

G4 Multi Channel Weighing Instrument

Program version 1.5.0.0



Scale Batching Program Option
Technical Manual Supplement
PM/DT/HE/RM types

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1. Introduction

General

In the program version 1.5.0.0 the 'G4 Modular Weighing Instrument' includes a program option for 'Batching'. The option can be activated by a code specific for each individual instrument. The code can be ordered from Nobel Weighing Systems and should be entered in menu 'Program Options' in 'Parameter Set-up' under the instrument 'Main Menu'.

This manual should be used as a supplement to the 'Technical Manual' for the 'G4 Modular Weighing Instrument'. It describes in detail the batching functionality. Note that this manual can be used for all instrument types (PM, DT, HE and RM) while the Technical Manuals are different for instruments with graphical display (PM, DT and HE) and for the alphanumeric display instrument (RM).

When batching with multiple scales, more digital inputs and outputs may be needed. Connection of external Ethernet WAGO I/O modules will add up to 128 inputs and 128 outputs.

Front panel

Graphical display

The following section applies to the graphical operating display used in the PM, DT and HE instrument types.

This type of instrument with a graphical display is well suited for use as a complete multi scale batching system including an easy to use operator interface. Push buttons on the front panel are used to start, stop, reset etc. It will also display necessary batching status, alarms etc. The instrument can also be remotely controlled from a supervising computer (PLC, SCADA system etc).

RM-instrument display

The following section applies to the alphanumeric display used in the RM (DIN rail mount) instrument type.

The RM instrument is a complete multi scale batcher but it is not intended as an operator interface for batching. It is possible to set-up the batching sequences from the RM instrument front panel. However for control (start, stop, reset etc) of the batching sequence should a supervising computer be used (PLC, SCADA system etc).

2. Batching principles

General

Batching with the G4 Instrument means performing up to 12 activities in numerical order as one sequence for each scale. Batching can be used with each used scale in the instrument. Each Scale Batching sequence operates independent of the other. The batching sequence can be repeated a defined number of times. As batching is performed, the instrument function is supervised and possible alarms will be given. Printing of alarms and batched weights can be performed on a connected printer, note that all scales / batching sequences share the same printer. The batching events can also be written to a log file in the instrument. Each scale will generate (if configured) it's own log file.

Digital inputs and outputs

The instrument uses digital outputs and inputs to control and monitor the batching process. If the number of internal inputs and outputs (inputs and outputs on IO modules in the instrument) are not sufficient it is possible to use a WAGO-I/O-SYSTEM 750 to increase the number of inputs and outputs in a batching system. See the 'Technical Manual' and the documentation, covering the WAGO I/O SYSTEM, supplied by WAGO.

Outputs can be divided in two categories (regarding batching). First there are indications used by an operator (lamps etc.) or by a supervising computer to monitor the status of the batching. Secondly there are outputs used to control the batching process, batching valves, heaters, stirrers etc. Internal outputs can be used for both categories while external outputs (WAGO-I/O-SYSTEM) are dedicated as batching process controls.

Inputs can be divided into three categories: First there are control signals used by an operator (buttons etc) or a supervising computer to control the batching sequence. These signals are start, stop, restart, reset, reset alarm etc. Secondly there are acknowledgement signals used as interlocks in the batching process. Thirdly there are pulse-counting inputs for pulse batching activities where the number of pulses corresponds to the amount of material batched. Internal inputs can be used for all three categories while external inputs (WAGO-I/O-SYSTEM) are dedicated to acknowledgement signals.

Internal inputs and outputs are configured in menu 'Parameter Set-up / Inputs' and 'Parameter Set-up / Outputs'. See the 'Technical Manual' chapter 'Set-up'. Note that internal inputs and outputs must be set to 'Batch Activity' (the default value) to be used in batching activities.

A digital input may be used in activities belonging to more than one scale (i.e. it is possible to share inputs between scales).

A digital output may only be used in activities belonging to one scale (i.e. it is not allowed share outputs between scales).

Batch start check

When batching is started (start button or communication start command) an I/O usage check is done to verify that all the rules described above are followed. This check is only done for the scale to start. If there are any violations to the I/O usage rules there will be an error and the batching sequence will not start. Note that if any batching is running editing of parameters is not allowed, except for some activity parameters. It's therefore recommended that all settings are properly tested before full production begins.

Batching activities

The following types of activities are available for the batching sequence:

Weigh In	used to batch a component into the weighed vessel (batch in).
Weigh Out	used to batch from a previously filled, weighed vessel (batch out). Displayed weight during Weigh Out is always negative.
Dump	used to empty a vessel into which components have been batched.
Fill	used to fill up a vessel to a certain level.
Timer	used to pause the batching sequence for a defined time.
Timer w. Output	used to activate an output for a defined time.
Latch On	used to make an output signal.
Latch Off	used to break an output signal.
Manual	used to halt the batching, making it possible to manually add special material. Then batching must be manually restarted.
Pulse Batch	used for batching with the aid of pulses from a flow meter.

Setpoint values

The activity types **Weigh In**, **Weigh Out**, **Timer**, **Timer w. Output**, **Manual**, and **Pulse Batch** require Setpoint values. All Setpoint values can be shown and edited in menu 'Batch Data' under the Batching display. Manual editing (from front panel) of setpoints can only be done on an instrument with graphical display.

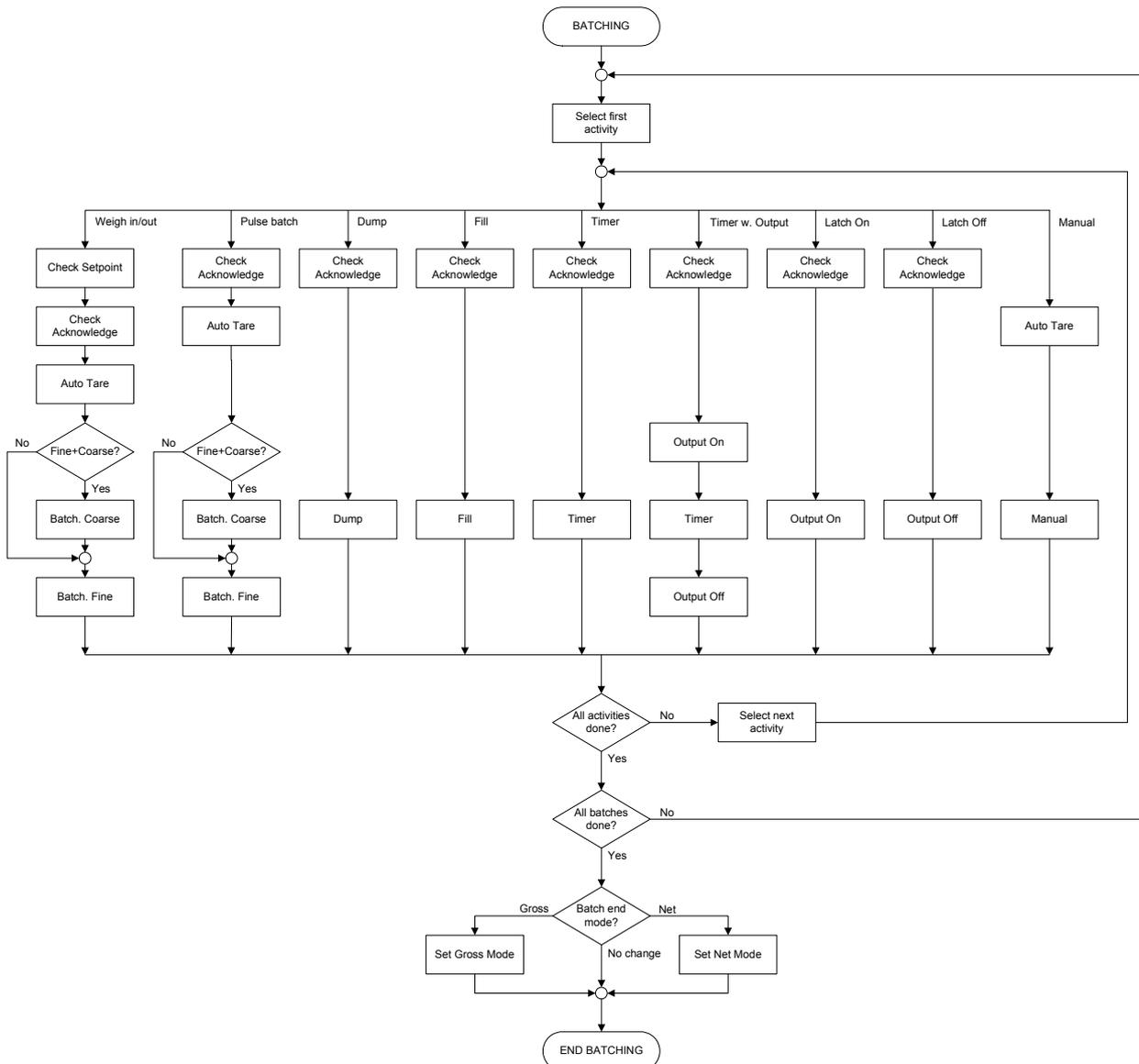
Weigh In and Weigh Out	The Setpoint value determines the component quantity, expressed in the measurement unit.
Timer and Timer w. Output	The Setpoint value determines the duration of the activity, expressed in seconds with max. one decimal. The range is 0.0 to 999999.0 seconds.
Manual	The Setpoint value normally determines a small component quantity to be added manually.
Pulse Batch	The Setpoint value determines the component quantity, expressed in the pulse batching unit.

The activity types **Dump**, **Fill**, **Latch On** and **Latch Off** do not require Setpoint values.

3. Activity description

General

In the description of activities below Scale 1 Activity 1 parameters are used as an example. The parameter names includes the scale number and the activity number. E.g. '1/1:ActivityType' applies to Scale 1, Activity 1 while '3/4:ActivityType' applies to Scale 3, Activity 4 etc. Calibration parameters have a prefix that shows which scale the parameter is belonging to. E.g. '1:Capacity' apply to Scale 1.



Principles how batching is carried out. The batching sequence can include up to twelve activities.

Weigh In

The Weigh In activity is used when the material is batched into the weighed vessel.

Setpoint check

When a Weigh In activity is started, the Setpoint value is checked to determine if the receiving container has sufficient capacity for the set quantity of material. The implication of this Setpoint check is that actual Gross weight + Setpoint value must be less than 'S1:Capacity' for the scale.

If the remaining scale capacity is not sufficient the batching sequence will be halted, an alarm message will be displayed and printed/logged to file. When the alarm cause has been taken care of the alarm can be reset and the batching restarted.

Acknowledgement check

When the Setpoint value has been checked and accepted, the acknowledgement input signal is checked according to '1/1:Acknowledge Type' setting':

- 'No Test': No acknowledgement checking is done. The batching sequence continues immediately.
- 'At Start' or 'Continuous': An unsatisfactory signal will initiate an alarm and the batching sequence is halted. The alarm should be reset and the sequence restarted to continue the batching sequence. The acknowledgement input signal will then be checked again.
- 'Wait' or 'Wait+Cont.': The instrument will wait (without alarm) until the correct acknowledgement input signal is received. When the acknowledgement signal is correct the batching sequence continues.

Stability Check before batching

If '1:Motion Check' is 'On' the instrument waits for the weight to become stable before Auto taring is performed. Alarm is never initiated by an unstable weight in conjunction with start of batching. After the instrument is tared it switches to net weight and displays zero weight.

Batching

Depending on the settings of '1/1:Batching Mode' and '1/1:Fine on during Coarse' parameters there are three different ways that batching can be done.

- '1/1:Batching Mode' is 'Fine+Coarse' and '1/1:Fine on during Coarse' is 'Yes': The coarse output and the fine output are activated. The instrument shows increasing weight. When the weight reaches 'Coarse Level' the coarse output is deactivated (Coarse Level = Setpoint – Fine Value – Inflight Value). When the increasing weight reaches 'Inflight Level' the fine output is deactivated (Inflight Level = Setpoint – Inflight Value).

- '1/1:Batching Mode' is 'Fine+Coarse' and '1/1:Fine on during Coarse' is 'No':
The coarse output is activated. The instrument shows increasing weight. When the weight reaches 'Coarse Level' the coarse output is deactivated and the fine output is activated (Coarse Level = Setpoint – Fine Value – Inflight Value). When the increasing weight reaches 'Inflight Level' the fine output is deactivated (Inflight Level = Setpoint – Inflight Value).
- '1/1:Batching Mode' is 'One Phase':
The output is activated. The instrument shows increasing weight. When the increasing weight reaches 'Inflight Level' the output is deactivated (Inflight Level = Setpoint – Inflight Value).

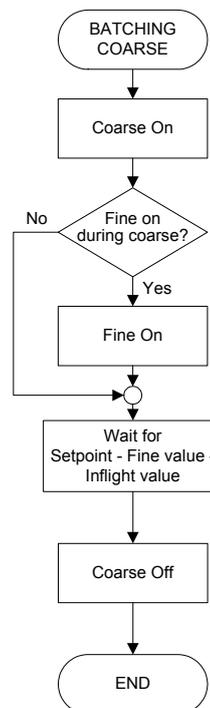
The '1/1:Inflight Value' is adjusted automatically after each batching if the activity parameter '1/1:Inflight Factor' is set to a value higher than zero.

Waiting after batching

The instrument waits equivalent to '1/1:Wait Time', a time that must be set so that all material is really stable on the scale before the waiting time has expired.

Batching timeout

The total batching time for the activity is monitored and if the time exceeds the set '1/1:Timeout Value', an alarm will be initiated. Timeout count will start when the acknowledgement signal is received and stop during possible batching halts. Timeout count starts all over again when a Timeout alarm has been reset and batching has been restarted.



Flow chart for batching step "Batching coarse".

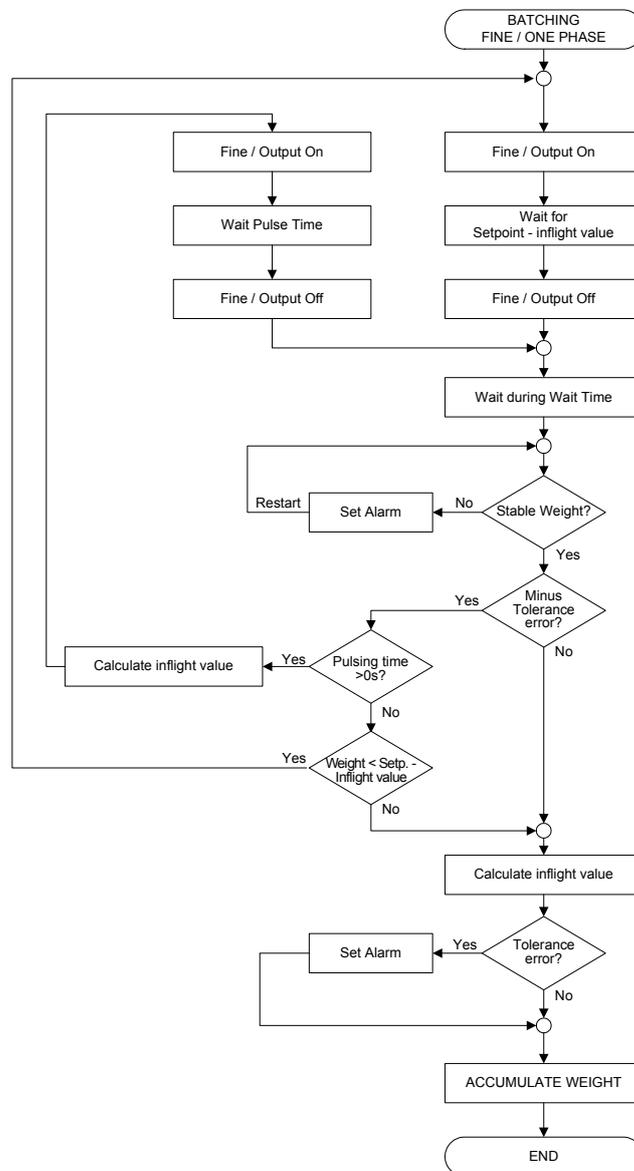
Stability check after batching

After the complete batching of a Weigh In (or Weigh Out) activity and Wait time, a stability check is performed if '1:Motion Check' is 'On' (stability check is never performed for a Pulse Batching activity).

Unstable weight initiates an alarm. A new weight stability check is performed at restart, implying that the weight MUST be stable for the instrument to continue the batching sequence. If stable weight cannot be obtained, batching must be reset or the ongoing activity skipped.

Tolerance check

The batched weight is always checked against the set tolerance limits. One parameter defines the '1/1:Minus Tolerance' (weight below the Setpoint value) and the other defines the '1/1:Plus Tolerance' (weight above the Setpoint value). The tolerance setting range is 0.00 - 100.00 %.



Flow chart for batching steps "Batching fine" and "Batching one phase".

100.00 % means that tolerance check is not performed (all weights are approved).
 5.00 % means that the batched weight is permitted to deviate from the Setpoint value by 5 % thereof.

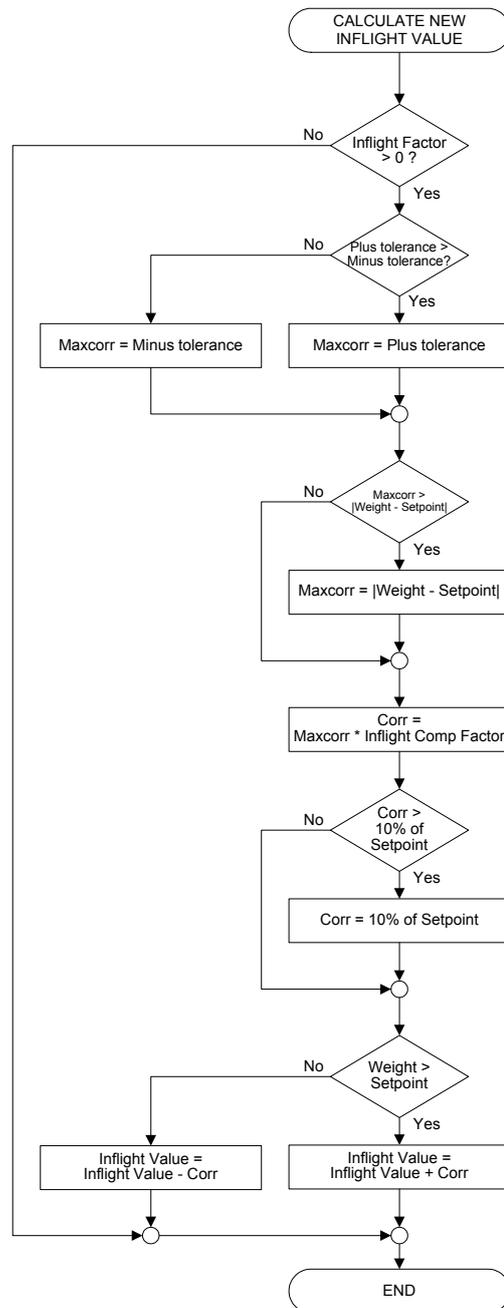
If the weight is below the '1/1:Minus Tolerance' limit, and a '1/1:Pulsing Time' other than zero is selected, the fine output will be activated again for the time defined by the parameter '1/1:PulsingTime'. After the '1/1:Wait Time' a renewed tolerance check will be performed.

If the weight value is still below the '1/1:Minus Tolerance' limit, pulsing of the fine output will be performed repeatedly until the weight value is above the '1/1:Minus Tolerance' limit. Selection of a '1/1:Pulsing Time' other than zero makes it possible to ensure that the obtained batch weights will never be below the '1/1:Minus Tolerance' limit.

If '1/1:Pulsing Time' is zero and the weight value is below the '1/1:Minus Tolerance' limit, batching will recommence in the fine phase if the remaining weight up to the Setpoint value is greater than the '1/1:Inflight Value'.

In other cases an alarm will be obtained. An alarm is always obtained if the weight value exceeds the '1/1:Plus Tolerance' limit.

The operator can bypass these tolerance alarms by resetting the alarm and restarting the batching sequence. Either the erroneous weight can be accepted or other manual adjustments can be made before batching is restarted. When restarting after a tolerance alarm a second tolerance check will *not* be performed but the actual weight will be used for accumulation and printing.



Automatic adjustment of Inflight value.

Automatic inflight compensation

Automatic inflight compensation is operative when the '1/1:Inflight Factor' has a value higher than zero. It is used to adjust the '1/1:Inflight Value' after each activity to bring the batched weight value as close to the Setpoint as possible.

Automatic inflight compensation for any activity is performed by:

$$\text{New Inflight value} = \text{preceding Inflight value} + (\text{batched weight} - \text{Setpoint value}) \times \text{'1/1:Inflight Factor'}$$

The range of the '1/1:Inflight Factor' is 0 - 100 % (0 % means no compensation).

A 50 % Inflight factor adjusts the '1/1:Inflight Value' by 50 % of the difference between batched weight and Setpoint value.

The previous figure describes the '1/1:Inflight Value' adjustment. Usually, the difference between batched weight and Setpoint value is the starting point for the changes.

The difference between batched weight and Setpoint value is limited to the largest value of:

$$\begin{aligned} &\text{Setpoint value} \times \text{'1/1:Plus Tolerance'} \text{ or} \\ &\text{Setpoint value} \times \text{'1/1:Minus Tolerance'} \end{aligned}$$

This limitation ensures that the correction (for example, by a possible tolerance error) will not be completely unreasonable. The correction of the '1/1:Inflight Value' is always limited to 10 % of the Setpoint value.

Note that the inflight value is only calculated once, even in pulsing is made several times.

Weigh Out

Weigh Out is very similar to Weigh In, but batching is done from an already filled vessel. The only difference being that the Setpoint value is checked to determine that a sufficient material quantity is available in the container. The requirement is for the gross weight to be larger than the Setpoint value + 20 × '1:Resolution'. If this requirement is not satisfied an alarm is initiated.

The weight display during this type of batching is always negative.

Pulse Batching

The Pulse Batching activity is very similar to the activities Weigh In and Weigh Out, but the Pulse Batching activity does not use the measured weight value for the batching. Instead it counts pulses (normally from a flow meter) that are scaled to a weight, volume or any other unit. Another difference is that there are no stability and setpoint checks included in the Pulse Batching sequence.

There are four more parameters in this activity, defining the input for pulses '1/1:Pulse Input No', the number of decimals for Pulse Batching '1/1:No of Decimals', the Pulse Batching unit '1/1:Unit', and the number of pulses/unit '1/1:Scale Factor'.

NOTE! For a Pulse Batching activity the weight in this manual should be read as 'No of counted pulses' × '1/1:Scale Factor'.

Dump

Only emptying of the vessel into which the components have been batched is performed by this activity.

Acknowledgement check

The acknowledgement input signal is checked according to '1/1:Acknowledge Type' setting':

- 'No Test': No acknowledgement checking is done. The batching sequence continues immediately.
- 'At Start' or 'Continuous': An unsatisfactory signal will initiate an alarm and the batching sequence is halted. The alarm should be reset and the sequence restarted to continue the batching sequence. The acknowledgement input signal will then be checked again.
- 'Wait' or 'Wait+Cont.': The instrument will wait (without alarm) until the acknowledgement input signal is received. When the acknowledgement signal is correct the batching sequence continues.

When the acknowledgement signal is correct the instrument switches to display of gross weight.

Dumping

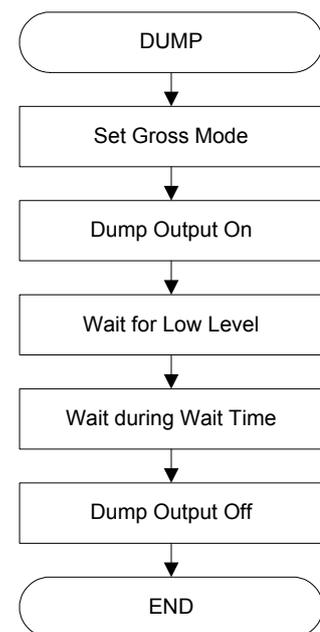
The dump output, defined in parameter '1/1:Output No', is activated. When the gross weight has come down to the '1/1:Low Level' a timer is started. This is a low-weight value, which is used to obtain a detectable weight value close to zero.

After a time equivalent to '1/1:Wait Time', the dump output is deactivated. Wait time must be selected long enough to allow all material left at the dump low level to leave the vessel during this time.

Dumping timeout

The total dumping time is monitored and if it exceeds the set '1/1:Timeout Value', an alarm will be obtained. Timeout count will start when the acknowledgement signal is received and stop during possible batching halts.

Timeout count starts all over again if a Timeout alarm has been reset and dumping has been restarted.



Dump activity

Fill

This activity type is used to fill a vessel with material.

Acknowledgement check

The acknowledgement input signal is checked according to '1/1:Acknowledge Type' setting':

- 'No Test': No acknowledgement checking is done. The batching sequence continues immediately.
- 'At Start' or 'Continuous': An unsatisfactory signal will initiate an alarm and the batching sequence is halted. The alarm should be reset and the sequence restarted to continue the batching sequence. The acknowledgement input signal will then be checked again.
- 'Wait' or 'Wait+Cont.': The instrument will wait (without alarm) until the acknowledgement input signal is received. When the acknowledgement signal is correct the batching sequence continues.

Filling

If the gross weight is below '1/1:Low Level' the instrument switches to display of gross weight and activates the Fill output defined in parameter '1/1:Output No', else nothing more is done in the activity.

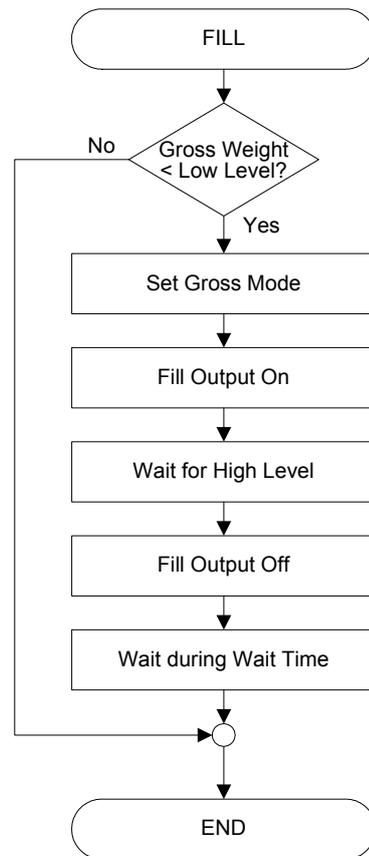
When the gross weight has come up to the '1/1:High Level' the output is deactivated.

The instrument waits equivalent to '1/1:Wait Time'. It must be set so that all material is really on the scale before the waiting time has expired.

Filling timeout

The total filling time is monitored and if the time exceeds the set '1/1:Timeout Value' an alarm will be obtained. Timeout count will start when the acknowledgement signal is received and stop during possible batching halts.

Timeout count starts all over again if a Timeout alarm has been reset and filling has been restarted.



Fill activity

Timer and Timer with Output

Timer activities are used to switch on an output signal for the set time or to give a 'pause' (without any output signal).

Acknowledgement check

The acknowledgement input signal is checked according to '1/1:Acknowledge Type' setting':

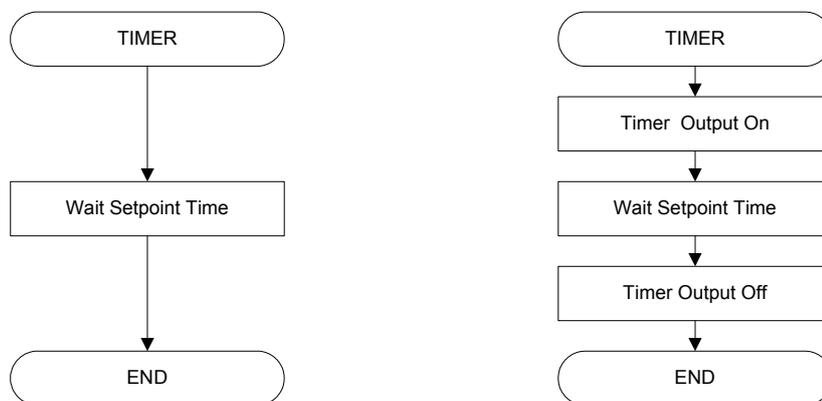
- 'No Test': No acknowledgement checking is done. The batching sequence continues immediately.
- 'At Start' or 'Continuous': An unsatisfactory signal will initiate an alarm and the batching sequence is halted. The alarm should be reset and the sequence restarted to continue the batching sequence. The acknowledgement input signal will then be checked again.
- 'Wait' or 'Wait+Cont.': The instrument will wait (without alarm) until the acknowledgement input signal is received. When the acknowledgement signal is correct the batching sequence continues.

Timer

When the acknowledgement signal is correct the Timer output (defined in parameter '1/1:Output No') is activated if '1/1:Activity Type' is 'Timer w. Output'.

The instrument counts down the time corresponding to Setpoint value (the count-down can be watched on the display). If batching is restarted after a temporary halt (due to, for example, an alarm) the time count starts from where it was stopped.

When the time has expired the output is deactivated (if it was active).



Timer and Timer with output activities.

Latch On

Latch On activities are used to switch on an output signal.

Acknowledgement check

The acknowledgement input signal is checked according to '1/1:Acknowledge Type' setting':

- 'No Test': No acknowledgement checking is done. The batching sequence continues immediately.
- 'At Start' or 'Continuous': An unsatisfactory signal will initiate an alarm and the batching sequence is halted. The alarm should be reset and the sequence restarted to continue the batching sequence. The acknowledgement input signal will then be checked again.
- 'Wait' or 'Wait+Cont.': The instrument will wait (without alarm) until the acknowledgement input signal is received. When the acknowledgement signal is correct the batching sequence continues.

When the acknowledgement signal is correct the output is activated.

The 'On During Halt' parameter determines if the output should be switched off or not during temporary halts.

Note that latches are turned off automatically when the batching sequence is finished. This means if the output is supposed to be on for the rest of the current batching sequence it is not necessary to use an Latch Off activity to turn it off.

Latch Off

Latch Off activities are used to switch off an output signal.

Acknowledgement check

The acknowledgement input signal is checked according to '1/1:Acknowledge Type' setting':

- 'No Test': No acknowledgement checking is done. The batching sequence continues immediately.
- 'At Start' or 'Continuous': An unsatisfactory signal will initiate an alarm and the batching sequence is halted. The alarm should be reset and the sequence restarted to continue the batching sequence. The acknowledgement input signal will then be checked again.
- 'Wait' or 'Wait+Cont.': The instrument will wait (without alarm) until the acknowledgement input signal is received. When the acknowledgement signal is correct the batching sequence continues.

When the acknowledgement signal is correct the output is deactivated.

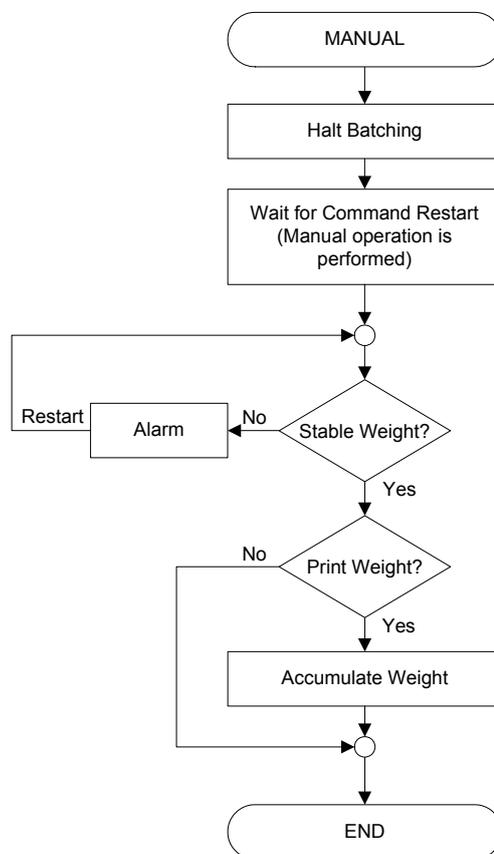
Note that latches are turned off automatically when the batching sequence is finished. This means if the output is supposed to be on for the rest of the current batching sequence it is not necessary to use an Latch Off activity to turn it off.

Manual

A Manual activity halts the batching to allow special operations that must be carried out manually. (For example, to add small quantities of material manually.) Before batching is halted autotaring is performed, which means that the net weight zero is displayed when the manual operation starts.

Batching must be restarted either by giving a Restart Command (communication or digital input) or manually by pressing the START button (only on PM/DT/HE instrument).

If '1/1:Print Weight' is 'Yes' then the weight value (weighed by the scale or entered manually) will be added to the accumulating registers and printed. Parameter '1/1:Enter Weight' defines whether the operator shall have the opportunity to enter the weight value for the added material manually, or not. If parameter '1/1:Enter Weight' is 'Yes' but the operator does not enter a weight value manually, then the weight value from the scale will be used. A "manual entered weight" sent by communication is used in the same way as if the operator enter a value from the front panel.



Flow chart for activity Manual.

4. Batching parameters

Changing and storing

Batching menus and batching parameters will only be displayed if the user has entered a valid option code for the Scale Batching Program Option. See the 'Technical Manual', for the relevant instrument type, for details on how to enter option code, how parameters are handled (editing, saving etc), how calibration etc. is performed. It is advisable to make all necessary basic set-ups like hardware configuration, calibration etc. before continuing with the batching setting.

Data entered to define batching parameters are permanently stored in the instrument and will not be lost if the instrument is switched off.

Certain activity parameters are of a conditional type, implying that they do not appear unless another parameter has a certain value. These conditions are given in the explanation text for the parameters.

The Scale Batching Program Option is available both on the PM/DT/HE graphical display instrument type as well as on the RM alphanumerical display instrument type. The same parameters are available on all instrument types but the spelling of the parameter names differ for the RM type. In the list below are the RM type parameter names written within brackets. The name used on a graphical display type of instrument is shown first on the row without brackets. The same applies to menu names. In the explanation part for parameters references only the graphical display type of instrument naming is used. The RM type of naming will be found for the respective parameter.

The G4 Multi Channel Instrument can handle batching for up to 8 scales depending on the number of measuring channels installed in the instrument. In the parameter list below are the parameters for scale number 1 shown. The same parameter list is available for all installed scales. The parameters for each scale is grouped in it's own sub menu. The prefix S1 – S8 is used to distinguish parameters belonging to the different scales. For each scale there are 12 activities available. The parameters for each scale and activity are distinguished by it's prefix; '1/1:Activity Type' or ['1/1:Act. Type'] is the activity type parameter for scale 1, activity 1, '5/11:Activity Type' or ['5/11:Act. Type'] is the activity type parameter for scale 5, activity 11 etc.

Parameter editing can be performed in menus 'Scale 1 Batching Params.' or ['S1 Batch.Param.'], to 'Scale 8 Batching Params.' or ['S8 Batch.Param.'], by front panel keys. The menus are available under 'Parameter Set-up / Batching Parameters' or ['Param. Set-up / Batching Param.'].

Parameters marked with an asterisk (*) can also be edited during a batching in progress.

Backup of all parameters is recommended after editing. The parameter backup will be valuable if an instrument has to be replaced.

Parameters

On the following pages a survey of all parameters is presented. The parameters are divided in groups following the menu they belong to. For choice parameters the available choices are given. For numerical parameters, a value range is given.

At the end of the table, the default value is given in < >.

To the right there is a short parameter explanation and, *in italic*, the results for the different alternatives.

Range/Alternatives <default value>	Explanation and result of alternatives.
---------------------------------------	--

Menu 'Scale 1 Batching Params.' ['S1 Batch.Param.']

S1:Display no of Batches [S1:Disp no of B.]

No	Defines if it should be possible to select a number of batches.
Yes	No: <i>Not possible to select a number of batches</i>
<No>	<i>(always one batch).</i> Yes: <i>Possible to select a number of batches.</i>

S1:Display Batch Size [S1:Displ. B-Size]

No	Defines if it should be possible to select the batch size.
Percent	No: <i>Not possible to select batch size</i>
Weight	<i>(always 100% batch size).</i>
<No>	Percent: <i>Possible to enter a batch size in percent.</i> Weight: <i>Possible to enter a batch size in weight units.</i>

S1:Batch Printout [S1:Batch Print.]

No	Defines the type of batch report.
Full Report	No: <i>No batch report is printed.</i>
Limited Report	Full Report: <i>Batched weights, alarms and other information are printed.</i>
Only Alarms	Limited Report: <i>Only batched weights and alarms are printed.</i>
Log Mode	Only Alarms: <i>Only batch alarms are printed.</i>
<No>	Log Mode: <i>All events like batched weights, alarms etc. are printed in the order they occur.</i>

Range/Alternatives <default value>	Explanation and result of alternatives.
S1:File Log [S1:File Log]	
No	Defines the type of file log.
Limited	No: No logging to file is made.
Full	Limited: Only batched weights and alarms are logged.
<No>	Full: Batched weights, alarms and other information are logged.
S1:Batch End Mode [S1:Batch E.Mode]	
No Change	Selection of weight display mode after finished batching operation.
Gross	
Net	No Change: No change of mode.
<Gross>	Gross: Sets gross mode.
	Net: Sets net mode.

Range/Alternatives <default value>	Explanation and result of alternatives.
---------------------------------------	--

Menu 'S1A1:name' ['S1A1:name']

In the menu name shown above 'name' is replaced with the Activity Name or, if no name is set, the Activity Type.

The following batching parameters are available in 12 sets for each scale, one for each activity in the instrument for each scale. They are grouped in one sub menu for each activity. Batching parameters '1/1:Activity Type' and '1/1:Activity Name' are available for all activity types.

1/1:Activity Type [1/1:Act. Type]

Not used	Defines the type of activity.
Weigh In	Not used: The activity is not used.
Weigh Out	Weigh In: Weigh in activity.
Dump	Weigh Out: Weigh out activity.
Fill	Dump: Dumping activity.
Timer	Fill: Filling activity.
Timer w. Output	Timer: Timer activity.
Latch On	Timer w. Output: Timer activity with output.
Latch Off	Latch On: Latch on activity.
Manual	Latch Off: Latch off activity.
Pulse Batch	Manual: Manual activity.
<Not used>	Pulse batch: Pulse batching activity.

1/1:Activity Name [1/1:Act. Name]

Activity name (16 character string).
The activity name is used to identify the activity in the instrument, on printouts, in log files and on the display on instruments with graphical display.

Note: This parameter is not shown if '1/1:Activity Type' is set to 'Not used'.

Weighing In or Out (Activity Type = Weigh In or Weigh Out)

1/1:Batching Mode [1/1:Batch Mode]

One Phase	Defines if it is a one phase batching or a Coarse/Fine batching activity.
Fine+Coarse	
< Fine+Coarse >	One Phase: One phase batching (only one output used). Fine+Coarse: Coarse-fine batching (two outputs used).

Range/Alternatives <default value>	Explanation and result of alternatives.
---------------------------------------	--

1/1:Output No [1/1:Output No]

11-18	Defines the output used for one phase batching. Internal outputs (11-68) must be defined as 'Batch. Activity' in the set-up menu 'Outputs'.
21-28	
31-38	
41-48	Note: This parameter is only shown if '1/1:Batching Mode' is set to 'One Phase'.
51-58	
61-68	
101-228	
<221>	

1/1:Coarse Output No [1/1:C. Outp No]

11-18	Defines the output used for coarse batching. Internal outputs (11-68) must be defined as 'Batch. Activity' in the set-up menu 'Outputs'.
21-28	
31-38	
41-48	Note: This parameter is only shown if '1/1:Batching Mode' is set to 'Fine+Coarse'.
51-58	
61-68	
101-228	
<221>	

1/1:Fine Output No [1/1:F. Outp No]

11-18	Defines the output used for fine batching. Internal outputs (11-68) must be defined as 'Batch. Activity' in the set-up menu 'Outputs'.
21-28	
31-38	
41-48	Note: This parameter is only shown if '1/1:Batching Mode' is set to 'Fine+Coarse'.
51-58	
61-68	
101-228	
<221>	

1/1:Fine on During Coarse [1/1:F.During C]

No	Defines if the fine output shall be active during the coarse batching phase.
Yes	
<No>	
	<i>No: Only the coarse output is active during the coarse batching phase.</i>
	<i>Yes: Both coarse and fine outputs are activated during the coarse batching phase.</i>
	Note: This parameter is only shown if '1/1:Batching Mode' is set to 'Fine+Coarse'.

1/1:Start Delay* [1/1:Start Del.]

Range: 0.0 - 99.9	The time period from batching start (output/coarse output on) until the instrument start to monitor the weight (comparing with the set-point). Used to avoid reacting on weight value oscillations at batching start.
Unit: s	
<0.0>	

Range/Alternatives <default value>	Explanation and result of alternatives.
---------------------------------------	--

1/1:Fine Start Delay* [1/1:F.Start D.]

Range: 0.0 - 99.9
Unit: s
<0.0>

The time period from start of fine phase (fine output on) until the instrument start to monitor the weight (comparing with the set-point). Used to avoid reacting on weight value oscillations at start of fine phase.

Note: This parameter is only shown if '1/1:Batching Mode' is set to 'Fine+Coarse'.

1/1:Fine Value* [1/1:Fine Value]

Range: 0 - 999999
Unit:
Measurement Unit
<0.0>

The amount of material batched in the fine batching phase.

Note: This parameter is only shown if '1/1:Batching Mode' is set to 'Fine+Coarse'.

1/1:Minus Tolerance* [1/1:Minus Tol.]

Range:
0.00 - 100.00
Unit: %
<100.00>

Minus tolerance value. 100 % = No tolerance check.

1/1:Plus Tolerance* [1/1:Plus Tol.]

Range:
0.00 - 100.00
Unit: %
<100.00>

Plus tolerance value. 100 % = No tolerance check.

1/1:Inflight Factor* [1/1:Infl. Fact]

Range: 0 - 100
Unit: %
<0>

Automatic inflight compensation is performed with this factor. The "Inflight value" is corrected with the resulting batching error multiplied by this factor.

0 = No automatic inflight compensation.

1/1:Inflight Value* [1/1:Infl. Val.]

Range: 0 - 999999
Unit:
Measurement Unit
<0.000>

Batching will be completed (output deactivated) when this value remains to batch.

If automatic inflight compensation is used, this value is adjusted after each batch.

1/1:Wait Time* [1/1:Wait Time]

Range: 0.1 - 999.9
Unit: s
<5.0>

Time from completed batching (outputs off) to stability check and tolerance check.

Range/Alternatives <default value>	Explanation and result of alternatives.
1/1:Pulsing Time* [1/1:Pulsing T.]	
Range: 0.0 - 999.9 Unit: s <0.0>	Time for one pulse on the output Fine/Output when the setpoint value is not reached after ordinary batching (minus tolerance error). 0 = No pulsing
1/1:Timeout Value* [1/1:Timeout V.]	
Range: 0 - 9999 Unit: s <0>	Max. allowed time for complete batching of the component (activity). 0 = No timeout control.
1/1:Acknowledge Type [1/1:Ack.Type]	
No Test At Start Wait Continuous Wait+Cont. <No Test>	Defines the type of acknowledgement control to be used before/during batching. No Test: No acknowledgement control is performed. At Start: Acknowledgement control is performed at start of the activity. Wait: The instrument waits for the acknowledgement signal before it starts the activity. Continuous: The acknowledgement control is performed continuously. Wait+Cont.: The instrument waits for the acknowledgement signal before it starts the activity and then the acknowledgement control is performed continuously.
1/1:Acknowledge Input No [1/1:Ack.Input]	
11-18 21-28 31-38 41-48 51-58 61-68 101-228 <221>	Defines the input used for acknowledgement control. Internal inputs (11-68) must be defined as 'Batch. Activity' in the set-up menu 'Inputs'. Note: This parameter is not shown if '1/1:Acknowledge Type' is set to 'No Test'.

Range/Alternatives <default value>	Explanation and result of alternatives.
---------------------------------------	--

Dumping (Activity Type = Dump)

1/1:Output No [1/1:Output No]

11-18	Defines the output used for dumping. Internal outputs (11-68) must be defined as 'Batch. Activity' in the set-up menu 'Outputs'.
21-28	
31-38	
41-48	
51-58	
61-68	
101-228	

<221>

1/1:Low Level* [1/1:Low Level]

Range: +/-999999 The gross weight level at which '1/1:Wait Time' starts.
Unit:
Measurement Unit
<0.0>

1/1:Wait Time* [1/1:Wait Time]

Range: 0.1 - 999.9 Time from that '1/1:Low Level' is reached until the (dump) output is deactivated.
Unit: s
<5.0>

1/1:Timeout Value* [1/1:Timeout V.]

Range: 0 - 9999 Maximum allowed time for complete dumping.
Unit: s
<0> 0 = No timeout control.

1/1:Acknowledge Type [1/1:Ack.Type]

See under "Weighing In or Out"

1/1:Acknowledge Input No [1/1:Ack.Input]

See under "Weighing In or Out"

Range/Alternatives <default value>	Explanation and result of alternatives.
---------------------------------------	--

Filling (Activity Type = Fill)

1/1:Output No [1/1:Output No]

11-18	Defines the output used for filling. Internal outputs (11-68) must be defined as 'Batch. Activity' in the set-up menu 'Outputs'.
21-28	
31-38	
41-48	
51-58	
61-68	
101-228	
<221>	

1/1:Low Level* [1/1:Low Level]

Range: +/-999999	The filling starts if the gross weight is below this level else no filling is performed.
Unit:	
Measurement Unit	
<0.0>	

1/1:High Level* [1/1:High Level]

Range: +/-999999	The gross weight level at which the fill output is deactivated.
Unit:	
Measurement Unit	
<0.0>	

1/1:Wait Time* [1/1:Wait Time]

Range: 0.1 - 999.9	Time from that '1/1:High Level is reached until the filling is regarded as finished.
Unit: s	
<5.0>	

1/1:Timeout Value* [1/1:Timeout V.]

Range: 0 - 9999	Maximum allowed time for complete filling.
Unit: s	
<0>	

1/1:Acknowledge Type [1/1:Ack.Type]

See under "Weighing In or Out"

1/1:Acknowledge Input No [1/1:Ack.Input]

See under "Weighing In or Out"

Range/Alternatives <default value>	Explanation and result of alternatives.
---------------------------------------	--

Timer or Timer with output (Activity Type = Timer or Timer w. Output)

1/1:Output No [1/1:Output No]

11-18	Defines the output used for the timer. Internal outputs (11-68) must be defined as 'Batch. Activity' in the set-up menu 'Outputs'.
21-28	
31-38	
41-48	
51-58	Note: This parameter is only shown if '1/1:Activity Type' is set to 'Timer w. Output'
61-68	
101-228	
<221>	

1/1:Acknowledge Type [1/1:Ack.Type]

See under "Weighing In or Out"

1/1:Acknowledge Input No [1/1:Ack.Input]

See under "Weighing In or Out"

Latch on or Latch off (Activity Type = Latch On or Latch Off)

1/1:Output No [1/1:Output No]

11-18	Defines the output used for the latch. Internal outputs (11-68) must be defined as 'Batch. Activity' in the set-up menu 'Outputs'.
21-28	
31-38	
41-48	
51-58	
61-68	
101-228	
<221>	

1/1:On During Halt [1/1:On D.Halt]

No	Defines if the latch output will remain activated during halts in batching sequence.
Yes	

<No>

No: Output is deactivated during halt.

Yes: Output will remain activated during halt.

Note: This parameter is only shown if '1/1:Activity Type' is set to 'Latch On'.

1/1:Acknowledge Type [1/1:Ack.Type]

See under "Weighing In or Out"

1/1:Acknowledge Input No [1/1:Ack.Input]

See under "Weighing In or Out"

Range/Alternatives <default value>	Explanation and result of alternatives.
---------------------------------------	--

Manual (Activity Type = Manual)

1/1:Print Weight [1/1:Print W.]

No	Defines if the weight value (from the scale or manually entered) is printed, written to log file and accumulated. Printing and writing to log file is also depending on other settings.
Yes	
<No>	

No: No printing, writing to log file or accumulation.

Yes: The weight value is printed, written to log file and accumulated.

1/1: Enter Weight [1/1: Enter W.]

No	Defines if the operator shall have the opportunity to manually enter a weight value. Note that the manually entered weight value can also be sent via communication.
Yes	
<No>	

No: Not possible to enter a weight value manually.

Yes: Possible to enter a weight value manually.

Pulse batching (Activity Type = Pulse Batch)

1/1:Batching Mode [1/1:Batch Mode]

One Phase	Defines if it is a one phase batching or a Coarse/Fine batching activity.
Fine+Coarse	
< Fine+Coarse >	

One Phase: One phase batching (only one output used).

Fine+Coarse: Coarse-fine batching (two outputs used).

1/1:Output No [1/1:Output No]

11-18	Defines the output used for one phase batching. Internal outputs (11-68) must be defined as 'Batch. Activity' in the set-up menu 'Outputs'.
21-28	
31-38	
41-48	
51-58	
61-68	
101-228	
<221>	Note: This parameter is only shown if '1/1:Batching Mode' is set to 'One Phase'.

1/1:Coarse Output No [1/1:C. Outp No]

11-18	Defines the output used for coarse batching. Internal outputs (11-68) must be defined as 'Batch. Activity' in the set-up menu 'Outputs'.
21-28	
31-38	
41-48	
51-58	
61-68	
101-228	
<221>	Note: This parameter is only shown if '1/1:Batching Mode' is set to 'Fine+Coarse'.

Range/Alternatives <default value>	Explanation and result of alternatives.
---------------------------------------	--

1/1:Fine Output No [1/1:F. Outp No]

11-18	Defines the output used for fine batching. Internal outputs (11-68) must be defined as 'Batch. Activity' in the set-up menu 'Outputs'.
21-28	
31-38	
41-48	
51-58	Note: This parameter is only shown if '1/1:Batching Mode' is set to 'Fine+Coarse'.
61-68	
101-228	
<221>	

1/1:Fine on During Coarse [1/1:F.During C]

No	Defines if the fine output shall be active during the coarse batching phase.
Yes	
<No>	
	<i>No: Only the coarse output is active during the coarse batching phase.</i>
	<i>Yes: Both coarse and fine outputs are activated during the coarse batching phase.</i>
	Note: This parameter is only shown if '1/1:Batching Mode' is set to 'Fine+Coarse'.

1/1:Fine Value* [1/1:Fine Value]

Range: 0 - 999999	The amount of material batched in the fine batching phase.
Unit:	Note: This parameter is only shown if '1/1:Batching Mode' is set to 'Fine+Coarse'.
Pulse Batching Unit	
<0.0>	

1/1:Minus Tolerance* [1/1:Minus Tol.]

Range:	Minus tolerance value. 100 % = No tolerance check.
0.00 - 100.00	
Unit: %	
<100.00>	

1/1:Plus Tolerance* [1/1:Plus Tol.]

Range:	Plus tolerance value. 100 % = No tolerance check.
0.00 - 100.00	
Unit: %	
<100.00>	

1/1:Inflight Factor* [1/1:Infl. Fact]

Range: 0 - 100	Automatic inflight compensation is performed with this factor. The '1/1:Inflight Value' is corrected with the resulting batching error multiplied by this factor.
Unit: %	
<0>	
	0 = No automatic inflight compensation.

Range/Alternatives <default value>	Explanation and result of alternatives.
1/1:Inflight Value* [1/1:Infl. Val.]	
Range: 0 - 999999 Unit: Pulse Batching Unit <0.000>	Batching will be completed (output deactivated) when this value remains to batch. If automatic inflight compensation is used, this value is adjusted after each batch.
1/1:Wait Time * [1/1:Wait Time]	
Range: 0.1 - 999.9 Unit: s <5.0>	Time from completed batching (outputs off) to stability check and tolerance check.
1/1:Pulsing Time* [1/1:Pulsing T.]	
Range: 0.0 - 999.9 Unit: s <0.0>	Time for one pulse on the output Fine/Output when the setpoint value is not reached after ordinary batching (minus tolerance error). 0 = No pulsing
1/1:Timeout Value* [1/1:Timeout V.]	
Range: 0 - 9999 Unit: s <0>	Max. allowed time for complete batching of the component (activity). 0 = No timeout control.
1/1:Acknowledge Type [1/1:Ack.Type]	
See under "Weighing In or Out"	
1/1:Acknowledge Input No [1/1:Ack.Input]	
See under "Weighing In or Out"	
1/1:Pulse Input No [1/1:Pulse Inp.]	
11-18 21-28 31-38 41-48 51-58 61-68 <11>	Defines the input used for pulse counting. The input must be defined as 'Batch. Activity' in the set-up menu 'Inputs'. Only internal inputs can be used as pulse input due to counting speed requirements. Max input frequency at 50 % duty cycle = 50 Hz.

Range/Alternatives <default value>	Explanation and result of alternatives.
---------------------------------------	--

1/1:No of Decimals [1/1:No of Dec.]

0	Defines if the number of decimals used for the pulse batching unit.
1	
2	
3	
<0>	

1/1:Unit [1/1:Unit]

NONE	Defines the engineering unit that should be used for pulse batching.
g	
kg	
t	
lb	
oz	
N	
daN	
kN	
psi	
kPa	
MPa	
bar	
lbf	
kgf	
Nm	
N/m	
kN/m	
PLI	
l	
mV/V	
pls	
<kg>	

1/1:Scale Factor [1/1:Scale Fact]

Range:	Number of counted pulses/Unit.
0.001 - 999.999	
Unit: -	
<1.000>	

5. Operation

General

This chapter describes how the batching operator interface works and is handled. Note that possible references to parameters are, as an example, done with scale 1 and activity 1 in the following chapters.

PM/DT/HE instrument display

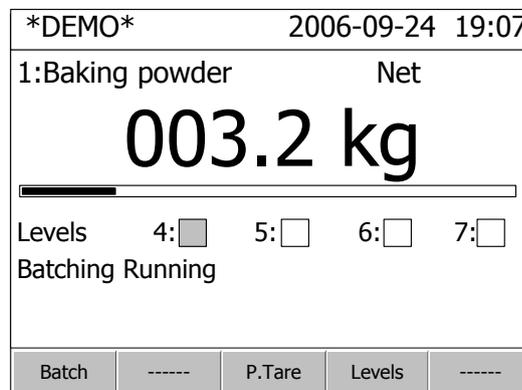
The following section applies to the graphical display used in the PM/DT/HE instrument types.

When the G4 Instrument is in normal operation, displaying the weight value, and the batching option is activated, this is indicated by the text "Batch" at the function key to the left (F1). Pressing that key will open the batching display provided that activities are configured for the selected scale. The F1 (Batch) key is dimmed if no activities are configured for the selected scale.

The selected scale in the weight display will also be shown when entering the batch display.

The Weight display is shown and the batching program option is activated (here in demo mode).

Pressing F1 (Batch) will show the batching display unless F1 is dimmed (see above).



Weight display

Batching display

The batching display shows the actual weight and status for the selected scale. The display also shows all necessary information of the batching sequence that an operator needs to handle the batching process. Scales that are not batching will display status 'Inactive'.

It is possible to change the selected scale by pressing '↑' or '↓' key or pressing a digit key corresponding to the wanted scale number. Only scales with configured activities will be shown in the batching display.

The batching status is displayed on a colored background with the following colors:

Green: batching active

Yellow: batching sequence halted (manually halted, by manual activity or after batch alarm reset).

Red: there is an alarm (the sequence is halted).

Batching	2006-09-24 19:07
1:Baking powder	Net
002.1 kg	
Status:	Batching Coarse
Batch no:	1 (3)
Activity:	2:Water
Setpoint:	44.4 kg
B.Data	Back

Batching display

Start Stop Keys

Two front panel keys get specific batching functions when the batching display is shown:

The start key is used to start a batching sequence for the selected scale. It is also used to restart batching if the sequence is halted for some reason.



The stop key is used to halt the batching sequence for the selected scale. It is also used to terminate a batching sequence when halted.



Batch Data Menu

From the batching display it is possible to reach a setup menu for batch data using key F1 'B.Data'. Batch data can be changed during batching but will not take effect until next batch is started.

Batch data are settings for number of batches, batch size and activity setpoints. Number of batches and batch size are optional data controlled by set-up parameters.

Activity setpoints such as weights or times are displayed and possible to change from the batch data menu. Weight or time setpoint depends on the type of activity.

Note that batch data also can be changed via communication.

Batch Data, Scale 1		
No of Batches	3	
Batch Size	60.000	kg
A1:Baking powder	11.0	kg
A2:Water	35.0	kg
A3:Heating	10.0	s
A4:Cooling time	2.5	s
A5:(Manual) Salt	1.000	kg
A6:(Manual) Pepper	0.300	kg

Edit
Escape

No of Batches:

If activated it shows the number of batches to perform. If this line is not activated only one batch at a time can be performed. Number of batches can be edited in the range 1 to 999999.

Batch size:

If activated it shows the size of one batch, in percent or in weight. If this line is not activated, the batch size is the sum of all Setpoint values without scaling, for the activity types 'Weigh in', 'Weigh out', 'Manual', and 'Puls batch'.

If percentage is shown, the Setpoint values (except for Timer) will be scaled by that percentage. Batch percentage can be edited in the range 1 to 999999 %.

If weight is shown, the Setpoint values (except for Timer) will be scaled to produce the wanted batch size. Batch weight can be edited in the range 0.001 to 999999.0 units.

NOTE! Strange effects may appear if '1/1:Unit' for a Pulse batch activity differs from '1:Measurement Unit' for the instrument, or if 'Weigh In' and 'Weigh Out' activities are used in the same batching sequence.

Setpoints:

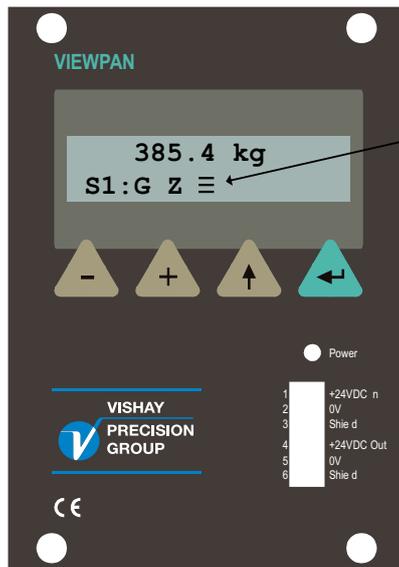
All used activities are listed. Each line shows the activity number (A1: etc.), the activity name (parameter '1/1:Activity Name') and actual Setpoint value or type of activity for an activity without setpoint. Setpoint values can be edited in the range 0 to 999999 units or seconds. If a setpoint is set to 0 this activity will be skipped. I.e. the activity will be regarded as 'No used'.

RM-instrument display

The following section applies to the alphanumeric display used in the RM (DIN rail mount) instrument type.

The RM instrument is a complete multi scale batcher but it is not intended as an operator interface for batching. It is possible to set-up the batching sequences from the RM instrument front panel. However for control (start, stop, reset etc.) and monitoring of the batching sequence should a supervising computer be used (a PLC, a SCADA system etc).

An animated symbol is shown in the weight display, when batching is active (running) for the selected scale.



Animated batching indicator symbol

Batching commands

General

Below a description is given for how batching commands are given from the front panel of the G4 Instrument. Note that this description applies to an instrument with a graphical display (PM/DT/HE types).

Batching commands can also be given from a control computer by communication or from digital inputs, defined in menu 'Parameter Set-up' / 'Inputs'.

Note that the Batching display must be shown to be able to manually control the batching sequence from the front panel of the instrument. It is also possible to fully control the batching sequence (start, stop etc) with communication commands or by using digital I/O. Communication commands or digital I/O commands do not require that the batching display is shown on the screen. When using a RM type of instrument commands can only be given with communication or digital I/O's.

Important

When using the front panel to control the batching process push button commands, front panel inputs (manually entered weight) etc. applies to the selected scale. The selected scale is the one shown on the batching display. Use '↑' and '↓' keys or press a digit key corresponding to wanted scale number to select which scale that should be selected (shown on the batching display). Only scales that have configured activities will be shown.

Also note that it is possible to leave the batching display showing the weight display or menu system. This will not interrupt batching. To be able to (manually from the front panel) stop or in any other way influence batching sequences, the user must return to the batching display.

If it is important to immediately, without having to move between the displays, stop or in any other way control the batching, use communication commands or digital I/O. Note that communication commands and digital I/O commands can be used in parallel with commands from the front panel (batching display).

Start batching

From the weight display press F1 (Batch) to show the Batching display. If batch data needs to be checked or changed, press F1 (B.Data) to show the Batch Data menu. When in the Batching display, press the green start key, on the front panel of the instrument, to start the batching sequence.

Batching	2006-09-24 19:07
1:Baking powder	Gross
002.7 kg	
Status:	Inactive
Batch no:	
Activity:	
Setpoint:	
B.Data	Back

Reset alarm

If an alarm is obtained the batching will be halted and the cause of the alarm will be displayed. The alarm can be reset from the front panel by function key F2 (A.Reset).

After the alarm has been reset, batching can be restarted, or it can be ended in different ways. See below.

Batching	2006-09-24 19:12	
1:Baking powder	Net	
010.7 kg		
Status:	* UNSTABLE WEIGHT ALARM *	
Batch no:	1 (3)	
Activity:	1:Baking powder	
Setpoint:	14.0 kg	
B.Data	A.Reset	Back

Stop batching

At any time, if not in remote operation, batching can be halted from the instrument panel. Press the stop key on the front panel of the instrument, also marked with a stop symbol.



When batching is halted it can be restarted, or it can be ended in different ways. See below.

Restart batching

As batching is halted (and a possible alarm has been reset) the batching operation can be restarted from where it was stopped by pressing the green START key on the instrument front panel.



Finish batch

Function key F4 (Finish) is shown only if a batching operation with several batches is halted (and a possible alarm has been reset). If F4 (Finish) is pressed the remaining activities of the actual batch will be performed. After that the batching operation will be ended.

When F4 (Finish) is pressed the user is asked to confirm the finish batch command.

Skip activity

As batching is halted (and a possible alarm has been reset) the current activity can be skipped by function key F3 (Skip Act). This means that the weight of the material that may have been batched will be accumulated and printed. After that batching will continue with next activity in the sequence.

When F3 (Skip Act.) is pressed the user is asked to confirm the skip activity command.

Batching	2006-09-24 19:18		
1:Baking powder	Net		
010.7 kg			
Status:	Halted		
Batch no:	1 (3)		
Activity:	1:Baking powder		
Setpoint:	10.8 kg		
B.Data	Skip Act.	Finish	Back

Terminate batching

As batching is halted (and a possible alarm has been reset) it is possible to terminate the batching operation by pressing the STOP key. The weight of the material that may have been batched will be accumulated and printed. After that the batching operation will be ended.

When the STOP key is pressed the user is asked to confirm terminate batching command.

Manual operation

Activity type Manual halts the batching sequence to allow manual operation, for example adding of a small quantity of material. Auto taring is performed so net weight zero will be displayed.

The instrument can be set for weighing of the manually added material.

- Add material to make the weight value equal to the shown Setpoint value.
- Then START key should be pressed to continue the batching.

Batching	2006-09-24 19:23	
1:Baking powder	Net	Zero
000.0 kg		
Status:	Halted, manual op.	
Batch no:	1 (3)	
Activity:	6:(Manual) Pepper	
Setpoint:	0.381 kg	
B.Data	Skip Act.	Back

Alternatively the instrument can be set to allow manual entry of the added material weight value.

- Manually add the amount of material, given as Setpoint value.
- Press function key F2 (Man.Edit) to edit the Manual Weight.
- Use the digit keys to enter the added material weight value at 'Manual W: ' and finish the entry by pressing the Enter key.
- Then the START key should be pressed to continue the batching.
(If no weight value is entered, the weight value from the scale will be used.)

Batching		2006-09-24 19:21	
1:Baking powder	Net	Zero	
000.0 kg			
Status: Halted, manual op.			
Batch no: 1 (3)			
Activity: 5:(Manual) Salt			
Setpoint:		1.268 kg	
Manual W:		0.000 kg	
B.Data	Man.Edit	Skip Act.	Back

Batched weights

For each scale an accumulated weight will be created for each batching activity of the types Weigh In, Weigh Out, Manual (if '1/1:Print Weight' is 'Yes'), and Pulse Batching.

For each scale will also a Total accumulated weight be created for the sum of all the above activities. Pulse batching values will be added to 'Activity total' only if the '1/1:Unit' for Pulse Batching is equal to 'Measurement unit'.

In the sub menu 'Batched Weights', in the 'Main Menu', are the accumulated weights for each configured scale to be found. The menu 'Batched Weights' is only shown if the Scale Batching Program Option is enabled. Each batched weight can be edited i.e. for zeroing.

There is also a possibility to zero all batched weights for a scale from this menu:

- By pressing the F3 (Zero) button on an instrument with graphical display (PM/DT/HE instrument).
- By finding the "Zero ALL values" function, after the last accumulated value, on an instrument with an alpha numerical display (RM instrument).

The instrument is capable of storing batched weight values up to 10 000 000 000 units with 3 decimals. When the limit is passed 10 000 000 000 will be subtracted from the value.

Printing

Printout of batching reports will be performed automatically according to the setting of parameter 'S1:Batch Printout' in menu 'Scale 1 Batching Params.':

- 'No': No reports will be printed.
- 'Full Report': Reports will be printed containing a report header, the batch number, batched weight values and other information (like Latch on, Latch off, Timer ready etc). A complete and coherent report will be printed after each batch. Alarms will be printed as they occur, i.e. between reports.
- 'Limited Report': Reports will be printed containing a report header, the batch number and batched weight values. A complete and coherent report will be printed after each batch. Alarms will be printed as they occur, i.e. between reports.
- 'Only Alarms': Alarms are printed when occurring together with date and time.
- 'Log Mode': Report header, batch number, batched weight values, alarms that have occurred and other information (like Latch on, HALTED etc.) will be printed. Each event will be printed as it occurs.

Full Report example

```

-----
2008-07-23 13:09   Batching report
S1:
Batch number           000001 (5)
13:11   A01:Water
          SP :    65.0   W:    66.0 kg
13:11   A02:Heating
          SP :     7.0s Timer finished
13:11   A03:Pigment
          SP :     3.5   W:     3.4 kg
13:12   A04:Stirring
          SP :    15.0s Timer finished
13:12   A05:Dumping
          Dumping finished
13:12   SUBTOTAL           69.500 kg
-----
    
```

- Starting delimiter
- Report header
- Scale no and possible scale name
- Batch no. (no to batch)
- Activity 1 ready
- Setpoint and batched weight
- Activity 2 ready
- Setpoint
- Activity 3 ready
- Setpoint and batched weight
- Activity 4 ready
- Setpoint
- Activity 5 ready
- Batch finished
- Ending delimiter

Limited Report example

This report shows the same batch as the Full Report above. As seen below only batching activities are printed in Limited Report mode

```

-----
2008-07-23 13:09   Batching report
S1:
Batch number           000001 (5)
13:11   A01:Water
          SP :    65.0   W:    66.0 kg
13:11   A03:Pigment
          SP :     3.5   W:     3.4 kg
13:12   SUBTOTAL           69.500 kg
-----
    
```

- Starting delimiter
- Report header
- Scale no and possible scale name
- Batch no. (no to batch)
- Activity 1 ready
- Setpoint and batched weight
- Activity 3 ready
- Setpoint and batched weight
- Batch finished
- Ending delimiter

Log Mode example

```
-----  
1: 2008-07-23 13:09   Batching report  
1: S1:  
1: Batch number           000001 (5)  
  
1: 13:11   A01:Water  
1:         SP :    65.0   W:    66.0 kg  
  
1: 13:11   A02:Heating  
1:         SP :    7.0s Timer finished  
1: 13:11   A03:HALTED FOR MAN. OPERATION  
  
1: 13:11   A03:RESTART  
1: 13:11   A03:Pigment  
1:         SP :    3.5   W:    3.4 kg  
  
1: 13:12   A04:Stirring  
1:         SP :   15.0s Timer finished  
  
1: 13:12   A05:Dumping  
1:         Dumping finished  
1: 13:12   SUBTOTAL           69.500 kg
```

- Starting delimiter
- Report header
- Scale no and possible scale name
- Batch no. (no to batch)

- Activity 1 ready
- Setpoint and batched weight

- Activity 2 ready
- Setpoint
- Halted

- Restart after manual operation
- Activity 3 ready
- Setpoint and batched weight

- Activity 4 ready
- Setpoint

- Activity 5 ready

- Batch finished

The empty lines indicated how the rows are printed together. If other scales are used or alarms are given they will appear instead of the empty rows. No empty rows will actually be printed.

Alarm example

1: 2008-07-23	B:1	- Alarm header
1: 13:10	A01:* UNSTABLE WEIGHT ALARM *	- Time, activity number and alarm

The alarm header will show date, possible scale name and the batch number.

Notes

- A subtotal is only printed if there is more than one batching activity.
- A manual activity is printed if the parameter '1/1:Print Weight' is set to 'Yes'.

6. Log files

General

The G4 Instrument has the possibility to log batching information to file. Each scale has it's own log file. The log file is named S1BATCH.LOG for scale no. 1, S2BATCH.LOG for scale no. 2 etc. The file is a plain text file with tab. separated data. Each position (column) has a defined type of information contents. See file format description below. The batch log file can be opened e.g. in MS Excel.

The configuration of file logging is made in set-up parameter 'S1:File Log':

- 'No': No logging to file is made.
- 'Limited': Only batched weights and alarms are logged.
- 'Full': Batched weights, alarms and other information are logged.

Log file handling

Log files are saved in the 'LogFiles' folder in the user area of the G4 Instrument. It is possible to access these files with the 'File Handling' function in the 'Maintenance' menu. Log files can be copied or moved to an USB memory for storing, analyzing, processing etc. on a computer. It is advisable to remove log files on a regular basis to avoid running out of disc space in the G4 Instrument. If disc space is low an alarm will be issued but batching can be continued after resetting the alarm. However the log files will not be written as long as disc space is low.

The log file in the example above is about 2.3 kB or average 50 bytes per line. It is recommended not to exceed 2 MB totally. Note that the available disc space may be limited if many backup files or other files are stored in the instrument.

When a log file has been removed from the instrument a new log file will be created automatically. Avoid accessing the log files when batching is running since it may cause a file access error alarm.

It is possible to access the user area using an ftp client. Use the user ID 'G4User' with the password '1937' to log on to the instrument. Using the ftp makes it possible to, either manually or automatically, delete log files, move log files to an external computer for storage etc. See the 'Technical Manual' chapter 'Communication' about the ftp Server.

Log file description

The example log below is using scale 1.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	2008-07-23	13:11:13	1	Batching started	5	100 %		1	1					
2		13:11:33	2	Activity ready						1 Water	65.0	66.0		kg
3		13:11:41	2	Activity ready						2 Heating	7.0			s
4		13:11:41	6	HALTED FOR MAN. OPERATION						3 Pigment				
5		13:11:53	9	RESTART						3 Pigment				
6		13:11:53	2	Activity ready						3 Pigment	3.400	3.500		kg
7		13:12:08	2	Activity ready						4 Stirring	15.0			s
8		13:12:17	2	Activity ready						5 Dumping				
9		13:12:17	3	Batch ready									69.500	kg
10	2008-07-23	13:12:17	1	Batching started	5	100 %		2	1					
11		13:12:44	2	Activity ready						1 Water	65.0	63.5		kg
12		13:12:51	2	Activity ready						2 Heating	7.0			s
13		13:12:51	6	HALTED FOR MAN. OPERATION						3 Pigment				
14		13:12:58	9	RESTART						3 Pigment				
15		13:12:59	2	Activity ready						3 Pigment	3.400	3.300		kg
16		13:13:14	2	Activity ready						4 Stirring	15.0			s
17		13:13:25	2	Activity ready						5 Dumping				
18		13:13:25	3	Batch ready									66.800	kg
19	2008-07-23	13:13:25	1	Batching started	5	100 %		3	1					
20		13:13:47	2	Activity ready						1 Water	65.0	64.6		kg
21		13:13:54	2	Activity ready						2 Heating	7.0			s
22		13:13:54	6	HALTED FOR MAN. OPERATION						3 Pigment				
23		13:14:01	9	RESTART						3 Pigment				
24		13:14:01	2	Activity ready						3 Pigment	3.400	3.500		kg
25		13:14:16	2	Activity ready						4 Stirring	15.0			s
26		13:15:46	2	Activity ready						5 Dumping				
27		13:15:46	3	Batch ready									68.100	kg
28	2008-07-23	13:15:46	1	Batching started	5	100 %		4	1					
29		13:15:55	106	* UNSTABLE WEIGHT ALARM *						1 Water				
30		13:16:04	9	RESTART						1 Water				
31		13:16:04	2	Activity ready						1 Water	65.0	65.8		kg
32		13:16:11	2	Activity ready						2 Heating	7.0			s
33		13:16:11	6	HALTED FOR MAN. OPERATION						3 Pigment				
34		13:16:19	9	RESTART						3 Pigment				
35		13:16:19	2	Activity ready						3 Pigment	3.400	3.300		kg
36		13:16:34	2	Activity ready						4 Stirring	15.0			s
37		13:16:56	2	Activity ready						5 Dumping				
38		13:16:56	3	Batch ready									69.100	kg
39	2008-07-23	13:16:56	1	Batching started	5	100 %		5	1					
40		13:17:09	2	Activity ready						1 Water	65.0	64.9		kg
41		13:17:16	2	Activity ready						2 Heating	7.0			s
42		13:17:16	6	HALTED FOR MAN. OPERATION						3 Pigment				
43		13:17:27	9	RESTART						3 Pigment				
44		13:17:27	2	Activity ready						3 Pigment	3.400	3.400		kg
45		13:17:42	2	Activity ready						4 Stirring	15.0			s
46		13:18:23	2	Activity ready						5 Dumping				
47		13:18:23	3	Batch ready									68.300	kg
48		13:18:23	4	BATCH FINISHED										

Example of 'Full' batch log file opened in MS Excel

This description refers to the example above. Note that the column denomination is only in Excel. There are no column names in the file itself.

- Column A: Date of the event.
Only batch start events have a date. For all other events this column is empty.
- Column B: Time of the event.
- Column C: The event type number.
See separate event list below. Intended for a supervising computer to check the type of event.
- Column D: The event type text.
See separate event list below. The text is intended to improve the readability of the file when visually examining the file.
- Column E: Number of batches.
This column is used for 'Batch started' events. For all other events it is empty. If the parameter 'S1:Display no of Batches' is set to 'No' a 1 is written in this column (only one batch is done).
- Column F: Batch size value.
This column is used for 'Batch started' events. For all other events it is empty. This column is set to 100 (%) if the parameter 'S1:Display Batch Size' is set to 'No' otherwise this column will contain the actual batch size value set by the user (or the default value)
- Column G: Batch size unit.
This column is used for 'Batch started' events. For all other events it is empty. This column is set to '%' if the parameter 'S1:Display Batch Size' is set to 'No'. Depending on the value of parameter 'S1:Display Batch Size' either this column will contain the measuring unit or percent.
- Column H: Batch no.
The number of the current batch being started. Only shown for the 'Batch started' event. For all other events is this column empty.
- Column I: Scale number or activity number.
For 'Batch started' events is the scale number shown. For 'Batch ready' and 'BATCH FINISHED' events is this column left empty. For all other events is the activity number shown.
- Column J: Scale name or activity name.
For 'Batch started' events is the scale name shown. In the example above is no scale name set. For 'Batch ready' and 'BATCH FINISHED' events is this column left empty. For all other events is the activity name shown.
- Column K: Activity setpoint value.
Shown at activity ready events for 'Weigh In', 'Weigh Out', 'Timer', 'Timer w. Output', 'Manual' and 'Pulse Batch' activities.
- Column L: Batched weight value.
Shown at activity ready events for 'Weigh In', 'Weigh Out', 'Manual' and 'Pulse Batch' activities.
- Column M: Batched subtotal weight.
Shown for 'Batch ready' event.
- Column N: The unit of the value in column K, L and M.

Technical Manual Supplement

The following event types/event texts are defined. The list also shows if the event will be recorded in the log file when 'Log Mode' is set to 'Limited'. When the 'Log Mode' is set to 'Full' all events shown below are logged.

Event no	Event text	Limited Log Mode
1	Batching started	Yes
2	Activity ready	Note 1
3	Batch ready	No
4	BATCH FINISHED	Yes
5	HALTED	No
6	HALTED FOR MAN. OPERATION	No
7	SKIPPING ACTIVITY	No
8	RESET	No
9	RESTART	No
101	* SETPOINT ALARM *	Yes
102	* ACKNOWLEDGE ALARM *	Yes
103	* TIMEOUT ALARM *	Yes
104	* MINUS TOLERANCE ALARM *	Yes
105	* PLUS TOLERANCE ALARM *	Yes
106	* UNSTABLE WEIGHT ALARM *	Yes
107	* WEIGHT ERROR ALARM *	Yes
108	* FILE WRITE ERROR ALARM *	Yes
109	* OUT OF DISK SPACE ALARM *	Yes
110	* POWER FAIL ALARM *	Yes

Note 1. Only the following activities will be shown in Limited Log Mode: Weigh In, Weigh Out, Manual and Pulse Batch.

The event type number is shown in the third column in a log file (column C in the Excel example).

7. Batching alarms

General

When a batching alarm is initiated, the following events take place:

- Batching is halted and all batching outputs are deactivated.
- The outputs for 'Batching Alarm' and 'Batching Stopped' will be activated if configured.
- An alarm message is displayed on the Batching display and Weight display. Displaying batching alarms on the Weight display for one scale is configurable. Two and four scales displays will always show alarm messages.
- An alarm report may be printed depending on the settings. A alarm event may be written to the log file if configured.

Whenever an alarm has been obtained, alarm reset and restart of batching are required (manually on an instrument with graphical display by pressing the 'F2' key A.Reset and thereafter the START key). If restart of batching is not possible, batching must be terminated (by pressing the STOP key) or the activity must be skipped (by 'F3' Skip Act.). After a restart the instrument will continue the batching sequence.

Batching alarms

* SETPOINT ALARM *

- **Weigh in:** The vessel, being batched to, does not have sufficient volume to contain the desired quantity of material (the gross weight will exceed Capacity).
- **Weigh out:** The contents of the vessel (gross weight) is not sufficient to batch out the desired quantity of material.

* ACKNOWLEDGE ALARM *

The alarm is caused by absence of acknowledgement signal.

Instrument behavior depends on the selected acknowledgement type set by parameter '1/1:Acknowledge Type':

- **No Test:** An alarm is never obtained in this case.
- **At start:** An acknowledgement signal was not present at start of activity.
- **Wait:** An alarm is never obtained in this case.
NOTE! If an acknowledgement signal is not present, the instrument waits for an acknowledgement signal for any length of time, displaying the text 'Waiting for Ack.'
- **Continuous:** The acknowledgement signal was cancelled during the activity or was not present at starting.
- **Wait+Cont.:** Identical to Wait until start of activity, after that identical to Continuous.

*** TIMEOUT ALARM ***

The activity was not completed within the specified maximum time, set by parameter '1/1:Timeout Value'.

*** MINUS TOLERANCE ALARM ***

Batched weight is below minus tolerance limit.

*** PLUS TOLERANCE ALARM ***

Batched weight exceeds plus tolerance limit.

*** UNSTABLE WEIGHT ALARM ***

Weight not stable after Wait time (obtained only if Motion Check is On).

*** WEIGHT ERROR ALARM ***

The weight is incorrect (e.g. transducer or weight converter fault).

*** FILE WRITE ERROR ALARM ***

There was an error when writing to a log file. This can occur if an external computer is accessing a log file when the instrument attempts to write to the same log file.

*** OUT OF DISK SPACE ALARM ***

The instrument is low on disk space. No data will be written to the Scale Batching log files. It is necessary to remove files from the user folders in the instrument to allow data to be written to the log files.

*** POWER FAIL ALARM ***

A power fail has occurred. This alarm will be displayed when the instrument is powered up after a power fail situation.

8. Communication

General

For a detailed description of communication interface and transmission principles, see chapter Communication in the Technical Manual.

Everything that can be performed from the front panel can also be performed from a control computer via communication.

The following sections covering Modbus register definitions, only deals with the registers used for the Scale Batching Program Option.

The registers are presented in tables, and some information in detail is also given. Note that there is one column for each scale in the instrument.

Last activity registers

Data type: Integer

Explanation	Scale number								No of reg	R/W
	1	2	3	4	5	6	7	8		
Counter (free running)	40500	40517	40534	40551	40568	40585	40602	40619	1	R
Batch number	40501	40518	40535	40552	40569	40586	40603	40620	3	R
Activity number	40504	40521	40538	40555	40572	40589	40606	40623	1	R
Setpoint	40505	40522	40539	40556	40573	40590	40607	40624	3	R
Batched quantity	40508	40525	40542	40559	40576	40593	40610	40627	3	R

Data type: Float

Explanation	Scale number								No of reg	R/W
	1	2	3	4	5	6	7	8		
Counter (free running)	44500	44514	44528	44542	44556	44570	44584	44598	2	R
Batch number	44502	44516	44530	44544	44558	44572	44586	44600	2	R
Activity number	44504	44518	44532	44546	44560	44574	44588	44602	2	R
Setpoint	44506	44520	44534	44548	44562	44576	44590	44604	2	R
Batched quantity	44508	44522	44536	44550	44564	44578	44592	44606	2	R

All these registers are updated each time an activity of the types 'Weigh In', 'Weigh Out', 'Manual', and 'Pulse Batch' is ended.

Register 'Counter' will increment one step for each update and can be used to indicate when the activity is ended.

Last batch registers

Data type: Integer

Explanation	Scale number								No of reg	R/W
	1	2	3	4	5	6	7	8		
Counter (free running)	40650	40755	40860	40965	41070	41175	41280	41385	1	R
Creation time, hour	40651	40756	40861	40966	41071	41176	41281	41386	1	R
Creation time, min.	40652	40757	40862	40967	41072	41177	41282	41387	1	R
Batch number	40653	40758	40863	40968	41073	41178	41283	41388	3	R
Subtotal	40656	40761	40866	40971	41076	41181	41286	41391	3	R
Activity 1 setpoint	40659	40764	40869	40974	41079	41184	41289	41394	3	R
Act. 1 batched quantity	40662	40767	40872	40977	41082	41187	41292	41397	3	R
Activity 2 setpoint	40665	40770	40875	40980	41085	41190	41295	41400	3	R
Act. 2 batched quantity	40668	40773	40878	40983	41088	41193	41298	41403	3	R
Activity 3 setpoint	40671	40776	40881	40986	41091	41196	41301	41406	3	R
Act. 3 batched quantity	40674	40779	40884	40989	41094	41199	41304	41409	3	R
Activity 4 setpoint	40677	40782	40887	40992	41097	41202	41307	41412	3	R
Act. 4 batched quantity	40680	40785	40890	40995	41100	41205	41310	41415	3	R
Activity 5 setpoint	40683	40788	40893	40998	41103	41208	41313	41418	3	R
Act. 5 batched quantity	40686	40791	40896	41001	41106	41211	41316	41421	3	R
Activity 6 setpoint	40689	40794	40899	41004	41109	41214	41319	41424	3	R
Act. 6 batched quantity	40692	40797	40902	41007	41112	41217	41322	41427	3	R
Activity 7 setpoint	40695	40800	40905	41010	41115	41220	41325	41430	3	R
Act. 7 batched quantity	40698	40803	40908	41013	41118	41223	41328	41433	3	R
Activity 8 setpoint	40701	40806	40911	41016	41121	41226	41331	41436	3	R
Act. 8 batched quantity	40704	40809	40914	41019	41124	41229	41334	41439	3	R
Activity 9 setpoint	40707	40812	40917	41022	41127	41232	41337	41442	3	R
Act. 9 batched quantity	40710	40815	40920	41025	41130	41235	41340	41445	3	R
Activity 10 setpoint	40713	40818	40923	41028	41133	41238	41343	41448	3	R
Act. 10 batched quant.	40716	40821	40926	41031	41136	41241	41346	41451	3	R
Activity 11 setpoint	40719	40824	40929	41034	41139	41244	41349	41454	3	R
Act. 11 batched quant.	40722	40827	40932	41037	41142	41247	41352	41457	3	R
Activity 12 setpoint	40725	40830	40935	41040	41145	41250	41355	41460	3	R
Act. 12 batched quant.	40728	40833	40938	41043	41148	41253	41358	41463	3	R

Data type: Float

Explanation	Scale number								No of reg	R/W
	1	2	3	4	5	6	7	8		
Counter (free running)	44650	44724	44798	44872	44946	45020	45094	45168	2	R
Creation time, hour	44652	44726	44800	44874	44948	45022	45096	45170	2	R
Creation time, min.	44654	44728	44802	44876	44950	45024	45098	45172	2	R
Batch number	44656	44730	44804	44878	44952	45026	45100	45174	2	R
Subtotal	44658	44732	44806	44880	44954	45028	45102	45176	2	R
Activity 1 setpoint	44660	44734	44808	44882	44956	45030	45104	45178	2	R
Act. 1 batched quantity	44662	44736	44810	44884	44958	45032	45106	45180	2	R
Activity 2 setpoint	44664	44738	44812	44886	44960	45034	45108	45182	2	R
Act. 2 batched quantity	44666	44740	44814	44888	44962	45036	45110	45184	2	R
Activity 3 setpoint	44668	44742	44816	44890	44964	45038	45112	45186	2	R
Act. 3 batched quantity	44670	44744	44818	44892	44966	45040	45114	45188	2	R
Activity 4 setpoint	44672	44746	44820	44894	44968	45042	45116	45190	2	R
Act. 4 batched quantity	44674	44748	44822	44896	44970	45044	45118	45192	2	R
Activity 5 setpoint	44676	44750	44824	44898	44972	45046	45120	45194	2	R
Act. 5 batched quantity	44678	44752	44826	44900	44974	45048	45122	45196	2	R
Activity 6 setpoint	44680	44754	44828	44902	44976	45050	45124	45198	2	R
Act. 6 batched quantity	44682	44756	44830	44904	44978	45052	45126	45200	2	R
Activity 7 setpoint	44684	44758	44832	44906	44980	45054	45128	45202	2	R
Act. 7 batched quantity	44686	44760	44834	44908	44982	45056	45130	45204	2	R
Activity 8 setpoint	44688	44762	44836	44910	44984	45058	45132	45206	2	R
Act. 8 batched quantity	44690	44764	44838	44912	44986	45060	45134	45208	2	R
Activity 9 setpoint	44692	44766	44840	44914	44988	45062	45136	45210	2	R
Act. 9 batched quantity	44694	44768	44842	44916	44990	45064	45138	45212	2	R
Activity 10 setpoint	44696	44770	44844	44918	44992	45066	45140	45214	2	R
Act. 10 batched quant.	44698	44772	44846	44920	44994	45068	45142	45216	2	R
Activity 11 setpoint	44700	44774	44848	44922	44996	45070	45144	45218	2	R
Act. 11 batched quant.	44702	44776	44850	44924	44998	45072	45146	45220	2	R
Activity 12 setpoint	44704	44778	44852	44926	45000	45074	45148	45222	2	R
Act. 12 batched quant.	44706	44780	44854	44928	45002	45076	45150	45224	2	R

All these registers are updated each time a batching sequence is ended.

Register 'Counter' will increment one step for each update and can be used to indicate when the sequence is ended.

Current batching status registers

Data type: Integer

Explanation	Scale number								No of reg	R/W
	1	2	3	4	5	6	7	8		
Batching Status	40300	40322	40344	40366	40388	40410	40432	40454	1	R
Batching Step	40301	40323	40345	40367	40389	40411	40433	40455	1	R
Batching Alarm	40302	40324	40346	40368	40390	40412	40434	40456	1	R
Batch Number	40303	40325	40347	40369	40391	40413	40435	40457	3	R
Current Activity	40306	40328	40350	40372	40394	40416	40438	40460	1	R
Current Setpoint	40307	40329	40351	40373	40395	40417	40439	40461	3	R
Current Quantity	40310	40332	40354	40376	40398	40420	40442	40464	3	R

Data type: Float

Explanation	Scale number								No of reg	R/W
	1	2	3	4	5	6	7	8		
Batching Status	44300	44320	44340	44360	44380	44400	44420	44440	2	R
Batching Step	44302	44322	44342	44362	44382	44402	44422	44442	2	R
Batching Alarm	44304	44324	44344	44364	44384	44404	44424	44444	2	R
Batch Number	44306	44326	44346	44366	44386	44406	44426	44446	2	R
Current Activity	44308	44328	44348	44368	44388	44408	44428	44448	2	R
Current Setpoint	44310	44330	44350	44370	44390	44410	44430	44450	2	R
Current Quantity	44312	44332	44352	44372	44392	44412	44432	44452	2	R

In registers Batching Status, Batching Step and Batching Alarm the status is described by codes, explained later in this chapter.

The 'Current Quantity' register will be:

- Current net weight for a Weigh In, Weigh Out or Manual activity.
- Current gross weight for a Fill or Dump activity.
- Calculated weight (no of pulses/scale factor) for a Pulse Batch activity.
- Remaining time for a Timer or Timer with Output activity.
- Zero for all other activities (Latch On, Latch Off).

Batch data registers

Data type: Integer

Explanation	Scale number								No of reg	R/W
	1	2	3	4	5	6	7	8		
Number of Batches	43150	43204	43258	43312	43366	43420	43474	43528	3	R/W
Batch Size	43153	43207	43261	43315	43369	43423	43477	43531	3	R/W
Activity 1 Setpoint	43156	43210	43264	43318	43372	43426	43480	43534	3	R/W
Activity 2 Setpoint	43159	43213	43267	43321	43375	43429	43483	43537	3	R/W
Activity 3 Setpoint	43162	43216	43270	43324	43378	43432	43486	43540	3	R/W
Activity 4 Setpoint	43165	43219	43273	43327	43381	43435	43489	43543	3	R/W
Activity 5 Setpoint	43168	43222	43276	43330	43384	43438	43492	43546	3	R/W
Activity 6 Setpoint	43171	43225	43279	43333	43387	43441	43495	43549	3	R/W
Activity 7 Setpoint	43174	43228	43282	43336	43390	43444	43498	43552	3	R/W
Activity 8 Setpoint	43177	43231	43285	43339	43393	43447	43501	43555	3	R/W
Activity 9 Setpoint	43180	43234	43288	43342	43396	43450	43504	43558	3	R/W
Activity 10 Setpoint	43183	43237	43291	43345	43399	43453	43507	43561	3	R/W
Activity 11 Setpoint	43186	43240	43294	43348	43402	43456	43510	43564	3	R/W
Activity 12 Setpoint	43189	43243	43297	43351	43405	43459	43513	43567	3	R/W

Data type: Float

Explanation	Scale number								No of reg	R/W
	1	2	3	4	5	6	7	8		
Number of Batches	46800	46836	46872	46908	46944	46980	47016	47052	2	R/W
Batch Size	46802	46838	46874	46910	46946	46982	47018	47054	2	R/W
Activity 1 Setpoint	46804	46840	46876	46912	46948	46984	47020	47056	2	R/W
Activity 2 Setpoint	46806	46842	46878	46914	46950	46986	47022	47058	2	R/W
Activity 3 Setpoint	46808	46844	46880	46916	46952	46988	47024	47060	2	R/W
Activity 4 Setpoint	46810	46846	46882	46918	46954	46990	47026	47062	2	R/W
Activity 5 Setpoint	46812	46848	46884	46920	46956	46992	47028	47064	2	R/W
Activity 6 Setpoint	46814	46850	46886	46922	46958	46994	47030	47066	2	R/W
Activity 7 Setpoint	46816	46852	46888	46924	46960	46996	47032	47068	2	R/W
Activity 8 Setpoint	46818	46854	46890	46926	46962	46998	47034	47070	2	R/W
Activity 9 Setpoint	46820	46856	46892	46928	46964	47000	47036	47072	2	R/W
Activity 10 Setpoint	46822	46858	46894	46930	46966	47002	47038	47074	2	R/W
Activity 11 Setpoint	46824	46860	46896	46932	46968	47004	47040	47076	2	R/W
Activity 12 Setpoint	46826	46862	46898	46934	46970	47006	47042	47078	2	R/W

Manually entered weight registers

Data type: Integer

Explanation	Scale number								No of reg	R/W
	1	2	3	4	5	6	7	8		
Man. Entered Weight	43600	43603	43606	43609	43612	43615	43618	43621	3	R/W

Data type: Float

Explanation	Scale number								No of reg	R/W
	1	2	3	4	5	6	7	8		
Man. Entered Weight	47100	47102	47104	47106	47108	47110	47112	47114	2	R/W

If the register for the manually entered weight has been written when 'Batching Status' is 'Batching halted for manual operation weight entry' (05), the value in the register will be used as manual entered weight when batching is restarted.

Note that the Integer register, the Float register and the manually entered weight from the front panel (PM/HE/DT instrument types) are "parallel" and that the latest entered value will be the value that is used (printed and accumulated) when batching is restarted.

Also note that the manually entered weight is only used if the parameter '1/1:Enter Weight' is set to 'Yes'.

Batched weight registers

Data type: Integer

Explanation	Scale number								No of reg	R/W
	1	2	3	4	5	6	7	8		
Total Batched LOW	42300	42402	42504	42606	42708	42810	42912	43014	3	R/W
Total Batched HIGH	42303	42405	42507	42609	42711	42813	42915	43017	3	R/W
Activity 1 LOW	42306	42408	42510	42612	42714	42816	42918	43020	3	R/W
Activity 1 HIGH	42309	42411	42513	42615	42717	42819	42921	43023	3	R/W
Activity 2 LOW	42312	42414	42516	42618	42720	42822	42924	43026	3	R/W
Activity 2 HIGH	42315	42417	42519	42621	42723	42825	42927	43029	3	R/W
Activity 3 LOW	42318	42420	42522	42624	42726	42828	42930	43032	3	R/W
Activity 3 HIGH	42321	42423	42525	42627	42729	42831	42933	43035	3	R/W
Activity 4 LOW	42324	42426	42528	42630	42732	42834	42936	43038	3	R/W
Activity 4 HIGH	42327	42429	42531	42633	42735	42837	42939	43041	3	R/W
Activity 5 LOW	42330	42432	42534	42636	42738	42840	42942	43044	3	R/W
Activity 5 HIGH	42333	42435	42537	42639	42741	42843	42945	43047	3	R/W
Activity 6 LOW	42336	42438	42540	42642	42744	42846	42948	43050	3	R/W
Activity 6 HIGH	42339	42441	42543	42645	42747	42849	42951	43053	3	R/W
Activity 7 LOW	42342	42444	42546	42648	42750	42852	42954	43056	3	R/W
Activity 7 HIGH	42345	42447	42549	42651	42753	42855	42957	43059	3	R/W
Activity 8 LOW	42348	42450	42552	42654	42756	42858	42960	43062	3	R/W
Activity 8 HIGH	42351	42453	42555	42657	42759	42861	42963	43065	3	R/W
Activity 9 LOW	42354	42456	42558	42660	42762	42864	42966	43068	3	R/W
Activity 9 HIGH	42357	42459	42561	42663	42765	42867	42969	43071	3	R/W
Activity 10 LOW	42360	42462	42564	42666	42768	42870	42972	43074	3	R/W
Activity 10 HIGH	42363	42465	42567	42669	42771	42873	42975	43077	3	R/W
Activity 11 LOW	42366	42468	42570	42672	42774	42876	42978	43080	3	R/W
Activity 11 HIGH	42369	42471	42573	42675	42777	42879	42981	43083	3	R/W
Activity 12 LOW	42372	42474	42576	42678	42780	42882	42984	43086	3	R/W
Activity 12 HIGH	42375	42477	42579	42681	42783	42885	42987	43089	3	R/W

Data type: Float

Explanation	Scale number								No of reg	R/W
	1	2	3	4	5	6	7	8		
Total Batched LOW	46250	46318	46386	46454	46522	46590	46658	46726	2	R/W
Total Batched HIGH	46252	46320	46388	46456	46524	46592	46660	46728	2	R/W
Activity 1 LOW	46254	46322	46390	46458	46526	46594	46662	46730	2	R/W
Activity 1 HIGH	46256	46324	46392	46460	46528	46596	46664	46732	2	R/W
Activity 2 LOW	46258	46326	46394	46462	46530	46598	46666	46734	2	R/W
Activity 2 HIGH	46260	46328	46396	46464	46532	46600	46668	46736	2	R/W
Activity 3 LOW	46262	46330	46398	46466	46534	46602	46670	46738	2	R/W
Activity 3 HIGH	46264	46332	46400	46468	46536	46604	46672	46740	2	R/W
Activity 4 LOW	46266	46334	46402	46470	46538	46606	46674	46742	2	R/W
Activity 4 HIGH	46268	46336	46404	46472	46540	46608	46676	46744	2	R/W
Activity 5 LOW	46270	46338	46406	46474	46542	46610	46678	46746	2	R/W
Activity 5 HIGH	46272	46340	46408	46476	46544	46612	46680	46748	2	R/W
Activity 6 LOW	46274	46342	46410	46478	46546	46614	46682	46750	2	R/W
Activity 6 HIGH	46276	46344	46412	46480	46548	46616	46684	46752	2	R/W
Activity 7 LOW	46278	46346	46414	46482	46550	46618	46686	46754	2	R/W
Activity 7 HIGH	46280	46348	46416	46484	46552	46620	46688	46756	2	R/W
Activity 8 LOW	46282	46350	46418	46486	46554	46622	46690	46758	2	R/W
Activity 8 HIGH	46284	46352	46420	46488	46556	46624	46692	46760	2	R/W
Activity 9 LOW	46286	46354	46422	46490	46558	46626	46694	46762	2	R/W
Activity 9 HIGH	46288	46356	46424	46492	46560	46628	46696	46764	2	R/W
Activity 10 LOW	46290	46358	46426	46494	46562	46630	46698	46766	2	R/W
Activity 10 HIGH	46292	46360	46428	46496	46564	46632	46700	46768	2	R/W
Activity 11 LOW	46294	46362	46430	46498	46566	46634	46702	46770	2	R/W
Activity 11 HIGH	46296	46364	46432	46500	46568	46636	46704	46772	2	R/W
Activity 12 LOW	46298	46366	46434	46502	46570	46638	46706	46774	2	R/W
Activity 12 HIGH	46300	46368	46436	46504	46572	46640	46708	46776	2	R/W

Batched weight is represented by two values (HIGH, LOW). To get the resulting value multiply value HIGH by 10000 and add value LOW. LOW is a value between ± 9999.999 with 3 decimals. HIGH is a value without decimals between ± 999999 . To zero a batched weight, send 0 to both HIGH and LOW.

NOTE! Both HIGH and LOW must be written in ONE Modbus message on order to change the value.

Batching status

This register contains the batching status.

Code	Description
00	Batching not active
01	Batching running
02	Batching halted
03	Batching alarm
04	Batching halted for manual operation
05	Batching halted for manual op. weight entry.

Batching step

This register contains the batching step.

Code	Description
00	Batching not active
01	Starting batching
02	Initializing activity
03	Checking acknowledge
04	Wait for acknowledge
05	Checking setpoint
06	Autotaring
07	Batching coarse
08	Batching fine
09	Batching one phase
10	Pulse batching coarse
11	Pulse batching fine
12	Pulse batching one phase
13	Delay after batching
14	Checking tolerance
15	Tolerance alarm
16	Pulsing
17	Dumping
18	Delay after dumping
19	Filling material
20	Delay after filling

(continued)

(continued)

21	Timing
22	Timing with output
23	Activating latch
24	Deactivating latch
25	Manual operation
26	Finishing manual operation
27	Finishing activity
28	Finishing batching
29	Resetting activity
30	Resetting batching

Batching alarm

This register contains the batching alarms present.

Code	Description
00	No alarm
01	Setpoint alarm
02	Acknowledge alarm
03	Timeout alarm
04	Minus tolerance alarm
05	Plus tolerance alarm
06	Unstable weight alarm
07	Weight error alarm
08	File write alarm
09	Out of disk space alarm
10	Power fail alarm

Batching commands

Only the commands used by batching are shown in the table below. Note that each scale has its own unique command codes.

Command	Command code per scale							
	1	2	3	4	5	6	7	8
Start batching	140	150	160	170	180	190	200	210
Stop batching	141	151	161	171	181	191	201	211
Reset batching	142	152	162	172	182	192	202	212
Restart batching	143	153	163	173	183	193	203	213
Reset batching alarm	144	154	164	174	184	194	204	214
Skip batching activity	145	155	165	175	185	195	205	215
Finish batching	146	156	166	176	186	196	206	216

General Batching Parameters

Location/Notes:
.....
.....
.....

General Information

Program version:
CPU S/N:
Instrument type:

Scale no: (1-8)
Scale Name:

Parameter Set-up

Display no of Batches:
Display Batch Size:
Batch Printout:
File Log:
Batch End Mode

Activity Parameters

Scale no: Activity Name:

Activity no: Activity Type:

Notes:

Weigh In/Weigh Out

Batching Mode:

Output No:

Coarse Output No:

Fine Output No:

Fine On During Coarse:

Start Delay:

Fine Start Delay:

Fine Value:

Minus Tolerance:

Plus Tolerance:

Inflight Factor:

Inflight Value:

Wait Time:

Pulsing Time:

Timeout Value:

Acknowledge Type:

Acknowledge Input No:

Dump

Output No:

Low Level:

Wait Time:

Timeout Value:

Acknowledge Type:

Acknowledge Input No:

Fill

Output No:

Low Level:

High Level:

Wait Time:

Timeout Value:

Acknowledge Type:

Acknowledge Input No:

Timer/Timer w. Output

Output No:

Acknowledge Type:

Acknowledge Input No:

Latch On/Latch Off

Output No:

On During Halt:

Acknowledge Type:

Acknowledge Input No:

Manual

Print Weight:

Enter Weight:

Pulse Batch

Batching Mode:

Output No:

Coarse Output No:

Fine Output No:

Fine On During Coarse:

Fine Value:

Minus Tolerance:

Plus Tolerance:

Inflight Factor:

Inflight Value:

Wait Time:

Pulsing Time:

Timeout Value:

Acknowledge Type:

Acknowledge Input No:

Pulse Input No:

No of Decimals:

Unit:

Scale factor:

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