

Operating manual PR 1713/00



Operating manual 9499-050-42910 Release 1.x

Other Manuals for PR1713:

Installation manual 9499-053-43010 Release 1.0
System manual 9499-054-43110 Release 1.x

(general)

Batching manual 9499-057-43210 Release 1.x
Programming 9499-053-35410 Release 1.x

Please note

In correspondence concerning this product, please quote the type, name and release number as well as all license numbers corresponding to the product.

This product is copyrighted in all its parts and may not be used or illegal modified or copied without purchasing the license or written authority from the copyright owner.

Important

This product may be operated only by trained and qualified personnel. By using this product, you agree to be bound by the terms of this notice.

Bitte beachten

Bei Schriftwechsel über dieses Produkt bitte Typ, Bezeichnung und Versionsnummer sowie alle mit dem Produkt in Zusammenhang stehenden Lizenznummern angeben.

Dieses Produkt ist in allen seinen Teilen urheberrechtlich geschützt und darf ohne Erwerb der Lizenz oder schriftliche Einwilligung nicht benutzt oder unerlaubt verändert oder kopiert werden.

Wichtig

Die Bedienung des Produktes darf nur von geschultem, fach- und sachkundigem Personal durchgeführt werden. Durch die Benutzung dieses Produktes werden oben genannte Bestimmungen anerkannt.

Veillez noter, s.v.p.

Dans votre correspondance se rapportant au présent produit, veuillez toujours spécifier le numéro de type, la description et le numéro de version ainsi que tous les numéros de licence en rapport avec ce produit.

Les droits d'auteur de toutes les parties de ce produit sont réservés. Ce produit ne doit être ni utilisé ni changé ni copié sans achat de la licence ou accord par écrit.

Important

L'exploitation de ce produit ne doit s'effectuer que par du personnel autorisé. L'utilisation du produit implique la reconnaissance des conditions mentionnées ci-avant.

© GWT Global Weighing Technologies GmbH
Meiendorfer Str. 205, 22145 Hamburg
1998

All rights are strictly reserved.

Reproduction or divulgation in any form whatsoever is not permitted without written authority from the copyright owner.

- Printed in Germany -

CONTENTS

1 INTRODUCTION	4
1.1 GENERAL	4
1.1.1 Manual repartition.....	4
1.1.2 Instrument description.....	4
2 DESCRIPTION OF CONTROLS	6
2.1 DISPLAY	6
2.2 KEYBOARD.....	7
2.3 OPERATING CONCEPT	8
2.3.1 Operation via 'soft'-key.....	9
2.3.2 Selecting from selection boxes.....	10
2.3.3 Editing with alphanumeric characters	11
3 MAIN MENU	13
3.1 BOOT MENU	13
4 FIXTARE	15
5 COUNTING SCALE.....	17
6 BATCHING.....	19
6.1 INPUT MENU FOR COMPONENT EDITING.....	20
6.1.1 Editing.....	20
6.1.2 Component parameters.....	23
6.1.2.1 Batch Mode.....	23
6.1.2.2 SPM output address	27
6.1.2.3 SPM input address	27
6.1.2.4 Preset Point	27
6.1.2.5 Overshoot.....	27
6.1.2.6 + Tolerance, - Tolerance.....	27
6.1.2.7 Minimum Flowrate	28
6.1.2.8 Calming time.....	28
6.1.2.9 Restart mode	29
6.1.3 Deleting.....	31
6.1.4 Printing	31
6.2 INPUT MENU FOR RECIPE EDITING	32
6.2.1 Editing.....	32
6.2.2 Recipe total mode.....	35
6.2.3 Setpoint scaling.....	36
6.2.4 Simulation.....	36
6.2.5 Deleting.....	37
6.2.6 Printing	37

6.3 STARTING A BATCH PROCESS.....	38
6.3.1 <i>Status display</i>	38
6.3.2 <i>Stopping the batch process</i>	38
6.3.3 <i>Continue, skip, abort</i>	39
6.3.4 <i>Messages during batching</i>	39
6.4 SELECTING A REPORT	40
6.4.1 <i>Consumption</i>	40
6.4.2 <i>Production report</i>	41
6.4.3 <i>Last batch report</i>	42
6.5 ADDRESS LAYOUT OF SIGNALS	43
6.5.1 <i>Digital in- and outputmodules PR1713/12.</i>	43
6.5.2 <i>SPM-addresses for addressing the digital outputs</i>	45
7 ANALOG TEST.....	47
8 SETUP.....	49
9 WHAT CAN BE DONE IN CASE OF TROUBLE.....	51
9.1 ERROR MESSAGES.....	51
9.1.1 <i>Error messages on the weight display</i>	51
9.2 ERROR MESSAGES ON THE TEXT DISPLAY	52
10 INDEX.....	53

1 INTRODUCTION

1.1 General

1.1.1 Manual repartition

The operation for the normal PR1713 user is described **in this manual**, comprising all functions except 'Setup', which must be operated via direct keys or via the softkey menu.

Additional manuals:

- Installation, configuration and calibration are described in the [☞ installation manual](#).
- Operating principle and behaviour of batching components, alarms and recipe are described in the [☞ batching manual](#).
- Connection to PR1730, PR1740, PR1720 as a further weighing point and communication are described in the [☞ system manual](#).
- The commands of the programming language are described in the [☞ programming manual](#).

1.1.2 Instrument description

The PR1713 basic configuration is an **indicator** with

- gross, net or tare weight display
- taring
- fix tare tables
- zero setting
- weight ticket printing
- checkweighing
- remote display
- functions via digital inputs and outputs

As a **batching controller** (licence PR1713/20 or PR1713/21), PR1713 also batches complex recipes.

- charge or discharge batching in net mode
- charge or discharge batching in gross mode
- charge or discharge batching without tare (top-up)
- discharge to set-point
- discharge complete
- manual component
- guide component for automatic set-point correction during runtime
- time components
- further control and synchronization components
- special components also programmable (licence PR1750/10)

- tolerance checking
- minimum material flow monitoring
- automatic overshoot correction
- preparation of consumption reports
- preparation of production reports
- preparation of batch reports

- remote display
- functions via digital inputs and outputs

As an additional **external weighing point**, a PR1720 can be connected to the DIOs card

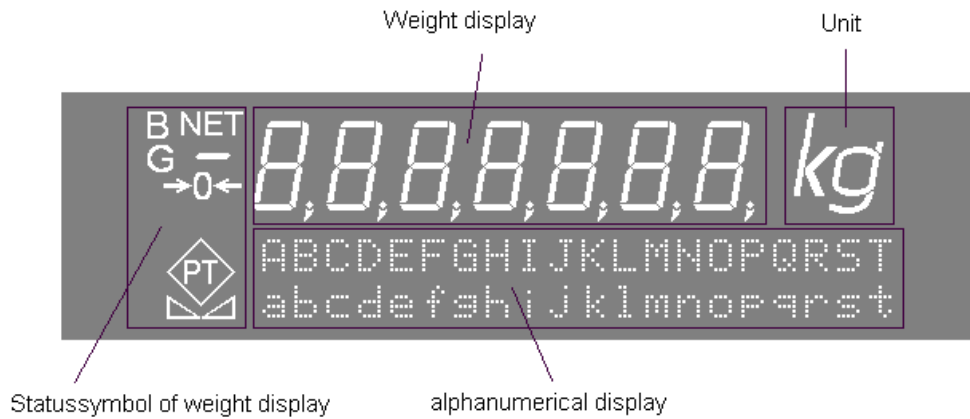
Due to **programmability** (licence PR1750/10) writing individual applications or matching the existing ones is easy.

Program package 'Filtering and controlling' (licence) can be used for controlling continuous weighing processes.





- control and filter components in recipes
- own control applications

2 DESCRIPTION OF CONTROLS

2.1 Display



Weight display status symbols

	Standstill	NET	Net weight display
	Gross or net zero within 1/4d		Batching is active
G or B	Gross weight display, dependent of national language		blinks, alarm is pending or manual component
T	Tare weight display		

2.2 Keyboard

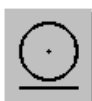
Indicator controls



Display switch-over to gross mode, as long as the key is pressed. Additionally, symbol **B** or **G** dependent of selected language is displayed.



Display switch-over to tare weight, as long as the key is pressed. Additionally, symbol **T** is displayed.



print-out-key for additional or self-programmed programs. Try to start program 'Print'.



Set and reset tare. The instantaneous gross weight is stored in the tare memory, provided that:

- weight standstill
- weight within the limits ($0 \leq \text{weight} \leq \text{f.s.d.}$)
- unit is not in error status.



Gross weight is set to zero. Condition is:

- weight standstill
- within zero set range
- not tared
- batching is not active

Menu control keys



Softkey for menu selection on the alphanumeric display



Scroll key for selection from a list



More key for display of further menu items



Quit-key for leaving an entry or menu and continuation at the next higher menu level.

Remaining keys



Cursor key for moving the cursor during numeric text editing



Enter key for completing entries



Back-space key. When editing alphanumeric texts, the previous character is deleted.



Stop- key for stopping a running batch process



Function keys for additional or self-programmed programs. Try to start program 'F1'.

#"()=	ABC	DEF
1	2	3
GHI	JKL	MNO
4	5	6
PQRS	TUV	WXYZ
7	8	9
-+*/	Ä/Æ/Å	
.	0	

Alpha-numeric keys

2.3.1 Operation via 'soft'-key



Each menu has a list of functions, which can be selected via softkeys.

Three functions are displayed at a time. Selecting a function via 'softkeys' is displayed by two small triangles between the inscription text fields (▼).



If more than three functions can be selected, double triangles are displayed.

Display of the next three selectable functions is by pressing key 'more'.



A menu item can be left with 'quit'. The operation is continued at the next higher level.

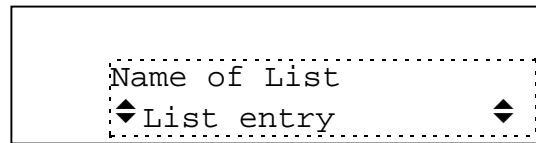
2.3.2 Selecting from selection boxes



An entry in a variable list can be selected by scrolling. If necessary, this list can be limited by preselection (e.g. all names starting with 'A').

In the display, this type of selection is shown by two special characters left and right from the selected \blacktriangledown text \blacktriangledown . Consequently, the overall list can be scrolled.

As scrolling would require pressing too many keys with very long lists, the list entry can be entered directly with the alphanumeric keys. Thereby, only as many letters of the list entry as required for identifying it clearly is need being entered, or until the number of possible remaining selections is sufficiently low. By entry of alphanumeric characters, selection from the list is limited and marked by display of a cursor. The cursor position marks the length of list limitation. However, the overall list entry is always displayed. 'delete' is used to delete the last character of limitation, until all list entries are selectable again.



Example:

Overall list **without** limiting

Limitation by pressing key '**B**'

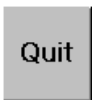
further limitation by pressing key '**A**'

```
*new*
A
AB
ABC
B
BA
BABX300
BBCT700
C
DEF
```

```
*new*
B_
BA
BABX300
BCT700
```

```
*new*
BA_
BABX300
```

If the list contains apparent entry '* new *', a new entry can be inserted in the list.



A menu item can be left with 'quit'. Operation is continued at the next higher level.



Select the entry with 'enter'.

2.3.3 Editing with alphanumeric characters

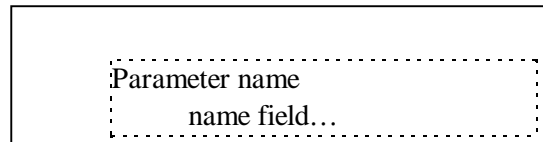
In the alphanumeric entry mode, a cursor blinks in the entry field. Unless already active, this mode is accessible by pressing a key from the right keypad of PR1713. Then, the softkeys are without importance.



The arrow keys from the right keypad are used to shift the cursor. Entries and deletings act in the cursor position.



An alphanumeric key has more than one significations. After pressing for the first time, the relevant first signification, e.g. 'A' is displayed in the cursor position. After pressing for the second time, e.g. 'B' instead of 'A' is displayed; 'C' is displayed after pressing for the third time, etc. After the last signification, the first one is displayed again. The entry of a character is completed by pressing another character key, or the arrow keys. The character is removed by pressing key 'del'.



If only numeric values are required for an entry, letters are not selectable via the editor. Therefore, values such as 555 can be entered only by pressing the key successively three times and without using the arrow key. A decimal point can be entered with the comma key. If a value has a polarity sign, a polarity sign can be entered by pressing the comma key in the extreme left position.

With weight values, the unit can be scrolled using the 'more' key. (g, kg, t, lb)

The single character editor can edit a longer character field than the space available for the editor. In this case, the display field is shifted right and left. In the last position, the partial character display is represented by special character '...'.

The multiple key significations are:

1	# " () = \$? ! % 1
2	A B C a b c 2
3	D E F d e f 3
4	G H I g h i 4
5	J K L j k l 5
6	M N O m n o 6
7	P Q R S p q r s 7
8	T U V t u v 8
9	W X Y Z w x y z 9
.	. - + * /
0	(special characters dependent of country) 0



The 'backspace' key deletes the character before the cursor.



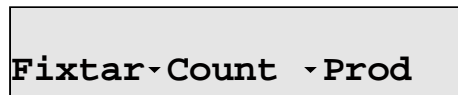
An entry can be completed with 'enter'. The changes are stored. The operation is continued at the next higher level..



The old value from before the change is displayed with 'quit'. By pressing 'quit', the operation is continued at the next higher level.

3 MAIN MENU

When the unit is ready for operation and batching is not active, the main menu functions are accessible.. Dependent of licence or programming, further or other application programs can be selected.



Menu items at the uppermost menu level:

Softkey		Function
Fixtar	P	Indicator functions with fixed tare value
Count	P	Counting application
Prod	P	Batch functions
Atest	P	Start test mode of internal weighingpoint
xxx	P	Other customer applications are appended to the list in this position
Setup		Configuration, Calibration

The sub-menus with identification (P) are programmed in IEC1131 and can be changed freely with a programming option by the user.

This uppermost main menu level is fixed in the firmware.

3.1 Boot menu

After switching on the mains voltage, the PR1713 version number is shown on the alphanumeric display. The main menu is active only thereafter.

4 FIXTARE

The fixed tare function permits taring of the scale with predefined tare values. These can be defined by the user and are stored in a separate table in the database.

```
Fixtare  Hopper1
◆ 1◆      2,5 kg
```

is displayed by selecting softkey 'Fixtar' from the main menu.

By scrolling ◆, the fixed tare value can be selected, or the fixed tare number can be selected directly by pressing the numeric keys. In addition to its number, each entry has its plain text name. The fixed tare number is selected with 'enter'.

With the fixed tare value selected, the weight display can be tared with a fixed tare value, the fixed tare value can be edited, the current gross weight can be loaded and printed out in the fixed tare memory.

```
Fixtare  hopper1
Tare   -Edit   -Weight
```

```
Fixtare  hopper1
Print   -      -
```

- ↑ Pressing softkey '**tare**' tares the scale with the fixtare value. The display returns to the main menu.
- ↑ Softkey '**edit**' can be used for editing the plain text name and entering the fixed tare weight directly. The display returns to the selection menu.
- ↑ Pressing softkey '**weight**' stores the current gross weight in the fixed tare memory. In the printout the value is put in <parentheses>. The display returns to the selection menu.

-
- ↑ Pressing softkey '**print**' prints out one or all fixed tare values. The display returns to the selection menu.

```
Print
Single-      - All
```

- An entry can be completed with 'enter'. The changes are stored.
- The entry is left with 'quit'. When editing a value, the old value is restored. With an unchanged value, a jump back to fixed tare selection is made.

5 COUNTING SCALE

A counting scale permits conversion of a weight from the weighing point into a number via a factor. These factors can be defined by the user and are stored in a separate table in the database.

Count	Screws4
◆ 1◆	264 pcs

is displayed by selecting softkey 'Count' from the main menu.

By scrolling ◆, the fixed tare value can be selected, or the factor number is selected directly by the numeric keys. Apart from its number, each entry has a plain text name. The count is updated continuously. The count factor is selected with 'Enter'.

The properties of the selected factor can be changed, displayed or printed out.

Count	Screws4
Set	▾ Show ▾ Print

⬆ By pressing softkey '**set**', a new factor is calibrated.

- 1) Discharge the hopper: empty bin or platform and set to zero or tare,
- 2) Calibrate with a selected number of objects and enter this value. Thereby, the accuracy is the higher the higher the calibration weight, similar to every calibration.

The display returns to the selection menu.

⬆ Softkey '**show**' displays the calibration values. The display returns to the selection menu.

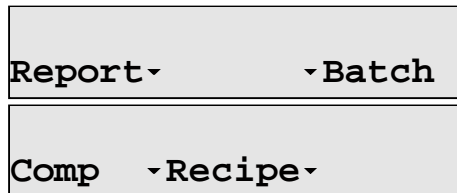
⬆ Softkey '**print**' prints out one or all count factors. The display returns to the selection menu.

Print	
Single ▾	▾ All

- An entry can be completed with 'enter'. The changes are stored.
- Pressing 'quit' leaves the entry. When editing a value, the old value is restored. With an unchanged value, the old value is restored. With an unchanged value, a jump back to the fixed tare selection is made.

6 BATCHING

All batching functions are classified in this menu item.



During normal operation, only functions Batch start and Report are required. In rare cases, the component and recipe tables are edited, usually by another person. Key 'more' switches between the two 'softkey' menus.

Softkey	Explanation
Report	Selects a report
Batch	Starts a batch process
Comp	Edits components
Recipe	Edits recipes

6.1 Input menu for component editing

Selecting softkey 'Comp' from the main menu displays:

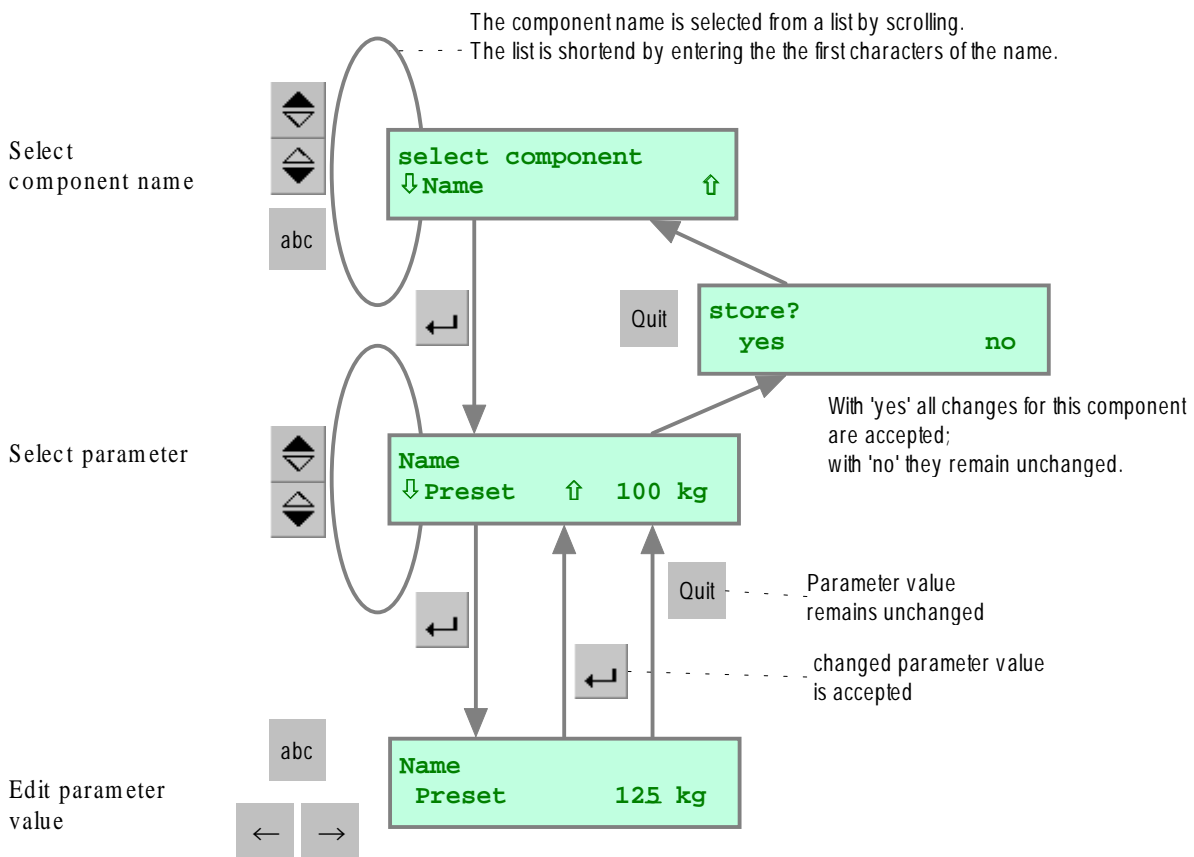
```
Component Table
Delete Edit Print
```

6.1.1 Editing

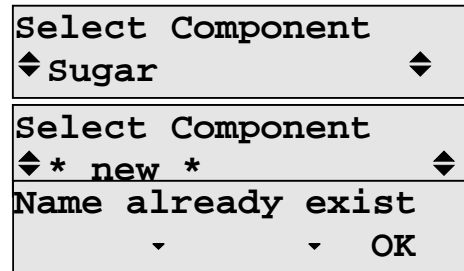
Editing single components is done with 'edit':

Survey

at the example of editing function



The entry is selected by scrolling \blacktriangle . A limitation of the list is possible. In position '* new *', a new component can be inserted. 'Enter' completes the selection.



When trying to give a name to a component which was already assigned to another component, an error message is displayed.

- Pressing key 'quit' leaves the entry of a new component.

A number of specific parameters which shall be read out and changed as simply and quickly as possible. The parameter set changes dependent of the batch mode.

Component name + ...

		Batch mode				
		A1, 2	B1 - B6 G1 - G6	B8	D1, 2	D3 - D8 RL, RQ, RW
WP	Weighing point	X	X	X	X	X
DosMode	Batch mode	X	X	X	X	X
SPM in	SPM address	X	X	X	X	X
SPM out	SPM address	X	X	X	X	X
Preset	Preset point		X			
OVRShoot	Overshoot		X			
Tol+	Max. tolerance		X		X	
Tol-	Min. tolerance		X		X	
Minflow	Min. flow rate		X			
Calmtime	Calming time		X	X		
RST Mode	Restart mode		X			
Analo+	Max. analog value	X				
Analo-	Min. analog value	X				

The selected name is displayed in the uppermost line. In the bottom line, all parameters can be selected. The first parameter is displayed. The relevant value is displayed beside the parameter, i.e. a quick survey of all settings of a component is possible by parameter scrolling.

For editing parameter 'Preset', selection with 'enter' is required. The value of this parameter is edited by entry of a number. See cursor in the numeric value. The unit is changed by the 'more'-key.

Sugar	
Preset:	_15 ▾ kg

Alle standard batch modes could be selected by scrolling. Additional new mode names could be selected by entering alphanumerical keys.

The setpoint of the 'calming time' is a time, which has to be entered with the units 'ms', 's', 'm' or 'h'. Eg. 1m30s are one minute and thirty seconds.

Sugar	◆ WP	◆ A
Sugar	◆ BMode	◆ B1
Sugar	◆ SPM in	◆ 1
Sugar	◆ SPM out	◆ 1
Sugar	◆ Preset	◆ 2 kg
Sugar	◆ OVRshoot	◆ 5 kg
Sugar	◆ Tol.+	◆ 1 kg
Sugar	◆ Tol.-	◆ 1 kg
Sugar	◆ MinFlow	◆ 25 kg
Sugar	◆ Calmtime	◆ 1s
Sugar	◆ RST Mode	◆ 0
Store ?	yes ▾	▾ no

- An entry can be completed with 'enter'. The changes are not stored.
- The entry is left with 'quit'. When editing a value, the old value is restored. With an unchanged value, a jump back to parameter selection is made. When leaving the parameter entries, a prompt if these data shall be stored is displayed. Subsequently, the operation is continued at the next higher level with component name selection.

6.1.2 Component parameters

6.1.2.1 Batch Mode

Each component can be a process step in a recipe. Determine the process step with the batch mode during component definition, e.g. "Bx" for real components and "Dx" for dummy components. If a guide component "Gx" was selected, the set-points of the following components are displayed as calculated from the recipe during a production. The actual set-points referred to the guiding value are output in the reports.

Batchable components B1-B6, G1-G6, B8

Manual components D1, D2

Dummy components D3-D8, RW RL, RQ

Analog components A1, A2

Other batch modes

6.1.2.1.1 Batchable components

Batchable components: All components for which automatic coarse + fine batching by weighing into/from silos is possible.

Net batching

Batch mode **B1** is the normal batch component for charge batching. Dossing is preceded by a tare step, i.e. the net weight is zero when starting the batch. The recipe set-point for this component is the net weight.

Setpoint calculation:

$$\begin{aligned} \text{setpoint} &= \text{tara} + \text{setpoint} \\ \text{coarse_switch_off} &= \text{setpoint} - \text{preset} - \text{overshoot} \\ \text{fine_switch_off} &= \text{setpoint} - \text{overshoot} \end{aligned}$$

Charge batching

Batch mode **B2** is used for charge batching. Batching is not preceded by a tare step, i.e. the last net weight remains unchanged. The recipe set-point for this component is the net weight based on the previous tare

Setpoint calculation:

$$\begin{aligned} \text{setpoint} &= \text{old_tara} + \text{setpoint} \\ \text{coarse_switch_off} &= \text{setpoint} - \text{preset} - \text{overshoot} \\ \text{fine_switch_off} &= \text{setpoint} - \text{overshoot} \end{aligned}$$

Gross batching

Batch mode **B3** is used for charge batching to an absolute value. Before batching, the tare is set to zero. The net weight is equal to the gross weight. The recipe set-point for this component is the gross weight.

Setpoint calculation:

$$\begin{aligned} \text{setpoint} &= \text{setpoint} \\ \text{coarse_switch_off} &= \text{setpoint} - \text{preset} - \text{overshoot} \\ \text{fine_switch_off} &= \text{setpoint} - \text{overshoot} \end{aligned}$$

Discharge batching

Batch mode **B4** is the normal batch component for discharge batching according to B1. Batching is preceded by taring, i.e. the net weight is zero at batch start. The recipe setpoint for this component is the net weight.

Setpoint calculation:

$$\begin{aligned} \text{setpoint} &= \text{tara} - \text{setpoint} \\ \text{coarse_switch_off} &= \text{setpoint} + \text{preset} + \text{overshoot} \\ \text{fine_switch_off} &= \text{setpoint} + \text{overshoot} \end{aligned}$$

Charge/discharge batching

Batch mode **B5** is used for discharge batching according B2. Batching is not preceded by taring, i.e. the last net weight remains unchanged. The recipe set-point for this component is the net weight.

Setpoint calculation:

$$\begin{aligned} \text{setpoint} &= \text{old_tara} - \text{setpoint} \\ \text{coarse_switch_off} &= \text{setpoint} + \text{preset} + \text{overshoot} \\ \text{fine_switch_off} &= \text{setpoint} + \text{overshoot} \end{aligned}$$

Gross discharge batching

Batch mode **B6** is used for discharge batching to an absolute value. Before dosing, the tare is set to zero. The net weight is equal to the gross weight. The input value for this component is the gross weight.

Setpoint calculation:

$$\begin{aligned} \text{setpoint} &= \text{setpoint} \\ \text{coarse_switch_off} &= \text{setpoint} + \text{preset} + \text{overshoot} \\ \text{fine_switch_off} &= \text{setpoint} + \text{overshoot} \end{aligned}$$

discharge component

The discharge mode **B8** is used for total discharge. Before batching, the tare is set to zero. The net weight is equal to the gross weight. The recipe set-point for this component is a gross weight. As discharging to ideal zero is rarely possible, batching is done at least until reaching rest value. Subsequently, the system waits until the calming time has elapsed, to discharge all rests, if possible. There is no fine flow.

setpoint calculation:

$$\text{setpoint} = \text{rest_value}$$

6.1.2.1.2 Manual components

A manual component **D1** is batched manually by a user. It is acknowledged by a signal or a switch. For this, their input SPM_IN must be defined. Output SPM_OUT requests the user to start filling in material. Batching is preceded by taring, i.e. the net weight is zero when starting the batch. The input value for this component is the net.

A manual component **D2** behaves almost exactly like D1. However, the component is used for pre-weighed manual additions which are too small for being measured exactly by this weighing point. Therefore, the set-point instead of the actual value measured after the calming time is recorded in the batch report.

setpoint calculation:

$$\text{setpoint} = \text{tare} + \text{setpoint}$$

6.1.2.1.3 Dummy components

Dummy components: non-batchable recipe entries, which control defined actions in the installation via SPM and PLC, e.g. timer, switch on/off, temperature control, motors. The SPM addresses for input and output are used in the **function block**

- D3** The **timer** component waits until the specified time has elapsed. `setpoint = time_in_ms`
The time is entered with a resolution of 1 sec.
- D4** The **stop** component is used for making a pause of unpredictable duration. Waiting for SPM_IN is omitted ! Restart by the control signal 'restart'
- D5** The SPM **waiting** component sets output address SPM_OUT to status TRUE and waits for status TRUE of SPM input address SPM_IN.
- D6** The SPM **set** component sets output SPM_OUT to TRUE.
- D7** The SPM **delete** component sets output SPM_OUT to FALSE.
- D8** The SPM **acknowledge** component waits for status TRUE of input SPM_IN and sets output SPM_OUT to FALSE.

6.1.2.1.4 RW, RQ, RL

RW (Wait), RL (Release), RQ (Request) are used in the recipe for production line synchronization. Assuming a weighing point WX 'shared resource' for several production lines

- RW** If WX shall not be started at recipe start, an RW component (wait component) must be used as a first process step for WX in the recipe. The following recipe lines of WX are not handled until started from another point in the recipe (RQ-component).
- RQ** The RQ component (request component) requests a weighing point WX and makes an attempt to start the process steps of this weighing point. WX must be specified as an input parameter of the RQ component. RQ remains active, until WX was started.
- RL** The RL component (release component) can be used for resetting weighing point WX to the 'wait' status. Subsequently, WX can be requested by another production line. RL is process step of weighing point WX. All subsequent process steps of this weighing point must be activated by another request (RQ).

The SPM input/output addresses of RW/RQ/RL can be used for synchronization, for process interlocking or for general status display.

6.1.2.1.5 Analog components

Analog components: Parameters Max, Min and Unit. The values are loaded into PR1713 when using the component. The set-point in PR1713 is converted into digits for the analog output, or read as actual value from the analog input. The SPM addresses are word addresses, which are assigned to the hardware in the PLC program.

A1 The analog function block sends the setpoint to the internal PLC. The analog value is scaled by parameters Min and Max.

$$analog_value = \frac{(target - min) * 4095}{max - min}$$

A2 This analog function block reads an actual value from the internal PLC and returns it.

$$actual_value = \frac{analog_input_value}{3000} * (max - min) + min$$

Min and *Max* are dependent of hardware configuration of plug-in module PR1713/06 .

	Plug-in module		
<i>Min</i>	0 V bis	0 mA to	4 mA to
<i>Max</i>	10 V	20 mA	20 mA

A PR1713 IEC 1131 program must write the relevant values from the SPM output address (SPM_OUT) to an analog output card or read it from an analog input card and write it into the SPM input card (SPM_IN).

6.1.2.1.6 Other batch modes

Other batch modes are programmable as function block in Proloc using the programming/development tool PR1750. The first two characters of the batch mode must correspond with a known mode and the same parameters must be used.

6.1.2.2 SPM output address

Output address function: Component handling activates this output bit. The default value of -1 must be set to the correct value during component definition. -1 means that there is no output address.

The output address is a bit address (integer number up to 8191) in marker area M (storage capacity for 1024*8 bits), which is activated by component handling. The real allocation to output area Q depends on the PLC program in which it can be programmed.

See section: Address layout of signals.

6.1.2.3 SPM input address

Input address function: Component handling is activated only when this enable bit is set. The default value of -1 must be set to the correct value during component definition. With address -1, the component is always enabled.

The input address is a bit address (integer number up to 8191) in marker area M (memory capacity for 1024*8 bits), which is read by component handling. The real allocation to input area I depends on the PLC program, where it is programmable.

See section: Address layout of signals.

6.1.2.4 Preset Point

Normal batching: The preset point determines the moment at which (set-point - preset point - overshoot) the coarse batching valve is closed.

During discharging (B8): After weight below preset value, the hopper is considered as discharged. Only the adjusted discharge time must elapse before the valve closes. The selected time value should ensure that all material is still discharged.

6.1.2.5 Overshoot

All material which reaches the hopper after valve closing is called overshoot. The default value must be selected so that it is slightly below the preset point. Only the overshoot part flown before elapse of the calming time is included in the report.

The overshoot is determined only with tolerance check. It is optimized for the batching process and corrected in the table, dependent of restart mode (1-4; 0=no correction). The next batch of this component works with corrected values.

6.1.2.6 + Tolerance, - Tolerance

The tolerance is specified as a weight and can be determined independently **with + for weight above set-point** and **with - for weight below set-point**.

Exceeded tolerances are followed by post-batching and overshoot correction for the component.

Tolerance errors generate a tolerance alarm which must be acknowledged. Moreover, an exceeded set-point tolerance causes a production stop for a process step.

No tolerance check is made with a zero in both fields. In this case, overshoot correction and post-batching are omitted. The overshoot value remains fixed, the restart mode remains without effect on batching.

6.1.2.7 Minimum Flowrate

For not monitoring the component flow:
Enter zero as minimum component flow.

For monitoring the component flow:
Enter the minimum component flow per minute. Monitoring is also done with short batching times. The value is converted internally into the measuring time. This is the min. flowrate with 'coarse' (or 12,5% thereof with 'fine' batching) otherwise, a flow alarm is output after approx. 30 seconds. Dependent of measuring time, resolution and total to be batched, the flow alarm can also be output earlier.

The component flow can vary during normal operation, e.g. the material starts flowing slowly after opening the valve, until reaching a maximum value. With decreasing level, the flowrate is reduced again.

6.1.2.8 Calming time

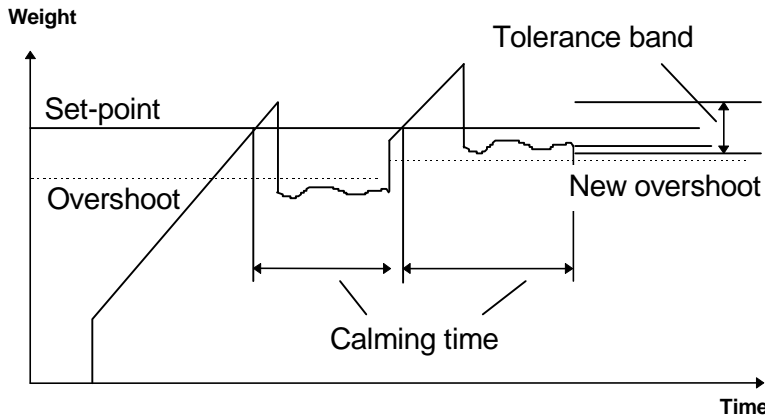
Enter the time in seconds which shall elapse before the tolerance test. This time can depend on the

- component consistency (solid, lumpy, liquid) or
- batching method (screw, vibrator, valve) or
- mechanical construction of the batching installation.

The tolerance check for weight is only correct after standstill.

6.1.2.9 Restart mode

If batching is stopped by a tolerance alarm, or if a correction is possible with the weight below the set-point, the defined restart mode determines the behaviour. A correction is possible with the batched weight below fine switch-off point after the calming time. As a prerequisite, the tolerance test must always be activated.



Example in restart mode 4

After the calming time, the measured weight is below the low deviation. A new overshoot value is calculated. If the difference to the set-point is higher than the overshoot value, a correction can be started. After waiting again until the calming time has elapsed, the weight is within the tolerance band, but still below the set-point. The overshoot value is corrected again. Further correction is not

possible. With a tolerance alarm batching stops and the user has the opportunity for process intervention. In this case, the process can be continued (Go) or aborted (A) .

Calculation of modified overshoot values:

$$\text{new_overshoot} = \text{old_overshoot} - \frac{\text{Setpoint} - \text{actual_weight}}{2}$$

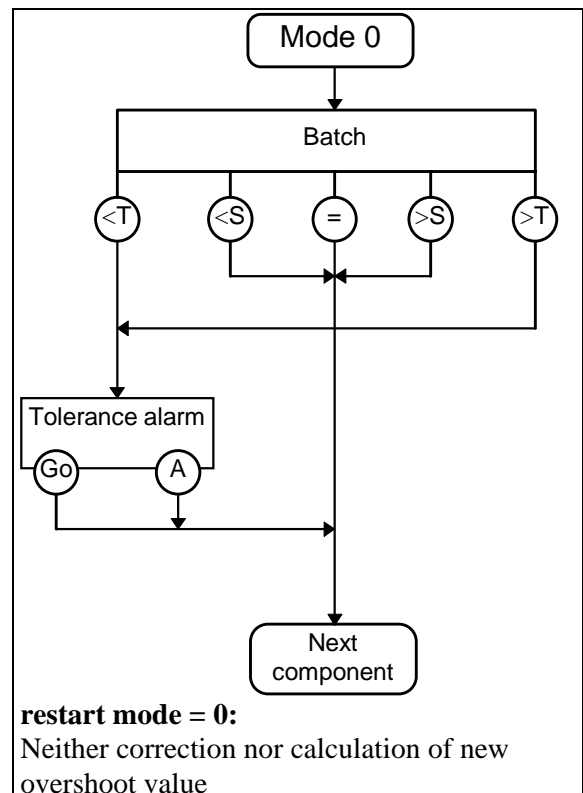
$$\text{corrected_overshoot} = \text{old_overshoot} - (\text{Setpoint} - \text{actual_weight})$$

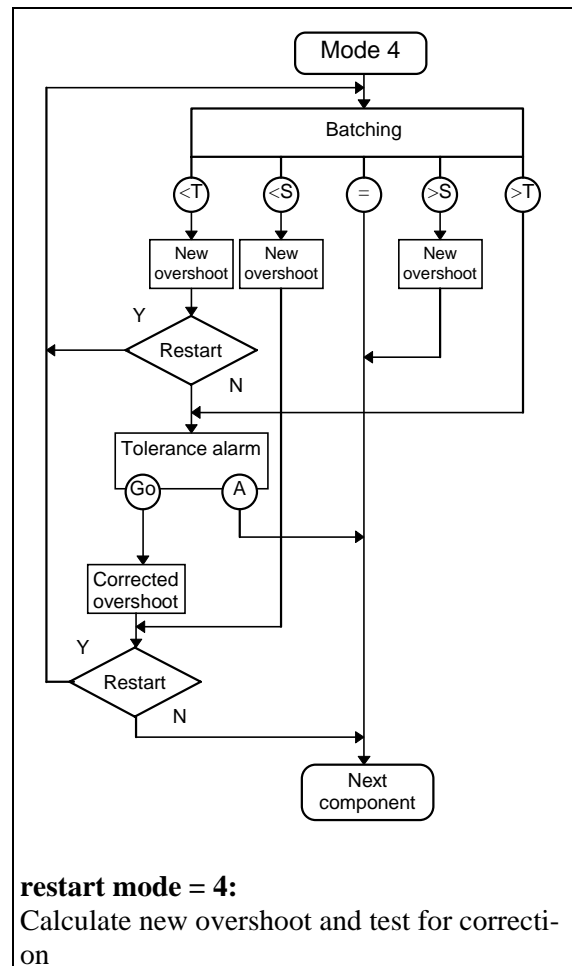
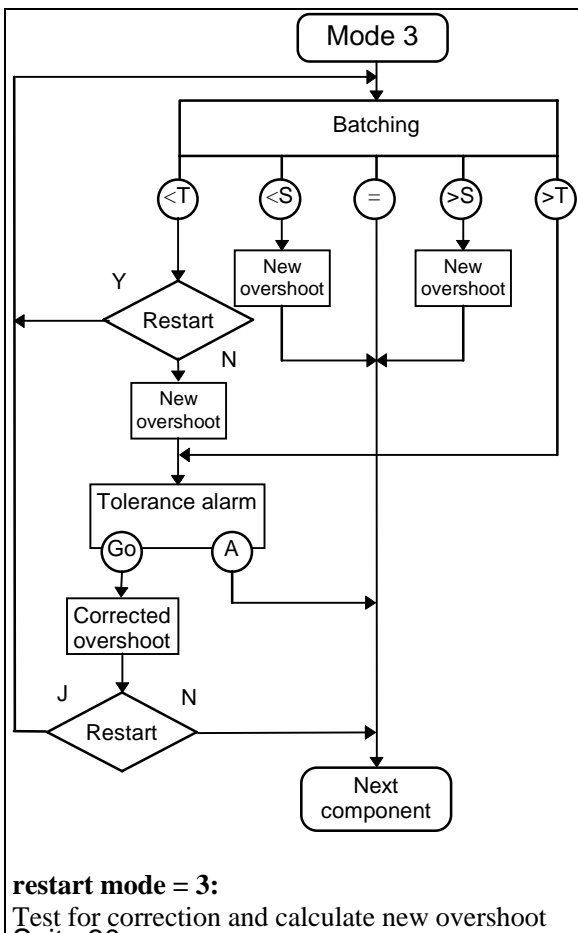
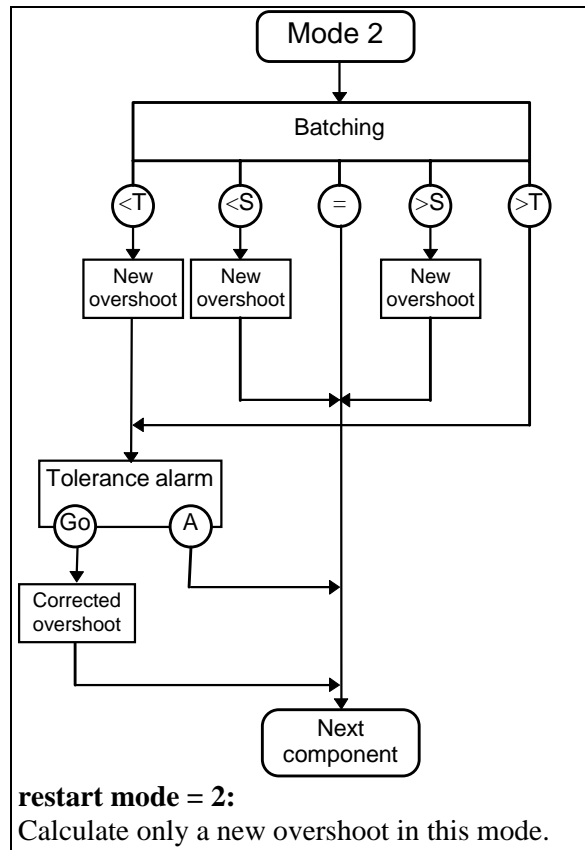
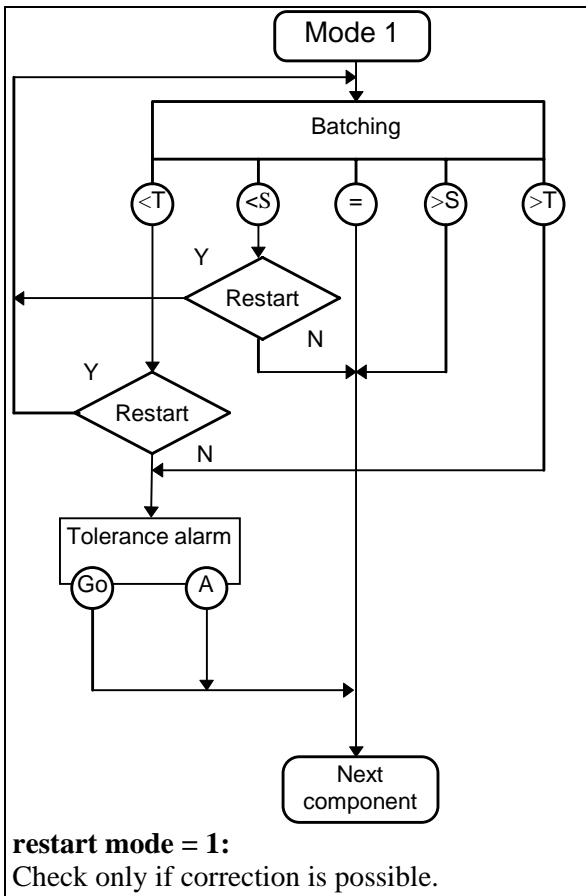
Click on the required option field:

- no post-batching ⇒ mode 0
- post-batching, but no optimization ⇒ mode 1
- no post-batching, but optimization ⇒ mode 2
- post-batching first before optim. ⇒ mode 3
- optimization first before post-batch. ⇒ mode 4

Significations in the following diagrams

- <T low deviation
- <S weight below set-point
- = set-point reached exactly
- >S set-point exceeded
- >T high deviation
- Go entry: go on batching
- A entry: abort batch





6.1.3 Deleting

Deleting individual or all component is with function **'delete'**:
The entry is selected by scrolling \blacktriangledown . Limitation of the list is possible. The selection is completed with 'Enter'.

- \uparrow 'Soft' key selection 'single' deletes only one selected component.
- \uparrow Unless the list is limited, all components are deleted: 'all'.
With a limited list, 'selected' is displayed instead.

Components, which are still used in recipes, must not be deleted.

- \uparrow 'Soft' key selection 'show' displays the component name and the first recipe in which this component is found.
- \uparrow If other components must still be deleted, the deleting operation is continued with 'soft' key selection 'next'.
- Key 'quit' can be pressed to leave submenu 'delete'.

```
Select Component
 $\blacktriangledown$ firstname  $\blacktriangledown$ 
```

```
Delete Component?
Single $\blacktriangledown$   $\blacktriangledown$  All
```

```
Delete Component?
Single $\blacktriangledown$   $\blacktriangledown$ Selected
```

```
Comp. used in recipe
Show  $\blacktriangledown$   $\blacktriangledown$  Next
```

6.1.4 Printing

Individual or all components are printed with function **'print'**:
Select the entry by scrolling \blacktriangledown . A list limitation is possible.
Complete the entry by pressing 'Enter'.

- \uparrow 'Soft' selection 'single' prints only one selected component.
- \uparrow Unless the list is limited, all components are printed with 'all'. With a limited list, 'selected' is displayed instead.
- Select submenu 'delete' with with key 'quit'.

```
Select Component
 $\blacktriangledown$ Sugar  $\blacktriangledown$ 
```

```
Print Component?
Single $\blacktriangledown$   $\blacktriangledown$  All
```

```
Print Component?
Single $\blacktriangledown$   $\blacktriangledown$ Selected
```

6.2 Input menu for recipe editing

```
Recipe Table
Delete>Edit  Print
```

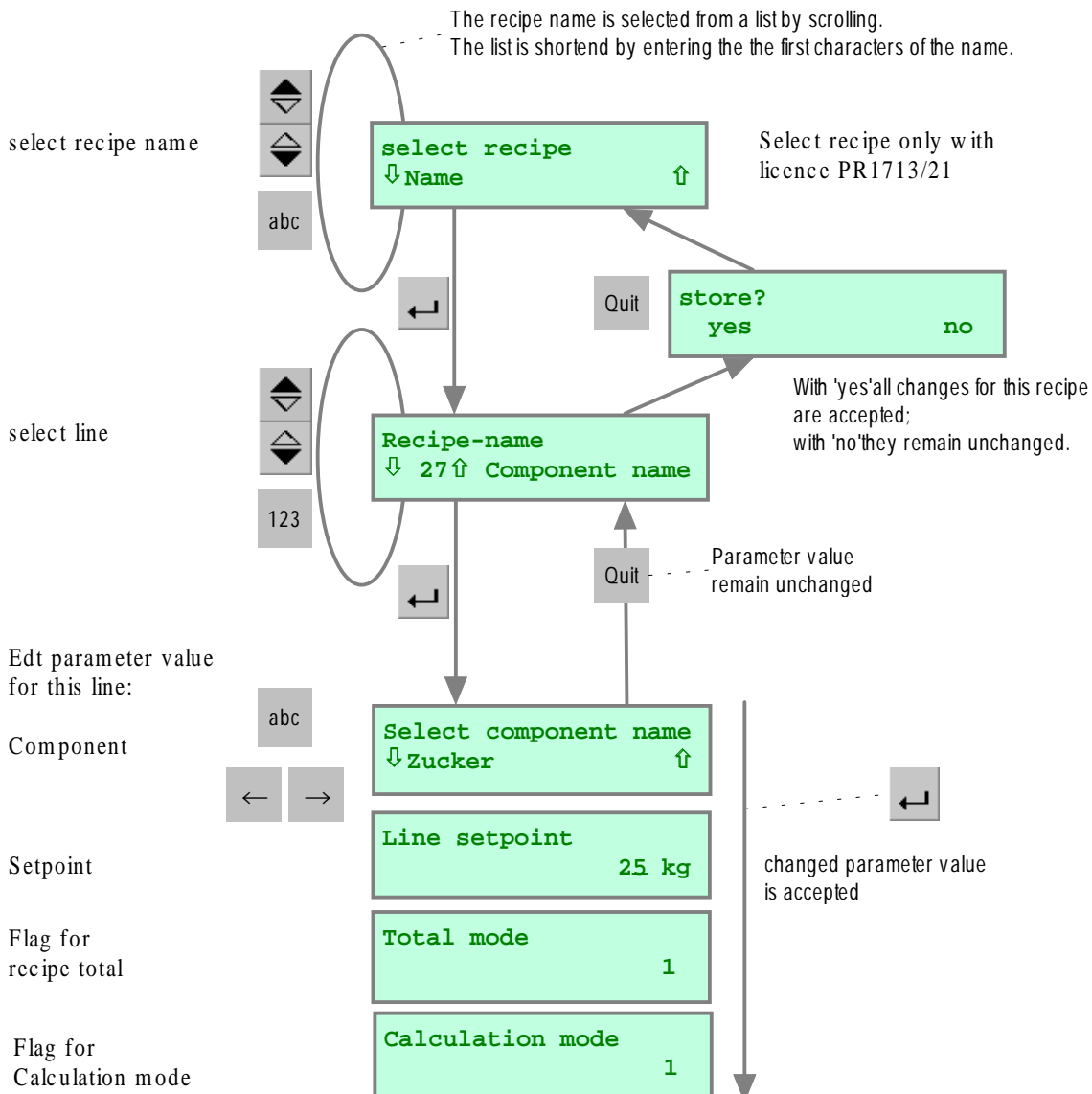
is displayed by selecting softkey 'Recipe' from the batch menu.

6.2.1 Editing

Edit individual recipes with 'edit':

Survey

at the editing function example



The component name can be selected by pressing 'enter'. When pressing key 'enter' again, the other parameters are always displayed right beside the line number.

All parameters are always called up successively.

- 1) Component name
- 2) Set-point
- 3) Recipe total mode
- 4) Set-point scaling

The setpoint of the D3 component is a value in seconds and has to be entered without a unit.

After completing the last parameter, the next line number is always displayed automatically, so that a quick survey of all data of a recipe is possible.

Select component ↕ Sugar1 ↕

Line setpoint 52.4 · kg

Total mode 1

Calculation mode 0

Tart18 ↕ 2 ↕ Flour-3a

Note: Detailed explanations for the 'Total mode' are located in section 'Recipe total'. The 'Calculation mode' is described in section 'Setpoint scaling'.

- An entry can be completed by pressing 'enter'. The changes are stored. The next parameter of the recipe line is displayed.

6.2.2 Recipe total mode

It could be defined for the components B1-B6, G1-G6 and D1-D2, if the setpoints of the recipe line should be added to the recipe sum. This marking is an element of the recipe line and not the component. The recipe sum is the base for the setpoint scaling. The recipe total mode is independent of the calculation mode.

Recipe		
B1	80 kg	T
B1	40 kg	T
<hr/>		
sum:	120 kg	
Recipe setpoint=120 kg		

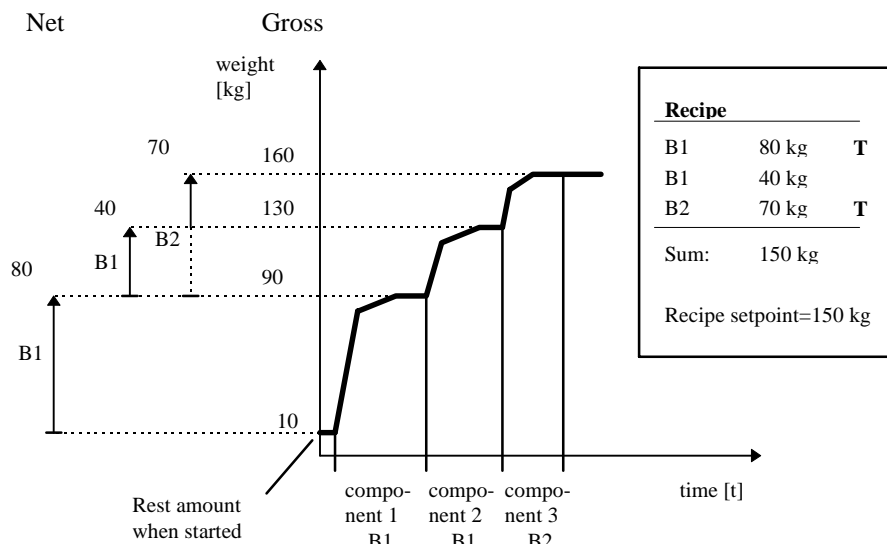
Marking

Recipe sum = Σ all lines with T

Start value of the recipe

In this recipe with fill components, all batches are added to the recipe total. In this example the recipe sum is calculated to 120 kg. If the recipe is started with this amount, all components are batched with exactly the setpoints given in the recipe lines. Then the recipe sum is the same as the recipe setpoint. With a different recipe setpoint, all recipe line setpoints are adapted proportional.

When the recipe is extended by a B2- or B3-component, then a wrong recipe sum is calculated. With the extension of a B2-component, the previous B1-component must not be used for the recipe sum calculation. The 'fil-up'-batch B2 is based on the last tare from the B1 and contains in its setpoint so to speak the setpoint of the previous component. If using a B3 instead of the B2 component, only the B3-component must have the mark for the recipe total.



Example:

Recipe 1	Recipe 2	Recipe 3	Recipe 4	Recipe 5
B1 20 kg T	B1 50 kg	B4 20 kg T	D1 100 kg	B1 50 kg
B1 20 kg T	B1 40 kg	B4 40 kg	B2 120 kg	B1 50 kg
D1 20 kg T	B3 100 kg T	B5 60 kg T	B3 150 kg	B2 100 kg
<hr/>	<hr/>	<hr/>	B1 20 kg	B3 180 kg T
Sum 60 kg	Sum 100 kg	Sum 80 kg	B3 180 kg T	B1 20 kg T
			Sum 180 kg	Sum 200 kg

When using components B2, B3, B5 and B6, pay attention to the correct setting of recipe total mode.

6.2.3 Setpoint scaling

The setpoints of each recipe line are recalculated according to the recipe setpoint on each new recipe start. A setpoint scaling is done. With the calculation mode it is defined, if the setpoint of the recipe line is recalculated on a new recipe start. In general all dosing components will be scaled. The amount of the executed batch is changed by the scaling factor.

$$Scaling_factor = \frac{Recipe_setpoint}{Recipe_sum}$$

Example:

Recipe 1	real batch min	Recipe 2	real batch min	Recipe 3	real batch min
B1 50 kg T S	100 kg	B1 50 kg S	100 kg	B1 50 kg	50 kg
B1 50 kg S	100 kg	B1 50 kg S	100 kg	B1 50 kg S	75 kg
B2 100 kg T S	200 kg	B3 150 kg T S	200 kg	B3 200 kg T S	300 kg
Σ 150 kg	300 kg	Σ 150 kg	300 kg	Σ 200 kg	300 kg
Recipe setpoint=300 kg		Recipe setpoint=300 kg		Recipe setpoint=300 kg	
Scaling factor = 2		Scaling factor = 2		Scaling factor = 1,5	

In the third example the first component should not be scaled. Then the setpoint of the recipe line is batched independingly of the scale factor.
The calculation mode is independing of the recipe total mode.

6.2.4 Simulation

Before each recipe start it is checked if this production could theoreticly run. All components for this recipe must exist. During the recipe test run, neither the maximum weight of the hopper should be excided, nor the weight should fall below zero. All weighing points must be free and should not be in an error state. Without this conditions the recipe could not be started.

6.2.5 Deleting

Deleting individual or all recipes with function **'delete'**:

Select the entry by scrolling \blacktriangle . Limitation of the list is possible. Complete the selection by pressing 'Enter'.

\uparrow 'Soft' key selection 'single' deletes one selected recipe.

\uparrow Unless the list is limited, all components are deleted with 'all'. With a limited list, 'selected' is displayed instead.

- Leave submenu 'delete' by pressing key 'quit'.

```
Select Recipe
↕firstname↕
```

```
Delete Recipe?
Single↵      ↵ All
```

```
Delete Recipe?
Single↵      ↵ Selected
```

6.2.6 Printing

Printing individual or all recipes with function **'print'**:

Select the entry by scrolling \blacktriangle . A list limitation is possible with 'Enter'.

\uparrow Press 'soft'key selection 'single' to print only one selected component.

\uparrow Unless the list is limited, all recipes are printed with 'all'. With a limited list, 'selected' is displayed instead.

- Leave submenu 'delete' by pressing key 'quit'.

```
Select recipe
↕firstname↕
```

```
Print recipe?
Single↵      ↵ All
```

```
Print recipe?
Single↵      ↵ Selected
```

6.3 Starting a batch process

Select recipe ↕Tart ↕
Recipe setpoint 20.0 kg
Number of cycles 1

By selecting softkey 'Batch' from the batch menu, the PR1713 start procedure is displayed. The operator is prompted for entry of recipe name, setpoint and number of cycles.

During configuration, a value can be assigned to individual or each of these parameters. When starting the batch, these parameters are not displayed for entry any more (e.g. the number of cycles is always one. An entry at each start is omitted.)

6.3.1 Status display

During batching, the user can display the current process status.

- Gross weight
- Net weight
- Tare weight
- Difference weight
- Set-point
- Recipe name
- Component name
- Batch mode
- Current line
- Current cycle
- Maximum cycle

Tart7		
3: Sugar4		
B1	D	-3.4 kg
7*	S	10.0 kg

The status display has two levels. The display will change the level by pressing the key 'more'.

- In the first level the recipe name is shown in the upper line. In the lower line, the recipe line number and the actual component name are displayed.
- In the second level the batch mode, difference weight, number of current remaining cycles and set-point are displayed. As long the first Soft-key is pressed, the maximum number of cycles are shown.

With the Gross-key the weight display changed for a minimum of 3 seconds to the gross-weight.

With the Tare-key the weight display changed for a minimum of 3 seconds to the tare-weight.

6.3.2 Stopping the batch process



A batch process can be stopped manually at any time by pressing the red stop key. The stop message is displayed blinkingly.

* stopped *		
7*	S	10.0 kg

6.3.3 Continue, skip, abort

For this, the batch process must be in stop condition. When pressing the stop key again, the following menu is displayed.

```

      skip abort
continue◀line◀recipe
  
```

- ⏪ Pressing the first softkey resets the stop condition. In case of a tolerance alarm, the recipe controller is instructed to go on operating. Dependent of error cause and restart mode, the operation is continued by postbatching.
- ⏩ When pressing the second softkey, the current recipe line is skipped. All following recipe lines are continued normally. In case of a tolerance alarm, the recipe controller is instructed to abort only this line, because the error cannot be removed, but the recipe can be continued.
- ⏹ When pressing the third softkey, the overall recipe is aborted.
 - The menu is left again with the quit key.

6.3.4 Messages during batching

If tolerance monitoring is activated by entry of the tolerance parameters above zero, a tolerance alarm can be generated after a batch. If the currently batched total exceeds the tolerance, this message blinks in the first line and the recipe goes to the stop condition automatically. Different reactions on a tolerance alarm are possible. See section: '*Continue, skip, abort*'

```

* tolerance alarm *
7*           S 10.0 kg
  
```

With flow monitoring activated by entry of the min. flow value, there may be a flow warning after a batch. If the material flow exceeds the min. flow rate (e.g. due to clogging), this message blinks in the first line. The recipe does not go to the stop condition, but continues checking the flow rate. The warning extinguishes automatically, when the error is removed.

```

* flow warning *
7*           S 10.0 kg
  
```

6.4 Selecting a report

is displayed by selecting softkey 'Report' from the batch menu.



The following reports are selectable:

- component consumption report
- recipe production report
- last batch report

The layout of all reports is programmed with IEC1131. With the programming licence, however, the user is able to match the reports to his requirements.

With the configuration, the physical interface is determined via configuration, where the report is printed.

The reports have to be activated in the configuration. At 'Setup' und then 'Software parameter', it could be selected if and for what purpose the recipecontroller generates a report.

'Report to'	none	no report is generated
	communication	only for communication.
	proloc	only for the user interface (IEC 1131 programs)
	communic. & proloc	for communication and user interface

Note: Alle generated reports have to be read and deleted. If reports are generated for eg. communication and user interface, the communication has to detete the batch reports. If not, the data base is filled until no free memory space is left and no new batch could be started.

6.4.1 Consumption

Individual or all consumption totals can be printed out, or the consumption values can be deleted by pressing the first softkey.

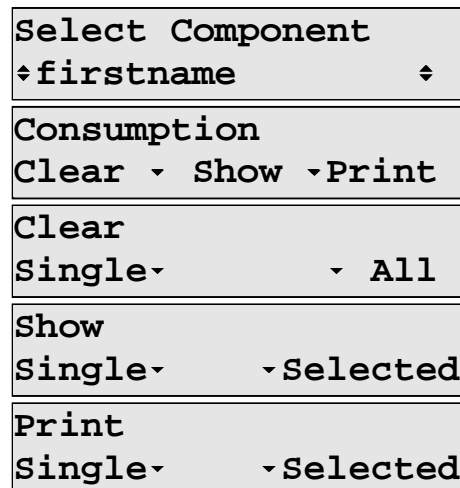
Select the entry by scrolling. A list limitation is possible. The selection is completed by pressing 'Enter'.

⬆️ 'Soft' key selection 'Clear' clears one or more consumption totals.

⬆️ 'Soft' key selection 'Show' shows one or more consumption totals. By pressing a key, the consumptions are displayed one by one. Pressing key 'quit' the list is aborted.

⬆️ 'Soft' key selection 'Print' prints one or more consumption totals.

- Unless the list is limited, all consumption totals are taken with 'all'. With a limited list, 'selected' is displayed instead. 'Soft' key selection 'single' taks only one selected component.
- Pressing key 'quit' leaves the respective submenu.



```
Consumption report
Date: 17.06.99 13:56
```

Component	WP Consumption	

Sugar-640	A	558,4 kg
Sugar-210	A	24,3 kg
Flour-fine	A	1330,8 kg
Egg powder	A	572,0 kg
Spice mixture-25	A	0,0 kg
Spice mixture-30	A	0,0 kg
Spice mixture-38	A	104,3 kg

6.4.2 Production report

Pressing the second softkey prints out individual or all production totals or deletes the production total values.

- ◆ Select the entry by scrolling. A list limitation is possible. Complete the selection by pressing 'Enter'.

⏴ 'Soft' key selection 'Clear' clears one or more production totals.

⏴ 'Soft' key selection 'Show' shows one or more production totals. By pressing a key, the productions are displayed one by one. Pressing key 'quit' the list is aborted.

⏴ 'Soft' key selection 'Print' prints one or more production totals.

- Unless the list is limited, all production totals are taken with 'all'. With a limited list, 'selected' is displayed instead. 'Soft' key selection 'single' takes only one selected recipe.
- Leave submenu 'delete' by pressing key 'quit'.

```
Select Recipe
◆firstname◆
```

```
Production
Clear ▾ Show ▾Print
```

```
Clear
Single ▾ ▾ All
```

```
Show
Single ▾ ▾ Selected
```

```
Print
Single ▾ ▾ Selected
```

```
Production report

Recipe                Production total
-----
Biscuits                502,0 kg
Cookies                 338,1 kg
Sand cake              1847,4 kg
```

6.4.3 Last batch report

Printing the last batch report with the third softkey:

Note: In the configuration, 'Setup' and then 'Config', it could be selected if an actual batch report is printed automatically after each batch. Therefore the menu 'batchep.auto prt' has to be selected to 'auto'.

Maier-Keks GmbH			
The world of biscuits			
Batch report			
Date: 03.10.99 12:35			
Recipe:	cookies		
Sequence number:	476		
Total:	100 kg		
Production number:	12		
Customer number:	1		
Start time:	12:01		
Stop time:	12:08		
Chargenumber:	1/3		
Alarmflags:	none		

Line Component	Actual value	Setpoint	Error
1 Flour-fine	1502,0 kg	1502,0 kg	0
2 Sugar-210	738,1 kg	738,1 kg	0
3 Egg powder	347,4 kg	347,4 kg	0
4 Spice mixture-38	82,9 kg	82,9 kg	0

6.5 Address layout of signals

6.5.1 Digital in- and outputmodules PR1713/12.

Note: The functionality described here, is the PLC standard program. This program could be changed with the software tool PR1750.

The output of the internal states or the input of 'commands' is defined by plugging the digital I/O cards (PR13/12) in the slots. Depending on the inserted licences the PR1713 has two operating modes: the indicator operation and the batch operating.

Indicator operation

Without a dosing licence PR1713/20 or PR1713/21
The indicator operation needs no further configuration.

	Inputs on	terminal	Outputs on	terminal
Slot 1 if the digital I/O-modul PR1713/12 is plugged in	tare in	B12	standstill	A12
	tare out	B34	¼ d indication	A34
	set to zero	B56	tared	A56
	weight valid	B78	free	A78
Slot 2 if the digital I/O-modul PR1713/12 is plugged in			Limit 1 on WP-A	A12
			Limit 2 on WP-A	A34
			Limit 1 on WP-B	A56
			Limit 2 on WP-B	A78
Slot 3				

Batching operation

For the batching operation the licence **PR1713/20** or **PR1713/21** has to be activated. With the digital inputs the recipe could be controled: stop, restart, abort.

Depending on the configuration: 'Setup' and then 'Config' in the parameter: 'Comp.& recipe I/O:' two variants exist: '**single**' or '**binary**'.

- 1) For each Component a **single** output is set and for each recipe a **single** input is read.
The output addresses of the components had to be entered in the parameter SPM-out for each component. The selection of the output is free.
For D1, D2, D5 and D8 components needs also the corresponding input addresses ('Quit' for D1, D2 and 'Go on' for D5, D8)
Recipes could be started with the 'Start'-input. With the licence PR1713/21 for multiple recipes, the recipe is started wich had been selected by one of the inputs of slot 2 or slot 3. Then the n-th recipe from the alphabetic sorted list of recipes is taken.

	Inputs on	terminal	Outputs on	terminal
Slot 1 if the digital I/O-modul PR1713/12 is plugged in	<u>Control signals</u>		<u>batch control</u>	
	Start / Restart / quit	B12	coarse valve	A12
	Stop	B34	fine valve	A34
	Abort	B56	discharge	A56
	Go on	B78	error	A78
Slot 2 if the digital I/O-modul PR1713/12 is plugged in	<u>single signals</u>		<u>single signals</u>	
	Start recipe 1	B12	component 1 active	A12
	Start recipe 2	B34	component 2 active	A34
	Start recipe 3	B56	component 3 active	A56
	Start recipe 4	B78	component 4 active	A78
Slot 3 if the digital I/O-modul PR1713/12 is plugged in	<u>single signals</u>		<u>single signals</u>	
	Start recipe 5	B12	component 5 active	A12
	Start recipe 6	B34	component 6 active	A34
	Start recipe 7	B56	component 7 active	A56
	Start recipe 8	B78	component 8 active	A78

- 2) The Component output is **binary coded** and the recipe input is read **binary coded**.
 The output addresses of the components had to be entered in the parameter SPM-out for each component. The selection of the output is free.
 For D1, D2, D5 and D8 components needs also the corresponding input addresses ('Quit' for D1, D2 and 'Go on' for D5, D8)
 Recipes could be started with the 'Start'-input. With the licence PR1713/21 for multiple recipes, the recipe is started wich had been selected by one of the inputs of slot 2 or slot 3. Then the n-th recipe from the alphabetic sorted list of recipes is taken.

	Inputs on	terminal	Outputs on	terminal
Slot 1 if the digital I/O-modul PR1713/12 is plugged in	<u>Control signals</u>		<u>batch control</u>	
	Start / Restart / Quit	B12	coarse valve	A12
	Stop	B34	fine valve	A34
	Abort	B56	discharge	A56
	Go on	B78	error	A78
Slot 2 if the digital I/O-modul PR1713/12 is plugged in	<u>Start recipe binary coded</u>		<u>Component binary coded</u>	
	2 ⁰	B12	2 ⁰	A12
	2 ¹	B34	2 ¹	A34
	2 ²	B56	2 ²	A56
	2 ³	B78	2 ³	A78
Slot 3 if the digital I/O-modul PR1713/12 is plugged in	<u>Start recipe binary coded</u>		<u>Component binary coded</u>	
	2 ⁴	B12	2 ⁴	A12
	2 ⁵	B34	2 ⁵	A34
	2 ⁶	B56	2 ⁶	A56
	2 ⁷	B78	2 ⁷	A78

6.5.2 SPM-addresses for addressing the digital outputs

All addresses in the parameter 'SPM-out' of the component had to be between 1024 and 1279. If the component active signals are routed individual to the outputs (single-mode) only the lower eight addresses 1024 to 1039 could be used.

With the binary coded output mode a maximum of 255 different components could be coded. Only one component at the same time may be active.

%MX1024	Free marker range for component output (256 bits)
to	
%MX1279	
%MX1280	Free marker range for recipe number input (32 bits)
to	
%MX1311	
%MX1312	'Quit'-input for 'manual'-component on WP-A (internal WP)
%MX1313	'Quit'-input for 'manual'-component on WP-B (external WP)
%MX1314	'Go on'-input for 'wait'-component on WP-A (internal WP)
%MX1315	'Go on'-input for 'wait'-component on WP-A (internal WP)
%MX1344	activate the waiting background task.
%MX1345	start a recipe
%MX1346...	free for additional functions
%MX1360	recipe number
to	
%MX1367	

Output of single component signals

Slot 2	
<u>Address</u>	<u>terminal</u>
1024	A12
1025	A34
1026	A56
1027	A78

Slot 3	
<u>Address</u>	<u>terminal</u>
1028	A12
1029	A34
1030	A56
1031	A78

Output of binary coded component signals

Slot 2		
<u>Address</u>	<u>Value after coding</u>	<u>terminal</u>
1024 LSB	2^0	A12
...	2^1	A34
1151 MSB	2^2	A56
	2^3	A78

Slot 3		
<u>Address</u>	<u>Value after coding</u>	<u>terminal</u>
1152 LSB	2^0	A12
...	2^1	A34
1279 MSB	2^2	A56
	2^3	A78

Input signals for components

The components for manual weighing (D1, D2) need a 'Quit'-signal from the operator. The address of the 'Quit'-input is 1312 and had to be entered at the component parameter 'SPM-in'.

The components which are waiting for the input signal 'Go on' (D5, D8), need the address 1314 at the component parameter 'SPM-in'.

7 ANALOG TEST

During the calibration of the device the test value is calculated automatically and stored in the EEPROM. This value is scaled to the full scale deflection (e.g. 5000).

When the test is activated, the measuring signal is disconnected from the loadcell. The displayed value appears without an unit on the weighing display. Depending on the calibration the value is displayed as the actual test value

or

as the difference between the original stored test value and the actual test value (e.g. 0000).

```
Analog test activ
      v          v Stop
```

The analog test remains activ, until it is terminated by 'Soft-key'-Stop or the Quit-key.

8 SETUP

Various functions can be selected during setup:

- Calibration
- Configuration
- Serial interfaces
- Display of board number
- Licence number management
- Initialization data print-out
- Set time
- Refresh display
- Reboot

These functions are described in the [☞ Installation manual](#).



Menu item 'Config' permits adjustment of the parameters for all operating functions.

9 WHAT CAN BE DONE IN CASE OF TROUBLE

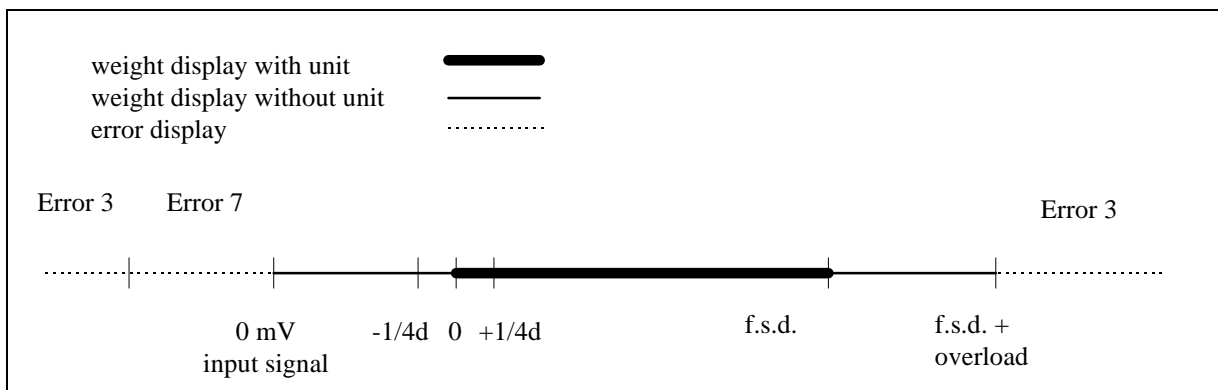
9.1 Error messages

9.1.1 Error messages on the weight display

Only the error statuses of the analog part are output on the weight display. They are displayed in code as 'Error x'.



Display	Signification/cause
Error 1	Internal computer overflow (faulty calibration values)
Error 2	The input voltage is above f.s.d. + overload
Error 3	The input voltage is below the permissible value of 36mV. However, the message can also be due to an analog section or load cell error, or a cable break.
Error 7	Negative input voltage or faulty load cell connection
Error 8	ADC error, e.g. hardware defective or overloaded



9.2 Error messages on the text display

These error messages are generated by the current application.

<u>Display</u>	<u>Signification/cause</u>
Dbase error	Opening or writing a table in the database was not possible. The table is reserved by another program, or not existing.
Tabelle is empty	No table contents were found.
Name already exist	An attempt to insert a new item with a name which already exists in this table into the database was made. The names in a table must be different.
Comp. used in rec.	An attempt to delete a component which is used in a recipe was made. Therefore, the component must be removed from the recipe previously.
Start error: ##	Error during batch start, ##=error number. 1: recipe table cannot be opened 2: unknown recipe 3: recipe line table cannot be opened 4: no recipe lines existing 5: material table cannot be opened 6: no material existing 7: unknown batch mode 8: internal error 9: no function module of this name existing 10: recipe lines are not numbered continuously 11: invalid PLC bit address 12: no function module existing 13: faulty function module type 14: parameter error in the function module 15: no free memory space 16: parameter error in the function module 17: invalid weighing point name 18: analog section not installed 19: simulation error 20: weighing point cannot be reserved 21: weighing point in error condition 22-29: internal 30: production table cannot be opened 31: production table cannot be written 32: a recipe is already running 33,34: internal 35: no free memory space 36: no licence for a production 37: negative set-point 38: too many active weighing points in the recipe 39: invalid weighing point 40: weighing point parameter in the request component is invalid 41: invalid batch mode for the reactor 42: no memory for the text parameter (recipe line, material) 43: invalid production line number
recipe not starting	The recipe controller was unable to handle the recipe.
Start timeout	
no batch licence	Batching licence PR1713/20 or PR1713/21 is required for handling this function.
PR1713/20 or /21	
Analog test failed	Analog test could not be activated. Weighingpoint is not free or in error.

10 INDEX

A

alarm indicaton.....	6
Analog components.....	26
analog input component.....	26
analog output component.....	26
analog test	47

B

Back-space	7
batch	
– abort recipe	39
– continue	39
– skip line.....	39
– start	38
– stop	38; 39
Batch Mode.....	23
Batchable components	23
Batching active indication.....	6
batching functions.....	19

C

calculation mode	35; 36
Calming time.....	28; 29
charge/discharge batching	24
component	
– delete.....	31
– editing	20
– print out	31
component signal	
– binary coded.....	43; 46
– single.....	43; 45
Configuration	49
consumption	40
correction	29
counting scale.....	17
Cursor key	7
cycles.....	38

D

delete.....	7
discharge mode	24
Dummy components	25

E

Enter key	7
error messages.....	51

F

fine switch-off point.....	29
fixed tare	15
flow warning.....	39
Flowrate	28
Function keys.....	7

G

gross discharge mode.....	24
---------------------------	----

I

Input signals for components	46
------------------------------------	----

L

last batch report 42

M

main menu 13
 manual 24
 manual control 24
 More key 7

N

net discharge batching 24

O

Other batch modes 26
 Overshoot 27
 overshoot correction 27

P

post-batching 27
 PR1713/06 26
 Preset Point 27
 print-out-key 7
 production totals 41

Q

Quit-key 7

R

Recipe
 – delete 37
 – edit 32
 – print out 37
 recipe setpoint 36
 recipe sum 35
 recipe total mode 35
 Reports 40
 restart mode 29
 RW, RQ, RL 25

S

scaling 36
 Scroll key 7
 set to zero 7
 set-point 29
 Setup 49
 simulation 36
 Softkey 7; 8
 SPM input address 27
 SPM output address 27
 Standstill 6
 Stop-key 7

T

tare set and reset 7
 Tolerance 27
 tolerance alarm 29; 39
 tolerance test 29
 total discharge 24