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1020
Supplement Belt Weigher Controller

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1020 Belt Weigher Controller

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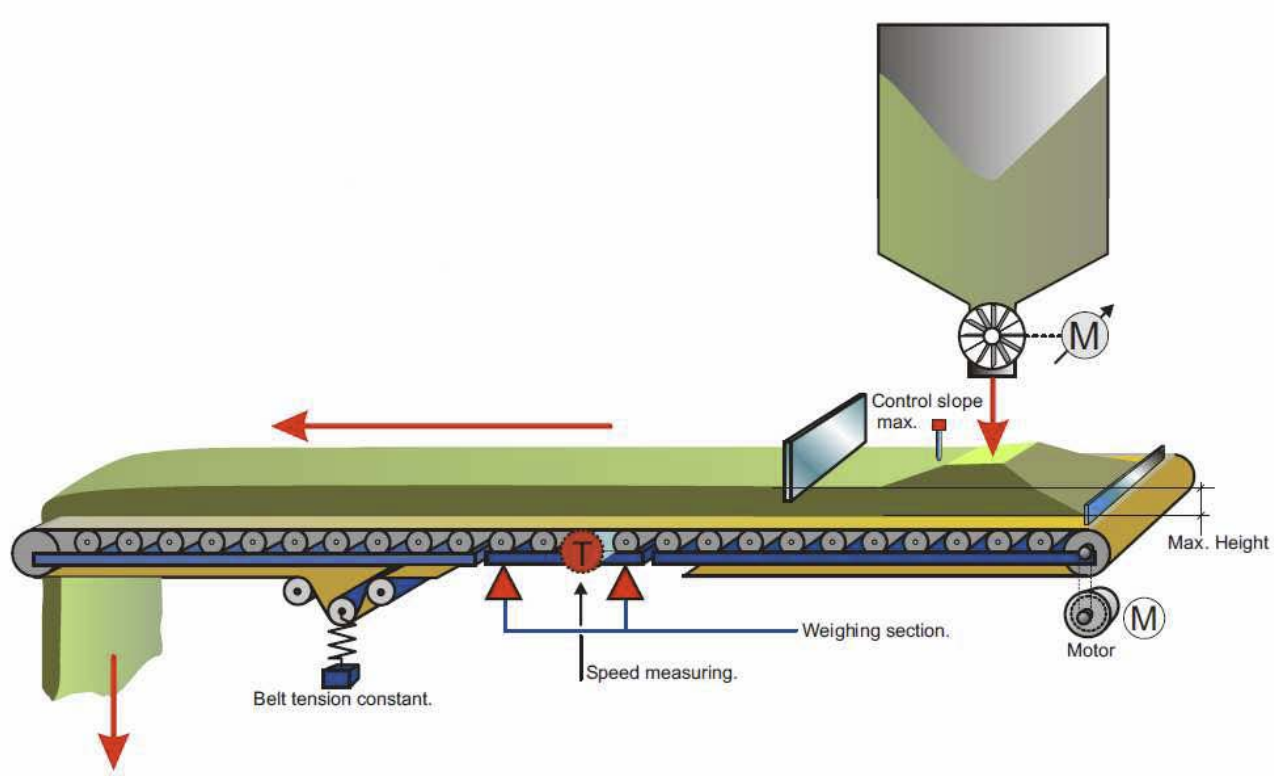
Application

A typical Belt Weigher application.



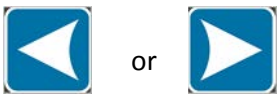
Indication of Display

1. Current selected recipe
2. Measured Flow
3. Weigher stable
4. Inputs 1, 2, 3
5. Current/actual total dosed product
6. Measured weight on the belt
7. Current belt speed
8. Status Indications, see chapter 2

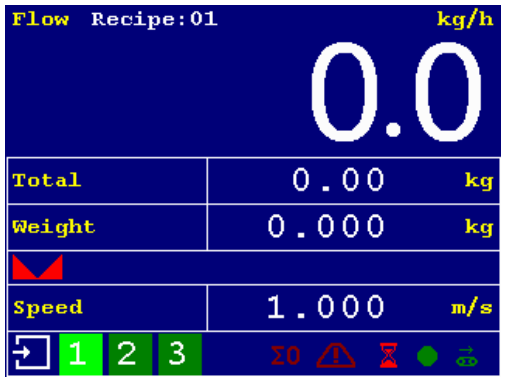
Options for indication 2nd screen

Use the LEFT of RIGHT key to switch between the four main screens.

The 2nd screen shows the flow as the largest indication.

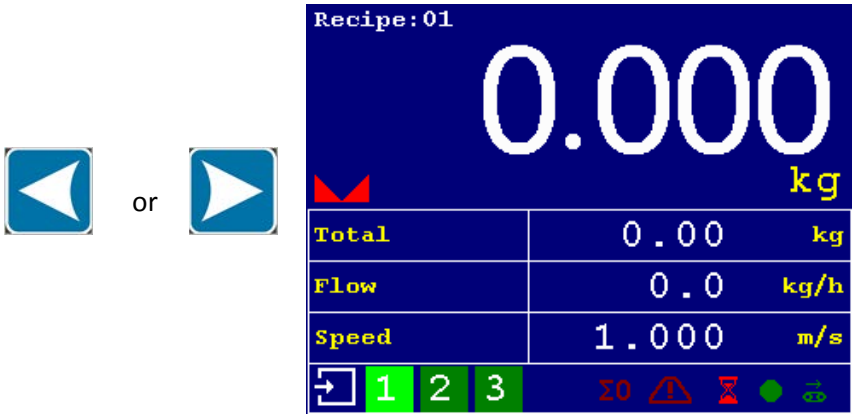


or



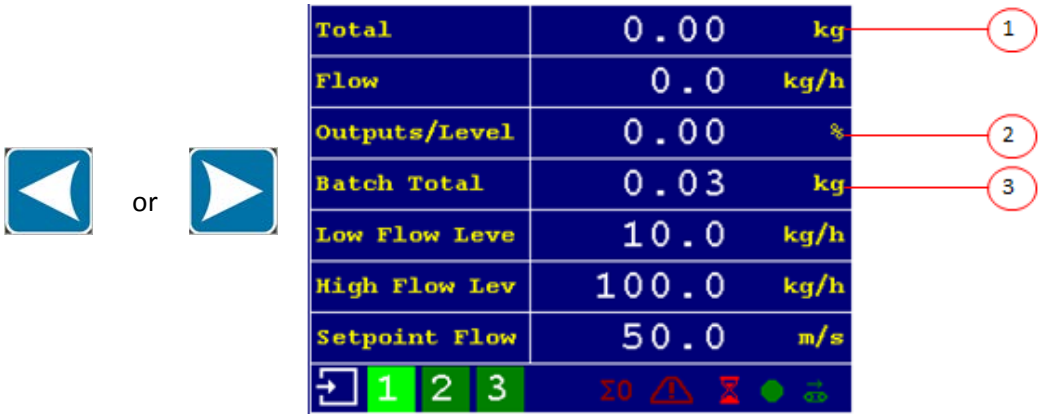
Options for indication 3rd screen

The 3rd screen shows the weight on the belt as the largest indication.



Options for indication 4th screen

The 4th screen shows the selected recipe values and output drive level.



1. Current/actual total dosed products
2. Indication or control signal for the flow
3. Wanted total dosed product/recipe setting

1020 Belt Weigher Controller

Status Indication

Measuring dynamic zero level

Live/Alarm active (The output is on when the indicator is on. The output is switched off when an alarm situation occurs)

Busy (This output is switched off when the Batch total amount is reached.)

Flow OK (output 3) Flow in kg/h. Flow OK is on when the Flow Level is in between Low and High Level.

When the belt is running, this indication will blinks every time output 4 is activated. The output gives a pulse every X kg that is totalized (see configuration)

Button functions

Reset the total batch weight to 0

>0< Resets the weight to 0

T Starts the dynamic zero level measurement. During this measurement the average weight of the empty belt is determined

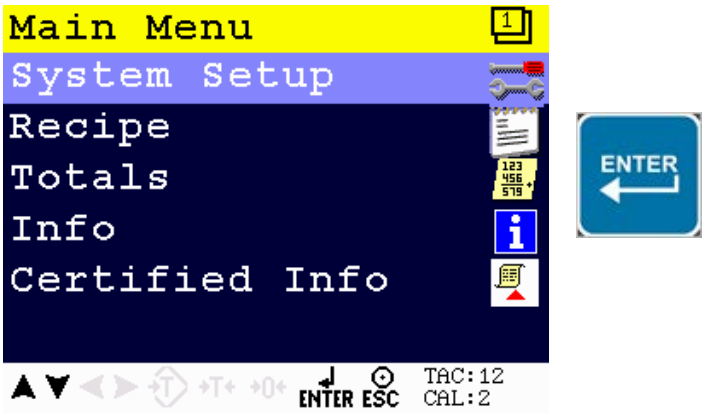
Configuration

To start the 1020, see chapter 'First use of indicator' of the 1020 manual.

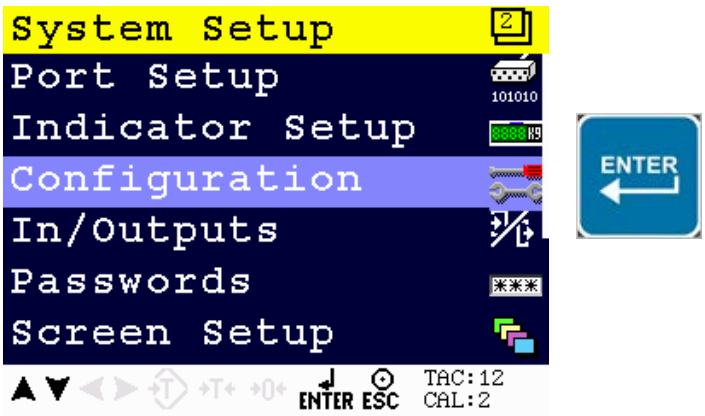
Hold the **Enter** button for 2 seconds to enter the **Main Menu.**

2 seconds

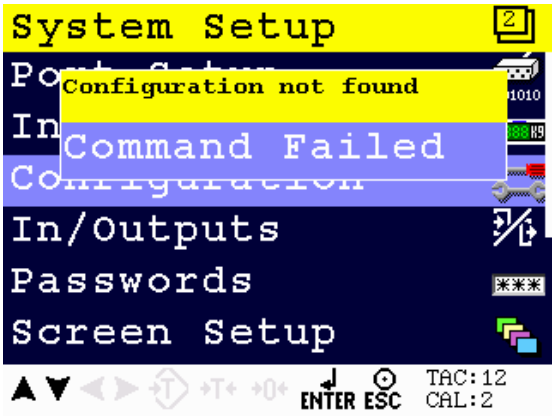
Select **System Setup** from the **Main Menu** and press **Enter**.



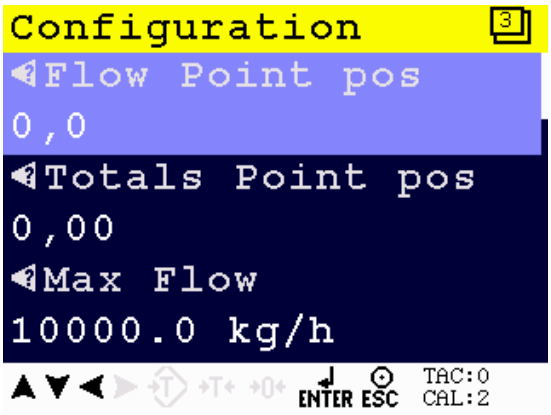
Select **Configuration** from the **System Setup Menu** and press **Enter**



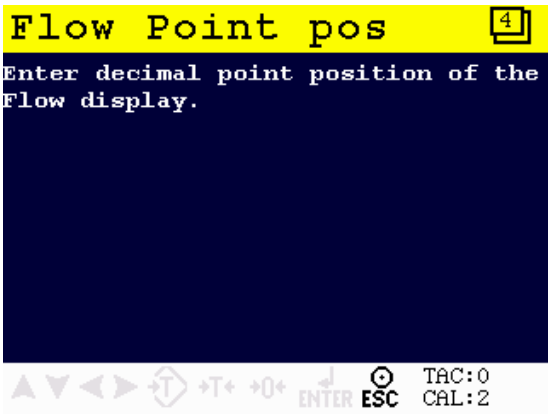
The following error is visible if no configuration is present



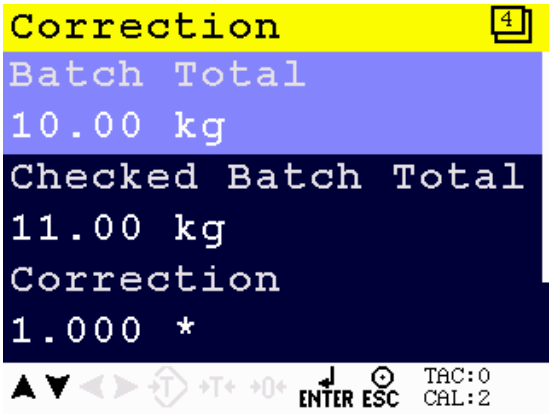
Press **Enter** to start with default values.

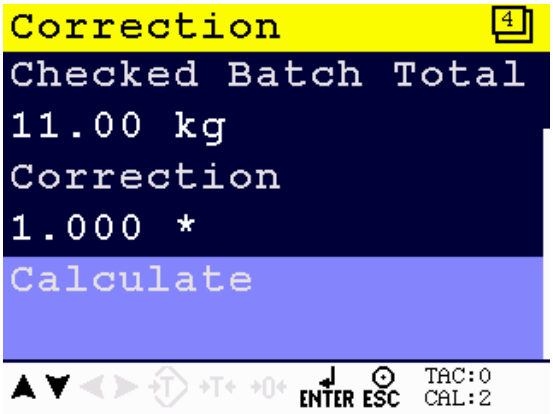


When pushing the LEFT key, the help text of the parameter is shown. Below the example for the help text for the parameter Flow Point Pos.

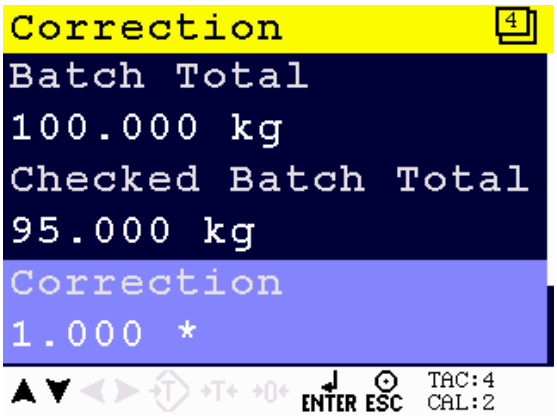


When selecting the Correction parameter, a new screen is shown.

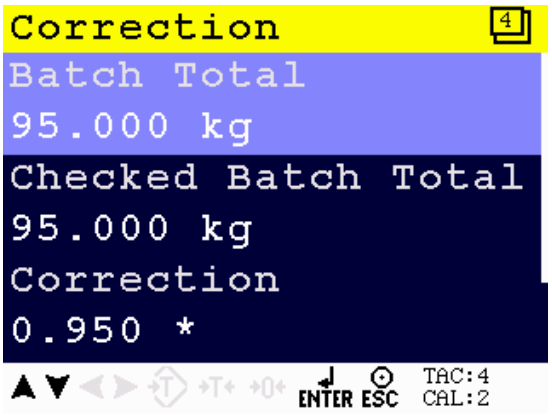




After a completed batch you can check if the Batch Total and the Checked Batch Total (the real value of the total batch) are the same. If not press on **Calculate** to calculate a new **Correction**. The next batch the Batch Total and Checked Batch Total should be closer together. In the example below the **Batch Total** is 100 kg and the **Checked Batch Total** is 95 kg.



Press on **Calculate** and the correction is calculated. After calculation both totals are equal.

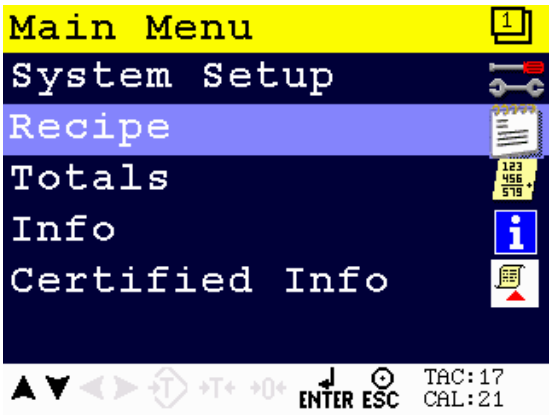


Configuration Parameters

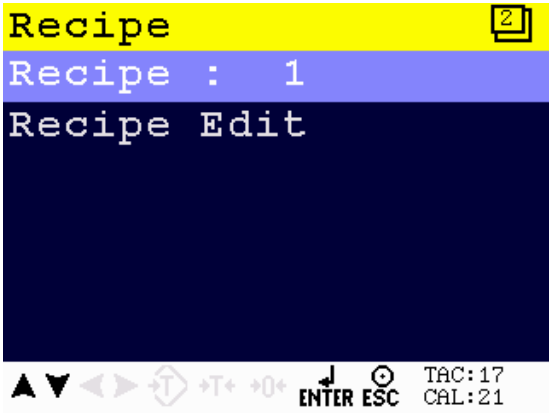
Configuration	Parameter information
Flow Point Position	Sets the decimal point position for the flow indications.
Totals Point Position	Sets the decimal point position for the totals indications.
Max Flow	Sets the maximum allowed flow. The analogue output can signal the flow as a percentage of the maximum flow.
Dynamic Tare Band	Within this range a Dynamic Tare Measurement is allowed. This range is entered as a percentage of the maximum flow. For instants if there is a piece of product sticking to the belt. You can set a new Tara point and it will show "0" again. If the new tare is outside the Dynamic Tare Band range, alarm (output 1) is turned off.
Dynamic Tare Time	During the Dynamic Tare Time the weight of the empty belt is sampled. The average Weight is subtracted to correct the displayed Weight. For best result, enter the number of seconds the belt takes to complete one revolution.
Zero Suppress	Lowest allowed Flow on the belt. Below this level, the Flow is forced to zero and it will show that there is nothing on the belt. For example if Zero Suppress is set to 1.0 kg every weight below 1.0 kg will show as 0.0 kg. And every weight above 1.0 kg will show as the actual weight.
Filter Time	Time for filling the filter with one new value. 10 values are averaged to stabilize the flow display value.
Weight per Pulse	Weight indicated by one pulse of the PLC pulse output (Output 4). Pulse duration is 0,5s. If you set Weight per Pulse to 5.0 kg the 1020 will send out a pulse after every 5.0 kg. The fastest Pulse time is 1Hz per second (0,5 sec high and 0,5 sec low).
Correction	Can be used to correct deviations in the total dosed amount by compensating for mechanical variations. When the final dosed amount is checked by weighing the resulting weight, the 1020 can recalculate this factor by calculating: New Correction = (Checked Batch Total / Last batch total) * Correction. After calculation both totals are equal.
Pulses per Meter	Enter the number of pulses the tachometer generates per meter.
Fixed Speed	Set the belt speed in m/sec. Or set the fixed speed to 0 to use a tachometer (input 1). Input 1 will act as a Start/Stop signal for the Belt weigher.
Measurement Method	Selects the flow measurement system used. Choose 'Belt Weigher' or 'Impact Flow Meter' Since an impact flow meter has no moving parts, this setting uses a fixed speed setting of 1.000 m/s pulse and no pulse input.
Analogue Use	Selects if the flow is regulated using the DAC or only measured. If the DAC is set to Regulation, the DAC function must be set on "Control".
Control Correction	When Flow regulation is selected, this is the percentage that the analog control signal can be influenced by the flow regulation.

Recipe

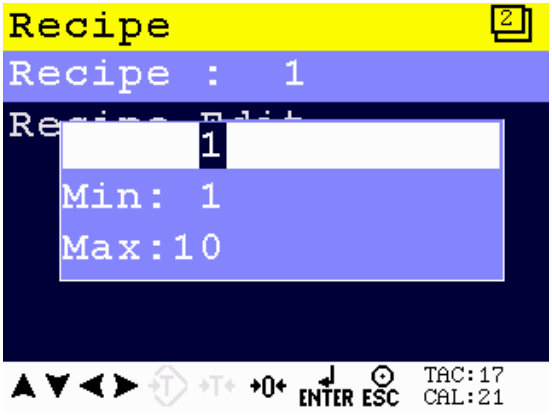
Select **Recipe** from the **Main Menu** and press **Enter**.



Select **Recipe** and press **Enter.**

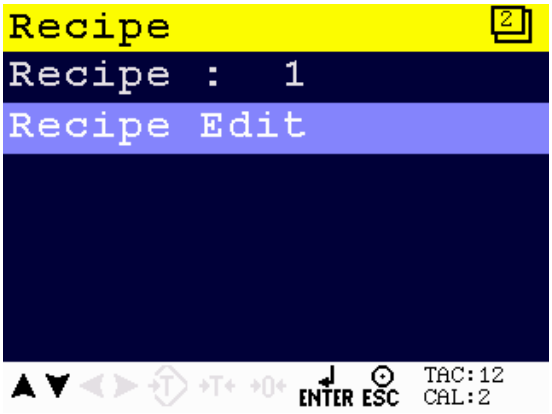


Enter the recipe that needs to be edited and press **Enter**.

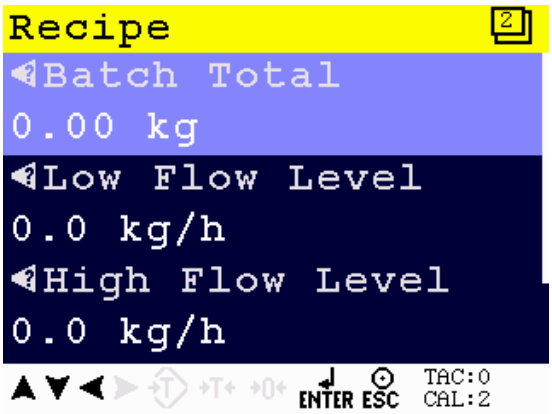


If the selected recipe does not exist, the following error is visible:

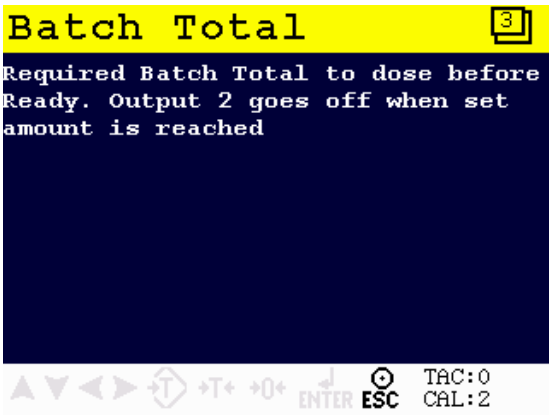
To edit currently selected recipe parameters, select **Recipe Edit** and press **Enter**.



The following screen is visible:



When pushing the LEFT key, the help text of the parameter is accessed. Below the example for the help text for the parameter Batch Total.



Recipe Parameters

Parameters	Remote Register		Parameter information
	Profibus	Ethernet	
Batch Total	EXT.85	EXT.11	Required Batch Total to dose before Ready. Output 2 goes off when set amount is reached.
Low Flow Level	EXT.87	EXT.13	When the Flow is above 'Low Level' and below 'High Level', the Flow is OK and Output 3 is on.
High Flow Level	EXT.86	EXT.12	When the Flow is above 'Low Level' and below 'High Level', the Flow is OK and Output 3 is on.
Setpoint Flow	EXT.88	EXT.14	Setpoint for the Flow Regulation. Only available when Flow regulation is selected in the configuration.

Remote Process Values

Process value	Remote Register	Value information
Nett weight value	EXT. 1	The actual filtered and nett weight of the belt.
Total	EXT. 2	The actual total weight of the batch.
Flow in kg/h	EXT. 3	The actual flow of the product.
Flow/Control	EXT. 4	When the parameter "Analogue Use" is set to "Flow measurement", the actual flow is shown as a percentage of the max flow. When the parameter "Analogue Use" is set to "Flow regulation", the analogue output is shown in a percentage. This percentage is used to control the flow per hour, to get the flow per hour as close as possible to the "Setpoint Flow".

Inputs

Input	Profibus marker	Ethernet IP marker	Name	Explanation
1	969	433	Start/Stop or Tachometer	This is the tachometer input which is used to measure the belt speed. When the belt speed is not used, a preset speed is entered and this input is used to start and stop dosing.
2	970	434	Dynamic Tare	Starts the Dynamic Tare level measurement. During this measurement the average weight of the empty belt is determined.
3	971	435	Zero	Resets the total to zero.
	972	436	Total	The indicator reads the Batch Total it receives from Profibus or Ethernet IP.
	973	437	Flow OK	The indicator reads the Flow (low and high level) it receives from Profibus of Ethernet IP.
	974	438	Setpoint	The indicator reads the Setpoint for the Flow Regulation it receives from Profibus or Ethernet IP (only when Flow Regulation is selected)

See chapter 'Load cell / power connection' of the 1020 manual for connecting the in- and outputs.

Outputs

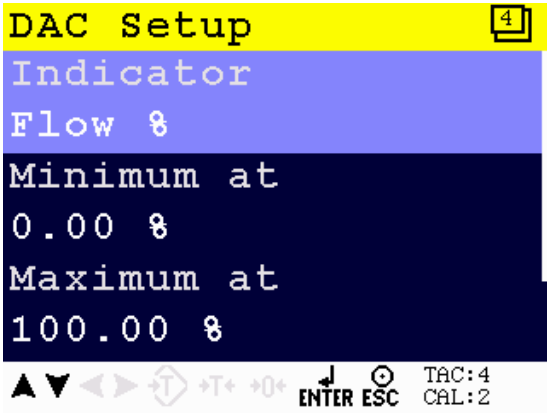
Output	Name	Explanation
1	Live/Alarm	The output is on when the indicator is on. The output is switched off when an alarm situation occurs like overload, underload or Dynamic Zero fail.
2	Busy	This output is switched off when the Batch total amount is reached.
3	Flow OK	This output is used to signal if the flow is within limits. The High and Low limits can be set in the recipe.
4	Weight Pulse	This output is pulsed high for 0,5 seconds for when a preset amount has been dosed. The dosed amount per pulse van be set in the Configuration menu.

Analog output

Output	Name	Explanation
Analog	Flow/Control	Depending on the configuration, this output can indicate or regulate the flow from 0,00% to 100,00%. The DAC source can also be changed as described in the 1020 manual page 58. This way the output can also be used to signal dosed amount or belt weight.

DAC setup

Select **In/Outputs** from the **System Setup Menu** and press **Enter**. Select **DAC Setup** and press **Enter**.



Set the Function of the analog output

Indicator	Explanation
Flow%	The Flow in kg/h. The maximum Flow is the same as configured in the 'Max Flow' parameter.
Corrected weight	The real weight corrected with the taken Tare belt
Corrected weight*10	The real weight corrected with the taken Tare belt, with an extra digit.
Speed	The speed of the belt. The maximum is the same as the Max Level.
Flow value	The Flow in kg/h. The maximum Flow is the max level in kg.
Control %	For Flow Regulation (selected in Configuration), Analog use

Printer Ticket

Example of the 1020 Printer recipe when 'Ticket' layout is selected.

```
Programmable header 1
Programmable header 2
Programmable header 3
Programmable header 4
---------------------------------------
DATE                      07-10-11
TIME                      05:57.13
RECIPE                         001
TICKETS                        100

DOSED                  00000.00 kg
COUNT                        100
---------------------------------------
Programmable footer 1
Programmable footer 2
```

Starting the program for the first time

With input 1 you can **Start** (input high) and **Stop** (input low) the 1020. If you use a tachometer the 1020 will start if the tachometer starts.

The 1020 should start measuring the flow if the flow is above the **Zero Suppression**. If the weight is below the **Zero Suppression**, the weight will be set to zero.

The **Correction Factor** must be set to 1.000, this means that there is no correction.

If you start the 1020 for the first time you must do the following steps:

1. Start a Dynamic tare, if you get an alarm, set the weight to zero and start a new Dynamic tare. If the Dynamic tare went OK, proceed to step 2.
2. Let the 1020 run without any product on the belt for a couple om minutes, the total should stay zero.
3. Let the 1020 run with product on the belt and preform a correction (see page 7 – 8).

The analog output can sent out the flow, or the weight, but the analog output can also be selected as a regulated output. The flow kg/h you have set is then maintained with the analog output.

You can set the 'analog use' to **Regulation** instead of **Measurement** in the **Configuration.** If you set the analog us to Regulation you can set the **Setpoint Flow** (in the Recipe) to the desired flow. The analog output must be set to **Control**.

Default settings

To access the Configuration setup, select **System Setup** from the **Main Menu** and press **Enter**.

Configuration	Setting
Flow Point Position	0.0
Totals Point Position	none
Max Flow	4000.0 kg/h
Dynamic Tare Band	10%
Dynamic Tare Time	30 sec
Zero Suppress	0.5 kg
Filter Time	1.0 sec
Weight per Pulse	10 kg
Correction	1.000
Pulses per Meter	0
Fixed Speed	1.000 m/sec
Measurement Method	Belt Weigher
Analogue Use	Flow Regulation
Control Correction	2%

To access the DAC setup, select **In/Outputs** from the **System Setup Menu** and press **Enter**. Select **DAC Setup** and press **Enter**.

DAC setup	Setting
Indicator	Control %
Min	0.00%
Max	100.00%
Mode	4 – 20 mA
Dynamic Tare Time	30 sec

1020 Belt Weigher Controller

To access the Weigher setup, select **Indicator Setup** from the **System Setup Menu** and press **Enter**. Select **Indicator** and press **Enter,** enter the **TAC code** (the TAC code is visible in the bottom right corner of the LCD screen) and press **Enter**. Select **Weigher** and press **Enter**.

Weigher	Setting
Name	1020 Belt
Unit Label	Kg
Step	1
Decimal point	0.000
Operation Mode	Industrial
Max Load	100.000

To access the Stable Condition setup, select **Indicator Setup** from the **System Setup Menu** and press **Enter**. Select **Indicator** and press **Enter,** enter the **TAC code** (the TAC code is visible in the bottom right corner of the LCD screen) and press **Enter**. Select **Stable Condition** and press **Enter**.

Stable Condition	Setting
Range	0.010 kg
Time	1.00 sec

To access the Stable Condition setup, select **Indicator Setup** from the **System Setup Menu** and press **Enter**. Select **Indicator** and press **Enter,** enter the **TAC code** (the TAC code is visible in the bottom right corner of the LCD screen) and press **Enter**. Select **Filter** and press **Enter**. Select **Digital** and press **Enter**.

Filter Digital	Setting
Digital Filter	Dynamic App.
Cutoff Frequency	1.0 Hz
Frequency	10 Hz

Notes

About PENKO

Our design expertise include systems for manufacturing plants, bulk weighing, check weighing, force measuring and process control, For over 35 years, PENKO Engineering B.V. has been at the forefront of development and production of high-accuracy, high-speed weighing systems and our solutions continue to help cut costs, increase ROI and drive profits for some of the largest global brands, such as Cargill, Sara Lee, Heinz, Kraft Foods and Unilever to name but a few.

Whether you are looking for a simple stand-alone weighing system or a high-speed weighing and dosing controller for a complex automated production line, PENKO has a comprehensive range of standard solutions you can rely on.

Certifications

PENKO sets high standards for its products and product performance which are tested, certified and approved by independent expert and government organizations to ensure they meet – and even – exceed metrology industry guidelines. A library of testing certificates is available for reference on:
Http://penko.com/nl/publications_certificates.html

PENKO Professional Services

PENKO is committed to ensuring every system is installed, tested, programmed, commissioned and operational to client specifications. Our engineers, at our weighing center in Ede, Netherlands, as well as our distributors around the world, strive to solve most weighing-system issues within the same day. On a monthly basis PENKO offers free training classes to anyone interested in exploring modern, high-speed weighing instruments and solutions. A schedule of training sessions is found on: **www.penko.com/training**

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