256	12257	12258	12259	12260	12261	12262	12263
			1533	12264	12265	12266	12267	12268	12269	12270	12271
		767	1534	12272	12273	12274	12275	12276	12277	12278	12279
			1535	12280	12281	12282	12283	12284	12285	12286	12287

8.3.5 Weighing point D

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
212	424	848	1696	13568	13569	13570	13571	13572	13573	13574	13575
			1697	13576	13577	13578	13579	13580	13581	13582	13583
		849	1698	13584	13585	13586	13587	13588	13589	13590	13591
			1699	13592	13593	13594	13595	13596	13597	13598	13599
	425	850	1700	13600	13601	13602	13603	13604	13605	13606	13607
			1701	13608	13609	13610	13611	13612	13613	13614	13615
		851	1702	13616	13617	13618	13619	13620	13621	13622	13623
			1703	13624	13625	13626	13627	13628	13629	13630	13631
213	426	852	1704	13632	13633	13634	13635	13636	13637	13638	13639
			1705	13640	13641	13642	13643	13644	13645	13646	13647
		853	1706	13648	13649	13650	13651	13652	13653	13654	13655
			1707	13656	13657	13658	13659	13660	13661	13662	13663
	427	854	1708	13664	13665	13666	13667	13668	13669	13670	13671
			1709	13672	13673	13674	13675	13676	13677	13678	13679
		855	1710	13680	13681	13682	13683	13684	13685	13686	13687
			1711	13688	13689	13690	13691	13692	13693	13694	13695
214	428	856	1712	13696	13697	13698	13699	13700	13701	13702	13703
			1713	13704	13705	13706	13707	13708	13709	13710	13711
		857	1714	13712	13713	13714	13715	13716	13717	13718	13719
			1715	13720	13721	13722	13723	13724	13725	13726	13727
	429	858	1716	13728	13729	13730	13731	13732	13733	13734	13735
			1717	13736	13737	13738	13739	13740	13741	13742	13743
		859	1718	13744	13745	13746	13747	13748	13749	13750	13751
			1719	13752	13753	13754	13755	13756	13757	13758	13759
215	430	860	1720	13760	13761	13762	13763	13764	13765	13766	13767
			1721	13768	13769	13770	13771	13772	13773	13774	13775
		861	1722	13776	13777	13778	13779	13780	13781	13782	13783
			1723	13784	13785	13786	13787	13788	13789	13790	13791
	431	862	1724	13792	13793	13794	13795	13796	13797	13798	13799
			1725	13800	13801	13802	13803	13804	13805	13806	13807
		863	1726	13808	13809	13810	13811	13812	13813	13814	13815
			1727	13816	13817	13818	13819	13820	13821	13822	13823
216	432	864	1728	13824	13825	13826	13827	13828	13829	13830	13831
			1729	13832	13833	13834	13835	13836	13837	13838	13839
		865	1730	13840	13841	13842	13843	13844	13845	13846	13847
			1731	13848	13849	13850	13851	13852	13853	13854	13855
	433	866	1732	13856	13857	13858	13859	13860	13861	13862	13863
			1733	13864	13865	13866	13867	13868	13869	13870	13871
		867	1734	13872	13873	13874	13875	13876	13877	13878	13879
			1735	13880	13881	13882	13883	13884	13885	13886	13887

%ML	%MD	%MW	%MB	%MX							
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217	434	868	1736	13888	13889	13890	13891	13892	13893	13894	13895
			1737	13896	13897	13898	13899	13900	13901	13902	13903
		869	1738	13904	13905	13906	13907	13908	13909	13910	13911
			1739	13912	13913	13914	13915	13916	13917	13918	13919
	435	870	1740	13920	13921	13922	13923	13924	13925	13926	13927
			1741	13928	13929	13930	13931	13932	13933	13934	13935
		871	1742	13936	13937	13938	13939	13940	13941	13942	13943
			1743	13944	13945	13946	13947	13948	13949	13950	13951
218	436	872	1744	13952	13953	13954	13955	13956	13957	13958	13959
			1745	13960	13961	13962	13963	13964	13965	13966	13967
		873	1746	13968	13969	13970	13971	13972	13973	13974	13975
			1747	13976	13977	13978	13979	13980	13981	13982	13983
	437	874	1748	13984	13985	13986	13987	13988	13989	13990	13991
			1749	13992	13993	13994	13995	13996	13997	13998	13999
		875	1750	14000	14001	14002	14003	14004	14005	14006	14007
			1751	14008	14009	14010	14011	14012	14013	14014	14015
219	438	876	1752	14016	14017	14018	14019	14020	14021	14022	14023
			1753	14024	14025	14026	14027	14028	14029	14030	14031
		877	1754	14032	14033	14034	14035	14036	14037	14038	14039
			1755	14040	14041	14042	14043	14044	14045	14046	14047
	439	878	1756	14048	14049	14050	14051	14052	14053	14054	14055
			1757	14056	14057	14058	14059	14060	14061	14062	14063
		879	1758	14064	14065	14066	14067	14068	14069	14070	14071
			1759	14072	14073	14074	14075	14076	14077	14078	14079
220	440	880	1760	14080	14081	14082	14083	14084	14085	14086	14087
			1761	14088	14089	14090	14091	14092	14093	14094	14095
		881	1762	14096	14097	14098	14099	14100	14101	14102	14103
			1763	14104	14105	14106	14107	14108	14109	14110	14111
	441	882	1764	14112	14113	14114	14115	14116	14117	14118	14119
			1765	14120	14121	14122	14123	14124	14125	14126	14127
		883	1766	14128	14129	14130	14131	14132	14133	14134	14135
			1767	14136	14137	14138	14139	14140	14141	14142	14143
221	442	884	1768	14144	14145	14146	14147	14148	14149	14150	14151
			1769	14152	14153	14154	14155	14156	14157	14158	14159
		885	1770	14160	14161	14162	14163	14164	14165	14166	14167
			1771	14168	14169	14170	14171	14172	14173	14174	14175
	443	886	1772	14176	14177	14178	14179	14180	14181	14182	14183
			1773	14184	14185	14186	14187	14188	14189	14190	14191
		887	1774	14192	14193	14194	14195	14196	14197	14198	14199
			1775	14200	14201	14202	14203	14204	14205	14206	14207

%ML	%MD	%MW	%MB	%MX							
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222	444	888	1776	14208	14209	14210	14211	14212	14213	14214	14215
			1777	14216	14217	14218	14219	14220	14221	14222	14223
		889	1778	14224	14225	14226	14227	14228	14229	14230	14231
			1779	14232	14233	14234	14235	14236	14237	14238	14239
	445	890	1780	14240	14241	14242	14243	14244	14245	14246	14247
			1781	14248	14249	14250	14251	14252	14253	14254	14255
		891	1782	14256	14257	14258	14259	14260	14261	14262	14263
			1783	14264	14265	14266	14267	14268	14269	14270	14271
223	446	892	1784	14272	14273	14274	14275	14276	14277	14278	14279
			1785	14280	14281	14282	14283	14284	14285	14286	14287
		893	1786	14288	14289	14290	14291	14292	14293	14294	14295
			1787	14296	14297	14298	14299	14300	14301	14302	14303
	447	894	1788	14304	14305	14306	14307	14308	14309	14310	14311
			1789	14312	14313	14314	14315	14316	14317	14318	14319
		895	1790	14320	14321	14322	14323	14324	14325	14326	14327
			1791	14328	14329	14330	14331	14332	14333	14334	14335
224	448	896	1792	14336	14337	14338	14339	14340	14341	14342	14343
			1793	14344	14345	14346	14347	14348	14349	14350	14351
		897	1794	14352	14353	14354	14355	14356	14357	14358	14359
			1795	14360	14361	14362	14363	14364	14365	14366	14367
	449	898	1796	14368	14369	14370	14371	14372	14373	14374	14375
			1797	14376	14377	14378	14379	14380	14381	14382	14383
		899	1798	14384	14385	14386	14387	14388	14389	14390	14391
			1799	14392	14393	14394	14395	14396	14397	14398	14399
225	450	900	1800	14400	14401	14402	14403	14404	14405	14406	14407
			1801	14408	14409	14410	14411	14412	14413	14414	14415
		901	1802	14416	14417	14418	14419	14420	14421	14422	14423
			1803	14424	14425	14426	14427	14428	14429	14430	14431
	451	902	1804	14432	14433	14434	14435	14436	14437	14438	14439
			1805	14440	14441	14442	14443	14444	14445	14446	14447
		903	1806	14448	14449	14450	14451	14452	14453	14454	14455
			1807	14456	14457	14458	14459	14460	14461	14462	14463
226	452	904	1808	14464	14465	14466	14467	14468	14469	14470	14471
			1809	14472	14473	14474	14475	14476	14477	14478	14479
		905	1810	14480	14481	14482	14483	14484	14485	14486	14487
			1811	14488	14489	14490	14491	14492	14493	14494	14495
	453	906	1812	14496	14497	14498	14499	14500	14501	14502	14503
			1813	14504	14505	14506	14507	14508	14509	14510	14511
		907	1814	14512	14513	14514	14515	14516	14517	14518	14519
			1815	14520	14521	14522	14523	14524	14525	14526	14527

%ML	%MD	%MW	%MB	%MX							
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227	454	908	1816	14528	14529	14530	14531	14532	14533	14534	14535
			1817	14536	14537	14538	14539	14540	14541	14542	14543
		909	1818	14544	14545	14546	14547	14548	14549	14550	14551
			1819	14552	14553	14554	14555	14556	14557	14558	14559
	455	910	1820	14560	14561	14562	14563	14564	14565	14566	14567
			1821	14568	14569	14570	14571	14572	14573	14574	14575
		911	1822	14576	14577	14578	14579	14580	14581	14582	14583
			1823	14584	14585	14586	14587	14588	14589	14590	14591
228	456	912	1824	14592	14593	14594	14595	14596	14597	14598	14599
			1825	14600	14601	14602	14603	14604	14605	14606	14607
		913	1826	14608	14609	14610	14611	14612	14613	14614	14615
			1827	14616	14617	14618	14619	14620	14621	14622	14623
	457	914	1828	14624	14625	14626	14627	14628	14629	14630	14631
			1829	14632	14633	14634	14635	14636	14637	14638	14639
		915	1830	14640	14641	14642	14643	14644	14645	14646	14647
			1831	14648	14649	14650	14651	14652	14653	14654	14655
229	458	916	1832	14656	14657	14658	14659	14660	14661	14662	14663
			1833	14664	14665	14666	14667	14668	14669	14670	14671
		917	1834	14672	14673	14674	14675	14676	14677	14678	14679
			1835	14680	14681	14682	14683	14684	14685	14686	14687
	459	918	1836	14688	14689	14690	14691	14692	14693	14694	14695
			1837	14696	14697	14698	14699	14700	14701	14702	14703
		919	1838	14704	14705	14706	14707	14708	14709	14710	14711
			1839	14712	14713	14714	14715	14716	14717	14718	14719
230	460	920	1840	14720	14721	14722	14723	14724	14725	14726	14727
			1841	14728	14729	14730	14731	14732	14733	14734	14735
		921	1842	14736	14737	14738	14739	14740	14741	14742	14743
			1843	14744	14745	14746	14747	14748	14749	14750	14751
	461	922	1844	14752	14753	14754	14755	14756	14757	14758	14759
			1845	14760	14761	14762	14763	14764	14765	14766	14767
		923	1846	14768	14769	14770	14771	14772	14773	14774	14775
			1847	14776	14777	14778	14779	14780	14781	14782	14783
231	462	924	1848	14784	14785	14786	14787	14788	14789	14790	14791
			1849	14792	14793	14794	14795	14796	14797	14798	14799
		925	1850	14800	14801	14802	14803	14804	14805	14806	14807
			1851	14808	14809	14810	14811	14812	14813	14814	14815
	463	926	1852	14816	14817	14818	14819	14820	14821	14822	14823
			1853	14824	14825	14826	14827	14828	14829	14830	14831
		927	1854	14832	14833	14834	14835	14836	14837	14838	14839
			1855	14840	14841	14842	14843	14844	14845	14846	14847

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
232	464	928	1856	14848	14849	14850	14851	14852	14853	14854	14855
			1857	14856	14857	14858	14859	14860	14861	14862	14863
		929	1858	14864	14865	14866	14867	14868	14869	14870	14871
			1859	14872	14873	14874	14875	14876	14877	14878	14879
	465	930	1860	14880	14881	14882	14883	14884	14885	14886	14887
			1861	14888	14889	14890	14891	14892	14893	14894	14895
		931	1862	14896	14897	14898	14899	14900	14901	14902	14903
			1863	14904	14905	14906	14907	14908	14909	14910	14911
233	466	932	1864	14912	14913	14914	14915	14916	14917	14918	14919
			1865	14920	14921	14922	14923	14924	14925	14926	14927
		933	1866	14928	14929	14930	14931	14932	14933	14934	14935
			1867	14936	14937	14938	14939	14940	14941	14942	14943
	467	934	1868	14944	14945	14946	14947	14948	14949	14950	14951
			1869	14952	14953	14954	14955	14956	14957	14958	14959
		935	1870	14960	14961	14962	14963	14964	14965	14966	14967
			1871	14968	14969	14970	14971	14972	14973	14974	14975
234	468	936	1872	14976	14977	14978	14979	14980	14981	14982	14983
			1873	14984	14985	14986	14987	14988	14989	14990	14991
		937	1874	14992	14993	14994	14995	14996	14997	14998	14999
			1875	15000	15001	15002	15003	15004	15005	15006	15007
	469	938	1876	15008	15009	15010	15011	15012	15013	15014	15015
			1877	15016	15017	15018	15019	15020	15021	15022	15023
		939	1878	15024	15025	15026	15027	15028	15029	15030	15031
			1879	15032	15033	15034	15035	15036	15037	15038	15039
235	470	940	1880	15040	15041	15042	15043	15044	15045	15046	15047
			1881	15048	15049	15050	15051	15052	15053	15054	15055
		941	1882	15056	15057	15058	15059	15060	15061	15062	15063
			1883	15064	15065	15066	15067	15068	15069	15070	15071
	471	942	1884	15072	15073	15074	15075	15076	15077	15078	15079
			1885	15080	15081	15082	15083	15084	15085	15086	15087
		943	1886	15088	15089	15090	15091	15092	15093	15094	15095
			1887	15096	15097	15098	15099	15100	15101	15102	15103
236	472	944	1888	15104	15105	15106	15107	15108	15109	15110	15111
			1889	15112	15113	15114	15115	15116	15117	15118	15119
		945	1890	15120	15121	15122	15123	15124	15125	15126	15127
			1891	15128	15129	15130	15131	15132	15133	15134	15135
	473	946	1892	15136	15137	15138	15139	15140	15141	15142	15143
			1893	15144	15145	15146	15147	15148	15149	15150	15151
		947	1894	15152	15153	15154	15155	15156	15157	15158	15159
			1895	15160	15161	15162	15163	15164	15165	15166	15167

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
237	474	948	1896	15168	15169	15170	15171	15172	15173	15174	15175
			1897	15176	15177	15178	15179	15180	15181	15182	15183
		949	1898	15184	15185	15186	15187	15188	15189	15190	15191
			1899	15192	15193	15194	15195	15196	15197	15198	15199
	475	950	1900	15200	15201	15202	15203	15204	15205	15206	15207
			1901	15208	15209	15210	15211	15212	15213	15214	15215
		951	1902	15216	15217	15218	15219	15220	15221	15222	15223
			1903	15224	15225	15226	15227	15228	15229	15230	15231
238	476	952	1904	15232	15233	15234	15235	15236	15237	15238	15239
			1905	15240	15241	15242	15243	15244	15245	15246	15247
		953	1906	15248	15249	15250	15251	15252	15253	15254	15255
			1907	15256	15257	15258	15259	15260	15261	15262	15263
	477	954	1908	15264	15265	15266	15267	15268	15269	15270	15271
			1909	15272	15273	15274	15275	15276	15277	15278	15279
		955	1910	15280	15281	15282	15283	15284	15285	15286	15287
			1911	15288	15289	15290	15291	15292	15293	15294	15295
239	478	956	1912	15296	15297	15298	15299	15300	15301	15302	15303
			1913	15304	15305	15306	15307	15308	15309	15310	15311
		957	1914	15312	15313	15314	15315	15316	15317	15318	15319
			1915	15320	15321	15322	15323	15324	15325	15326	15327
	479	958	1916	15328	15329	15330	15331	15332	15333	15334	15335
			1917	15336	15337	15338	15339	15340	15341	15342	15343
		959	1918	15344	15345	15346	15347	15348	15349	15350	15351
			1919	15352	15353	15354	15355	15356	15357	15358	15359
240	480	960	1920	15360	15361	15362	15363	15364	15365	15366	15367
			1921	15368	15369	15370	15371	15372	15373	15374	15375
		961	1922	15376	15377	15378	15379	15380	15381	15382	15383
			1923	15384	15385	15386	15387	15388	15389	15390	15391
	481	962	1924	15392	15393	15394	15395	15396	15397	15398	15399
			1925	15400	15401	15402	15403	15404	15405	15406	15407
		963	1926	15408	15409	15410	15411	15412	15413	15414	15415
			1927	15416	15417	15418	15419	15420	15421	15422	15423
241	482	964	1928	15424	15425	15426	15427	15428	15429	15430	15431
			1929	15432	15433	15434	15435	15436	15437	15438	15439
		965	1930	15440	15441	15442	15443	15444	15445	15446	15447
			1931	15448	15449	15450	15451	15452	15453	15454	15455
	483	966	1932	15456	15457	15458	15459	15460	15461	15462	15463
			1933	15464	15465	15466	15467	15468	15469	15470	15471
		967	1934	15472	15473	15474	15475	15476	15477	15478	15479
			1935	15480	15481	15482	15483	15484	15485	15486	15487

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
242	484	968	1936	15488	15489	15490	15491	15492	15493	15494	15495
			1937	15496	15497	15498	15499	15500	15501	15502	15503
		969	1938	15504	15505	15506	15507	15508	15509	15510	15511
			1939	15512	15513	15514	15515	15516	15517	15518	15519
	485	970	1940	15520	15521	15522	15523	15524	15525	15526	15527
			1941	15528	15529	15530	15531	15532	15533	15534	15535
		971	1942	15536	15537	15538	15539	15540	15541	15542	15543
			1943	15544	15545	15546	15547	15548	15549	15550	15551
243	486	972	1944	15552	15553	15554	15555	15556	15557	15558	15559
			1945	15560	15561	15562	15563	15564	15565	15566	15567
		973	1946	15568	15569	15570	15571	15572	15573	15574	15575
			1947	15576	15577	15578	15579	15580	15581	15582	15583
	487	974	1948	15584	15585	15586	15587	15588	15589	15590	15591
			1949	15592	15593	15594	15595	15596	15597	15598	15599
		975	1950	15600	15601	15602	15603	15604	15605	15606	15607
			1951	15608	15609	15610	15611	15612	15613	15614	15615
244	488	976	1952	15616	15617	15618	15619	15620	15621	15622	15623
			1953	15624	15625	15626	15627	15628	15629	15630	15631
		977	1954	15632	15633	15634	15635	15636	15637	15638	15639
			1955	15640	15641	15642	15643	15644	15645	15646	15647
	489	978	1956	15648	15649	15650	15651	15652	15653	15654	15655
			1957	15656	15657	15658	15659	15660	15661	15662	15663
		979	1958	15664	15665	15666	15667	15668	15669	15670	15671
			1959	15672	15673	15674	15675	15676	15677	15678	15679
245	490	980	1960	15680	15681	15682	15683	15684	15685	15686	15687
			1961	15688	15689	15690	15691	15692	15693	15694	15695
		981	1962	15696	15697	15698	15699	15700	15701	15702	15703
			1963	15704	15705	15706	15707	15708	15709	15710	15711
	491	982	1964	15712	15713	15714	15715	15716	15717	15718	15719
			1965	15720	15721	15722	15723	15724	15725	15726	15727
		983	1966	15728	15729	15730	15731	15732	15733	15734	15735
			1967	15736	15737	15738	15739	15740	15741	15742	15743
246	492	984	1968	15744	15745	15746	15747	15748	15749	15750	15751
			1969	15752	15753	15754	15755	15756	15757	15758	15759
		985	1970	15760	15761	15762	15763	15764	15765	15766	15767
			1971	15768	15769	15770	15771	15772	15773	15774	15775
	493	986	1972	15776	15777	15778	15779	15780	15781	15782	15783
			1973	15784	15785	15786	15787	15788	15789	15790	15791
		987	1974	15792	15793	15794	15795	15796	15797	15798	15799
			1975	15800	15801	15802	15803	15804	15805	15806	15807

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
247	494	988	1976	15808	15809	15810	15811	15812	15813	15814	15815
			1977	15816	15817	15818	15819	15820	15821	15822	15823
		989	1978	15824	15825	15826	15827	15828	15829	15830	15831
			1979	15832	15833	15834	15835	15836	15837	15838	15839
	495	990	1980	15840	15841	15842	15843	15844	15845	15846	15847
			1981	15848	15849	15850	15851	15852	15853	15854	15855
		991	1982	15856	15857	15858	15859	15860	15861	15862	15863
			1983	15864	15865	15866	15867	15868	15869	15870	15871
248	496	992	1984	15872	15873	15874	15875	15876	15877	15878	15879
			1985	15880	15881	15882	15883	15884	15885	15886	15887
		993	1986	15888	15889	15890	15891	15892	15893	15894	15895
			1987	15896	15897	15898	15899	15900	15901	15902	15903
	497	994	1988	15904	15905	15906	15907	15908	15909	15910	15911
			1989	15912	15913	15914	15915	15916	15917	15918	15919
		995	1990	15920	15921	15922	15923	15924	15925	15926	15927
			1991	15928	15929	15930	15931	15932	15933	15934	15935
249	498	996	1992	15936	15937	15938	15939	15940	15941	15942	15943
			1993	15944	15945	15946	15947	15948	15949	15950	15951
		997	1994	15952	15953	15954	15955	15956	15957	15958	15959
			1995	15960	15961	15962	15963	15964	15965	15966	15967
	499	998	1996	15968	15969	15970	15971	15972	15973	15974	15975
			1997	15976	15977	15978	15979	15980	15981	15982	15983
		999	1998	15984	15985	15986	15987	15988	15989	15990	15991
			1999	15992	15993	15994	15995	15996	15997	15998	15999
250	500	1000	2000	16000	16001	16002	16003	16004	16005	16006	16007
			2001	16008	16009	16010	16011	16012	16013	16014	16015
		1001	2002	16016	16017	16018	16019	16020	16021	16022	16023
			2003	16024	16025	16026	16027	16028	16029	16030	16031
	501	1002	2004	16032	16033	16034	16035	16036	16037	16038	16039
			2005	16040	16041	16042	16043	16044	16045	16046	16047
		1003	2006	16048	16049	16050	16051	16052	16053	16054	16055
			2007	16056	16057	16058	16059	16060	16061	16062	16063
251	502	1004	2008	16064	16065	16066	16067	16068	16069	16070	16071
			2009	16072	16073	16074	16075	16076	16077	16078	16079
		1005	2010	16080	16081	16082	16083	16084	16085	16086	16087
			2011	16088	16089	16090	16091	16092	16093	16094	16095
	503	1006	2012	16096	16097	16098	16099	16100	16101	16102	16103
			2013	16104	16105	16106	16107	16108	16109	16110	16111
		1007	2014	16112	16113	16114	16115	16116	16117	16118	16119
			2015	16120	16121	16122	16123	16124	16125	16126	16127

%ML	%MD	%MW	%MB	%MX							
				0	1	2	3	4	5	6	7
252	504	1008	2016	16128	16129	16130	16131	16132	16133	16134	16135
			2017	16136	16137	16138	16139	16140	16141	16142	16143
		1009	2018	16144	16145	16146	16147	16148	16149	16150	16151
			2019	16152	16153	16154	16155	16156	16157	16158	16159
	505	1010	2020	16160	16161	16162	16163	16164	16165	16166	16167
			2021	16168	16169	16170	16171	16172	16173	16174	16175
		1011	2022	16176	16177	16178	16179	16180	16181	16182	16183
			2023	16184	16185	16186	16187	16188	16189	16190	16191
253	506	1012	2024	16192	16193	16194	16195	16196	16197	16198	16199
			2025	16200	16201	16202	16203	16204	16205	16206	16207
		1013	2026	16208	16209	16210	16211	16212	16213	16214	16215
			2027	16216	16217	16218	16219	16220	16221	16222	16223
	507	1014	2028	16224	16225	16226	16227	16228	16229	16230	16231
			2029	16232	16233	16234	16235	16236	16237	16238	16239
		1015	2030	16240	16241	16242	16243	16244	16245	16246	16247
			2031	16248	16249	16250	16251	16252	16253	16254	16255
254	508	1016	2032	16256	16257	16258	16259	16260	16261	16262	16263
			2033	16264	16265	16266	16267	16268	16269	16270	16271
		1017	2034	16272	16273	16274	16275	16276	16277	16278	16279
			2035	16280	16281	16282	16283	16284	16285	16286	16287
	509	1018	2036	16288	16289	16290	16291	16292	16293	16294	16295
			2037	16296	16297	16298	16299	16300	16301	16302	16303
		1019	2038	16304	16305	16306	16307	16308	16309	16310	16311
			2039	16312	16313	16314	16315	16316	16317	16318	16319
255	510	1020	2040	16320	16321	16322	16323	16324	16325	16326	16327
			2041	16328	16329	16330	16331	16332	16333	16334	16335
		1021	2042	16336	16337	16338	16339	16340	16341	16342	16343
			2043	16344	16345	16346	16347	16348	16349	16350	16351
	511	1022	2044	16352	16353	16354	16355	16356	16357	16358	16359
			2045	16360	16361	16362	16363	16364	16365	16366	16367
		1023	2046	16368	16369	16370	16371	16372	16373	16374	16375
			2047	16376	16377	16378	16379	16380	16381	16382	16383

8.4 SPM Layout of the Firmware

Defined ranges are assigned to firmware functions.

Weights are DINT formats in "kg" or "lb" depending on scale configuration.

8.4.1 Weighing point A

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	R	ADC error	X32
BOOL	R	Above Max (FSD)	X33
BOOL	R	Overload, above (Max + the range that is still permissible)	X34
BOOL	R	Below zero	X35
BOOL	R	Zero ±¼d	X36
BOOL	R	Within the zero setting range	X37
BOOL	R	Weight is stable	X38
BOOL	R	Below zero or above Max (FSD)	X39
BOOL	R	Measuring signal negative (error 7)	X40
BOOL	R	Measuring signal >36 mV (error 3)	X41
BOOL	R	Internal arithmetic error; CAL data perhaps faulty (error 1)	X42
BOOL	R	No or too low sense voltage (error 6)	X43
BOOL	R	No communication with xBPI scale (error 9)	X44

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	R	Command error	X48
BOOL	R	Command active	X49
BOOL	R	Power fail signal	X50
BOOL	R	Test mode active	X56
BOOL	R	Calibration active	X57
BOOL	R	Instrument is tared	X58
BOOL	R/W	Switch D11 to net weight	X72
BOOL	W	Set device to zero	X112
BOOL	W	Taring a device	X113
BOOL	W	Reset the tare of the device	X114
BOOL	W	Start test mode	X115
BOOL	W	End test mode	X116
BOOL	W	Reset the power fail signal	X117
BOOL	W	Set the fixtare value as tare	X118
BOOL	W	Store the current gross weight in the fixtare memory (D31)	X119
BOOL	W	Reset error	X121
BYTE	R	Indicator status	B4 (X32–X39)
BYTE	R	ADC status	B5 (X40–X44)
BYTE	R	Command status	B6 (X48–X50)
BYTE	R	Active status	B7 (X56–X58)
BYTE	R	Exponent (digits behind the decimal point)	B16
BYTE	R	Weight unit 2=gr, 3=kg, 4=t, 5=lb	B17
BYTE	R	Scale interval (multi-interval/multiple range:d1 or e1)	B18
USINT	R	Last error	B19
BYTE	R	High byte of product code (0x54)	B20
BYTE	R	Low byte of product code (0x10)	B21
BYTE	R	Major version number (1.0)	B22
BYTE	R	Minor version number (1.0)	B23

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BYTE	R	ADC status	B31
UDINT	R	Serial number	D6
DINT	R	Current gross weight	D8
DINT	R	Current net weight	D9
DINT	R	Current tare weight	D10
DINT	R	Current gross/net weight selected with X72	D11
DINT	R	Max weight (FSD)	D14
DINT	R	Min weight	D15
DINT	R/W	Write the value in the fixtare memory	D31
INT	R	Counter incremented with every measurement value	W14

8.4.2 Weighing point B

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	R	ADC error	X4128
BOOL	R	Above Max (FSD)	X4129
BOOL	R	Overload, above (Max + the range that is still permissible)	X4130
BOOL	R	Below zero	X4131
BOOL	R	Zero ±¼d	X4132
BOOL	R	Within the zero setting range	X4133
BOOL	R	Weight is stable	X4134
BOOL	R	Below zero or above Max (FSD)	X4135
BOOL	R	Measuring signal negative (error 7)	X4136
BOOL	R	Measuring signal >36 mV (error 3)	X4137
BOOL	R	Internal arithmetic error; CAL data perhaps faulty (error 1)	X4138
BOOL	R	No or too low sense voltage (error 6)	X4139
BOOL	R	No communication with xBPI scale (error 9)	X4140

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	R	Command error	X4144
BOOL	R	Command active	X4145
BOOL	R	Power fail signal	X4146
BOOL	R	Test mode active	X4152
BOOL	R	Calibration active	X4153
BOOL	R	Instrument is tared	X4154
BOOL	R/W	Switch D139 to net weight	X4168
BOOL	W	Set device to zero	X4208
BOOL	W	Taring a device	X4209
BOOL	W	Reset the tare of the device	X4210
BOOL	W	Start test mode	X4211
BOOL	W	End test mode	X4212
BOOL	W	Reset the power fail signal	X4213
BOOL	W	Set the fixtare value as tare	X4214
BOOL	W	Store the current gross weight in the fixtare memory (D159)	X4215
BOOL	W	Reset error	X4217
BYTE	R	Indicator status	B516 (X4128–X4135)
BYTE	R	ADC status	B517 (X4136–X4140)
BYTE	R	Command status	B518 (X4144–X4146)
BYTE	R	Active status	B519 (X4152–X4154)

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BYTE	R	Exponent (digits behind the decimal point)	B528
BYTE	R	Weight unit 2=gr, 3=kg, 4=t, 5=lb	B529
BYTE	R	Scale interval (multi-interval/multiple range:d1 or e1)	B530
USINT	R	Last error	B531
BYTE	R	High byte of product code (0x54)	B532
BYTE	R	Low byte of product code (0x10)	B533
BYTE	R	Major version number (1.0)	B534
BYTE	R	Minor version number (1.0)	B535
BYTE	R	ADC status	B543
UDINT	R	Serial number	D134
DINT	R	Current gross weight	D136
DINT	R	Current net weight	D137
DINT	R	Current tare weight	D138
DINT	R	Current gross/net weight selected with X4168	D139
DINT	R	Max weight (FSD)	D142
DINT	R	Min weight	D143
DINT	R/W	Write the value in the fixtare memory	D159
INT	R	Counter incremented with every measurement value	W270

8.4.3 Weighing point C

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	R	ADC error	X8224
BOOL	R	Above Max (FSD)	X8225
BOOL	R	Overload, above (Max + the range that is still permissible)	X8226
BOOL	R	Below zero	X8227
BOOL	R	Zero ±¼d	X8228
BOOL	R	Within the zero setting range	X8229
BOOL	R	Weight is stable	X8230
BOOL	R	Below zero or above Max (FSD)	X8231
BOOL	R	Measuring signal negative (error 7)	X8232
BOOL	R	Measuring signal >36 mV (error 3)	X8233
BOOL	R	Internal arithmetic error; CAL data perhaps faulty (error 1)	X8234
BOOL	R	No or too low sense voltage (error 6)	X8235
BOOL	R	No communication with xBPI scale (error 9)	X8236
BOOL	R	Command error	X8240
BOOL	R	Command active	X8241
BOOL	R	Power fail signal	X8242
BOOL	R	Test mode active	X8248
BOOL	R	Calibration active	X8249
BOOL	R	Instrument is tared	X8250
BOOL	R/W	Switch D267 to net weight	X8264
BOOL	W	Set device to zero	X8304
BOOL	W	Taring a device	X8305
BOOL	W	Reset the tare of the device	X8306
BOOL	W	Start test mode	X8307
BOOL	W	End test mode	X8308
BOOL	W	Reset the power fail signal	X8309
BOOL	W	Set the fixtare value as tare	X8310
BOOL	W	Store the current gross weight in the fixtare memory (D287)	X8311

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	W	Reset error	X8313
BYTE	R	Indicator status	B1028 (X8224–X8231)
BYTE	R	ADC status	B1029 (X8232–X8236)
BYTE	R	Command status	B1030 (X8240–X8242)
BYTE	R	Active status	B1031 (X8248–X8250)
BYTE	R	Exponent (digits behind the decimal point)	B1040
BYTE	R	Weight unit 2=gr, 3=kg, 4=t, 5=lb	B1041
BYTE	R	Scale interval (multi-interval/multiple range:d1 or e1)	B1042
USINT	R	Last error	B1043
BYTE	R	High byte of product code (0x54)	B1044
BYTE	R	Low byte of product code (0x10)	B1045
BYTE	R	Major version number (1.0)	B1046
BYTE	R	Minor version number (1.0)	B1047
BYTE	R	ADC status	B1055
UDINT	R	Serial number	D262
DINT	R	Current gross weight	D264
DINT	R	Current net weight	D265
DINT	R	Current tare weight	D266
DINT	R	Current gross/net weight selected with X8264	D267
DINT	R	Max weight (FSD)	D270
DINT	R	Min weight	D271
DINT	R/W	Write the value in the fixtare memory	D287
INT	R	Counter incremented with every measurement value	W526

8.4.4 Weighing point D

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	R	ADC error	X12320
BOOL	R	Above Max (FSD)	X12321
BOOL	R	Overload, above (Max + the range that is still permissible)	X12322
BOOL	R	Below zero	X12323
BOOL	R	Zero ±¼d	X12324
BOOL	R	Within the zero setting range	X12325
BOOL	R	Weight is stable	X12326
BOOL	R	Below zero or above Max (FSD)	X12327
BOOL	R	Measuring signal negative (error 7)	X12328
BOOL	R	Measuring signal >36 mV (error 3)	X12329
BOOL	R	Internal arithmetic error; CAL data perhaps faulty (error 1)	X12330
BOOL	R	No or too low sense voltage (error 6)	X12331
BOOL	R	No communication with xBPI scale (error 9)	X12332
BOOL	R	Command error	X12336
BOOL	R	Command active	X12337
BOOL	R	Power fail signal	X12338
BOOL	R	Test mode active	X12344
BOOL	R	Calibration active	X12345
BOOL	R	Instrument is tared	X12346
BOOL	R/W	Switch D395 to net weight	X12360
BOOL	W	Set device to zero	X12400
BOOL	W	Taring a device	X12401
BOOL	W	Reset the tare of the device	X12402
BOOL	W	Start test mode	X12403
BOOL	W	End test mode	X12404
BOOL	W	Reset the power fail signal	X12405
BOOL	W	Set the fixtare value as tare	X12406
BOOL	W	Store the current gross weight in the fixtare memory (D415)	X12407

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	W	Reset error	X12409
BYTE	R	Indicator status	B1540 (X12320–X12323)
BYTE	R	ADC status	B1541 (X12328–X12332)
BYTE	R	Command status	B1542 (X12336–X12338)
BYTE	R	Active status	B1543 (X12344–X12346)
BYTE	R	Exponent (digits behind the decimal point)	B1552
BYTE	R	Weight unit 2=gr, 3=kg, 4=t, 5=lb	B1553
BYTE	R	Scale interval (multi-interval/multiple range:d1 or e1)	B1554
USINT	R	Last error	B1555
BYTE	R	High byte of product code (0x54)	B1556
BYTE	R	Low byte of product code (0x10)	B1557
BYTE	R	Major version number (1.0)	B1558
BYTE	R	Minor version number (1.0)	B1559
BYTE	R	ADC status	B1567
UDINT	R	Serial number	D390
DINT	R	Current gross weight	D392
DINT	R	Current net weight	D393
DINT	R	Current tare weight	D394
DINT	R	Current gross/net weight selected with X12360	D395
DINT	R	Max weight (FSD)	D398
DINT	R	Min weight	D399
DINT	R/W	Write the value in the fixtare memory	D415
INT	R	Counter incremented with every measurement value	W782

8.5 SPM Layout of the Application

8.5.1 Weighing point A

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	R	Built-in digital input 1...4	X0-3
BOOL	R	Built-in digital output 1...4	X8-11
BOOL	R	Limit 1	X16
BOOL	R	Limit 2	X17
BOOL	R	Weight is valid	X1024
BOOL	R	Coarse flow	X1028
BOOL	R	Fine flow	X1029
BOOL	R	Discharge	X1030
BOOL	R	Direction for simulation	X1031
BOOL	R	Flow warning	X1035
BOOL	R	Tolerance alarm	X1036
LWORD	R	SPM out: Output	L17 X1088–X1151
LWORD	R	SPM out AND coarse: Output and coarse	L18 X1152–X1215
LWORD	R	SPM out AND fine: Output and fine	L19 X1216–X1279
DINT	R	Alive counter Check communication to device	D23
DINT	R	Limit 1 on	D24
DINT	R	Limit 1 off	D25
DINT	R	Limit 2 on	D26
DINT	R	Limit 2 off	D27

8.5.2 Weighing point B

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	R	Built-in digital input 1...4	X4096-4099
BOOL	R	Built-in digital output 1...4	X4104-4107
BOOL	R	Limit 1	X4112
BOOL	R	Limit 2	X4113
BOOL	R	Weight is valid	X5120
BOOL	R	Coarse flow	X5124
BOOL	R	Fine flow	X5125
BOOL	R	Discharge	X5126
BOOL	R	Direction for simulation	X5127
BOOL	R	Flow warning	X5131
BOOL	R	Tolerance alarm	X5132
LWORD	R	SPM out: Output	L81 X5184–X5247
LWORD	R	SPM out AND coarse: Output and coarse	L82 X5248–X5311
LWORD	R	SPM out AND fine: Output and fine	L83 X5312–X5375
DINT	R	Alive counter Check communication to device	D151
DINT	R	Limit 1 on	D152
DINT	R	Limit 1 off	D153
DINT	R	Limit 2 on	D154
DINT	R	Limit 2 off	D155

8.5.3 Weighing point C

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	R	Built-in digital input 1...4	X8192-8195
BOOL	R	Built-in digital output 1...4	X8200-8203
BOOL	R	Limit 1	X8208
BOOL	R	Limit 2	X8209
BOOL	R	Weight is valid	X9216
BOOL	R	Coarse flow	X9220
BOOL	R	Fine flow	X9221
BOOL	R	Discharge	X9222
BOOL	R	Direction for simulation	X9223
BOOL	R	Flow warning	X9227
BOOL	R	Tolerance alarm	X9228
LWORD	R	SPM out: Output	L145 X9280–X9343
LWORD	R	SPM out AND coarse: Output and coarse	L146 X9344–X9407
LWORD	R	SPM out AND fine: Output and fine	L147 X9408–X9471
DINT	R	Alive counter Check communication to device	D279
DINT	R	Limit 1 on	D280
DINT	R	Limit 1 off	D281
DINT	R	Limit 2 on	D282
DINT	R	Limit 2 off	D283

8.5.4 Weighing point D

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	R	Built-in digital input 1...4	X12288-12291
BOOL	R	Built-in digital output 1...4	X12296-12299
BOOL	R	Limit 1	X12304
BOOL	R	Limit 2	X12305
BOOL	R	Weight is valid	X13312
BOOL	R	Coarse flow	X13316
BOOL	R	Fine flow	X13317
BOOL	R	Discharge	X13318
BOOL	R	Direction for simulation	X13319
BOOL	R	Flow warning	X13323
BOOL	R	Tolerance alarm	X13324
LWORD	R	SPM out: Output	L209 X13376–X13439
LWORD	R	SPM out AND coarse: Output and coarse	L210 X13440–X13503
LWORD	R	SPM out AND fine: Output and fine	L211 X13504–X13567
DINT	R	Alive counter Check communication to device	D407
DINT	R	Limit 1 on	D408
DINT	R	Limit 1 off	D409
DINT	R	Limit 2 on	D410
DINT	R	Limit 2 off	D411

8.5.5 Digital and Analog Inputs and Outputs

Keyword	Access type: Read [R]/ Write [W]	Function	Address
DINT	R	Digital input 1	D512
DINT	R	Digital input 2	D513
DINT	R	Digital input 3 (internal)	D514
DINT	R/W	Digital output 1	D516
DINT	R/W	Digital output 2	D517
DINT	R/W	Digital output 3 (internal)	D518
DINT	R	Analog input 1	D520
DINT	R	Analog input 2	D521
DINT	R/W	Analog output 1	D523
DINT	R/W	Analog output 2	D524

8.5.6 ModBus-TCP modules

Keyword	Access type: Read [R]/ Write [W]	Function	Address
UINT	R	Input module 1	W1052
BOOL	R	Digital inputs 1–16	X16832–16847
UINT	R	Input module 2	W1053
BOOL	R	Digital inputs 1–16	X16848–16863
UINT	R	Input module 3	W1054
BOOL	R	Digital inputs 1–16	X16864–16879
UINT	R	Input module 4	W1055
BOOL	R	Digital inputs 1–16	X16880–16895
UINT	R	Input module 5	W1056
BOOL	R	Digital inputs 1–8	X16904–16911
UINT	R	Input module 6	W1057
BOOL	R	Digital inputs 1–8	X16920–16927
UINT	R	Input module 7	W1058
BOOL	R	Digital inputs 1–8	X16936–16943
UINT	R	Input module 8	W1059
BOOL	R	Digital inputs 1–8	X16952–16959
UINT	R/W	Output module 1	W1062
BOOL	R/W	Digital outputs 1–16	X16992–17007
UINT	R/W	Output module 2	W1063
BOOL	R/W	Digital outputs 1–16	X17008–17023
UINT	R/W	Output module 3	W1064
BOOL	R/W	Digital outputs 1–16	X17024–17039
UINT	R/W	Output module 4	W1065
BOOL	R/W	Digital outputs 1–16	X17040–17055
UINT	R/W	Output module 5-0	W1066
BOOL	R/W	Digital outputs 1–16	X17056–17071
UINT	R/W	Output module 5-1	W1067
BOOL	R/W	Digital outputs 17–32	X17072–17087
UINT	R/W	Output module 5-2	W1068
BOOL	R/W	Digital outputs 33–36	X17100–17103

Keyword	Access type: Read [R]/ Write [W]	Function	Address
UINT	R/W	Output module 6-0	W1069
BOOL	R/W	Digital outputs 1–16	X17104–17119
UINT	R/W	Output module 6-1	W1070
BOOL	R/W	Digital outputs 17–32	X17120–17135
UINT	R/W	Output module 6-2	W1071
BOOL	R/W	Digital outputs 33–36	X17148–17151
UINT	R/W	Output module 7-0	W1072
BOOL	R/W	Digital outputs 1–16	X17152–17167
UINT	R/W	Output module 7-1	W1073
BOOL	R/W	Digital outputs 17–32	X17168–17183
UINT	R/W	Output module 7-2	W1074
BOOL	R/W	Digital outputs 33–48	X17184–17199
UINT	R/W	Output module 7-3	W1075
BOOL	R/W	Digital outputs 49–52	X17212–17215
UINT	R/W	Output module 8-0	W1076
BOOL	R/W	Digital outputs 1–16	X17216–17231
UINT	R/W	Output module 8-1	W1077
BOOL	R/W	Digital outputs 17–32	X17232–17247
UINT	R/W	Output module 8-2	W1078
BOOL	R/W	Digital outputs 33–48	X17248–17263
UINT	R/W	Output module 8-3	W1079
BOOL	R/W	Digital outputs 49–52	X17276–17279

8.5.7 Common SPM

Keyword	Access type: Read [R]/ Write [W]	Function	Address
BOOL	R/W	Stop all batching processes	X20482
BOOL	R/W	A tolerance alarm was triggered at a weighing point.	X20484
BOOL	R/W	Remote production	X20488...20495

9 Databases

9.1 General Information

The editing of the databases via OPC is divided into three classes:

Class 1: Databases with unrestricted access rights (read and write)

ORDER	New orders are stored here by the user.
REPORT	The batch reports from the system are saved here by line.

Class 2: Databases that can be read (ready only)

MAT	Description of a "material"
REC	Description of the lines of all "recipes"
ORD	List of "orders" that are pending or in progress

Class 3: Databases that cannot be accessed (hidden)

WRK	Docket for active recipes
TMP	Copy of the last batch report
SPL	Printer buffer for batch reports

9.2 Databases with Unrestricted Access Rights

9.2.1 Order (ORDER)

The user stores new orders here. The orders are checked over a period of approx. 1 s and moved to "ORD", with the addition of important internal parameters. If the check shows that the order cannot be produced then the dataset is marked as defective and is not moved.

The error must then be rectified or the dataset must be deleted.

Structure

```
T_ORDER        : STRUCT
  ID           : STR18;              (* order identification *)
  RecMat       : STR18;              (* name of the recipe / material *)
  Name         : STR18;              (* name of the product *)
  Text         : STR18;              (* configuration dependent data *)
  Setpoint     : REAL;               (* setpoint total recipe / material *)
  ChgBy        : STR18;              (* user has created *)
  Error        : INT;                (* <> 0 if order was not accepted *)
END_STRUCT;
```

Variable	Content during writing	Content in the event of a fault
ID	Identification of the order – double identification is not possible.	unchanged
RecMat	Name of the recipe or material* as it has been saved in the REC or MAT databases	unchanged
Name	Name of the product (for the reports), as included in the report	unchanged
Text	Coefficient of the order, as included in the report	unchanged
Set point	Set point for the recipe or material in "kg" (if necessary also in "lb" or "oz" in the case of corresponding "Setup")	unchanged
ChgBy	Identification of the "Creator", as included in the report	unchanged
Error	0 (fixed!)	0: not yet edited
		1: double order ("ID")
		2: recipe or material not found

* A search is first carried out for a matching recipe, then for a material.

9.2.2 Report (REPORT)

The system saves a report for each processed recipe line here. Prerequisite is that this function has been activated under [Configuration]-[Parameters]-[Log to database]. The system only writes to the database; it does not use the written data. Normal usage is as follows:

1. The system saves one or more records.
2. The user reads the saved records.
3. The user deletes the read records.

There is therefore a risk that when the function is activated, after a while this database will fill the entire memory if the records are not deleted, see also Chapter 6.5.5.

Structure

```
T_REP          : STRUCT
  Sequence     : DINT;          (* sequence number *)
  Order        : STR18;         (* order identification *)
  Body         : BOOL;          (* only for sorting the report *)
  Clean        : BOOL;          (* was from cleaning recipe *)
  Line         : INT;           (* line number *)
  Done         : BOOL;          (* was done *)
  Name         : STR18;         (* name of the product *)
  Recipe       : STR18;         (* recipe *)
  Material     : STR18;         (* material *)
  Repl         : STR64;         (* result from dialog *)
  Scale        : STR20;         (* used scale *)
  WP           : INT;           (* WP index (internal) *)
  Mode         : INT;           (* batch mode index *)
  Recalc       : BOOL;          (* was recalculated *)
  Setp         : REAL;          (* set point *)
  Actual       : REAL;          (* actually dosed material *)
  Cons         : REAL;          (* consumption of this line *)
  PosTol       : REAL;          (* abs. upper tolerance *)
  NegTol       : REAL;          (* abs. lower tolerance *)
  Unit         : STR8;          (* unit if not a weight *)
  User1        : STR18;         (* user who entered the order *)
  User2        : STR18;         (* name of weighing user *)
  Status       : INT;           (* dosing result status *)
  Begin        : DT;            (* dosing started at *)
  End          : DT;            (* dosing ready at *)
  Text         : STR20;         (* configuration dependent data ord / mat *)
  Copy         : BOOL;          (* TRUE if a copy is requested *)
  CRC          : UINT;          (* CRC from this record *)
END_STRUCT;
```

Variable	Contents
Sequence	Sequence number under which this order was edited (1–999999).
Order	Identification of the order.
Body	Used internally for the sorting of the database.
Clean	Lines from the "cleaning part".
Line	Line number in the recipe. The main part and cleaning part each start counting from 1. Line 0 contains summary data.
Done	This line has been edited (FALSE: e.g. left out due to "Cancel").
Name	Name of the product as entered in the order.
Recipe	Identification of the recipe.
Material	Identification of the "Material" in this line.
Repl	Result of the material verification and dialog. Syntax:* [ID=<ident>][;][<prompt=<value>[<dimension>]]
Scale	Name of the scale from the configuration, if necessary with appended WP (e.g. "Batching A").
WP	Index of the weighing point (A=1, B=2, etc.).
Mode	Index of the batching mode, see Chapter 6.2.3.
Recalc	This line has been recalculated.
Setp	Set point for this line ("kg" for weights, "s" for timer, according to material definition for analog input and output).
Actual	Result of the batching in relation to the set point. **
Cons	Material actually moved (important in the case of components which do not re-tare).
PosTol	Relative upper tolerance limit (in %/100) for batching.
NegTol	Relative lower tolerance limit (in %/100) for batching.
Unit	Unit of the set point and actual values (for weights "kg", "lb" or "oz" or the material definition).
User1	ID of the user who issued/changed the order.
User2	ID of the user who produced the line.
Status	Status of batching (0: no error, 1: outside the tolerance limits, 2: interrupted).
Begin	Start time for the production of this line (line 0 of the order).
End	End time for production.
Text	Coefficient of the material (line 0 of the order).
Copy	Internal use
CRC	CRC for checking the integrity of the dataset

* "ID=" only if an incorrect ID has been entered; <prompt>, <value> and <dimension> originate from the material definition. ";" separates ID and dialog part if required.

** The timer components are rounded to 0.1 s; analog components are released with complete resolution and scaled; weights in kg/lb/oz.

9.3 Databases with Read Right

9.3.1 Material (MAT)

Each material occupies an entry in the database.

Structure

```
T_MAT          : STRUCT
  ID           : STR18;                    (* name of material *)
  WP           : INT;                      (* assigned WP, 0 = selected by
the user *)
  BMode        : INT;                      (* code of batch mode *)
  Cons         : REAL;                     (* consumption report *)
  Preset       : REAL;                     (* preset *)
  OVS          : REAL;                     (* overshoot *)
  Dens         : REAL;                     (* density in kg/l, not yet used*)
  PTol         : REAL;                     (* upper tolerance in % *)
  NTol         : REAL;                     (* lower tolerance in % *)
  Calm         : REAL;                     (* calming time *)
  Flow         : REAL;                     (* min flow in kg/min *)
  AMin         : REAL;                     (* set point for 0/4 mA *)
  AMax         : REAL;                     (* set point for 20 mA *)
  Setp         : REAL;                     (* set point for single material
dosing *)
  Unit         : STR8;                     (* unit if has set point *)
  SPMin        : INT;                      (* enable bit *)
  SPMout       : INT;                      (* material select *)
  Dialog       : INT;                      (* mode of dialog *)
  RstMode      : UINT;                     (* restart mode for automatic
batching *)
  Text         : STR18;                    (* comment *)
  dsp1         : STR18;                    (* dialog prompt message *)
  dsp2         : STR8;                     (* dimension for dialog *)
  Report       : BOOL;                     (* report to database *)
  ConsRep      : BOOL;                     (* has consumption report *)
  Ticket       : BOOL;                     (* print a ticket *)
  DlgOnly      : BOOL;                     (* material has a dialog only *)
  Auto         : BOOL;                     (* usage in automatic recipes *)
  Clean        : BOOL;                     (* usage in cleaning recipes *)
  Choice       : BOOL;                     (* usage in real manual recipes
*)
  Sequent      : BOOL;                     (* usage sequential recipes *)
  Order        : BOOL;                     (* usage to create an order *)
  ChkID        : BOOL;                     (* verify material ID *)
  Protected    : BOOL;                     (* not be be deleted *)
  ChgBy        : STR18;                    (* user has changed this line *)
  ChgAt        : DT;                       (* at this date *)
END_STRUCT;
```

9.3.2 Recipe (REC)

The database contains one entry per line.

Structure

```
T_REC          : STRUCT
  ID           : STR18;       (* name of the recipe *)
  Clean        : BOOL;        (* is cleaning *)
  Line         : INT;         (* line number *)
  Section      : INT;         (* number of the section *)
  fixTol       : BOOL;        (* tolerance not yet changed by the user *)
  Temp         : BOOL;        (* TRUE: delete if finished, manual only *)
  Mat          : STR18;       (* name of the material *)
  Setp         : REAL;        (* set point of this line *)
  Total        : REAL;        (* last set point of the recipe *)
  Prod         : REAL;        (* production total *)
  PTol         : REAL;        (* upper tolerance *)
  NTol         : REAL;        (* lower tolerance *)
  CalcTotal    : BOOL;        (* use the lie to calculate total *)
  Relative     : BOOL;        (* set point of line must be recalculated *)
  Recalc       : BOOL;        (* recalculation allowed for this recipe *)
  RMode        : INT;         (* must be done automatically, ... *)
  SPMin        : INT;         (* enable bit *)
  SPMout       : INT;         (* material select *)
  ChgBy        : STR18;       (* user has changed this line *)
  ChgAt        : DT;          (* at this date *)
END_STRUCT;
```

9.3.3 Order (ORD)

There is one entry in the database per order. The entries are generated interactively or following checking from the "ORDER" database.

Structure

```
T_ORD          : STRUCT
  ID           : STR18;     (* order identification *)
  Sequence     : DINT;      (* sequence number *)
  RecMat       : STR18;     (* name of the recipe / material *)
  Mode         : INT;       (* how to do it *)
  isRec        : BOOL;      (* TRUE is assigned to a recipe *)
  WP           : INT;       (* WP = 0 is recipe / choice, >0 is material *)
  Name         : STR18;     (* name of the product *)
  Text         : STR18;     (* configuration dependent data *)
  Setp         : REAL;      (* setpoint total recipe *)
  Expanded     : BOOL;      (* recipe was already expanded *)
  Active       : BOOL;      (* order is active *)
  ChgBy        : STR18;     (* user has created / changed this order *)
  ChgAt        : DT;        (* at this date *)
END_STRUCT;
```

10 Printouts

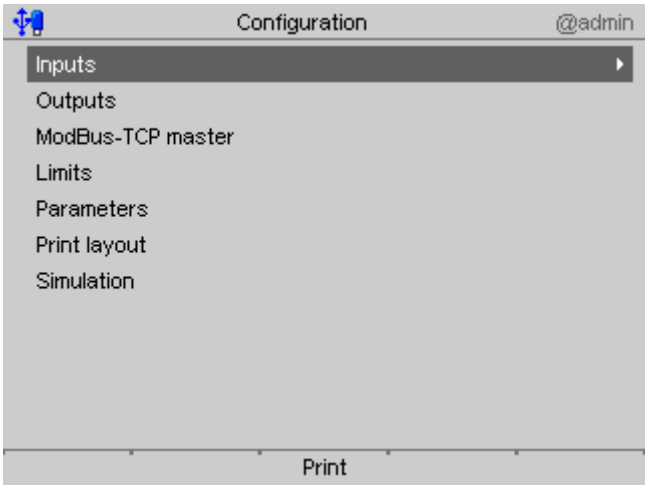
10.1 General Information

The following printouts are available for the PR 5900 with the Batch application:

- Device configuration data, see PR 5900 instrument manual
- Batching configuration data, see Chapter 10.2
- Tickets, see Chapter 10.3
- Batch reports, see chapter 10.4

10.2 Batching Configuration Data

The option is available to print out the batching configuration data. The configuration data is output to the printer configured in the system menu [System setup]–[Connected devices] under "General devices" (see PR 5900 instrument manual). The print width is limited to 39 characters per line. This means a ticket printer can also be used. When printing the first line, the program checks whether printing is possible. In the event of a printer failure during printing, a time-out of approximately 3 s is active for each print line. The printout cannot be changed using "NiceLabelExpress." The printout reflects the current data status.



▶ Press the [Print] soft key or the button to print out the configuration.

▷ An example printout is shown on the next two pages.

```
Configuration  Batching 01.00.00
 Changed by                        admin
 Changed at          05.04.2013 15:02:28
---------------------------------------

Inputs
 Option 1                     no inputs
 Option 2                     no inputs
 Option 3                 Digital input
  Input 1                             0
  Input 2                             0
  Input 3                             0
  Input 4                             0

Outputs
 Option 1                    no outputs
 Option 2                    no outputs
 Option 3                Digital output
  Output 1                            0
  Output 2                            0
  Output 3                            0
  Output 4                            0

ModBus-TCP master
 ModBus-TCP module Phoenix 1: 16IN:16OU
  IP address                      0.0.0.0
  Digital inputs        SPM address %MX
   1                                  0
   2                                  0
   3                                  0
   4                                  0
   5                                  0
   6                                  0
   7                                  0
   8                                  0
   9                                  0
   10                                 0
   11                                 0
   12                                 0
   13                                 0
   14                                 0
   15                                 0
   16                                 0
  D
```

```
igital outputs       SPM address %MX
  1                                  0
  2                                  0
  3                                  0
  4                                  0
  5                                  0
  6                                  0
  7                                  0
  8                                  0
  9                                  0
  10                                 0
  11                                 0
  12                                 0
  13                                 0
  14                                 0
  15                                 0
  16                                 0
 ModBus-TCP module           not active
 ModBus-TCP module           not active
 ModBus-TCP module           not active
 ModBus-TCP module           not active
 ModBus-TCP module           not active
 ModBus-TCP module           not active
 ModBus-TCP module           not active

Limits
 Weighing point A Limit1On       890.0 g
 Weighing point A Limit1Off      900.0 g
 Weighing point A Limit2On       300.0 g
 Weighing point A Limit2Off      290.0 g
 Weighing point C Limit1On          0 kg
 Weighing point C Limit1Off         0 kg
 Weighing point C Limit2On          0 kg
 Weighing point C Limit2Off         0 kg
 Weighing point D Limit1On          0 kg
 Weighing point D Limit1Off         0 kg
 Weighing point D Limit2On          0 kg
 Weighing point D Limit2Off         0 kg
```

```
Parameters
 Scale identifier      PR 5900-Batching
 Start orders                      Yes
 Start recipes                     Yes
 Start materials                   Yes
 Remote production                 Yes
 Use product name                  Yes
 Fix comment             Bitte prüfen!
 Prompt for order
 Prompt for material
 Recalculate                  Operator
 Identification               numeric
 Check recipe                      On
 Line ticket          1 times
 Order ticket          1 times
 Batch report          1 times
 Long report                       Yes
 Ticket printer              Printer 1
 Report printer              Printer 1
 Log to database                   Yes
 Delimiter                           ~

Print layout
Line ticket
     1: Blank line
     2: Scale name
     3: ---------
     4: Recipe name
     5: Recipe line number
     6: Material name
     7: Reply from dialog
     8: Set point
     9: Print time
    10: Actual value
    11: Tolerance
    12: Batch status
    13: Ordered by
    14: Weighed by
    15: Start time
    16: Final time
    17: Blank line
Order ticket
     1: Blank line
     2: Order name
     3: ---------
     4: Recipe name
     5: Sequence number
     6: Set point
     7: Actual value
     8: Batch status
     9: Scale name
    10: Ordered by
    11: Weighed by
    12: Sequence number
    13: Final time
    14: Blank line
    15: Blank line
Report header
     1: Blank line
     2: Order name
     3: ---------
     4: Set point
     5: Actual value
     6: Batch status
     7: Scale name
     8: Ordered by
     9: Weighed by
    10: Start time
    11: Final time
    12: Blank line
Report line
     1: Recipe line number
     2: Material name
     3: Set point
     4: Actual value
     5: Act. mat. cons.
     6: Blank line
Report trailer
     1: ---------
     2: Print time
     3: Blank line

Simulation
 Simulation Weighing point A         No
 Material flow                 0 g/min
 Simulation Weighing point C         No
 Material flow                 0 kg/min
 Simulation Weighing point D         No
 Material flow                 0 kg/min
```

10.3 Tickets

10.3.1 General Information

The configuration for tickets is performed in the menu [Configuration]-[Print layout]-[Print template], see Chapter 5.4.6.

To start printing, the application must be started.

The following ticket printout options are available:

- Per recipe line
- On completion of recipe processing (summary without individual lines)
- Tickets without NLE (NiceLabelExpress)
- Tickets with NLE (NiceLabelExpress)
- Multiple printout using the button, provided no new ticket has been produced

Note	No line tickets are printed in the case of automatic recipes.

The following items are printed by line if no NLE ticket has been defined.

Item	Ticket		Note
	Line	Order	
Blank	x	x	
Dotted line	x	x	
Form feed	x	x	
Order name	x	x	
Product name	x	x	Only if configured
Recipe name	x	x	
Line number in recipe	x		
Material name	x		
Reply from dialog	x		As 2nd line: Dialog and material identification (incorrect)
Set point	x	x	
Actual value *	x	x	
Tolerance (2 lines)	x		
Status of batching	x	x	
Scale name	x	x	The code for the weighing point is added to the line ticket, e.g. "Batching device B".
Customer	x	x	
(Last) operator	x	x	
Start time	x	x	
Final time	x	x	
Recalculated	x	x	Character in recipe line: "%"
Print time	x	x	
Order coefficient		x	
Material coefficient	x		
Text from the configuration	x	x	
Sequence number	x	x	

* The timer components are rounded to 0.1 s.
Analog components are released with full resolution and scaled; weights according to the scale.

10.3.2 Line Ticket

This ticket is automatically printed at the end of each line (if configured under [Configuration]-[Parameters], with the exception of automatic recipes).

The  button can be used to print the latest ticket at various points, even if it was switched off in the configuration.

The ticket can also be printed in the application menu under [Print tickets and reports]-[Print last line ticket].

The ticket is printed with 39 characters per line.

The items listed in the table above can be included in the ticket by means of the configuration. The ticket can be printed multiple times according to the configuration.

Example without NLE (NiceLabelExpress)

```
Scale name            PR 5900-Batching-A
---------------------------------------
Recipe name                 Mandelkuchen
Recipe line no.                        2
Material name                       Mehl
Dialog
Set point                      1000.0 g
Print time         2013-04-05  09:18:23
Actual value                    999.9 g
+ Tol.                         1.0 %
- Tol.                         1.0 %
Batch status
Ordered by                        admin
Weighed by                        admin
Start time         2013-04-05  09:17:53
Final time         2013-04-05  09:18:06
```

10.3.3 Order Ticket

This ticket is automatically printed at the end of each order (if configured under [Configuration]-[Parameters]).

The  button can be used to print the latest ticket at various points, even if it was switched off in the configuration.

The ticket can also be printed in the application menu under [Print tickets and reports]-[Print last order ticket].

The ticket is printed with 39 characters per line.

The items listed in the table above can be included in the ticket by means of the configuration. The ticket can be printed multiple times according to the configuration.

Example without NLE (NiceLabelExpress)

```
Order name              2013-02-26 Abend
---------------------------------------
Recipe name                    Nusskranz
Sequence number                        6
Set point                     1000.0 g
Actual value                     0.0 g
Batch status                   Canceled
Scale name              PR 5900-Batching
Ordered by                        admin
Weighed by                        admin
Sequence number                        6
Final time          2013-05-17  10:56:32
```

10.4 Batch Report

10.4.1 General Information

To start printing, the application must be started.

10.4.2 Short Report

The short batch report is a one-line report which, in addition to the date/time and weight, records the name of the order and recipe as well as the status.

The report is automatically printed at the end of each order (if activated with the selection "once" under [Configuration]-[Parameters]).

The  button can be used to print the latest report at various points, even if it was switched off in the configuration.

Short reports can also be printed in the application menu under [Print tickets and reports]-[Print last batch report].

The report is printed with 80 characters per line.

This line cannot be configured with NLE (NiceLabelExpress).

Example

```
05.04.2013 11:27:54    2013-02-26 Abend   Mandelkuchen           1000.0 g
```

10.4.3 Long Report

The long report is automatically printed at the end of each recipe (if activated with the selection "once" under [Configuration]-[Parameters]). The data are taken from the docket (working database).

The  button can be used to print the latest report at various points, even if it was switched off in the configuration.

Long reports can also be printed in the application menu under [Print tickets and reports]-[Print last batch report].

If the number of columns in a line is restricted in the configuration, a printout with 39 characters per line is possible. Otherwise, the report will be printed with 80 characters per line.

Long reports can be configured with NLE (NiceLabelExpress), see Chapter 10.5.

In addition to the header data, for certain recipe lines, a line will be printed in the report for specific materials. The materials for which a report is issued are detailed in Chapter 6.2.3.

The configuration for the long batch report is performed under [Configuration]-[Print layout]-[Print template], see Chapter 5.4.6.

The following items are printed by line if no NLE ticket has been defined.

Item	Long batch report			Note
	Headers	(Columns in a) line	Trailers	
Blank	x		x	
Dotted line	x		x	
Form feed	x		x	
Order name	x		x	
Product name	x		x	Only if configured
Recipe name	x		x	
Line number in recipe		x		
Material name		x		
Reply from dialog		x		As 2nd line: Dialog and material identification (incorrect)
Set point	x	x	x	
Current value	x	x	x	Related to the set point
Status of batching	x	x	x	Character in recipe line: "#" = tolerance "*" = aborted "-" = skipped
Scale name	x		x	
Customer	x		x	
(Last) operator	x		x	
Start time	x		x	
Final time	x		x	
Recalculated	x	x	x	Character in recipe line: "%"
Print time	x		x	
Order coefficient	x		x	
Text from the configuration	x		x	
+ Tolerance		x		
- Tolerance		x		
Tidy up		x		Character in recipe line: "="
Material consumed		x		Material actually transported

Example without NLE (NiceLabelExpress)

```
Order name                  Nusskranz~006
--------------------------------------
Set point                      1000.0 g
Act. value                        0.0 g
Batch status                   Canceled
Scale name              PR 5900-Batching
Ordered by                        admin
Weighed by                        admin
Start time          17.05.2013  10:56:26
Final time          17.05.2013  10:56:32

    Material name          Set point   Act. value   Mat. cons.
-------------------------------------------------------------
  1 Sanella                  250.0 g        0.0 g        0.0 g
  2 Zucker                   250.0 g        0.0 g        0.0 g
  3 Mehl                     500.0 g        0.0 g        0.0 g
--------------------------------------
Print time          17.05.2013  12:03:36
```

10.5 Tickets and Batch Reports with NLE (NiceLabelExpress)

10.5.1 General Information

To create a user-defined log, the "NiceLabelExpress" program is required. All variable contents (e.g., weights) and invariable texts (e.g., "Sequence number") for these logs are transmitted to the log using variables. In many cases this enables the user to create language adjustments for NLE with "TranslateIt." In this case, "NiceLabelExpress" does not need to be called up. A fixed structure of variables from the application is provided for "NiceLabelExpress."

In the case of tickets, all variables contain the data of the most recently edited line or order.

In batch reports, "Line" is printed as many times as there are lines that need to be printed in the report. Control instructions do not have any lines in the batch report. The relevant data applicable for the lines are entered into the variables line, material, set point, actual, etc.

By default, no printouts are printed using "NiceLabelExpress" (= no NLE files integrated). If customer-designed NLE files are integrated, printing will take place via NLE with this layout. All data required for a printout will be made available for NLE.

Note	An NLE layout is not included with the equipment supplied.

The names of the NLE files are:

- For line ticket: "TLine.lbl"
- For order ticket: "TOrder.lbl "
- For header of the batch report: "RHeader.lbl"
- For a line of the batch report: "RLine.lbl"
- For trailer of the batch report: "RTrailer.lbl"

The data in the following table is available for all tickets and reports with "NiceLabelExpress".

Data Formats

WSTR20	=	Max. 20 alphanumeric characters; 9/18/30 are also allowed
DINT	=	Double integer, pure numerical value
WEIGHT	=	Weight value with plus/minus sign and unit
Date	=	Current date and time

10.5.2 Table of Available Data

Variable for NLE	Data format	Description	1-line ticket	2-order ticket	3-batch report - header	4-batch report - trailer	5-batch report - (columns in a) line
		Parameter content					
Order	WSTR18	Name of the order	x	x	x	x	
Sequence	DINT	Internal number	x	x	x	x	
Recipe	WSTR18	Name of the recipe	x	x	x	x	
Name	WSTR18	Name of the product	x	x	x	x	
Line	INT	Line number in recipe	x				x
Material	WSTR18	Name of the material	x				x
Repl	WSTR18	Input value, e.g. the LOT number	x				x
Recalc	WSTR8	Recipe has been recalculated	x	x	x	x	
Set point	WSTR18	Set point, related to the line or order depending on the printout	x	x	x	x	x
Actual	WSTR18	Result of the batching (net), related to the line or order	x	x	x	x	x
Cons	WSTR18	Material consumption (net)	x				x
PosTol	REAL	Relative upper tolerance in %	x				x
NegTol	WEIGHT	Relative lower tolerance in %	x				x
Status	WSTR18	Status (tolerance, cancel, recalculated)	x	x	x	x	x
SStatus	WSTR8	Status (short: "-", "*" or "#")					x
Clean	WSTR1	Identification "Cleaning/Tidy up"					x
Scale	WSTR20	Scale name	x	x	x	x	
User1	WSTR18	Created the order	x	x	x	x	
User2	WSTR18	Last user to carry out filling	x	x	x	x	x
NowDate	WSTR18	Current date	x	x	x	x	x
NowTime	WSTR18	Current time	x	x	x	x	
BegDate	WSTR18	Beginning date	x	x	x	x	
BegTime	WSTR18	Beginning time	x	x	x	x	
EndDate	WSTR18	End date	x	x	x	x	
EndTime	WSTR18	End time	x	x	x	x	
TxtCnf	WSTR18	Text depending on the configuration	x	x	x	x	
TxtOrd	WSTR18	Order coefficient	x	x	x	x	
TxtMat	WSTR18	Material coefficient	x				

Variable for NLE	Data format	Description	1-line ticket	2-order ticket	3-batch report - header	4-batch report - trailer	5-batch report - (columns in a) line
		Parameter name					
TOrder	WSTR18	Fixed text	x	x	x	x	
TSeq	WSTR18	Fixed text	x	x	x	x	
TRecipe	WSTR18	Fixed text	x	x	x	x	
TName	WSTR18	Fixed text	x	x	x	x	
TLine	WSTR18	Fixed text	x				
TMat	WSTR18	Fixed text	x				
TMsg	WSTR18	Dialog prompt	x				
TSetp	WSTR18	Fixed text	x	x	x	x	
TActual	WSTR18	Fixed text	x	x	x	x	
TCons	WSTR18	Fixed text					
TRecalc	WSTR18	Fixed text	x	x	x	x	
TPTol	WSTR18	Fixed text	x				
TNTol	WSTR18	Fixed text	x				
TStatus	WSTR18	Fixed text	x	x	x	x	
TScale	WSTR18	Configurable text	x	x	x	x	
TUser1	WSTR18	Fixed text	x	x	x	x	
TUser2	WSTR18	Fixed text	x	x	x	x	
TNow	WSTR18	Fixed text	x	x	x	x	
TBegin	WSTR18	Fixed text	x	x	x	x	
TEnd	WSTR18	Fixed text	x	x	x	x	
TTxtOrd	WSTR18	Configurable text	x	x	x	x	
TTxtMat	WSTR18	Configurable text	x				

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