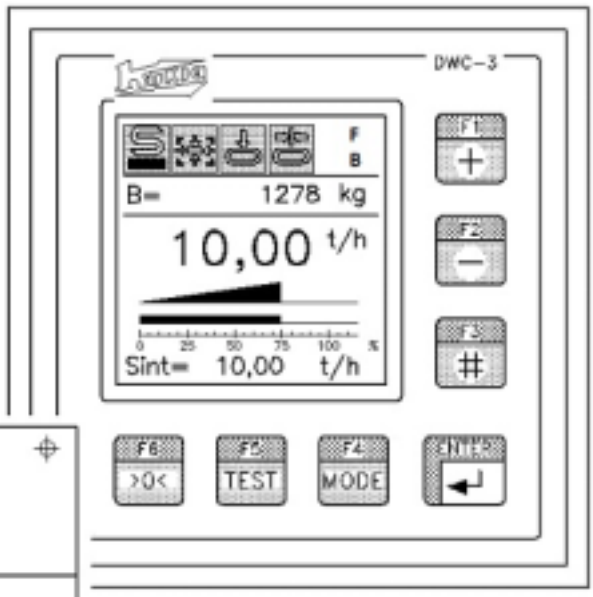
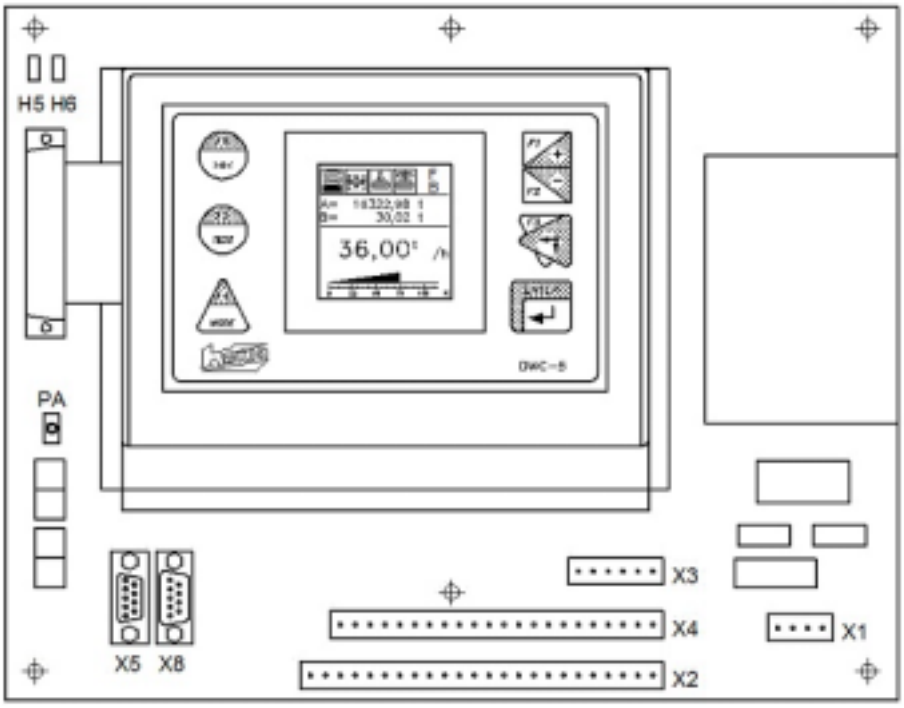
Weighing computer

Manual

T1

DWC-3D





DWC-5C

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Software indication

These instructions are based on Software version (N1) A2.00 / C2.00.
In the course of technical progress modifications at the software can be carried out. At subsequent software versions therefore deviations are possible against these instructions.

*** SAFETY REGULATIONS ***

Being under voltage the device must not be opened. Danger of electric shock exists. Service works at the weighing equipment are permitted only for qualified personnel. In case of works at the weighing belt the drive has to be switched off.

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14. April 2011

1 General description

Belt scales are available for installation into conveyor belt plants or with own weighing belt.
Mostly they are integrated in the material flow.
In case of batch operation the discharge often is carried out directly from a storage hopper.

Weigh feeders are used for continuous dosing of bulk materials.
They discharge either directly from a hopper or the material discharge is carried out with the help of a discharge device as e.g. rotary vane feeder or discharge screw.

The systems with an own weighing belt are provided with a mechanic belt steering device.
The conveying belt is kept in the middle of the roller system by the belt steering device.
Optionally the belt scale can be equipped with mis-run monitoring (monitoring of off-track running).

Weigh feeders, which must have a very constant discharge (e.g. for gypsum plaster production) are provided with rotary vane feeder or screw feeding, whereby the material level in the feeding hopper is additionally controlled via a level probe or via weighing rollers in the feeding area.

Thus, the rotational speed of the rotary vane feeder is determined by the load set value, by the speed of the weighing belt and by the switch condition of the level probe. If the level probe is not covered, the material feeding delivers by approx. 20% more than the weigh feeder is discharging. In case of covered level probe the material feeding is lowered via the rotary vane feeder/screw by approx. 20% -30% (adjustable under “Feeder reduction“).

At the design with weighing rollers in the feeding area (pre-bin control) the material level in the feeding hopper is kept constant via the continuous control. The set value for the bin contents is adjusted via the parameter „Load set value“. The control is adapted via the parameters „Readjustment factor Open/Closed“, „DeadTime“ and „Feeder Window“.

Always the material discharge from a discharge hopper filled over the discharge opening must be ensured as otherwise the short time accuracy is decreasing..

1.1 Service module DWC-5C

While at the DWC-3D the service module is installed directly, it has to be detached on the device in case of DWC-5C.
The two fastenings at the back side of the service module have to be hanged into the metal hood from above according to the instructions sticked on the housing. Only then the service module can be detached on the base device with slight pressure.

The service module may be detached on and removed during operation. Immediately after detaching a text- or graphic representation should be on the display.

In exceptional cases a manual re-set may be necessary. This is done by pressing down the switch SW6 for a period of approx. 2 seconds. ATTENTION!! At running production a Reset might cause a downtime of the plant (Ready for operation switches to „0“, Profibus connection is short-time interrupted).

2 Operation of the weighing plant

2.1 Preparation for starting procedure

Before the plant is started, the scale has to be tared at empty weighing belt at manual operation. Then a test with test weight has to be carried out (see „Maintenance“ on page 17 and 19).

2.2 The production set value at dosing

At manual operation the weigh feeders are working with the set value which can be adjusted via the keyboard of the weighing electronics. If an additional setting block exists, this setting block is mostly activated at manual operation. Determination of the source of set value (nominal value) is done via parameter „INTERNAL“.

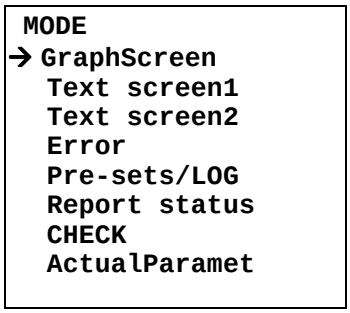
At automatic operation often an analog set value (0/4-20mA) (Bus System) is used. Determination of the source of set value (nominal value) is done via parameter „EXTERNAL“.

There is, however, also the possibility to select other sources of set values by a corresponding parameterizing.

2.3 Calling the indication- and adjustment pictures

The indication- and adjustment pictures are called from the graphic picture with the help of keys „F4“, „F3“ and „ENTER“.

By pressing key „F4“ the selection „**MODE**“ is called.



With key „F3“ the arrow left in the picture is moved to the desired position, with key „ENTER“ the call is carried out.

3 DESCRIPTION OF THE INDICATION PICTURES

For reading the operation data, input of set values in case of corresponding parameterizing and for control indications several pictures are available at normal operation.

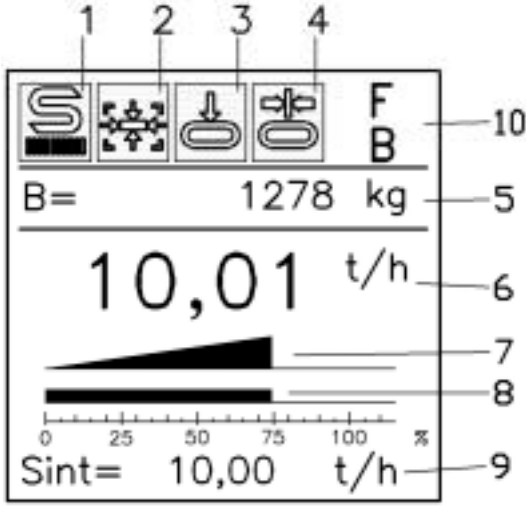
3.1 Graphic screen

After switching on the current supply „**GraphScreen**“ is represented. There are several possibilities for representation at the graphic screen, which – depending on the type of scale – are determined in the parameterizing mode.

.

3.1.1 Standard picture for belt scale, for weigh feeder and for impact flow meter

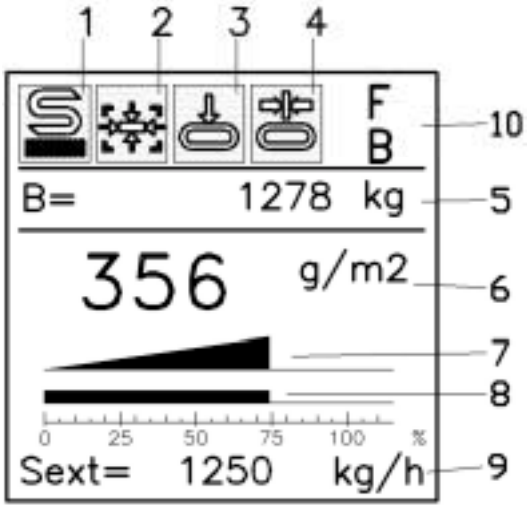
In the uppermost row symbols for information about certain operation statuses are faded in (1-4).



1	Simulation activated
2	Error recognized
3	Load of the measuring length under "**Belt empty**"
4	Belt drive stopped (Tacho frequency under 1Hz)
5	Quantity counter "**B**" Re-set to zero with key „F3“ at hold pressed key „F2“
6	Conveying capacity in kg(t)/h. Alternative indication: Actual load (g1) in per cent (only if the source of set value is at „**Sext**“)
7	Conveying capacity in percent in graphic representation
8	Capacity set value in graphic representation
9	**Sint** [2] or **Sext** [3] Set value in kg/h (t/h)
10	Fieldbus connection active

3.1.2 Picture for fleece scales

The representation of the production actual value is done in (k)g/m2 resp. in oz/sy (ounces per square yard) or in per cent, if a multiplicating set value **„EXTERNAL“** is active and the indication picture is correspondingly parameterized. As for the rest like the standard picture.



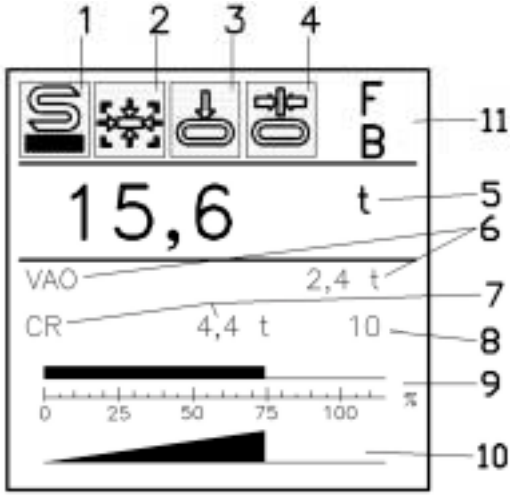
1	Simulation activated
2	Error recognized
3	Load of the measuring length under „**Belt empty**“
4	Belt drive stopped (tacho frequency under 1 Hz)
5	Quantity counter „**B**“ Re-set to zero with key „F3“ at hold pressed key „F2“
6	Production value in (k)g/m^2 Alternative Indication: actual load (g1) in per cent (at source of set value „**Sext**“)
7	Conveying capacity in %
8	Capacity set value in per cent
9	**Sint** [2] or **Sext** [3] set value in kg/h (t/h).
10	Fieldbus connection active

[2] **Sint:** Source of set value "INTERNAL" is used.
[3] **Sext:** Source of set value "EXTERNAL" is used.

3.1.3 Picture for batch weighing

Batch operation is possible at registration and dosing.

In the uppermost row symbols for information about certain operation statuses are faded in (1-4).



1	Simulation activated
2	Error recognized
3	Load of the measuring length under "**Belt empty**"
4	Belt drive stopped (Tacho frequency under 1Hz)
5	Batch quantity counter [1]
6	Silo No. (**VA0/1/2/3**) and pre-switch-off-value [2]
7	Batch set quantity (**CS**) or batch residual quantity (**CR**) [3]
8	Batch run-off-indication (run-off-step)
9	Batch set value / residual quantity in per cent
10	Conveying capacity as ramp in per cent of final value
11	Fieldbus connection active

There are 3 different batch-run-offs:

a) Standard batch operation with loaded weighing belt at Start and Stop.
Control output „**Batch drive**".

b) Start and Stop with empty weighing belt. It is possible to work with 4 different pre-switch-off-quantities. (distance to the storage hopper) .
Control by „**Batch drive**" and „**Batch mode**".

c) Batch operation with loaded weighing belt at Start and Stop. Reduction of the discharge quantity before batch end (fine stream).
Control by „**Coarse str.**" and „**Fine stream**" resp. via the analog signal „**Charge Fine**".

Run-off-steps variant a):

0	Wait for Start, overtake set value.
1	Started, re-set batch quantity counter, Switch on contact outputs „**Batch drive**" and „**Batch mode**".
10	Batch runs. **Final condition:** Batch quantity counter equal set quantity.
50	Switch off „**Batch drive**" and „**Batch mode**".
51	Settling time 5s.
52	Printer output (Timeout after 5s).
53	Batch step counter to 0.

[1] The batch quantity counter (6-digit, with comma 5-digit) is set to zero at batch start. At batch end printer output is done.

[2] Only at modes of operation „with emptying" and „Fine stream".

[3] The switching over from batch set quantity to batch residual quantity is done at batch start. Batch (charge) set quantity (**CS**) is indicated at run-off-step „0" .

Run-off-steps variant b):

0	Wait for Start, overtake set value.
1	Started, re-set batch quantity counter, Switch on contact outputs „**Batch drive**“ and „**Batch mode**“.
20	Batch runs. **Final condition:** Batch quantity counter equal set quantity minus pre-switch-off-quantity (**VAX**) **.**
21	Switch off „**Batch mode**“. **Final condition:** Belt load under „**Belt empty**“.
22	Post-Runtime. **Final condition:** Time has run down.
50	Switch off „**Batch drive**“ .
51	Settling time 5s.
52	Printer output (Timeout after 5s).
53	Batch step counter to 0.

Run-off-steps variant c):

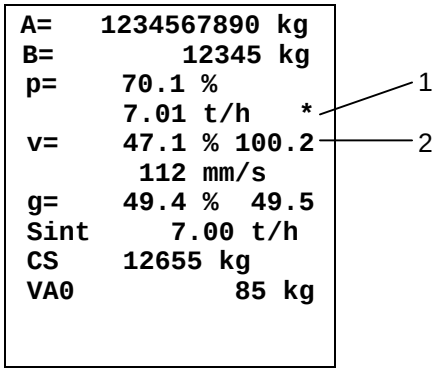
0	Wait for Start, overtake set value.
1	Started, re-set batch quantity counter, Switch on contact outputs „**Batch drive**“ and „**Batch mode**“.
30	„**Coarse str.**“ is switched on. Batch runs. **Final condition:** Batch quantity counter equal set quantity minus pre-switch-off-quantity (**VA0**). „**Coarse str.**“ is switched off.
31	Fine stream. „**Fine stream**“ is switched on. The analog output „**Charge fine**“ runs down proportionally to the decreasing remainder to 5% of the final value. At „DBW“ the nominal value is decreasing proportionally to the decreasing remainder to „**Min-Set Value**“. **Final condition:** Counter „**B**“ equal set quantity. „**Fine stream**“ is switched off.
50	„**Batch drive**“ and „**Batch mode**“ are switched off.
51	Settling time 5s.
52	Printer output (Timeout after 5s).
53	Batch step counter to 0.

3.1.3.1 Printer output

At charge end resp. at activating binary input „**B=>0 print**“ via serial interface the following output is started:

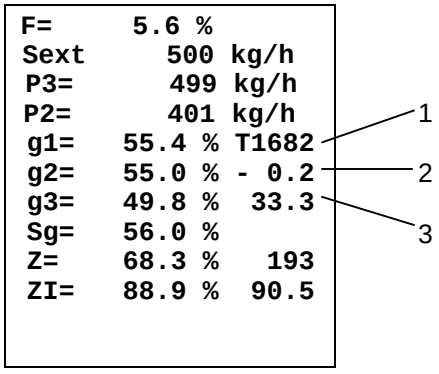
```
08:43:15  05.Jan. 2011  B=     27,3 t
```

3.2 Text Screen 1



A=	Total quantity counter "A" Re-set to zero with key „F3“ at hold pressed keys „F1“ + „F2“.
B=	Quantity counter "B" Re-set to zero with key „F3“ at hold pressed key „F2“.
p=	Conveying capacity in per cent; Conveying capacity in kg(t)/h**.**
v=	Speed of the weighing belt in %, Speed in mm/s
g=	Load of the measuring length in per cent and load at discharge end (g3)
Sint / Sext	Set value in kg/h (t/h) [1]
CS / CR	Batch set quantity /remainder [2]
VA0/1/2 /3	Pre-switch-off-value at batch „with emptying“
1	At re-calculation of the control-factor.
2	At „**Range of integration**“ >10: Control factor (100% ± 15%)

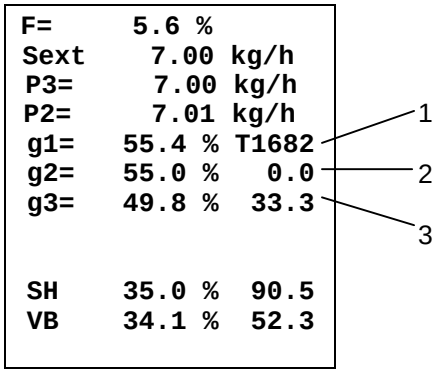
3.3 Text screen 2



F=	actual moisture measured value [3]
Sint Sext	actual set value (Sint“=INTERNAL; "Sext" =EXTERNAL)
P3=	actual conveying capacity
P2=	Conveying capacity at point „g2"
g1=	Load of the measuring length
g2=	Load at point „g2"
g3=	Load at point „g3"
Sg=	Load set value [4]
Z=	%-feeder for belt drive and dead-length-counter [4]
ZI	Actual position and nominal position (value on the right side) at continuously controlled dosing device [4]
1	actual tare cell (max. 2000)
2	Control deviation in % [5]
3	admissible minimal load (only at DBW)

[1] **Sint:** The source of set value "**INTERNAL**" is used / **Sext:** The source of set value "**EXTERNAL**" is used
[2] Only at activated batch operation
[3] The moisture measured value is indicated only at released dry weight calculation
[4] Only at activated feeder control
[5] Related to „**RATED CAPACITY**“

3.4 Text screen 2 at activated VB (pre-bin) control



F=	actual moisture measured value [3]
Sint **Sext**	actual set value „Sint“= INTERN; "Sext" =EXTERNAL)
P3=	actual conveying capacity at point „g3“
P2=	conveying capacity at point „g2"
g1=	load of the measuring length
g2=	load at point „g2"
g3=	load at point „g3"
SH=	set value pre-bin / aside control factor
VB=	actual bin contents (in case of change to „vb“ a new variable for the feeder is calculated / topical variable % put-out aside.
1	actual tare cell (max. 2000)
2	control deviation in % [5]
3	admissible minimal load (only DBW)

[1] **Sint:** Source of set value "**INTERNAL**" is used / **Sext:** Source of set value "**EXTERNAL**" is used
[2] Only at activated batch operation
[3] The moisture measured value is indicated only at released dry weight calculation

3.5 Error

In this picture the actual error messages are indicated. The indication „**A**" at the right side of the screen means „actual", the indication „**M**" means „stored". Stored errors can be deleted with key „F2“.
Deleting with key „F2“ is only possible if the error picture is indicated. If errors are activated, the error picture is shown automatically each 20 seconds during a period of approx. 4 seconds in the operation pictures (graphic screen and text screen).
Remedy against disturbances see from page 22 on under „Remedy against disturbances".

3.6 Pre-set value

Under „**Pre-sets/LOG**“ set values can be adjusted.

- **Cap.setValue** ___ is used, if the source of set value „**Display**" or „**Disp.+/-**" is adjusted. Pre-set in kg(t)/h.
- **Nominal load** ____ Only at design with feeder and control, if at parameter „**Nominal load**“ „**%Pre-set1(2)**“ is adjusted.
- **Feeder Reduct.** _Only at feeder control or pre-bin control if „Feeder reduction“ was selected
- **g-Simu** _____ Only for purpose of test if „g-SIMU“ was activated.
- **v-Simu** _____ For flow meters or belt scales without digital tacho if „v-SIMU“ was activated.

[3] The moisture measured value is indicated only at released dry weight calculation
[5] Related to „**RATED CAPACITY**“

3.6.1 Log book

The log book is called under „**Pre-set/LOG**“.
The activities mentioned under b) are always stored.
Approx. 6000 data sets can be stored. The memorizing always is done with date and time.

a) The following activities are stored, if the Logbook is activated:

- Taring with tare mean value
- Test with test weight with test result
- Material test with factor of correction (**1000** = no correction)
- Area weight test with factor of correction (**1000** = no correction)
- Leaving the parameterizing mode with check sum „**RA**“ and „**FP**“

b) Always stored are:

- Cold start with indication, which type of scale has been charged.

  V = 1 (Belt scale)

  V = 3 (Weigh feeder)

- Data loss with indication, how many re-charges have been carried out.

The log book registrations can be selected with keys „F1“ (+) and „F2“ (-) . At hold pressed key the speed scanning is increasing.

3.6.2 Adjustment of the clock

Under „**Pre-set/LOG**“ after calling „**Set clock**“ the real-time clock can be adjusted.
The change of adjustments is done with keys „F1“ (+) and „F2“ (-). At hold pressed key the speed of adjustment is increasing..
The changeable position is marked by a cursor, which can be moved with key „F3“.

3.7 Report status

For purpose of test the analog input channels AD1 and AD2, the load of the scale and the speed of the weighing belt can be replaced by a simulated value.
At the flow meter always a simulated speed is used.
The sources for the simulation can be adjusted in the parameterizing mode.
In picture „**Report status**“ activated simulations are indicated with the adjusted percentages.
In the graphic screen the symbol „**S**“ in the symbol ledge indicates an activated simulation.

3.8 Control

```
 CHECK
→ AD/SYS
  DA
  Relay
  OPTO/BCD
  COMMUNICATION

  ANALYSIS

 == exit <F4>==
```

Under „**CONTROL**“ actual measured values, signal statuses, output values and internal information can be read.

Selection picture „**CONTROL**“.

3.8.1 Analog measured values and system data

```
 AD/SYS
WK= 34846  49.4%
S= 100.0 % 30000
AD1=   22   0.0%
AD2=   22   0.0%
Temp= 43 C
NC= 0
KT=80 [20000]
    256 1763
RA=1482 FP=1482
```

WC=	Measured value weighing channel and percentage of the net load (calculated considering „**WC-OFFSET**“) Minimal value: 12000 approx. 0,55 mV Maximal value: 60000 approx. 23,5 mV
S=	Correction of the working span („**SPAN 100%**“) against „**SICHAD**“ and actual working span. „**SPAN 100%**“ is change against „**SICHAD**“ after an area weight correction.
AD1=	Measured value analog channel 1 and percentage of signal
AD2=	Measured value analog channel 2 and percentage of signal
Temp=	Temperature inside the device in °C
NC=	Number of the automatic parameter re-charges carried out. Is deleted at cold start.
KT=	Test of keys. Hexadecimal number of the pressed key(s). F1 = **8** F2 = **4** F3 = **2** F4 = **10** F5 = **20** F6 = **40** PA = **80** ENTER = **1**

At simultaneous pressing of several keys the hexadecimal sum is indicated.

Examples: F6 + ENTER = **41**
F1 + F2 = **c**

In the row of „**KT**“ in square brackets the value deposited in the tare memory is indicated.
In the row of „**KT**“ in square brackets the value deposited in the tare memory is indicated
Both at absolute value tare and at mean value tare max. 2000 tare values are deposited per belt revolution and are indicated here at running belt
At mean value tare the mean value of the deposited tare values is used. This tare mean value can be read under „**ANALYSIS**“ in picture „**TARE**“.

Beneath two numbers are indicated.
The left number shows the WK-measured value less tare. At net load calculation also the net calculation is already considered.

The right number indicates the number of the actual tare cell. At achieving the tare cell with the highest number the tare cell number is recorded.
SYNC stops the counter, at belt slip monitoring therefore the counting mostly is terminated before achieving the highest tare cell!

RA = Check sum RAM-memory

FP = Check sum EEPROM-memory

The RA-check sum is made and stored at leaving the parameterizing mode, the FP-check sum after „**Data securing**“.
Both check sums are unequal, if after a change of parameters no data securing has been carried out
(Error message „**programmFLASH.**“).

3.8.2 The analog outputs

```
DA
**0800**
DA1= 40.0%
DA2= 38.6 %
DA3= 70.0 %
DA4= 76.2 %

tFIFO    0   123

 == exit <F4>==
```

Actual output values of the analog output channels 1 - 4.
The retardation-run and the output value is indicated by the shifting register „**t-FIFO**“ (100% = 10.000)

The number in row 2 is an internal information.

In the standard adjustment (DBW) is put out:

DWC-3			**DWC-5**		
DA1	=	g1 load	**DA1**	=	Drive WB
DA2	=	Drive WB	**DA2**	=	Feeder SV
DA3	=	Feeder SV	**DA3**	=	P3-Capacity
DA4	=	P3-Capacity			

The adjustments of the DA-channels 1-3(4) can be chosen different at parameterizing.

The DA-channel 1 (DWC-3) has a lower resolution (8-Bit) than the other DA-channels (DA2 - 4 = 10-Bit).

3.8.3 Die Contact outputs

```
Relais

TICK= 0
  K1= 1
  K2= 0
  K3= 0
  K4= 1 00004947
  K5= 0 00000913
  K6= 0 59d90087
 == exit <F4>==
```

Actual switch position of the contact outputs 1-6 and of the counting pulse output („**TICK**“).

Standard adjustment (DBW) of the contact outputs:

DWC-3			DWC-5		
K1	=	Ready to operate	**K1**	=	Ready to operate
K2	=	Error	**K2**	=	Error
K3	=	Min load	**K3**	=	Min load
K4	=	Fieldrelay 1	**K4**	=	Fieldrelay 1
K5	=	Feeder on	**H5**	=	Error
K6	=	Lay on test weight	**H6**	=	Ready to operate

The hexadecimal number in the row of „**K5**“ informs about the activated outputs (outputs not occupied by relays are also indicated).

Example:
913 = 800 + 100 + 10 + 2 + 1

1	=	Error	**10000**	=	Coarse stream
2	=	Ready to operate	**20000**	=	Fine stream
4	=	Charge Silo	**40000**	=	Belt stopped
8	=	Feeder ON	**80000**	=	Feeder-direction
10	=	Min load (point „g3“)	**100000**	=	Feeder OPEN (3-point-step)
20	=	Max load (point „g3“)	**200000**	=	Feeder CLOSED (3-point-step)
40	=	Lay on test weight	**400000**	=	Belt empty MS
80	=	Test/Tare runs	**800000**	=	Filling WB
100	=	Belt empty (point „g3“)	**1000000**	=	FailureMovem.
200	=	Belt slip	**2000000**	=	W-Bin empty
400	=	Scale ON at Charge	**4000000**	=	ChkWeighDevi
800	=	Min load MS (point „g1“)	**8000000**	=	AUTO active
1000	=	Max load MS (point „**g1**“)	**10000000**	=	Fieldrelay 3
2000	=	Fieldrelay 1	**20000000**	=	Fieldrelay 4
4000	=	Fieldrelay 2	**40000000**	=	Fieldrelay 5
8000	=	Deviation	**80000000**	=	FeederReduc

In the row of „**K6**“ an internal information is put out.

3.8.4 Binary- and BCD-inputs

```
 OPTO/BCD
STRINT= 1
SYNC  = 0    0
U1= 0 BCD1= 1010
U2= 1 BCD2= 2020
U3= 0 S1=  10000
U4= 0 S2=  10000
U5= 1   00000210

== exit <F4>==
```

STRINT = Impulse input Digital tacho
SYNC = Control impulse input
U1-U4 = Actual signal status at the binary inputs. Possibly adjusted invertings are **not** considered.

Consider the indication values „**BCD1/2**“, if factor 10 or 0,1 is parameterized.

„**S1(2)**“ inform about the composition of the multiplicating set values. Both values 10.000 each are set value 100%.
At variable working width adjustment, however, the set value is reduced in the ratio „**Belt width**“ to „**Working width**“.

S1 = First value of the set value forming
(e.g. A/D1)

S2 = Second value of the set value forming
(e.g. BCD1)

U5 shows if Software input U5 is activated – to the right the adjustment (0-3) decided by the OPTOS „**Selection 1(2)**“ .

Standard adjustment of the binary inputs (DBW):
U1= Motor fault
U2= Belt runs
U3= Set value switching-over INTERNAL/EXTERNAL
U4= Delete errors
U5= free

„**U5**“ is an internal marker but no binary input.

The hexadecimal number in the row of „**U5**“ indicates the activated binary functions.

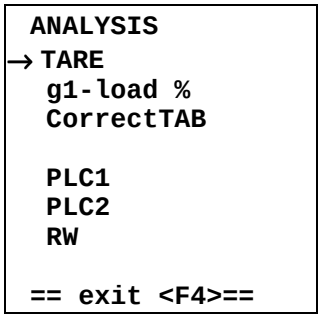
1	=	Start Tare
2	=	EXTERNAL (Cap.setValue)
4	=	JOG Feed
8	=	Mis-run (weighing belt)
10	=	Belt runs
20	=	Not occupied (free)
40	=	Delete error
80	=	Fault motor
100	=	Fuse
200	=	Enable regu
400	=	Start batch
800	=	Break batch
1000	=	Emptying
2000	=	Mot.Poti +
4000	=	Mot.Poti -
8000	=	Printer output and zero setting of counter „**B**“
10000	=	Charge set value EXTERN
20000	=	Selection 1 (Charge „with emptying“ resp. „Multi range design“)
40000	=	Selection 2 (Charge „with emptying“ resp. „Multi range design“)
80000	=	Charge with fine stream
100000	=	Load measuring with moisture correction
200000	=	+/- FIFO
400000	=	measSuspend
800000	=	RM Filling
1000000	=	Field In 1
2000000	=	Field In 2
4000000	=	Test Start
8000000	=	FeederReduc
10000000	=	Span recalc
20000000	=	Field In 3
40000000	=	Field In 4
80000000	=	Field In 5

3.8.5 Communication

Selection of the pictures for supervision of the data transfers..

There is a separate manual for the (serial) data transfer.

3.8.6 Analysis



Selection picture for inspection of the graphic representations, of the calculations in the freely programmable calculating unit and the results of the calculating unit.

3.8.6.1 TARE

After calling „**TARE**“ a graphic representation of the measured values at taration appears.

Disconnected line = **WC OFFSET**

Curve = measured tare values

Connected line = mean tare values

At „**WC-OFFSET**“ = tare value and minor tare fluctuation only one line is visible.
The vertical line, moving from left to right, shows the belt movement. The circle at the line shows the actual measured value.

The screen represented by points has a vertical partition of 5 % of the load of the measuring length. Horizontal the profile of the belt revolution is distributed over the screen width.
At mean value tare the line - due to missing synchronizing - is not identical with the measuring length.

The number upper right in the picture is the tare mean value.

At the bottom left in the picture the number of the used tare cells is indicated.

.

3.8.7 Load indication (Actual load)

The measured values in the discharge shifting register are represented. The resolution at the screen is 10% (vertical).
The three vertical lines signify the points „**g1**“, „**g2**“ and „**g3**“ from left to right.

3.8.7.1 Linearization of measured values (CorrectTAB)

If the detection of the weight measured value is not linear (e.g. at a flow meter) a linearization can be carried out.
The horizontal line indicates the working point.
The vertical line indicates how much the measured value is deviating from the ideal course.
Upper left the value (%) measured at the weighing channel is indicated.
The percentage beneath is the value corrected by the linearization which is used in reality.
Upper right the actual percentile correction is indicated..

3.8.7.2 The calculating unit (PLC1(2))

The function of the calculating unit can be observed.
A change of the formula(s) is possible only in the parameterizing mode.

3.8.7.3 Result indication of the calculating unit (RW)

The results of the calculations („**RW0**“ up to „**RW5**“) are indicated. Additionally the Long-values „**RL0**“ and „**RL1**“.

3.9 Actual parameterized

After calling this menu point the complete parameter adjustment can be scanned step by step with key „ENTER“ or key „F1“.

The picture before can be achieved with key „F2“.

At kept pressed key the speed of scanning is increasing.

With key „F6“ the dosing data can be achieved from any position.

Key „F4“ effects the immediate exit from parameter scanning into the menu „**MODE**“.

Via interface „**COM 1**“ the adjustment of parameters is put out, if key „F3“ is pressed. Also a parallel output at the display is given.

Find indications for software version in picture 1.

4 First time operation

The erection resp. the installation of the weighing device has to be carried out according to the instructions in the mechanic-section of the manual.

The electric connections (cable connections) are to be carried out as per enclosed connection and wiring diagrams. They have to correspond to the valid prescriptions (DIN, ÖVE etc.) as well as to the conditions of the local electric supply company.

The weighing device has to be connected to earth with large cross section (at least 32mm²).

5 INDICATIONS FOR MAINTENANCE

The belt scale/weigh feeder is a sensitive measuring device. As sometimes disturbing material sediments are occurring, an adequate maintenance is necessary.
The intervals of maintenance are depending on the conditions of the environment. After the first time operation the scale should be checked every day. Based on the condition stated thereby later on the intervals of maintenance can be changed correspondingly.
.

5.1 Status control belt scale / weigh feeder

Maintenance works of scales largely are limited to control of pollution and to the checking of the tare.

Attention!
After replacing parts of the scale or after exchanging the digital electronics , the correct function of the scale must be restored by taration and test load.

5.2 Taring

In order to supply exact results the tare of the scale must be adjusted properly.

Attention!
Before starting the taration of the scale, make sure, that there are no disturbing influences.

Taring always with running belt. Flow meters are tared at switched off conveying way.

After pressing key >0< (F6) the taring process runs down automatically.

5.2.1 Mean value tare

The taration runs down in the following steps:

- **`EMPTY THE SCALE`** (only if the scale does not recognize „empty“ at tare start).
- **`Settling time`** (5 seconds)
- Storing of the tare measured values (one belt revolution).

5.2.2 Absolute value tare

The taration runs down in the following steps:

- **`EMPTY THE SCALE`** (only if the scale does not recognize „empty“ at tare start).
- **`Wait for SYNC`**
- **`Calibration of belt`** (one belt revolution).
- Storing of the tare measured values (one belt revolution).

5.3 Test

If key „TEST“ is pressed at normal operation, a selection appears:

<F1> MAT-Test (Start material test)
<F2> AW-Correct. (Start area weight correction. Do not use at belt scale/weigh feeder!)
<F3> Test load (Start Test load)

The desired function is selected with keys „F1“, „F2“ or „F3“.
With key „F4“ the selection can be left without starting a monitoring device.
If no function is selected within 10s, the test screen is left.
.

5.3.1 Material test:

Permits checking of material with 10-fold resolution in comparison with normal operation. Evaluation is done at measuring point „**g1**“.
The counters „**A**“ and „**B**“ and the counting pulse outlet are blocked during material test routine. Apart from that the weighing electronics continues working normally.
If the weighing belt is becoming empty during the material test, negative measured values are deducted from the actual count of a counter. However, no negative counting value is possible.
The adaptation to the structure of fibres carried out with the correction of area weight is deleted!

Proceeding at material test:

Provide a material specimen with at least 10-fold quantity of the counter step at normal operation (=100-counter steps at material test).

Carry out material test.

1. Press key „TEST“.
   The selection picture „**TEST**“ appears.
2. Start material test with key „F1“.
   The picture „**MAT-TEST**“ appears.
   The counters „**A**" and „**B**" and the pulse outlet are blocked.
3. Switch on material feeding. The load of the weighing belt should be in the normal range during material test („**g1**“ = approx. 50-80%).
4. As soon as the material specimen has run through, stop material transport.

Evaluation of the material test.

1. Press key „F4“. The text „**RE-WEIGHING**“ appears. The counting is released again.
   At a test quantity less than 100 counting-steps the test routine is left after 10s. Evaluation is not possible
2. Re-weigh conveyed material specimen.
3. Overwrite the proposal value (= the value measured by the scale) with the actual weight of the material specimen.
4. Press key „ENTER“ (key „F4“ leaves the material test without correction).
   The material test permits a correction corresponding to the adjustment at the parameter „**Lim.of correc.**“. If the limit of correction or the measuring range of the weighing channel were exceeded due to the correction, no correction is possible. The error message „**Lim.of correc.**“ resp. „**A/D-Error**“ arrives. The change is rejected and the original value is re-indicated.
   If the correction is possible, in row 2 the percentage of the correction is indicated.
   The correction at material test changes the parameter „**SICHAD**“ and „**SPAN 100%**“ and the reference value for the test weight („**Test weight xxxx**“).
5. With key „F4“ „**Material test**“ is left. Without „F4“ the material test is terminated self-acting after 20s.

5.3.2 Test load:

Determines a reference number with the help of the test weight (nominal = 1000) over a test length (parameter „**Belt length**").
Adaptations carried out at the correction of area weight are deleted!
The weighing belt-drive must run!
The plant must not convey any weighing material during the test load!

Proceedings at the test load:

1. Press key „TEST" and start test load with „F3".
   If the message „**EMPTY THE SCALE**" appears, the tare of the scale is not O.K. The test must be stopped (key „F4"), the scale must be checked and tared.
   After two belt revolutions at „**EMPTY THE SCALE**" the test load is stopped automatically
   If „**LAY ON TESTW.!**" is indicated, lay on test weight (sometimes the test weight consists of two weights, which are to be laid on left and right at the weighing bridge).
   If there is a motoric lay-on-device for the test weight, the test weight is laid on by pressing key „ENTER".
2. If the load due to the test weight achieves about 60% of the test weight parameter, the display changes to „**SettlingTime**". The settling time is about 10 seconds.
3. The test load runs down.
   While the test is running, the load value with test weight is displayed („**g1**").
   „**Cell no**" informs about the progress of the test run-down.
   „**End at**" indicates at which cell number the test is ending(one belt revolution, max. 2000)
4. Evaluation.
   If „**Cell no**" achieves the number of „**End at**", the evaluation is carried out.

   Indicated is:

   ```
   Test correct
   at 1000
   RESULT !xxxx!
   ```

   The result gives information about the measuring accuracy of the scale. If the deviation is higher than the permitted tolerance and within the limits of correction (standard adjustment = 10%) with key „F1" (+) a correction can be carried out.

   The messages „**Lim.of correc.**" and „**A/D-Error**" indicate, when a correction is not possible because of too big deviation.

   If at the test load a deviation over the permitted tolerance (1,0%) is measured, the test must be repeated with key „F3".

   Only if several test loads in succession supply the same result higher than the tolerance limit and if it is sure, that the deviation determined at the test is not caused by a disturbance at the scale, the possibility of correction with key „F1" may be used..

Possible reasons for a too high deviation, which have to be abolished before correction:

- Pollution of weighing pulley(s) measuring bar resp. measuring distance limiter.
- Pollution of the weighing belt or mis-run of the weighing belt
- Damage at the weighing belt
- Material sediments on the test weight (at built-in test weight)
- Not exactly laid-on test weight(s)
- Not exactly adjusted material guiding. The material guiding must not inhibit the scale.

5. Terminate test load..
   If the test weight is lifted (at motoric lay-on-device with key „ENTER"), the scale returns to normal operation. The operating picture re-appears..

5.4 Remedy against disturbances

In this picture the error messages actual at present are indicated. The fade-in „A“ at the right screen margin means „actual“, the fade-in „M“ means „stored“.
Stored errors can be deleted with key „F2“.
Deleting with key „F2“ is possible only , if the error picture is indicated. If errors are activated, the error picture automatically is faded-in at the operating pictures (graphic screen and text screen) each 20 seconds for a period of approx. 2 seconds.

In picture error „**Error**“ right at the bottom a hexadecimal number is given. This hexadecimal number indicates all actually recognized errors, regardless, whether the error is considered in the error handling or not. Stored errors, which are no longer active, are not indicated!

Meaning of the errors and remedy in case of occurrence of errors

- **Fuse (00000001)**

Reason: The falling out of a fuse has been indicated to the weighing electronics from external (OPTO „**Fuse**").

Remedy: Check the fuses.

- **Drive/Tacho (00000002)**

Reason: The weighing electronics receives the message „Drive switched on", nominal value is present, but no tacho pulses can be measured.

Remedy:
1. Check, if the motor is really running.
2. Check, if the indication changes between 0 and 1 in figure „**CONTROL**" under „**OPTO**" at „**STRINT**".
3. Check, if the tacho is working.
4. Check, if the connection of wiring between the weighing electronics and tacho is O.K.

If there is the tacho-pulse at the terminals X13:19/20 (DWC-3); X2: 20/18 (DWC-5) existing but no change between 0 and 1 to be determined in figure „**CONTROL**", the weighing electronics is defective.

- **A/D-Error (00000004)**

Reason: The measured value at the weighing channel is either smaller than 12.000 or higher than 60.000.

Remedy:
1. Check, if a damage can be determined at the load cell(s).
2. Check, if the cable connections between weighing electronics and load cell(s) is O.K.
3. Check supply voltage for power measuring and measuring signal:
   Connection 2/3: 10VDC
   Connection 1/4: Measured signal, max. 20mV, 0mV at discharged load cell(s) (see test-protocol).

- **Overheat (00000008):**

Reason: The temperature inside the weighing electronics is too high (permitted ambient temperature is 68°C).

Remedy: Provide for lower ambient temperature (max. approx. 40°C).

- **Speed (00000010):**

Reason: The drive system is not adjusted optimally. Thus, the precision regulator cannot keep the nominal dosing capacity.

Remedy: Correct adjustment of the motor-controller.
If there is a rotational number feedback 0-10VDC to the motor controller via frequency-converter on the I/O-card1, check resp. correct the adjustment of the frequency-converter. (Trimmer „f0" = 0V, trimmer „f" = 10V)
At AC-motors with frequency converters the rotational number must be linear to the master value.

- **Feeder limit. (00000020):**

Reason: At feeder control the measuring distance load cannot meet the adjusted load set value (at belt scale with feeder control the adjusted nominal capacity) with the adjusted limit values „**Min-Limit**“ and „**Max-Limit**“ .
Remedy: Improve feeder-adaptation.

- **Mis-Run (00000040):**

Reason: The belt monitoring signals an uncentric running of the weighing belt.
Remedy: Check the belt steering device, adjust belt to centric running.

- **Min Load (00000080):**

Reason:: At a weigh feeder the belt load required for keeping the dosing capacity (according to the set value) only hardly can be achieved.
Remedy: Provide for a higher material discharge. If the lower material feeding is due to changed material characteristics, a re-adjustment of the material feeding may be necessary.

- **Max Load (00000100):**

Reason: The weighing belt is overloaded.
Remedy: Provide for a lower material discharge. If the heavier material feeding is due to changed material characteristics, a re-adjustment of the material feeding may be necessary.
At a belt scale the weighing range (rated capacity) is set too low.

- **Belt slip (00000200):**

Reason:
1. At existence of a control pulse generator the control pulses do not come or come too late.
2. At the design with „Absolute value tare“ the synchronizing pulse does not come or comes too late.

Remedy: A torn weighing belt might also be the reason for „**Belt slip**“. If the belt does not really slip, at design „Absolute value tare“ also the synchronizing mark might be fallen off.

- **Test wrong (00000400):**

Reason: At the test with test weight the desired number 1000 was not achieved by more than the permitted tolerance (+/- 1,0%) .
Remedy: Check the scale, make taration, repeat the test.

- **Taration err. (00000800):**

Reason:
1. During taration an unadmissible measured value was supplied by the weighing bridge (A/D-error resp. deviation of „**WK-OFFSET**“ higher than „**Taration err.**“).
2. The taration was cut short before the regular end.

Remedy: Check/clean the scale, repeat taration.

- **Belt stopped (00001000):**

Reason: No tacho pulses arrive (drive switched off).
Remedy: If the message comes at running belt, check tacho for proper function.
Also see „**Drive/Tacho**".

- **Bad Set Value (00002000):**

Reason: The dosing capacity set value is not within the permitted range.
Admissible range:
Smaller than „**SetValueNull**" and „**MinSet Value**" up to 102% of „**Rated capacity**".
Remedy: Provide for correct set value. At set value higher than 102% limiting to 102% is done.

- **Belt empty (00004000):**

Reason: The belt load is smaller than the limit value „**Belt empty**".

- **Deviation (00008000):**

.Reason: Due to a minor belt load or due to an error in the drive system the nominal dosing capacity cannot be kept. The deviation is higher than the adjusted tolerance (tolerance related to the set value of the scale).
Remedy: 1. Weigh feeder.
Provide for sufficient weighing material on the weighing belt. Check the drive system at sufficiently loaded scale (minimal load is the percentage indicated quite right in the row of „**g3**" in the text screen)..
2. Belt scale with feeder control.
Improve feeder adaptation.

- **ProgrammFLASH (00010000):**

Reason: The parameterizing level was left after a changing of parameters without data securing.
Remedy: Switch into the parameterizing mode (switch at the back wall of the device) and leave parameterizing mode **with** data securing.

- **ParameterInp. (00040000):**

Reason: The monitoring device of RAM and EEPROM has responded.
Remedy: Carry out priming charge and re-adjust parameters.

- **Data lost (00020000):**

Reason: The parameters were re-charged from the EEPROM .

- **fillingFailur (00080000):**

Reason: After adjusted filling time the refilling of the weighing bin is not yet finished.

- **FailureMovem. (000100000):**

Reason: During the emptying process (status 4) a weight increase or a too rapid weight loss – more than the adjusted limit value – is measured.

5.5 The battery-RAM

Write/read memory with integrated battery (SRAM) and real-time-clock (working up to 2090).
The durability of the battery in the SRAM is at least 10 years. After that time the SRAM should be replaced.
A battery, which is working no longer, can be recognized, if the error message „**Data lost**" appears after an interruption of power supply and the counters were re-set to zero.
The replacement of the SRAM is carried out by our field service or in the factory.