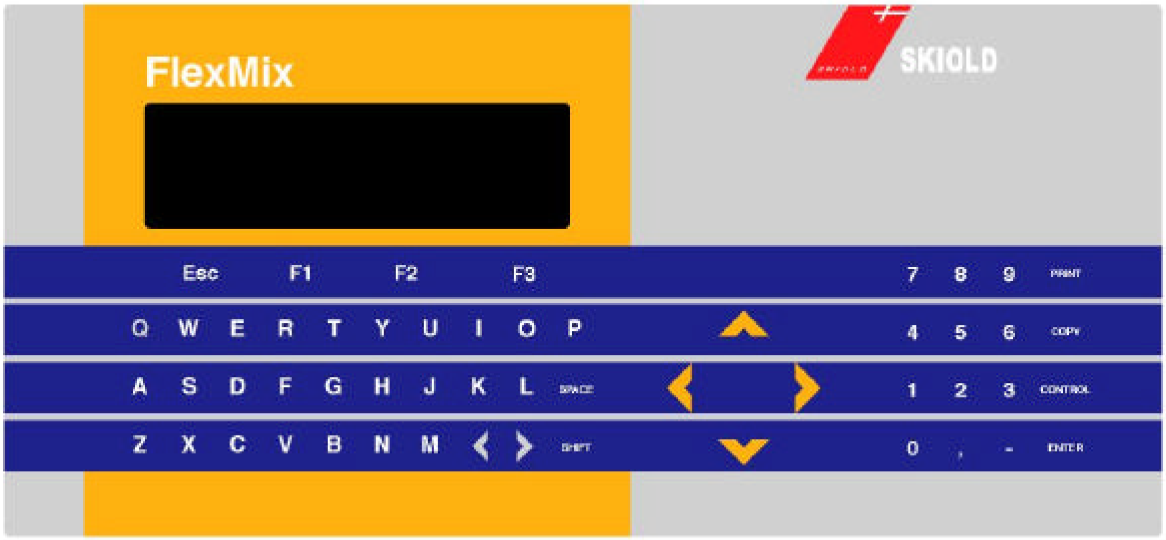
24-03-03
CE/asn
70115GB

INSTRUCTION MANUAL

SKIOLD FlexMix

For Program Version 2.24


FlexMix
SKIOLD
Esc F1 F2 F3
7 8 9 PRINT
Q W E R T Y U I O P
4 5 6 COPY
A S D F G H J K L SPACE
1 2 3 CONTROL
Z X C V B N M SHIFT
0 , - ENTER

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3 PREFACE

FlexMix is an efficient and flexible computer controller comprising all facilities to be expected by a modern control system for production of feed.

It has been crucial to make the operation simple, clear and easy to understand.

Still, we kindly ask you to study this instruction carefully in order to be sure that you get full utilization of all controller functions.

4 APPLICATION

FlexMix is used for automatic control of weight-based feed production plants.

5 WARNING

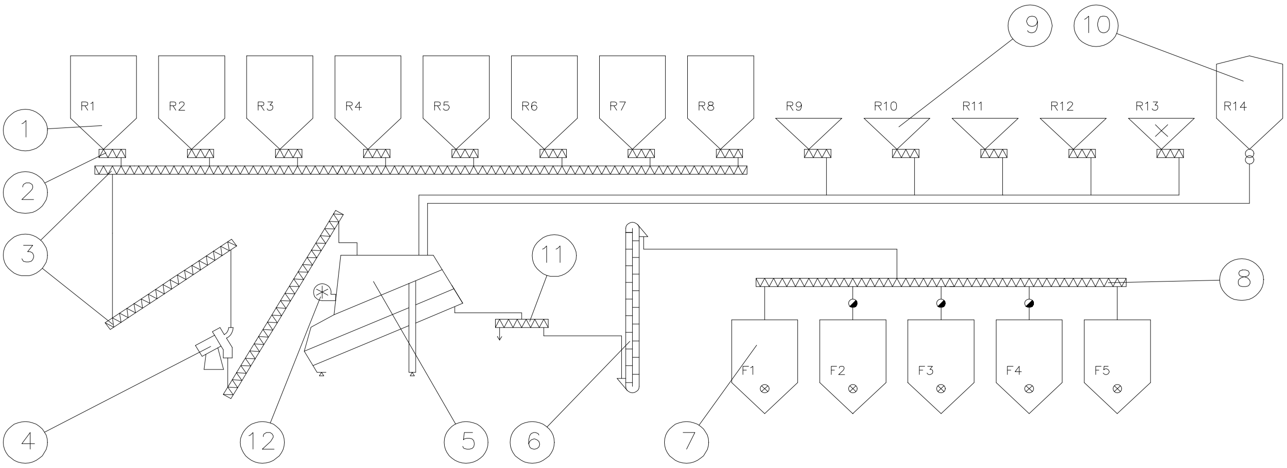
This controller is supplied from the power network and must be connection by an authorized electrician according to the power regulations DS/EN 60204-1.

Do not open the electric panel and do not service any machine connected until the current has been disconnected at the main switch.

6 MODE OF OPERATION

A computer controlled weight-based milling/mixing plant can be constructed in many ways.
The following describes a typical solution.

Fig. 1, Plant example

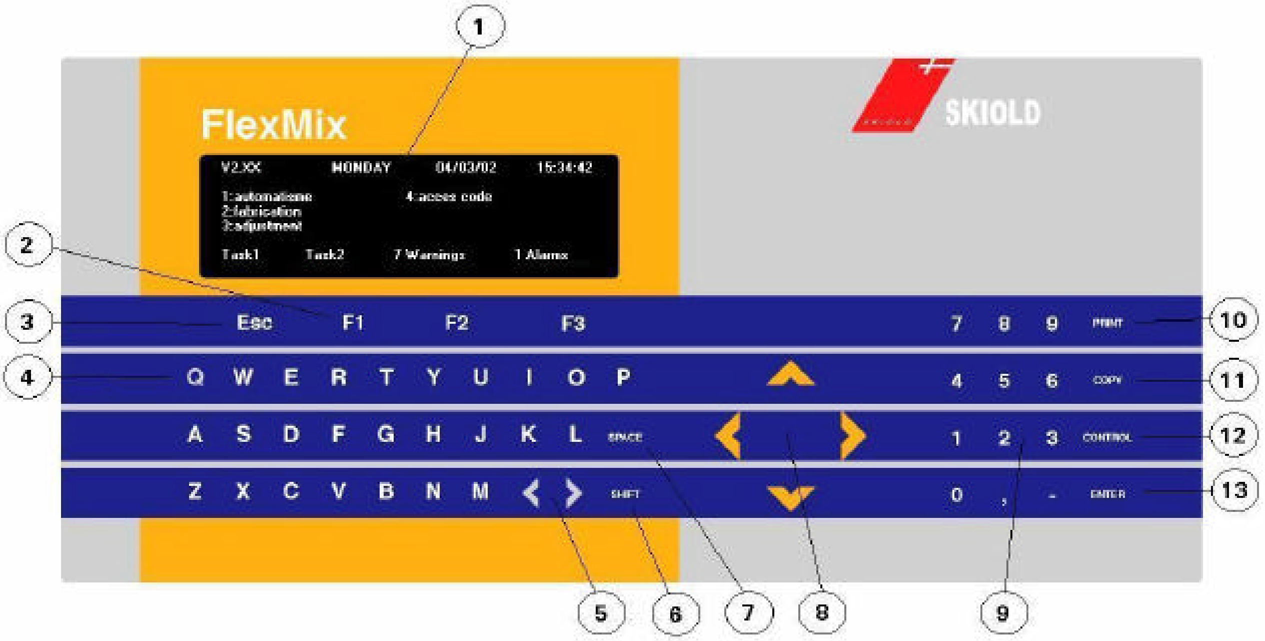


Beforehand raw material and recipe data are encoded in the computer, defining the composition of the mixtures, and where they shall be used.
The plant starts after a signal from an empty indicator in the ready feed silo, fig. 1, pos. 7 or after a built timer.
The raw materials are taken out of the raw material silos R1-R8, fig. 1, pos. 1 by proportioning augers with variable speed, fig. 1, pos. 2.
The speed of the proportioning augers is controlled by values encoded in the current recipe in Flex-Mix.
Collecting auger and transport auger, fig. 1, pos. 3 take the material to the mill, fig. 1, pos. 4.
The mill, in this case a disc mill, has variable milling degree, and the current adjustment is also controlled by values encoded n the recipe.
From the mill the material is taken into the mixer, fig. 1, pos. 5, placed on load cells.
All raw materials in the current recipe are taken into the mixer and are weighed one by one.
The minerals, R9-R13, fig. 1, pos. 9 are transported directly into the mixer by flex auger or fixed auger.
Fat, R14, fig. 1, pos. 10 is pumped in via pipeline
FlexMix takes care of compensating for possible inaccuracies because of excess flow of the components with a long transport distance to the mixer.

Once all components are weighed, the mixing time starts, and then the ready mixture is emptied into the defined ready feed silos f1-f5, fig. 1, pos. 7.

7 GENERALLY ABOUT OPERATION

Fig. 2, FlexMix front


FlexMix
SKIOLD
V2.XX
MONDAY
04/03/02
15:34:42
1:automatisme
2:fabrication
3:adjustment
4:acces code
Task1
Task2
7 Warnings
1 Alarms
Esc
F1
F2
F3
Q W E R T Y U I O P
A S D F G H J K L
SPACE
Z X C V B N M
SHIFT
7 8 9
PRINT
4 5 6
COPY
1 2 3
CONTROL
0 , -
ENTER
1
2
3
4
5
6
7
8
9
10
11
12
13

Programming and exchange of data and information are done via the display, fig. 2, pos. 1 of the computer front and the keyboard.
The alphanumeric keyboard, fig. 2, pos. 4 and 9 is used for encoding texts and data.
The cursor-control keys, fig. 2, pos. 8 move the cursor around between menu functions or encoding sections.
The cursor-control keys at the same time give a receipt for encoded data in the section that is left.
When encoding a text the cursor can be moved within the text section with the small cursor-control keys, fig. 2, pos. 5.
In order to write capital letters, press “SHIFT”, fig. 2, pos. 6 down at the same time.
”SPACE”, fig.2, pos.7, inserts space in a text.
”ENTER”, fig.2, pos.13, choose functions in menus or confirms encoding in a section without shifting to the next section.
”ESC”, fig.2, pos.3, leaves a function and returns to the previous function until the main menu is reached.
”f1-f3”, fig.2, pos. 2, executes the functions that at present are mentioned at the bottom of the display just above them.
”PRINT”, fig.2, pos.10, starts a print regarding the current display subject.
”COPY”, fig.2, pos.11, copies the last encoding to a new section
”CONTROL”, fig.2, pos.12, shifts to the operation picture where the current activities in the plant can be followed.

Computer functions are normally chosen from a main menu with sub-menus.
A menu function can be chosen by keying its number on the numeric keyboard, fig.2, pos.9, or, with the cursor-control keys, by pointing it out with the menu beam and key “ENTER”.

However, there is direct access to ongoing process related functions directly from the process control window.

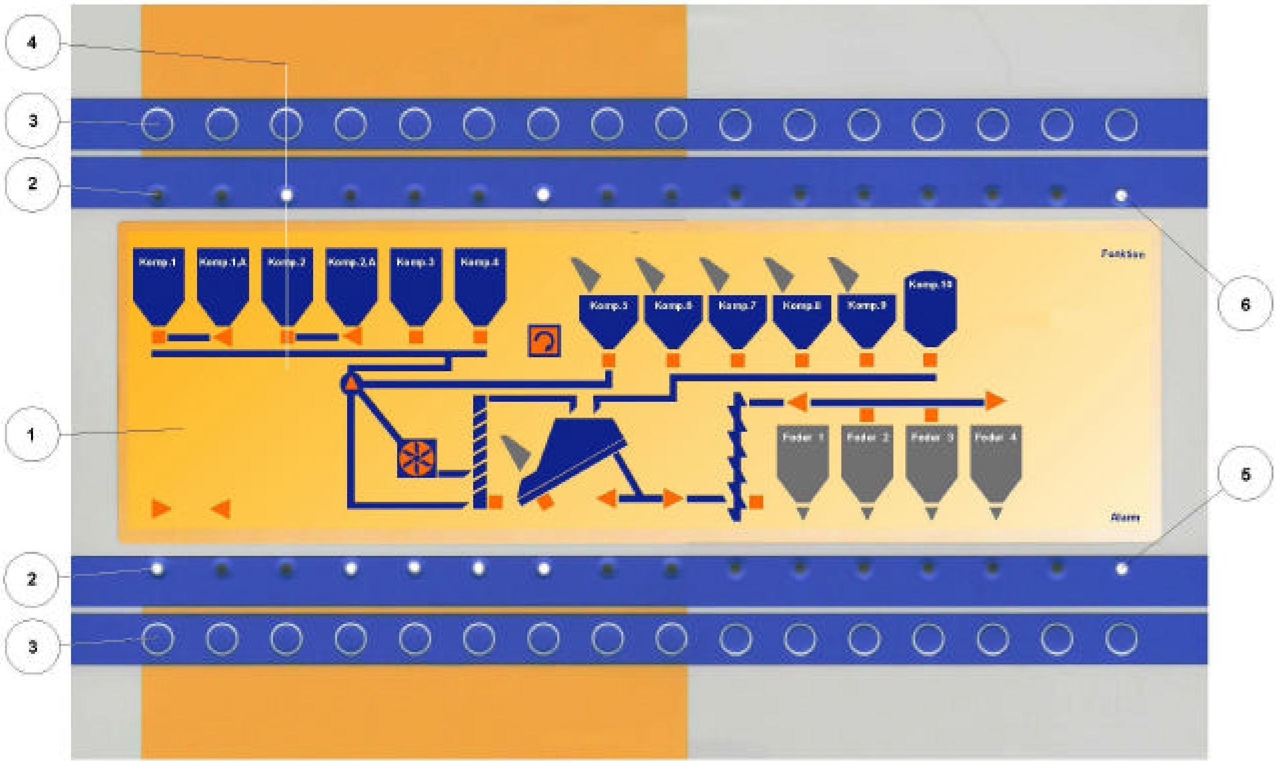
Place the menu beam on the required and press “F1:Detail”.
Press “ESC” in order to return to process control.

Note! There can only be altered in data and functions, if their code is encoded.

8 SYSTEM PANEL

The computer panel front can, depending on the plant size and complexity, be equipped with one or more so-called system panels.

Fig. 3, System panel


4
3
2
1
2
3
6
5
Komp.1
Komp.1,A
Komp.2
Komp.2,A
Komp.3
Komp.4
Komp.5
Komp.6
Komp.7
Komp.8
Komp.9
Komp.10
Foder 1
Foder 2
Foder 3
Foder 4
Funktion
Alarm

The system panel comprises a flow diagram, fig. 3, pos. 1, designed individually for each plant, which gives the user a view of what is going on in the system, right now. Each system panel is equipped with 2 rows of 16 control lamps, fig. 3, pos. 2 and belonging keys, fig. 3, pos. 3 for manual operation.

The flow diagram is designed in such a way that each lamp and key is placed directly over or under the machine/function is relates to, fig. 3, pos. 4 (deviations may occur, but in that case a distinct reference will be indicated).
When a machine is activated in automatic or manual state, the belonging lamp will shine.

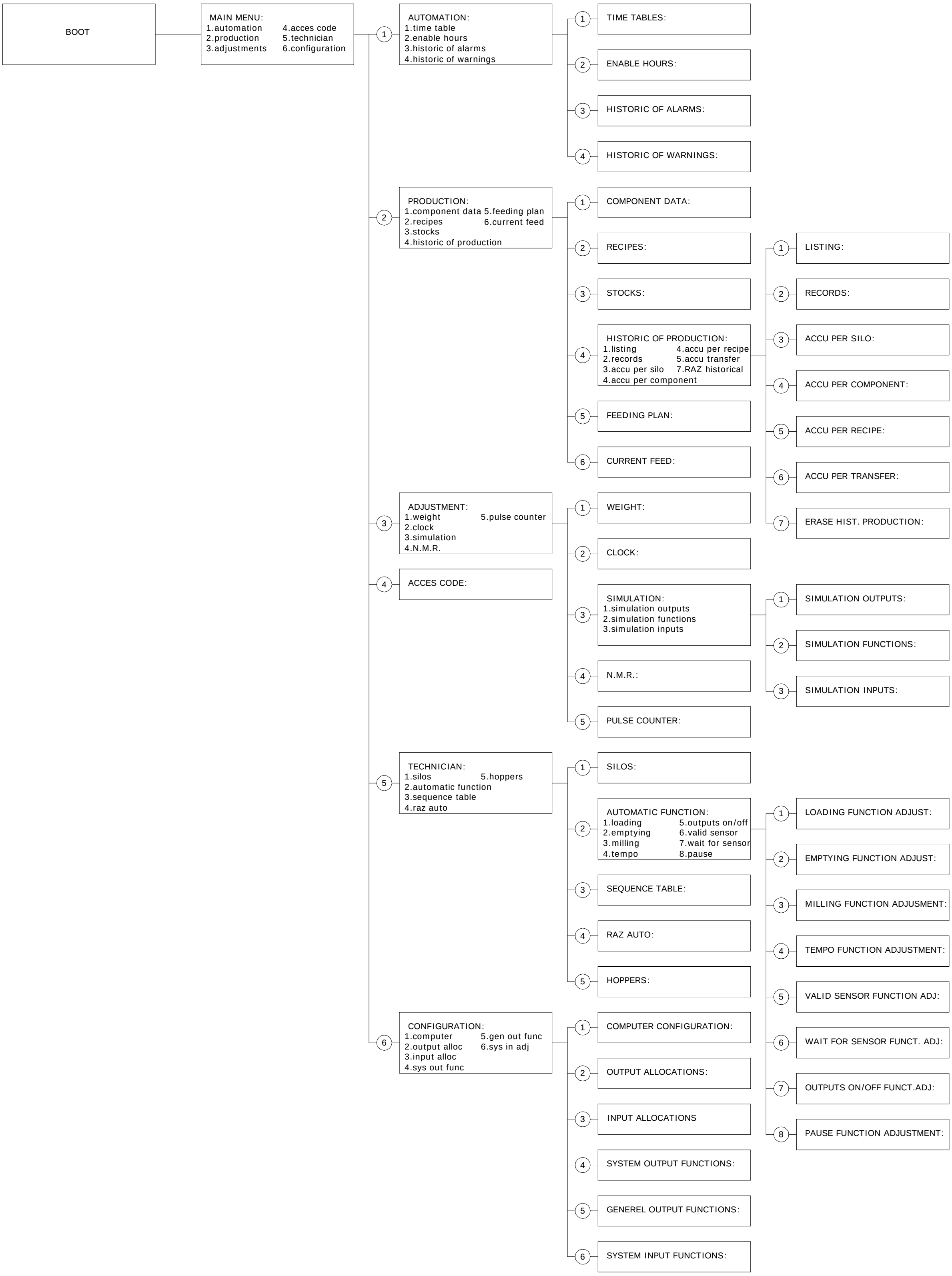
Two of the lamps on the systems panel will normally be reserved for reading of alarm signals and function state, fig. 3, pos. 5 and 6.
The alarm lamp shines at stop because of error in the process.

The function lamp has three readings:

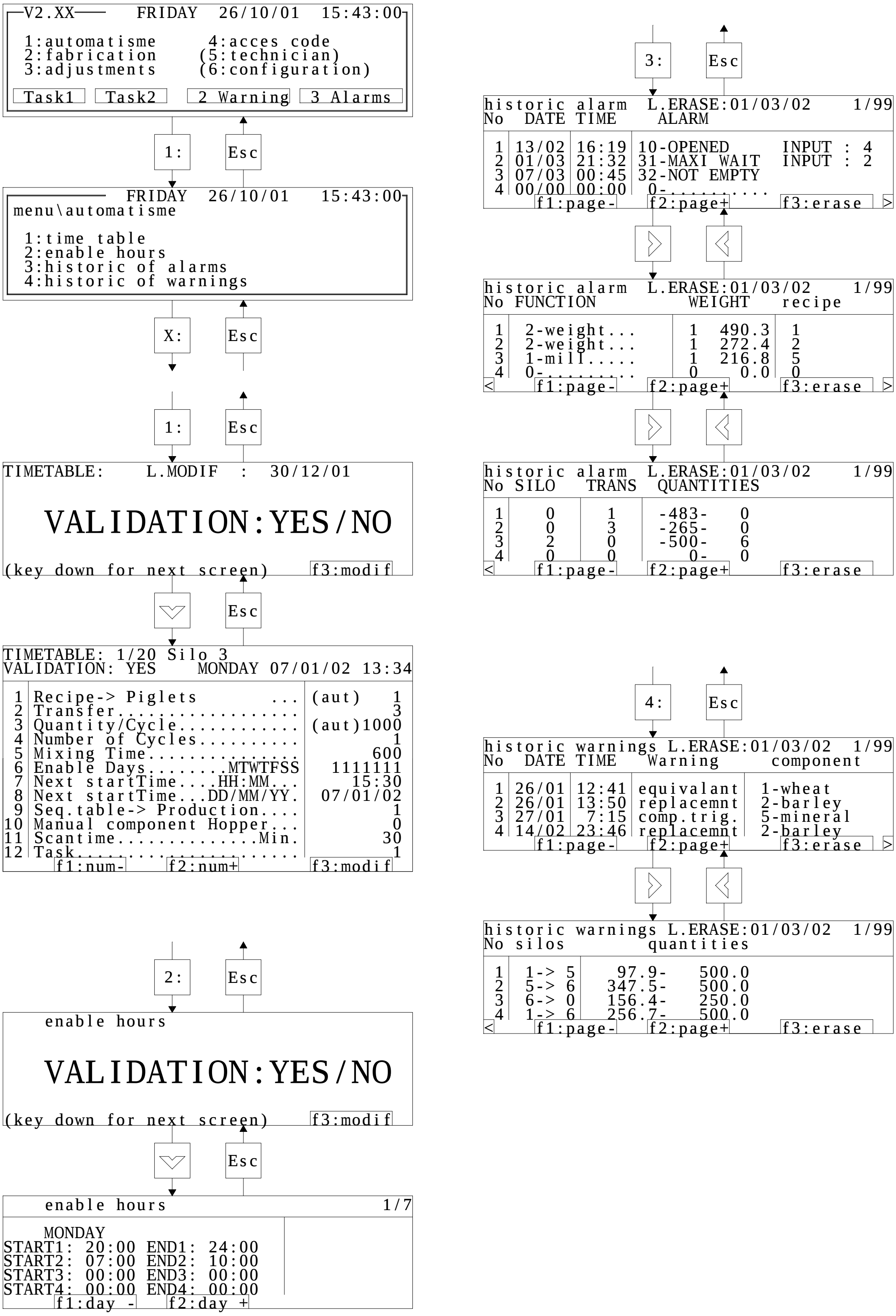
- It is switched off when the system is not operating (e.g. time tables cancelled or, if the MAN/AUTO switch is in position ”MAN”, and at alarm).
- The lamp shines if the system is ready for production, but no activity at present
- shines constantly when a process is going on.

9 OPERATION SURVEY

9.1 General


BOOT
MAIN MENU:
1.automation
2.production
3.adjustments
4.acces code
5.technician
6.configuration
1
AUTOMATION:
1.time table
2.enable hours
3.historic of alarms
4.historic of warnings
1 TIME TABLES:
2 ENABLE HOURS:
3 HISTORIC OF ALARMS:
4 HISTORIC OF WARNINGS:
2
PRODUCTION:
1.component data
2.recipes
3.stocks
4.historic of production
5.feeding plan
6.current feed
1 COMPONENT DATA:
2 RECIPES:
3 STOCKS:
4
HISTORIC OF PRODUCTION:
1.listing
2.records
3.accu per silo
4.accu per component
4.accu per recipe
5.accu transfer
7.RAZ historical
5 FEEDING PLAN:
6 CURRENT FEED:
1 LISTING:
2 RECORDS:
3 ACCU PER SILO:
4 ACCU PER COMPONENT:
5 ACCU PER RECIPE:
6 ACCU PER TRANSFER:
7 ERASE HIST. PRODUCTION:
3
ADJUSTMENT:
1.weight
2.clock
3.simulation
4.N.M.R.
5.pulse counter
1 WEIGHT:
2 CLOCK:
3
SIMULATION:
1.simulation outputs
2.simulation functions
3.simulation inputs
4 N.M.R.:
5 PULSE COUNTER:
1 SIMULATION OUTPUTS:
2 SIMULATION FUNCTIONS:
3 SIMULATION INPUTS:
4 ACCES CODE:
5
TECHNICIAN:
1.silos
2.automatic function
3.sequence table
4.raz auto
5.hoppers
1 SILOS:
2
AUTOMATIC FUNCTION:
1.loading
2.emptying
3.milling
4.tempo
5.outputs on/off
6.valid sensor
7.wait for sensor
8.pause
3 SEQUENCE TABLE:
4 RAZ AUTO:
5 HOPPERS:
1 LOADING FUNCTION ADJUST:
2 EMPTYING FUNCTION ADJUST:
3 MILLING FUNCTION ADJUSMENT:
4 TEMPO FUNCTION ADJUSTMENT:
5 VALID SENSOR FUNCTION ADJ:
6 WAIT FOR SENSOR FUNCT. ADJ:
7 OUTPUTS ON/OFF FUNCT.ADJ:
8 PAUSE FUNCTION ADJUSTMENT:
6
CONFIGURATION:
1.computer
2.output alloc
3.input alloc
4.sys out func
5.gen out func
6.sys in adj
1 COMPUTER CONFIGURATION:
2 OUTPUT ALLOCATIONS:
3 INPUT ALLOCATIONS
4 SYSTEM OUTPUT FUNCTIONS:
5 GENEREL OUTPUT FUNCTIONS:
6 SYSTEM INPUT FUNCTIONS:

9.2 Automatic



```
V2.XX      FRIDAY  26/10/01   15:43:00

 1:automatisme       4:acces code
 2:fabrication      (5:technician)
 3:adjustments      (6:configuration)
 Task1     Task2     2 Warning   3 Alarms
```

```
            FRIDAY  26/10/01   15:43:00
menu\automatisme

 1:time table
 2:enable hours
 3:historic of alarms
 4:historic of warnings
```

```
TIMETABLE:     L.MODIF   :   30/12/01

    VALIDATION:YES/NO

(key down for next screen)    f3:modif
```

```
TIMETABLE: 1/20 Silo 3
VALIDATION: YES     MONDAY 07/01/02 13:34

 1 Recipe-> Piglets          ...  (aut)   1
 2 Transfer......................         3
 3 Quantity/Cycle................ (aut)1000
 4 Number of Cycles..............         1
 5 Mixing Time...................       600
 6 Enable Days.........MTWTFSS     1111111
 7 Next startTime....HH:MM...        15:30
 8 Next startTime...DD/MM/YY.     07/01/02
 9 Seq.table-> Production....            1
10 Manual component Hopper...            0
11 Scantime..............Min.           30
12 Task......................            1
      f1:num-      f2:num+         f3:modif
```

```
    enable hours

    VALIDATION:YES/NO

(key down for next screen)    f3:modif
```

```
    enable hours                        1/7

    MONDAY
START1: 20:00 END1: 24:00
START2: 07:00 END2: 10:00
START3: 00:00 END3: 00:00
START4: 00:00 END4: 00:00
      f1:day -    f2:day +
```

```
historic alarm  L.ERASE:01/03/02    1/99
No  DATE TIME     ALARM

 1 13/02 16:19 10-OPENED       INPUT : 4
 2 01/03 21:32 31-MAXI WAIT    INPUT : 2
 3 07/03 00:45 32-NOT EMPTY
 4 00/00 00:00  0-..........
      f1:page-   f2:page+       f3:erase  >
```

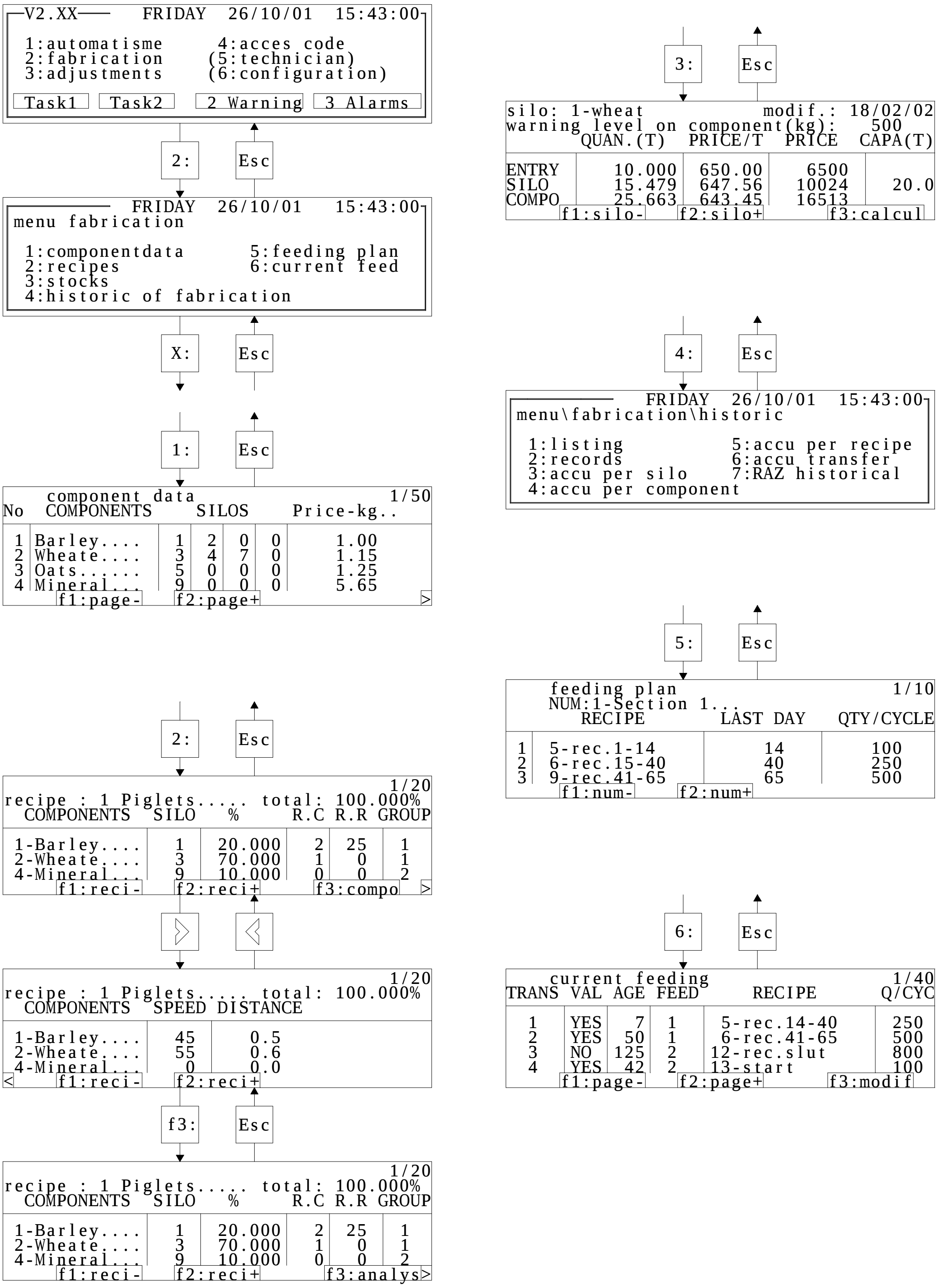
```
historic alarm  L.ERASE:01/03/02    1/99
No FUNCTION            WEIGHT   recipe

 1  2-weight...        1  490.3   1
 2  2-weight...        1  272.4   2
 3  1-mill.....        1  216.8   5
 4  0-.........        0    0.0   0
<     f1:page-   f2:page+       f3:erase  >
```

```
historic alarm  L.ERASE:01/03/02    1/99
No SILO   TRANS  QUANTITIES

 1    0       1   -483-    0
 2    0       3   -265-    0
 3    2       0   -500-    6
 4    0       0      0-    0
<     f1:page-   f2:page+       f3:erase
```

```
historic warnings L.ERASE:01/03/02  1/99
No  DATE TIME   Warning      component

 1 26/01 12:41 equivalant    1-wheat
 2 26/01 13:50 replacemnt    2-barley
 3 27/01  7:15 comp.trig.    5-mineral
 4 14/02 23:46 replacemnt    2-barley
      f1:page-   f2:page+       f3:erase  >
```

```
historic warnings L.ERASE:01/03/02  1/99
No silos            quantities

 1  1-> 5      97.9-    500.0
 2  5-> 6     347.5-    500.0
 3  6-> 0     156.4-    250.0
 4  1-> 6     256.7-    500.0
<     f1:page-   f2:page+       f3:erase
```

9.3 Production



```
V2.XX       FRIDAY  26/10/01   15:43:00
 1:automatisme      4:acces code
 2:fabrication     (5:technician)
 3:adjustments     (6:configuration)
 Task1   Task2    2 Warning   3 Alarms
```

```
               FRIDAY  26/10/01   15:43:00
menu fabrication
 1:componentdata         5:feeding plan
 2:recipes               6:current feed
 3:stocks
 4:historic of fabrication
```

```
    component data                    1/50
No  COMPONENTS      SILOS       Price-kg..
 1 Barley....   1  2  0  0        1.00
 2 Wheate....   3  4  7  0        1.15
 3 Oats......   5  0  0  0        1.25
 4 Mineral...   9  0  0  0        5.65
     f1:page-     f2:page+                >
```

```
                                       1/20
recipe : 1 Piglets..... total: 100.000%
  COMPONENTS  SILO    %       R.C  R.R  GROUP
 1-Barley....   1   20.000     2   25    1
 2-Wheate....   3   70.000     1    0    1
 4-Mineral...   9   10.000     0    0    2
     f1:reci-     f2:reci+     f3:compo    >
```

```
                                       1/20
recipe : 1 Piglets..... total: 100.000%
  COMPONENTS  SPEED  DISTANCE
 1-Barley....   45     0.5
 2-Wheate....   55     0.6
 4-Mineral...    0     0.0
<    f1:reci-     f2:reci+
```

```
                                       1/20
recipe : 1 Piglets..... total: 100.000%
  COMPONENTS  SILO    %       R.C  R.R  GROUP
 1-Barley....   1   20.000     2   25    1
 2-Wheate....   3   70.000     1    0    1
 4-Mineral...   9   10.000     0    0    2
     f1:reci-     f2:reci+      f3:analys>
```

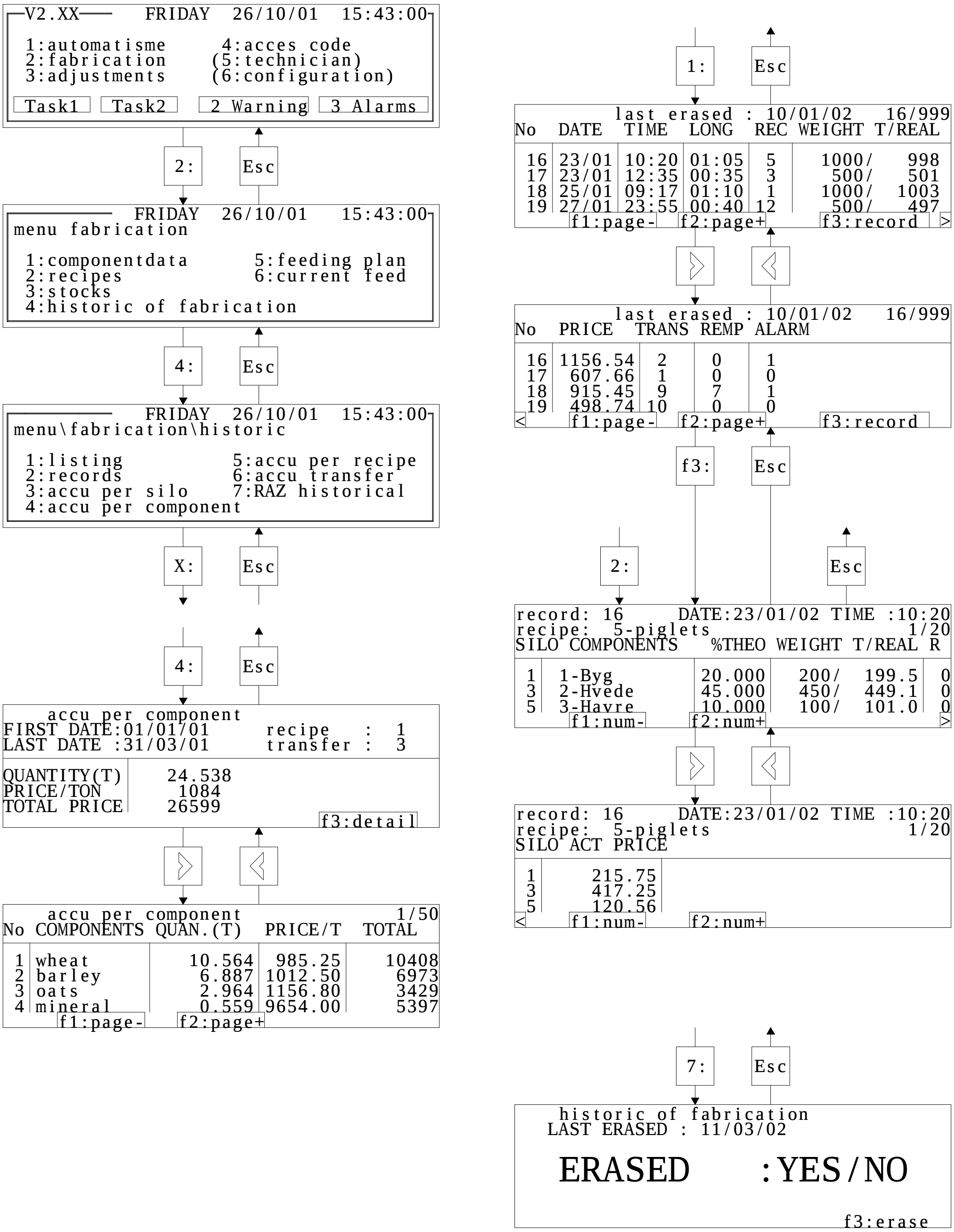
```
silo: 1-wheat              modif.: 18/02/02
warning level on component(kg):    500
        QUAN.(T)   PRICE/T   PRICE   CAPA(T)
ENTRY    10.000    650.00     6500
SILO     15.479    647.56    10024     20.0
COMPO    25.663    643.45    16513
      f1:silo-   f2:silo+          f3:calcul
```

```
               FRIDAY  26/10/01   15:43:00
menu\fabrication\historic
 1:listing               5:accu per recipe
 2:records               6:accu transfer
 3:accu per silo         7:RAZ historical
 4:accu per component
```

```
    feeding plan                       1/10
    NUM:1-Section 1...
       RECIPE            LAST DAY    QTY/CYCLE
 1   5-rec.1-14             14          100
 2   6-rec.15-40            40          250
 3   9-rec.41-65            65          500
      f1:num-     f2:num+
```

```
    current feeding                    1/40
TRANS  VAL  AGE  FEED      RECIPE       Q/CYC
  1    YES    7   1     5-rec.14-40      250
  2    YES   50   1     6-rec.41-65      500
  3    NO   125   2    12-rec.slut       800
  4    YES   42   2    13-start          100
      f1:page-    f2:page+          f3:modif
```

9.4 History



```
V2.XX      FRIDAY  26/10/01   15:43:00
 1:automatisme       4:acces code
 2:fabrication      (5:technician)
 3:adjustments      (6:configuration)
 Task1    Task2     2 Warning  3 Alarms
```

```
            FRIDAY   26/10/01    15:43:00
menu fabrication

 1:componentdata        5:feeding plan
 2:recipes              6:current feed
 3:stocks
 4:historic of fabrication
```

```
             FRIDAY  26/10/01   15:43:00
menu\fabrication\historic

 1:listing             5:accu per recipe
 2:records             6:accu transfer
 3:accu per silo       7:RAZ historical
 4:accu per component
```

```
    accu per component
FIRST DATE:01/01/01      recipe   :  1
LAST DATE :31/03/01      transfer :  3

QUANTITY(T)    24.538
PRICE/TON       1084
TOTAL PRICE    26599
                                f3:detail
```

```
    accu per component                 1/50
No COMPONENTS QUAN.(T)   PRICE/T   TOTAL

 1 wheat         10.564   985.25     10408
 2 barley         6.887  1012.50      6973
 3 oats           2.964  1156.80      3429
 4 mineral        0.559  9654.00      5397
        f1:page-     f2:page+
```

```
              last erased : 10/01/02    16/999
No  DATE   TIME   LONG   REC WEIGHT T/REAL

 16 23/01  10:20  01:05   5     1000/    998
 17 23/01  12:35  00:35   3      500/    501
 18 25/01  09:17  01:10   1     1000/   1003
 19 27/01  23:55  00:40  12      500/    497
       f1:page-   f2:page+        f3:record  >
```

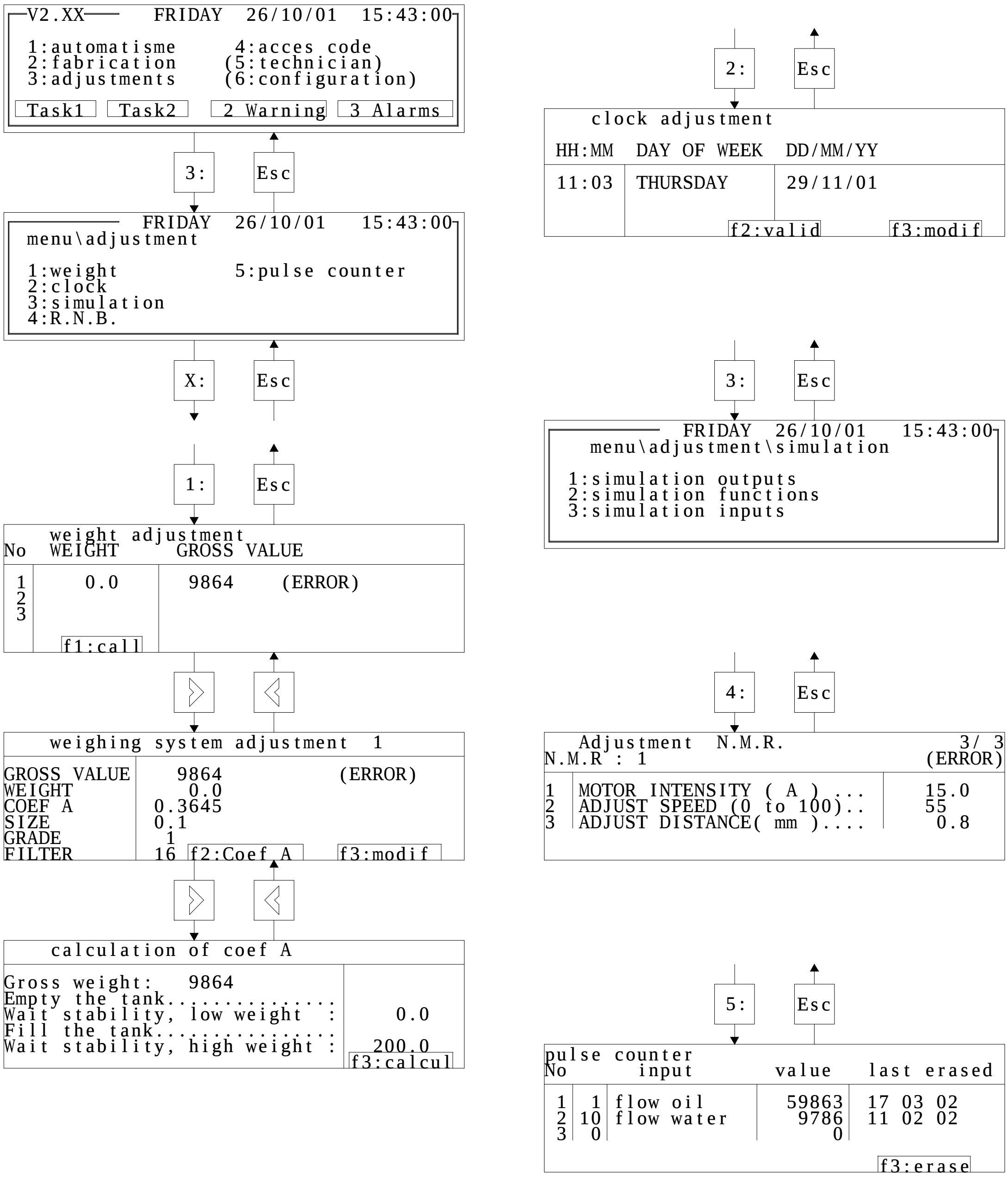
```
              last erased : 10/01/02    16/999
No  PRICE   TRANS REMP ALARM

 16 1156.54   2     0     1
 17  607.66   1     0     0
 18  915.45   9     7     1
 19  498.74  10     0     0
<      f1:page-   f2:page+        f3:record
```

```
record: 16      DATE:23/01/02 TIME :10:20
recipe:  5-piglets                     1/20
SILO COMPONENTS    %THEO WEIGHT T/REAL R

 1   1-Byg         20.000   200/   199.5  0
 3   2-Hvede       45.000   450/   449.1  0
 5   3-Havre       10.000   100/   101.0  0
       f1:num-       f2:num+              >
```

```
record: 16      DATE:23/01/02 TIME :10:20
recipe:  5-piglets                     1/20
SILO ACT PRICE

 1       215.75
 3       417.25
 5       120.56
<      f1:num-       f2:num+
```

```
   historic of fabrication
  LAST ERASED : 11/03/02

    ERASED      :YES/NO

                               f3:erase
```

9.5 Regulation



```
V2.XX         FRIDAY  26/10/01   15:43:00

 1:automatisme       4:acces code
 2:fabrication      (5:technician)
 3:adjustments      (6:configuration)

 Task1   Task2   2 Warning   3 Alarms
```

```
              FRIDAY  26/10/01    15:43:00
 menu\adjustment

 1:weight            5:pulse counter
 2:clock
 3:simulation
 4:R.N.B.
```

```
    weight adjustment
No  WEIGHT      GROSS VALUE
1      0.0        9864     (ERROR)
2
3
       f1:call
```

```
    weighing system adjustment  1
GROSS VALUE     9864             (ERROR)
WEIGHT            0.0
COEF A        0.3645
SIZE          0.1
GRADE           1
FILTER        16  f2:Coef A    f3:modif
```

```
    calculation of coef A
Gross weight:   9864
Empty the tank..............
Wait stability, low weight  :      0.0
Fill the tank...............
Wait stability, high weight :    200.0
                                f3:calcul
```

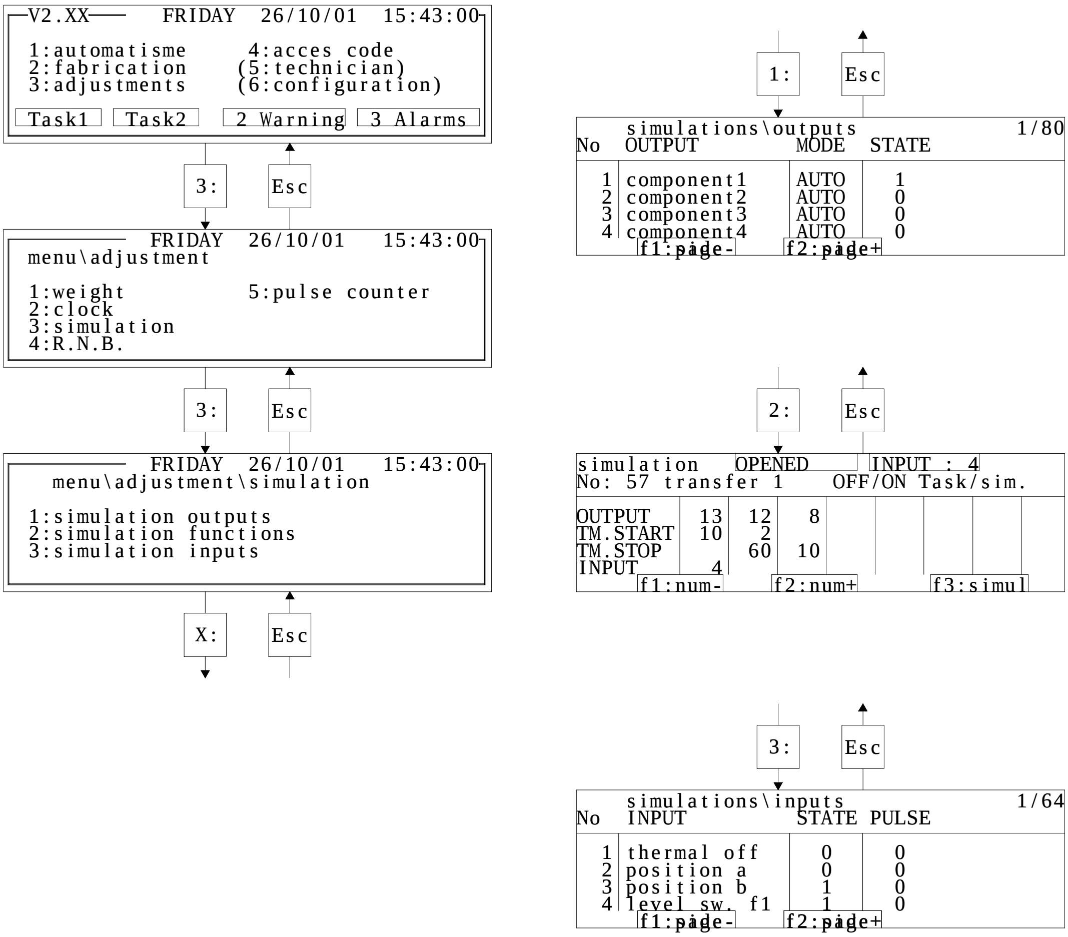
```
   clock adjustment
HH:MM  DAY OF WEEK   DD/MM/YY
11:03  THURSDAY      29/11/01
               f2:valid        f3:modif
```

```
               FRIDAY  26/10/01    15:43:00
   menu\adjustment\simulation

 1:simulation outputs
 2:simulation functions
 3:simulation inputs
```

```
   Adjustment  N.M.R.                  3/ 3
N.M.R : 1                           (ERROR)
1  MOTOR INTENSITY ( A ) ...       15.0
2  ADJUST SPEED (0 to 100)..       55
3  ADJUST DISTANCE( mm )....        0.8
```

```
pulse counter
No      input            value    last erased
1   1  flow oil          59863    17 03 02
2  10  flow water         9786    11 02 02
3   0                        0
                                   f3:erase
```

9.6 Simulation



```
V2.XX      FRIDAY  26/10/01   15:43:00
 1:automatisme       4:acces code
 2:fabrication      (5:technician)
 3:adjustments      (6:configuration)
 Task1   Task2    2 Warning   3 Alarms
```

```
           FRIDAY  26/10/01   15:43:00
 menu\adjustment

 1:weight            5:pulse counter
 2:clock
 3:simulation
 4:R.N.B.
```

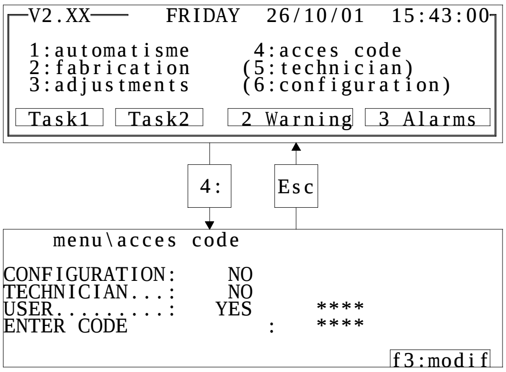
```
           FRIDAY  26/10/01   15:43:00
   menu\adjustment\simulation

 1:simulation outputs
 2:simulation functions
 3:simulation inputs
```

```
    simulations\outputs                  1/80
No  OUTPUT          MODE  STATE

 1  component1      AUTO   1
 2  component2      AUTO   0
 3  component3      AUTO   0
 4  component4      AUTO   0
      f1:page-       f2:page+
```

```
simulation    OPENED      INPUT : 4
No: 57 transfer 1    OFF/ON Task/sim.

OUTPUT     13   12    8
TM.START   10    2
TM.STOP         60   10
INPUT       4
      f1:num-     f2:num+       f3:simul
```

```
    simulations\inputs                   1/64
No  INPUT           STATE  PULSE

 1  thermal off       0     0
 2  position a        0     0
 3  position b        1     0
 4  level sw. f1      1     0
      f1:page-       f2:page+
```

9.7 Code



```
V2.XX     FRIDAY  26/10/01  15:43:00
 1:automatisme      4:acces code
 2:fabrication     (5:technician)
 3:adjustments     (6:configuration)
 Task1  Task2    2 Warning  3 Alarms
```

```
    menu\acces code

CONFIGURATION:    NO
TECHNICIAN...:    NO
USER.........:   YES      ****
ENTER CODE           :    ****
                             f3:modif
```

10 SOFTWARE SPECIFICATIONS

Number of components	50
Optional sub-comp. For analysis	10
Storage silos per component	4
Component identification via name	
Number of recipes	50
Components per recipes	20
Recipe analysis	
Phase feeding plans	5
No. of recipe changes per plan	20
Storage control with optional date intervals	
Per component	
Per comp. silo	
Per recipe	
Per ready feed silo	
Historic. fabrications	999
Historic. alarms	99
Historic. warnings	99
No. of work sequence tables	20
Number of time tables	20
Number of weighing systems	3
Number of mills	3
Regulation of disc distance in SK	
Control of proportioning augers	
Number of mixers	3
Number of outlets	96
Number of inlets	128
Number of languages	4

std.- Danish, German, English, Polish (other combinations may occur)

Display- 8 lines, each 40 characters

11 BEFORE START UP

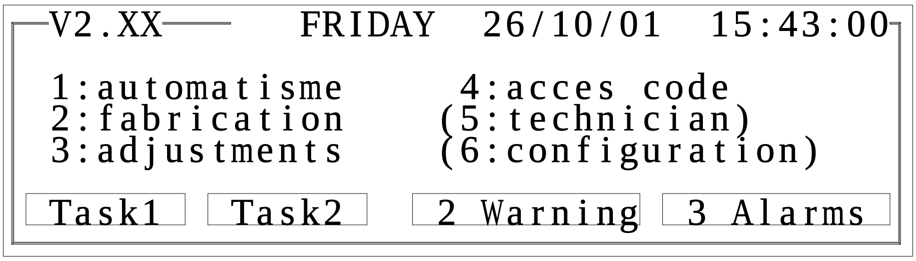
The procedure for first start up of the plant.

1. Test function of all machines at manual operation and check incoming signals to the computer (to be undertaken by technician and according to mounting and configuration instructions).
2. Key in admission code.
3. Check that the basic settings of the computer, e.g. language, calendar and clock are correctly set.
4. Examine and adjust, if necessary, the basic configuration, so that it corresponds to the actual conditions (to be undertaken by technician and according to mounting and configuration instructions).
5. Calibrate scales.
6. Configure and adjust controller for automatic disc mill, if any.
7. Program component data.
8. Program recipes.
9. Program feeding plans, if any.
10. Encode start time.
11. Start up and production.

12 PROGRAMMING

12.1 Main menu

When connecting the computer, the main menu appears in the desplay after some seconds.



```
V2.XX        FRIDAY   26/10/01   15:43:00

 1:automatisme      4:acces code
 2:fabrication     (5:technician)
 3:adjustments     (6:configuration)

 Task1   Task2    2 Warning   3 Alarms
```

All system functions are chosen from here.
The technician and configuration functions can only be chosen in case their code is keyed in.
A menu function is chosen by – with the cursor-control keys – pointing it out with the menu beam, and then press "ENTER", or key the number for the menu function.

In order to return to the main menu from an underlying function press "ESC".

NOTE! It is only possible to alter in the data or functions in the computer, if the right code for same is encoded correctly.

The function and alarm status of the system can be read in the bottom line.
The system can handle two process lines at the same time, and "Task1" and "Task2" register status for one and the other process line respectively.
Flashing section means that the process line is in waiting position.
Constantly visible section means that the process line is operating.
Section not visible indicates that all processes are taken out of operation.

Warning and alarm sections show status for the number of movements, stored in the historic lists for same, since the sections were zero set the last time.
There is access to warning and alarm lists in the function "automatism" or directly from the main menu when pressing "F2" or "F3".

12.2 Access codes

There are more levels for access codes in FlexMix.

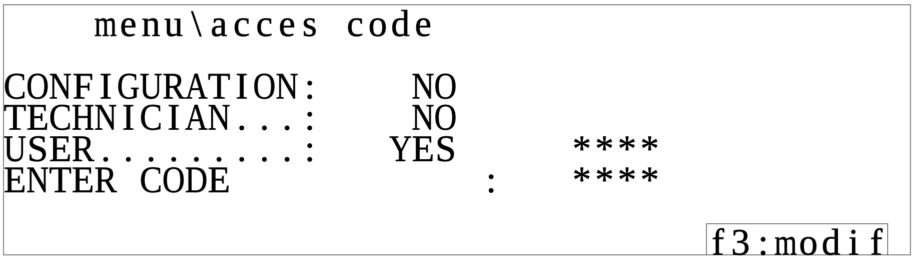
User code = "**0000**" –
Gives access to modify of data under main menu points 1-4 (component data, recipe data, summary, store control etc.)
User code can be modified.

Technician code = "**tech**" -
Gives access to modify of data under main menu points 1-5 (user + calibration, parameters for raw material silos, functions and working tables etc.).

Configuration code = "**conf**" -
Gives access to modify of data under main menu points 1-6 (technician + configuration of outlets and system functions etc.).

12.3 Encoding of code

Menu point "access codes" is chosen in the main menu.



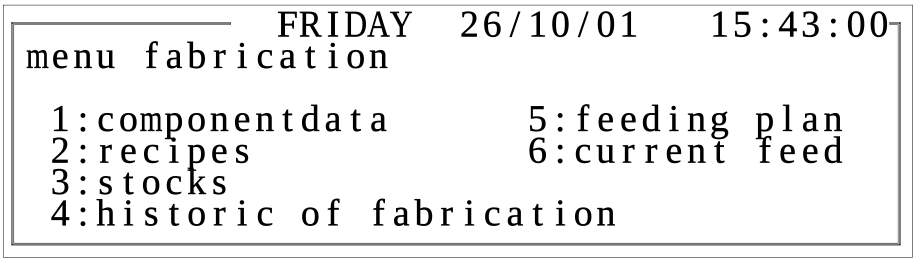
```
    menu\acces code

CONFIGURATION:    NO
TECHNICIAN...:    NO
USER.........:   YES      ****
ENTER CODE          :     ****

                                   f3:modif
```

Encode the code and end with "ENTER".
It is now possible to see to which functions you have access (YES/NO).

Configuration and technician codes cannot be modified, and it is always possible to read the actual user code by encoding one of these codes.
For modification of code press "f3".
The working user code is encoded again, and then the system asks for encoding of a new code.
End by pressing twice "ENTER".
Follow also the instruction in the display.
Test "ESC" in order to return to main menu.

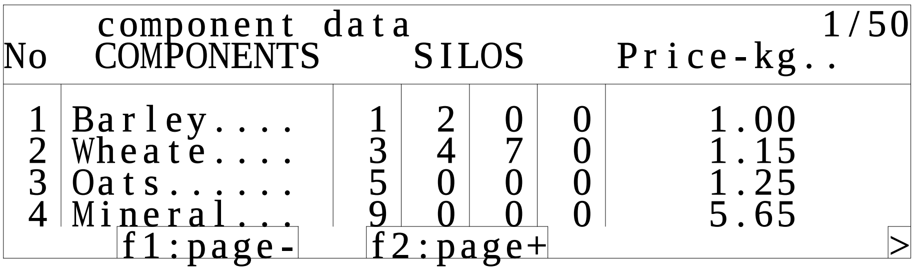
12.4 Component data

Choose the function "fabrication" in the main menu.



```
              FRIDAY  26/10/01   15:43:00
menu fabrication

 1:componentdata        5:feeding plan
 2:recipes              6:current feed
 3:stocks
 4:historic of fabrication
```

Choose "component data".



```
    component data                     1/50
No  COMPONENTS     SILOS       Price-kg..

 1  Barley....   1   2   0   0    1.00
 2  Wheate....   3   4   7   0    1.15
 3  Oats......   5   0   0   0    1.25
 4  Mineral...   9   0   0   0    5.65
         f1:page-     f2:page+               >
```

The components are recognized by their number and name in recipes and summaries. The silo in which they are placed is inferior.

This enables you to place the same component in more silos at the same time and enables a re-placing to other silos later on, without having to modify the programming of recipes etc.

In the picture over this can be encoded a name for each component and in which silos the component is placed (at least one must be indicated and max. four placings).

At weighing, the system will at first search for the component in the silo whose number is standing first.

If the silo is empty, it is placed at the back of the queue, and the next silo is advanced and becomes the primary component silo, until it is empty, etc.

If all silos are empty, the system switches to replacement component, if same is chosen, or it stops and gives alarm for used up component.

Components to be added manually, directly into the mixer or hopper for later automatic transport into the mixer, shall also be programmed here.

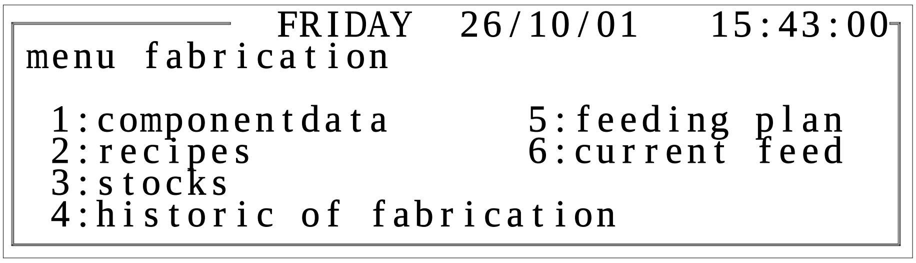
The components are all given the same fictive silo number, e.g. silo 15, if the plant has 14 component silos.

In the following 10 columns (choose with "arrow right) can be encoded different data, optional for the components, e.g. price/kg, protein, energy etc.

If data are encoded in these sections, the system can calculate a theoretic analysis of the recipes for exactly these data, based on the current mixture proportion.

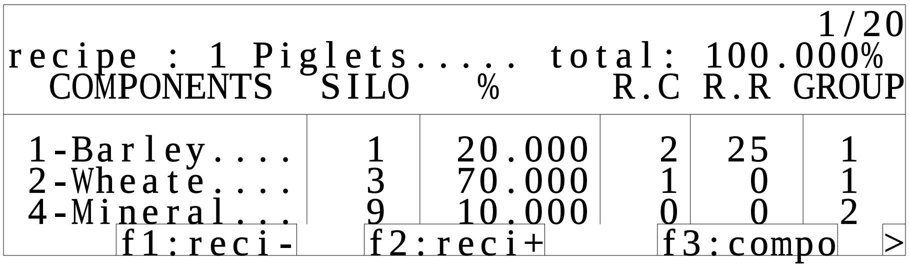
12.5 Recipes

Choose the function "fabrication" in the main menu.



```
             FRIDAY  26/10/01   15:43:00
menu fabrication

 1:componentdata         5:feeding plan
 2:recipes               6:current feed
 3:stocks
 4:historic of fabrication
```

Choose "recipes".



```
                                          1/20
recipe : 1 Piglets..... total: 100.000%
  COMPONENTS  SILO    %      R.C R.R GROUP

 1-Barley....   1    20.000    2  25    1
 2-Wheate....   3    70.000    1   0    1
 4-Mineral...   9    10.000    0   0    2
       f1:reci-    f2:reci+      f3:compo   >
```

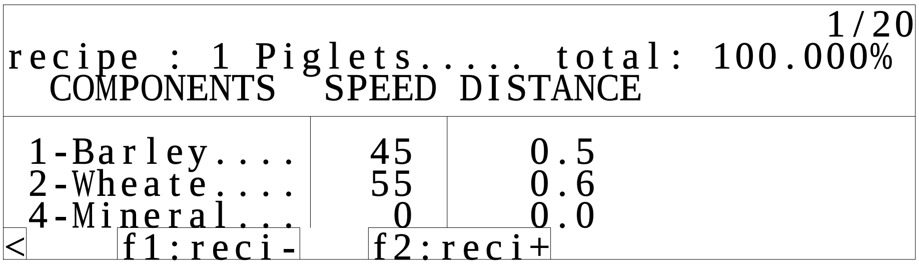
The upper line shows recipe number and it is possible to encode a name for the recipe so that it is easier to recognize the recipe later on.
The section "total" shows the total %-sum of all comprised components. The sum must be 100,000 when the recipe is programmed correctly.
At programming a new recipe, the cursor is placed in the upper component line in the column "COMPONENTS".
Key the number of the first component to be added, or press several times "f3", until the wanted component appears in the section.
The column "SILO" is automatically completed with the number of the primary component silo, containing the chosen component.
The column "%" indicates the share with which the chosen component shall participate in the recipe.
It is possible to choose a replacement component that the system can use, if the original component is consumed, in the column "R.C"
If change to replacement component is not allowed, unless there is already weighed in a certain share of the original component, the limit for same can be indicated in the column "R.R".
Example: If 200 kg barley shall be weighed in and the silo is run empty during operation, a change to replacement component 2 wheat is only allowed, if beforehand at least 25% of 200 kg = 50 kg of the barley is weighed in.
If data was programmed in "R.R" but no replacement component was stated in same line, the process must go on even if the silo for the current component gets empty, if only the percentage minimum limit was reached.

NOTE! Only choose replacement component from the same weighing in group as the original component.

The weighing-in is undertaken in groups, depending on the way in which the components get to the weighing.
In general, a separate group will be registered for each way of introducing a component to the weighing.
At programming the recipe, the components are then given the group number that fits the way of weighing of the various components.
The components passing the mill will often be given one or two group numbers, depending on a cleaner before the mill, or not.
One group for the components to pass through the cleaner before entering the mill, and one for those just to pass the cleaner and go directly to the mill.
Minerals, usually transported by auger directly to weighing, has an independent group number.
Normally liquids, too, has an independent group number, as the mixer must operate continuously during reception of liquids in order to avoid lumps.
Components with the same group number will be weighed in the order they occur in the recipe.
Group numbers are determined by configuration/start up of the plant and can vary from plant to plant.
Here is also determined whether possible manually added components must be added first or last at weighing.
Therefore it is important to have this information registered for later use in connection with start up of the plant.
The example above is based on the plant, fig. 1, where all components from silo 1-8 shall through the mill, and therefore they are all given group number 1. The minerals from silo 9-13 are given group number 2, as they are transported directly to weighing.
Liquid from silo 14 is given group number 3, as the mixer must be operating during weighing-in.
Possible manually added components may be given group number 4.

When a recipe line is completed, the cursor is moved down into the next line in the column “COMPONENTS”, and the next component in the recipe is chosen in the same way as before, and then the data are programmed.
Continue in this way until all wanted components are chosen. Keep an eye on the “total section” on top. Once all components are registered, the %-sum must be 100,000 in order for the recipe to be valid.

If the system contains a disc mill with automatic regulation and/or frequency controlled proportioning augers (as example fig. 1, pos. 2 and 4) now press “arrow right” until the below picture appears.



```
                                          1/20
recipe : 1 Piglets..... total: 100.000%
  COMPONENTS   SPEED  DISTANCE

 1-Barley....    45      0.5
 2-Wheate....    55      0.6
 4-Mineral...     0      0.0
<     f1:reci-     f2:reci+
```

In the column "SPEED" can be encoded a figure between 0 and 100, depending on the wanted proportioning speed from the proportioning auger at weighing of the actual component. The proportioning speed must be adapted to the mill capacity (start cautiously with a rather low value, e.g. 25 so that the mill is not overfilled).
The value can later on, during operation, be adapted, so that the mill obtains the optimal amp. load.
Do not indicate proportioning speed for the components that are transported directly into the weighing system by augers or the like.
Example: Minerals that are normally transported directly from a hopper by flex auger (fig. 1, pos. 9).

If the component shall be ground on a SKIOLD disc mill, or other mill with possibility of automatic variation of the milling degree, encode a value in the column "DISTANCE".
A good basis at milling of cereals will be 0.5 mm.
Soya and pellets can usually be ground with a distance of 2.0 mm.
The values for distance can later on, during operation, be adapted for obtaining the ideal milling degree.
NOTE! When the milling degree is changed, it influences on the mill capacity and motor load.
If a finer milling is wanted, it is therefore a good idea at first to reduce the speed for the proportioning auger a little. If not, the mill might be overloaded.

If the component shall not be ground, or if it shall just be ground on a traditional hammer mill, no value shall be encoded in the column "DISTANCE".

12.6 Recipe analysis

Once the recipe is completely programmed, it is possible to see a theoretic analysis of the ready feed mixture.
The analysis will only show values for the variable ones, chosen at programming of component data, and the analysis is only correct, if there are encoded data for all comprised components.

```
                                                1/20
recipe : 1 Piglets..... total: 100.000%
  COMPONENTS   SILO    %      R.C  R.R  GROUP
 1-Barley....    1    20.000    2   25    1
 2-Wheate....    3    70.000    1    0    1
 4-Mineral...    9    10.000    0    0    2
      f1:reci-     f2:reci+        f3:analys>
```

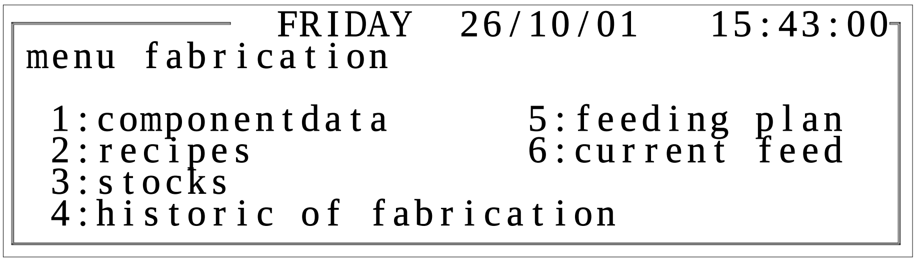
Place the cursor at the recipe top and press ”f3 ” for showing the analysis.

```
     recipe analysis:  1

price-kg..:     4.2   ...........:     0.0
protein...:    10.6   ...........:     0.0
energi....:     1.4   ...........:     0.0
..........:     0.0   ...........:     0.0
..........:     0.0   ...........:     0.0
```

12.7 Feeding plans

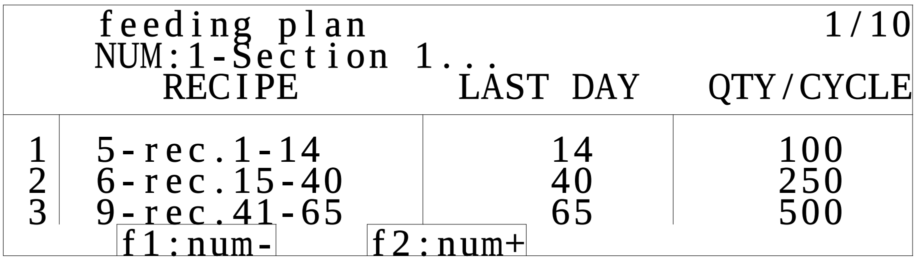
If the FlexMix system is used in connection with feed fabrication for stables divided in sections, where the animals are for the entire growth period, the system can be programmed to automatic change of the feed mixture in proportion to the animals’ actual age so that they are always getting the optimal composed feed.

Choose “fabrication” in the main menu.



```
              FRIDAY  26/10/01   15:43:00
menu fabrication

 1:componentdata        5:feeding plan
 2:recipes              6:current feed
 3:stocks
 4:historic of fabrication
```

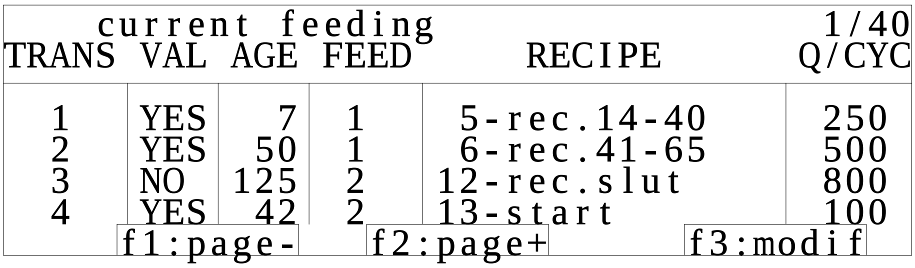
In the sub-menu choose ”feeding plan”.



```
     feeding plan                       1/10
     NUM:1-Section 1...
        RECIPE          LAST DAY   QTY/CYCLE
 1   5-rec.1-14            14          100
 2   6-rec.15-40           40          250
 3   9-rec.41-65           65          500
       f1:num-      f2:num+
```

A total of 5 different feeding plans can be made. For an easier recognition of each feeding plan, it is possible to encode a name in line 2.
Each feeding plan can consist of up to 20 recipe changes.
Encode in the column under “RECIPE” in the first line to the left the number of the recipe to start with from day 1.
The name of the recipe will be visible to the right in the column.
In the column “LAST DAY encode how many days old the animals must be, before you change to the recipe indicated in the next line.
When the age of the animal passes the next modification day, change over to the recipe indicated in the next line etc.
In the shown example the animals are fed with recipe 5 from day 1 until they are 14 days old.
From 15 to 40 days old they are fed with recipe 6 and then recipe 9.
Encode in the column “PORT/CYCLE” how many kg to be made per cycle of the chosen recipe. Normally you start with small portions and as the animals grow older, bigger portions are chosen.
It is not necessary to encode data in alle 20 lines. The system stays on the last recipe number, before it gets to a blank line, also although the last day is overrun.

In order to activate a feeding plan to a transfer (ready feed silo / stable section) choose the function "current feeding" in the sub-menu for "fabrication".



```
     current feeding                        1/40
TRANS  VAL  AGE  FEED       RECIPE        Q/CYC

  1    YES    7   1      5-rec.14-40        250
  2    YES   50   1      6-rec.41-65        500
  3    NO   125   2     12-rec.slut         800
  4    YES   42   2     13-start            100
     f1:page-      f2:page+         f3:modif
```

If you feed using a feeding plan, "YES" should be in the line for the current transfer in the column "VAL".
At "NO" the automatic recipe change will not be activated, and you choose recipe for the current transfer in the traditional way (see also the section "Production").
At each transfer, in the column "FEED", you can choose which feeding plan (1-5) after which you shall feed now.
The age of the animals that can be read in the column "AGE", compared with the chosen feeding plan, prescribes the actual recipe which is automatically written in the column "RECIPE".
When the animals get older and a last day, according to the feeding plan, is passed, the system changes automatically to the next recipe in the row.
When new animals are placed in a stable section, the day counter must be reset to 1.

13 PRODUCTION

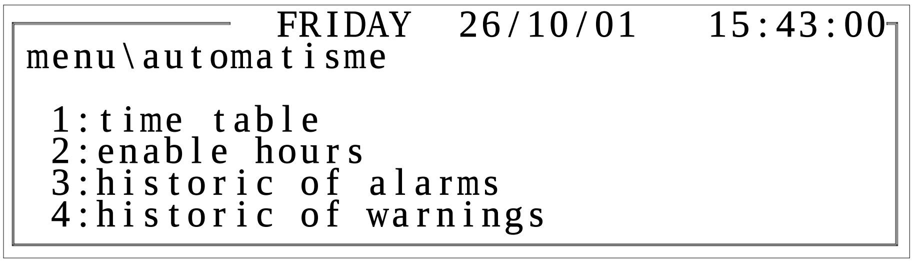
13.1 Start of a process

In order to start a production, some conditions must be fulfilled:

- The system must be configurated and all mechanical functions must be tested and found OK.
- The weighing system must be calibrated.
- A possible disc mill controller must be configurated and adjusted.
- The weighing system / mixer must be empty.
- Component and recipe data must be programmed.
- The component comprised by the recipe must be available in the component silos.
- The MAN/AUTO changer of the computer panel must be in position "AUTO".

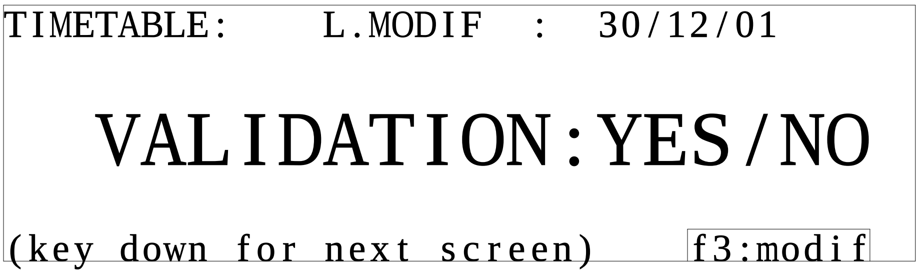
For start up there are 20 time tables, each being able to start up a system function, e.g. recipe production one or more times a day or at chosen days of a week.

13.2 Timetables



```
                FRIDAY   26/10/01    15:43:00
menu\automatisme

  1:time table
  2:enable hours
  3:historic of alarms
  4:historic of warnings
```

Choose "automatisme" in the main menu and choose "timetable" in the sub-menu.

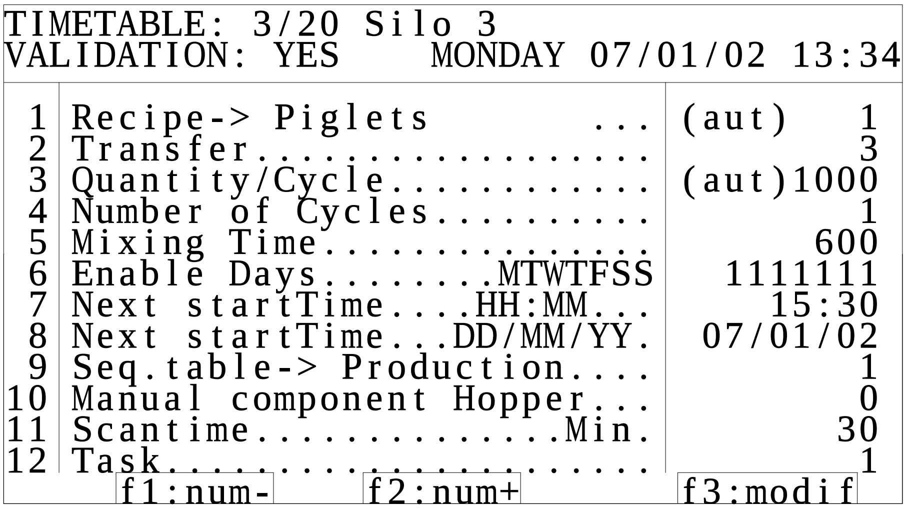


```
TIMETABLE:     L.MODIF  :  30/12/01

    VALIDATION:YES/NO

(key down for next screen)    f3:modif
```

This picture is a superior start/stop function for the system.
With "NO" in the section after "VALIDATION", the system is out of operation and no process can be started up.
With "YES" the system is ready for receiving start signal and for executing mixing processes etc.
A change from "YES" to "NO" during the process, it will be executed before the system is stopping the operation.

Press "f3" in order to change and follow also the instruction in the display.
If there is a function lamp at the front of the control panel, the lamp will be switched off when the system is out of operation and no process is operating.
The lamp flashes if the system is in operation, but waits for start signal.
When a process is operating the lamp shines constantly.

In order to get access to the timetables press "cursor control down".



```
TIMETABLE: 3/20 Silo 3
VALIDATION: YES    MONDAY 07/01/02 13:34

 1 Recipe-> Piglets         ...  (aut)   1
 2 Transfer..................            3
 3 Quantity/Cycle............   (aut)1000
 4 Number of Cycles..........            1
 5 Mixing Time...............          600
 6 Enable Days........MTWTFSS      1111111
 7 Next startTime....HH:MM...        15:30
 8 Next startTime...DD/MM/YY.     07/01/02
 9 Seq.table-> Production....            1
10 Manual component Hopper...            0
11 Scantime.............Min.            30
12 Task......................            1
      f1:num-      f2:num+       f3:modif
```

In the first line of the table head choose the number of the timetable to be established or edited (it is not necessary, but for clearness and if possible, it is best to use table 1 for transfer 1, table 2 for transfer 2, etc.).
It is possible to encode a name for easier recognition.
Each timetable can be blocked individually by inserting "NO" at "START" in the second line.
This function is useful if no feed shall be fabricated for certain transfers for some time.
The other possibilities that can be chosen in this section are start "NOW, start on "TIME" or "LINK".
At start "NOW" and if timetable on beforehand is completed with the necessary data, the system will start, when "ESC" is pressed twice in order to return to the menu "production" or back to the process control window – and provided that "VALIDATION: YES" was chosen in the superior start/stop function of the previous window.
When a process was finished with the start "NOW" function, subsequently the system automatically chooses start on "TIME".

When start on "TIME" is chosen, the process will start at the next start time programmed.

"LINK" links the timetable with a "master" timetable so that when the process is started by the "master" it allows, all "linked" "slave timetables" to be finished one at a time.

When the function is used, it is therefore only necessary to program next start time in the "master" time table.

The function is often used in connection with emptying of mixer via buffer silo as – depending on the system's configuration – it allows a certain overlap between productions.
When using the "LINK" function remember to state the number of the "master" timetable in the section immediately after.

A number of data shall be programmed for establishing a new timetable.

The number of the recipe for the feed mixture is stated in parameter line 1 "recipe". The chosen recipe's name will then be shown.

In parameter line 2 "Transfer" insert the number of the transfer where the feed is to be delivered.

If a feed plan is attached to the chosen transfer, the section for recipe number in previous line and the section for portion size in following line will show "AUTO" as these parameters are controlled by the feeding plan. In this case they cannot be changed here (read more about this in "feeding plans).

The quantity (in kg) of feed per batch is programmed in parameter line 3 "batch/cycle".
If the mixer cannot contain the portion to be produced, the portion must be divided into more smaller batches.
The number of batches or cycles can be programmed in parameter line 4. The value can be changed during operation.
NOTE! The number of cycles must be indicated as minimum 1 in order to activate the system.

The required mixing time in seconds is programmed in line 5 "mixing time".

The parameter lines 6, 7, 8 and 11 are related to each other and decide the next start time for the process if start on "TIME" was chosen.
Encode time and date for next start in the parameter lines 7 and 8 "next start time".
NOTE! A start time more than 12 hours behind will be cancelled.

"Next start time" is connected to the lines 6 "enable days" and 11 "scantime".
In the line "enable days" you can encode 0 or 1 for each weekday.
If a start time is encoded or start "NOW" is chosen, this timetable will be activated automatically in the future on each weekday marked with 1 to this time.
If all weekdays are marked with 0, the timetable will only be activated this once.

"Scantime" is used in plants that shall start up automatically on signal from empty level sensors in the ready feed silos.
Scantime determines how often the system shall check the sensor.
If the scantime e.g. is set on 30, the system will activate the timetable every 30 minutes, and it will be checked if there is lack of feed in the silo en question (if another process is ongoing, the check will take place when the system is free).
At the same time a new start time 30 minutes later is calculated and inserted.
In this way the process continues repeating itself.

If sensor indicates empty silo, the system will start up and produce a new portion feed.
This process is repeated at every 30 minutes 24 hours a day on the weekdays marked with 1.
NOTE! If no weekdays are marked with 1, the periodical control of the empty sensor will take place for the rest of that day only, when the timetable was activated.

The system's function and working way is determined by sequence tables that are programmed during erection and configuration of the plant.
Normally the system is satisfied with one single sequence table for all tasks, but in more advanced systems with several different processes it may also be necessary to have more sequence tables.
It is important to note information about which tables to be used for which purpose in connection with start of the plant.
The number of the table wanted for control of the process started in the actual time table is stated in the line 9 "seq.table".
Hereafter the name of the chosen table is shown.

"Manual component hopper" is used when components, manually weighed beforehand, shall be added.
Normally these components can be added directly into the mixer, but if e.g. the plant shall operate over night, it is more appropriate that they are weighed beforehand and added into a hopper, from which they are transported automatically into the mixer at recipe production.
Preparation of manually weighed components for a total of 7 portions feed is possible.
The number of the actual hopper is programmed in parameter line 10 "manual component hopper".

The FlexMix system can handle two processes at the same time, e.g. feed fabrication in two independent mixing lines.
These two process lines are called "task:1" and "task:2".
In parameter 12 choose in which process line (task:1 or 2) the process shall take place.
Most normal farm plants only have one process line operating at a time, and if so always choose "task:1".

A timetable does not start up until it is left.
Now the section "START" must show "NOW", "TIME", or "LINK", and "VALIDATION:YES" must be chosen in the superior start/stop function of previous picture.
The timetable is left by pressing "ESC" (the table is only activated when "menu/automatism" or the process control window is shown in the display again).

13.3 Manual addition of components

Components can be added manually directly into the weighing system or into a hopper that is later automatically emptied into the weighing system during recipe production.

13.3.1 Manual addition directly in the weighing system

Manual components get group numbers in the recipe as all other components.
Often two possible group numbers are established that can be given, depending on the time of the addition (at the beginning or the end of the recipe production – however, always before addition of fluids).
In the process control window the text in the section for actual function will show when the manual components must be added.
Often there is also a lamp in the front of the system panel indicating when the system is ready for manual addition.
The lamp shines for each component when the system is ready, and when the calculated quantity was added the lamp stops to shine. Then there is a short break till the next manual component is added – or till the system continues the automatic production.
Under any circumstances the weighing can be followed in the process control detail window where setpoint and actually weighed quantity is shown continuously.

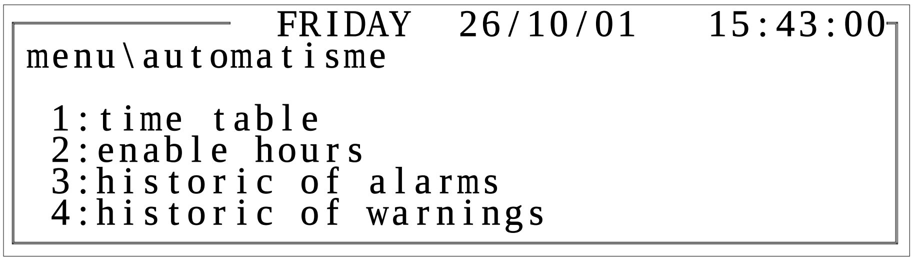
13.3.2 Manual addition via hopper

The quantity of manual components of the recipe must be calculated manually on basis of the recipe data and size of the portion.
The components are weighed and placed in the specific hopper stated in the time table for the actual production (parameter 10).

13.4 Enable hours

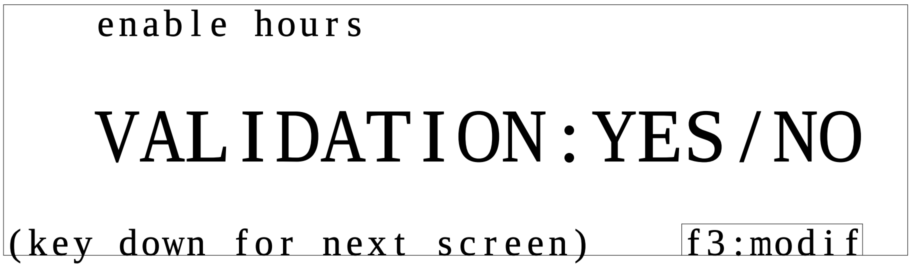
The system permits inserting limited operation periods, individually for each weekday. The function can e.g. be used for cheap night current.

Choose the menu "automatism".



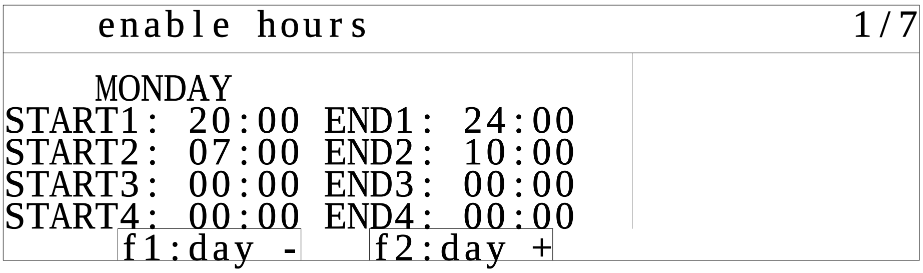
```
               FRIDAY  26/10/01   15:43:00
menu\automatisme

 1:time table
 2:enable hours
 3:historic of alarms
 4:historic of warnings
```

Choose "enable hours".



```
    enable hours

    VALIDATION:YES/NO

(key down for next screen)    f3:modif
```

Press "cursor control key down".



```
    enable hours                    1/7

    MONDAY
START1: 20:00 END1: 24:00
START2: 07:00 END2: 10:00
START3: 00:00 END3: 00:00
START4: 00:00 END4: 00:00
     f1:day -    f2:day +
```

You can choose up to four enable hours per 24 hours and individually for each weekday.

NOTE! Start time must be earlier that end time.

The shown example indicates an enable hour Monday from 07:00h to 10:00h and again from 20:00h to 23:59h (00:00h is not allowed).

In the periods apart from these two, the system is not operating, provided that:

?? The previous picture says "VALIDATION:YES".

?? The configuration is set up to support the function (regarding description of operation sequences, and should only be programmed by a technician).

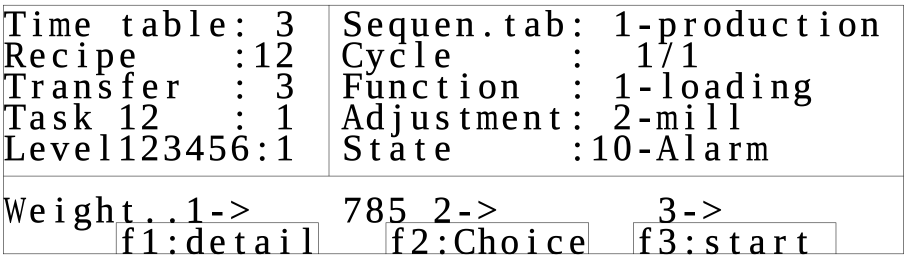
Depending on the setting up of the system, it is possible only to block certain functions, whereas others can be executed all 24 hours.
Is can also be chosen, whether an ongoing process shall be finished, although the time ahs passed the end time, or whether the process shall be interrupted and not be finished until the time is again with an enable hour.

Further to programming of enable hours, controlled by the timer, it is also possible to control enable hours via external signal, from e.g. 24 hours' timer or the like, or in combination.

Determine together with the technician, how the function shall be. Then the technician sets up the system as wanted.

13.5 Process state

From all menus it is possible to change to the process control window by pressing the “CONTROL” key (real time control).



```
Time table: 3   Sequen.tab: 1-production
Recipe     :12  Cycle     :  1/1
Transfer   : 3  Function  : 1-loading
Task 12    : 1  Adjustment: 2-mill
Level123456:1   State     :10-Alarm

Weight..1->     785 2->       3->
    f1:detail    f2:Choice   f3:start
```

Here the current activities in the system are shown, and detailled information on the most separate points are shown when placing the menu beam on them and press “F1:Detail”.
With “F3:start/stop” the actual process can be stopped and started again, and “F3” is normally used when starting again after alarm, if any. However, “F2” gives alternative possibilities.
“F2:choose” has different function depending on whether the process runs or was stopped (stopped on purpose or due to alarm).

Alternatives with “F2:choose” with process running are:
?? Stop the process after ongoing cycle with “SHIFT” + “C” (ongoing process is finished, and after that the process stops).
?? Stop the ongoing function and go to next step of the process with “SHIFT” + “S”.
?? Regret and return to the process control window with “F2”.

Alternatives with “F2:choose” with stopped process:
?? Stop the process totally with “SHIFT” + “I” (the plants must be emptied manually before start of new production).
?? Stop the ongoing function and go to next step of the process with “SHIFT” + “S”.
?? Regret and return to the process control window with “F”.

First column contains information on the timetable that has started the current activity, the recipe that may be produced and the transfer to deliver the recipe in.
Here it is also shown in which “task” and “level” the process is running.
If two processes are running at the same time – or if the process is more complicated and running in more levels – here you can choose which “task” or “level” you want to follow in the detail window.

The second column shows which sequence table is used and how many times the process must be repeated as well as which number of flow is actually running (cycle:).

The actual function for the chosen “task” and “level” is read in 3rd line.
More details for ongoing process can be read in process details chosen by placing the menu beam in this section, or in the section “task”, and press “F1:detail”.
See also the paragraph “process details”.
The actual adjustment for the ongoing function can be seen in the next line.

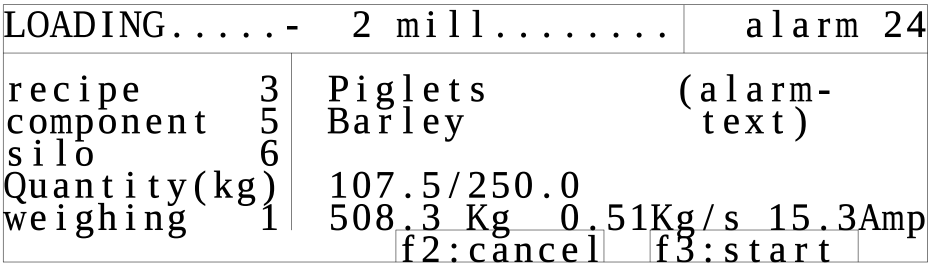
In the “state” section the actual condition of the system for the actual process (task) is shown, and e.g. at alarm it is indicated in this section.
In order to get more details on the alarm, if any, place the menu beam in this section and press “F1:detail”.
See also the paragraph “alarm details”.
Information that are shown in the status section:

- Normal – The process runs normally.
- Ext.stop – The process was stopped due to activation of external stop signal.
- Stop key – The Process was stopped due to activation of “F3:stop”.
- Pause ext. – The process is on pause because external signal was activated.
- Operation pause – The process is on pause because the actual time is outside the operation period stated.
- Stop emptying – Batchwise emptying ready for next portion.
- Alarm xx – The process was stopped due to alarm No. xx.

The actual load on all connected weighing systems is shown at the bottom of this window.

13.5.1 Process details

In order to see details on ongoing processes, place the menu beam on the section “task” or “process” and press “F1:detail” – or press “CONTROL” once again.
Then following is shown in the display:



```
LOADING.....-  2 mill........      alarm 24
recipe       3  Piglets          (alarm-
component    5  Barley             text)
silo         6
Quantity(kg)    107.5/250.0
weighing     1  508.3 Kg  0.51Kg/s 15.3Amp
                 f2:cancel   f3:start
```

According to the process currently ongoing, this picture will contain various related data.
In this case the system is loading component 5 for recipe 3.
Actual loading and calculated loading can be read as well as total weight and the present material flow in kg/sec.
When using a disc mill with automatics, the amp. consumption of the mill can be read.
In case of alarm, the alarm number and text can also be read here.

13.5.2 Alarm details

At alarm place the menu beam on the "state" section of the process control display, and press "F1:detail" in order to see details on alarms.

```
 ALARM nr: 10-open input
Function..: 1-loading       Recipe....:12
Quant.prog:  100            Silo.........
Q.achived :   55            Transfer..: 3
Weight....: 1-    55
Out/input.:INPUT : 15-valve to clean.
```

In this window all related information on the alarm can be read which makes it easier to find the problem.
See also the paragraph "alarms".
Press "ESC" in order to return to the process control window.
Restart after alarm with "F3:start" or choose one of the possibilities under "F2:choose".

Alarms and warning are stored in historic surveys in the menu "automatism".

13.6 Production data

In order to get access to production data, choose the menu “production”.

```
                FRIDAY  26/10/01   15:43:00
menu fabrication

 1:componentdata        5:feeding plan
 2:recipes              6:current feed
 3:stocks
 4:historic of fabrication
```

Here choose the menu ”historic production”.

```
                FRIDAY  26/10/01  15:43:00
menu\fabrication\historic

 1:listing            5:accu per recipe
 2:records            6:accu transfer
 3:accu per silo      7:RAZ historical
 4:accu per component
```

The FlexMix system generates a list with detailed data for the last up to 999 productions. This enables you to go back and see the data for a specific earlier executed production. At the same time the production list is the basis for many different listing possibilities for the accumulated component and feed consumption and in an optional date interval.
It is possible to bring about data for consumption per:

component silo total,
component silo per recipe,
component silo per transfer,
component silo per recipe per transfer,

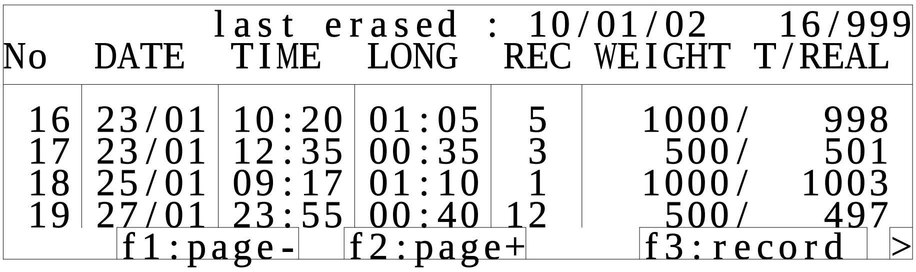
component total,
component per recipe,
component per transfer,
component per recipe per transfer,

recipe total,
recipe per transfer,

transfer total,
transfer per recipe.

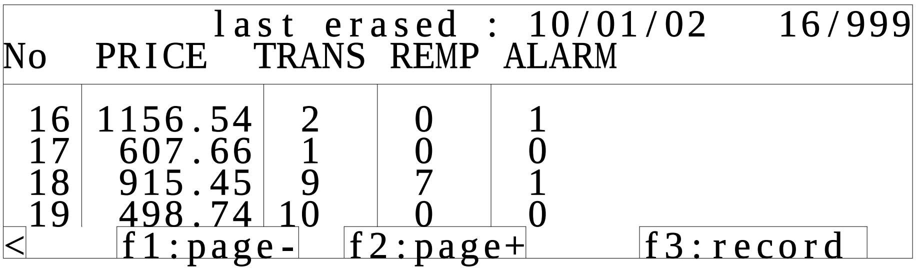
13.7 Production list

Choose ”production list”.



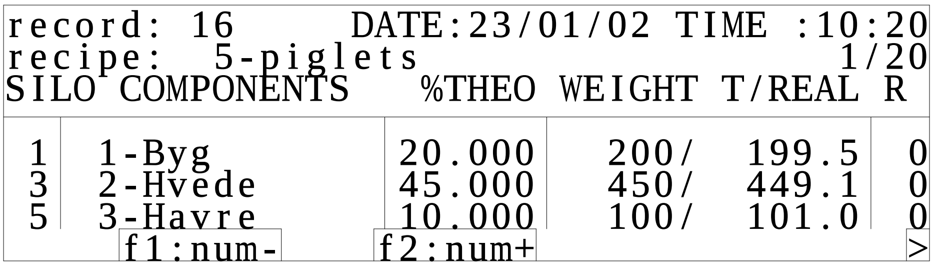
```
           last erased : 10/01/02   16/999
No   DATE   TIME   LONG   REC WEIGHT T/REAL

 16 23/01  10:20  01:05   5    1000/   998
 17 23/01  12:35  00:35   3     500/   501
 18 25/01  09:17  01:10   1    1000/  1003
 19 27/01  23:55  00:40  12     500/   497
      f1:page-  f2:page+     f3:record   >
```

Press ”cursor control right” in order to see more information.



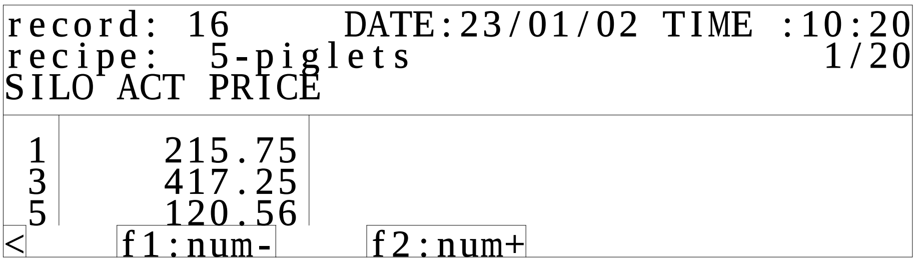
```
           last erased : 10/01/02   16/999
No   PRICE   TRANS REMP ALARM

 16 1156.54    2    0    1
 17  607.66    1    0    0
 18  915.45    9    7    1
 19  498.74   10    0    0
<     f1:page-  f2:page+     f3:record
```

The latest production is the one that at the entrance to the picture is listed in the bottom line.
The production list contains the most important data, e.g. time for production, duration, recipe number, calculated and really weighed total quantity, price (only if the price section for component stock in “storage control” is completed), transfer and possibly used replacement component and number of alarms during production.
If you want more detailed information on a specific production, place the cursor on the production number and press “f3” for details.



```
record: 16     DATE:23/01/02 TIME :10:20
recipe:  5-piglets                  1/20
SILO COMPONENTS   %THEO WEIGHT T/REAL  R

 1   1-Byg         20.000   200/  199.5  0
 3   2-Hvede       45.000   450/  449.1  0
 5   3-Havre       10.000   100/  101.0  0
       f1:num-      f2:num+              >
```

Detailed information on the progress if the separate production can be read here – e.g. recipe programming, calculated theoretical and really weighed weight for each component in the recipe as well as possibly used replacement components.
Press “cursor control right” for more information.

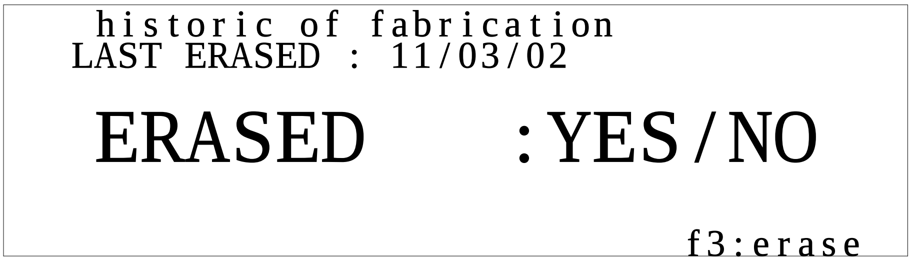


```
record: 16     DATE:23/01/02 TIME :10:20
recipe:  5-piglets                  1/20
SILO ACT PRICE

  1       215.75
  3       417.25
  5       120.56
<      f1:num-     f2:num+
```

The total price for each component can be read here, if the price section in component stock under ”storage control” is completed.

13.8 Cancel production list

The production list is cancelled with the function “CANCEL historic”.



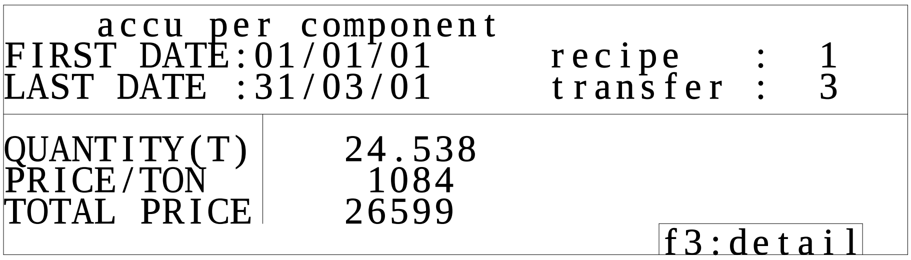
```
   historic of fabrication
  LAST ERASED : 11/03/02

   ERASED       :YES/NO

                              f3:erase
```

Press ”f3” for cancelling and follow instructions in the display.

NOTE! This function cancels all accumulations and consumption data.
However, the storage control is not influenced.

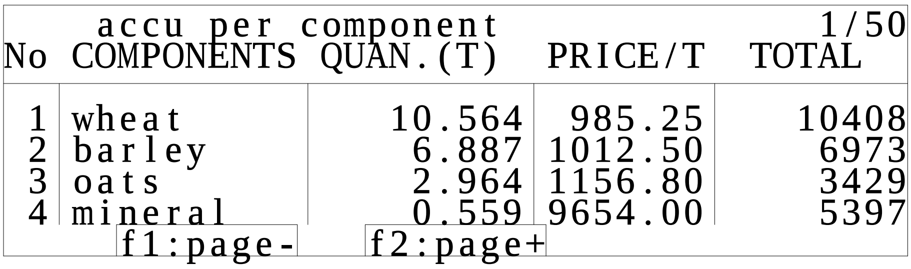
13.9 Accumulated consumption

The accumulation functions are very much the same, and the following example shows accumulation per component.



```
    accu per component
FIRST DATE:01/01/01     recipe   :  1
LAST DATE :31/03/01     transfer :  3

QUANTITY(T)    24.538
PRICE/TON       1084
TOTAL PRICE    26599
                                  f3:detail
```

Encode a date interval (dd/mm/yy) and possibly recipe and transfer numbers.
If no recipe and/or transfer number is encoded, the data for the accumulated consumption will be for the components in total.
Press "f3" for details.

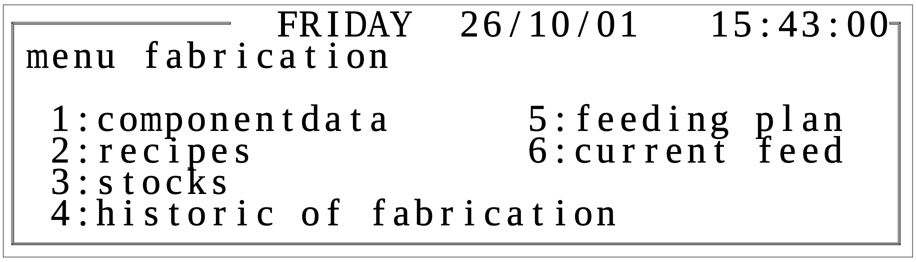


```
    accu per component                 1/50
No COMPONENTS QUAN.(T)   PRICE/T   TOTAL

 1 wheat        10.564   985.25    10408
 2 barley        6.887  1012.50     6973
 3 oats          2.964  1156.80     3429
 4 mineral       0.559  9654.00     5397
       f1:page-     f2:page+
```

Here can be read a consumption list for all components for the given date interval and with the given conditions.

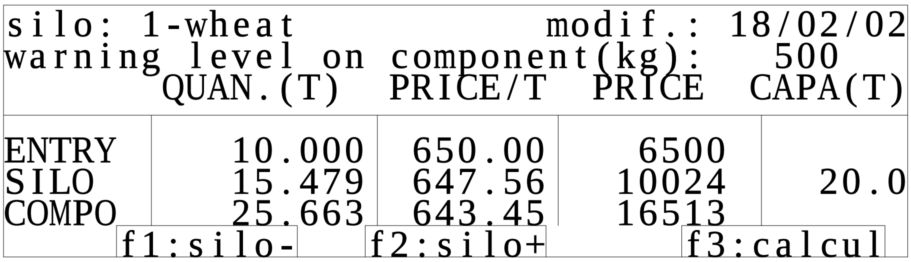
13.10 Storage control

Control of actual stocks and addition of new stock to the storage is undertaken in storage control.



```
                FRIDAY  26/10/01   15:43:00
menu fabrication

 1:componentdata         5:feeding plan
 2:recipes               6:current feed
 3:stocks
 4:historic of fabrication
```

Choose "storage control" in the menu "production".



```
silo: 1-wheat                  modif.: 18/02/02
warning level on component(kg):    500
         QUAN.(T)   PRICE/T   PRICE    CAPA(T)

ENTRY      10.000    650.00     6500
SILO       15.479    647.56    10024      20.0
COMPO      25.663    643.45    16513
      f1:silo-    f2:silo+        f3:calcul
```

Choose silo number in the left section in the first line.

In the right side can be read when the last change of the data for this silo has been executed.

In the second line can be inserted a minimum stock for the silo, for an automatic reminder that the silo is almost empty when the theoretic level gets under this limit.

The two lowest lines in the picture show the current stock for the silo and for the component in total, and possibly also the value of the stock, (the component stock is normally higher that the silo stock, if the component is present in more silos).

If the stock shall be updated with new entry, place the cursor in the column "PORT.(T)" and at the section "ENTRY".

Encode the added quantity in tons and encode price/ton in the next column, if it is known.

Now press "f3" for calculation, and the stock for the silo and the component is now being updated.

It is also possible to zero set silo and/or component stock in this picture.

Place the cursor in the column "PORT.(T)" and at the section "SILO" or "COMPO" according to what is zero set and press "f3" (follow also the instruction in the display).

14 ALARMS AND WARNINGS

14.1 Alarms

When alarms occur, this is indicated in the main menu and in the alarm section of the process control window, and alarm outlet with lamp is activated, if any.
More information on alarms can be read choosing the alarm section of the process control window and press “F1” for details.

```
 ALARM nr: 10-open input
Function..: 1-loading        Recipe....:12
Quant.prog:  100             Silo......:..
Q.achived :   55             Transfer..: 3
Weight....: 1-    55
Out/input.:INPUT : 15-valve to clean.
```

Alarm number and text are indicated at the top.
The function going on when the alarm occurred can be seen on 1st column.
If an error occurs during intake of material for a recipe production, programmed and realized quantity as well as actual load on the scales can be read in the next lines of 1st column.
If the problem has something to do with out- or input, the actual number and belonging text, if any, can be seen in last line.
Actual recipe, component silo and transfer can be read in 2nd column.
Press “ESC” in order to return to the process control window.

An alarm stops the plant and the process does not continue until the user has interfered and corrected possible errors that have caused the alarm.
Apart from alarm for power failure, where in “computer configuration” you can choose whether the plant shall start up automatically when the current returns.
You normally restart after alarm pressing “F3:start” in the process control window.
If it is not possible to correct the error causing the alarm, press “F2:choose” and you get following possibilities:

?? Stop the process completely with “SHIFT” + “I” (the plant must be emptied manually before start of new production).
?? Stop the ongoing function and go to next step of the process with “SHIFT” + “S”.
?? Regret and return to the process control window with “F2”.

14.2 Warnings

Warnings are (just as alarms) shown in the main menu and in the alarm section of the process control window.
The alarm outlet is not activated at warnings.
A warning is just for information and does not stop the plant.
The system stores information on the last up to 100 alarms and 100 warnings in lists for later reading.

14.2.1 Alarm and warning lists

There is access to the alarm and warning lists directly from the main menu with "F2" and "F3" or from the menu "automatism".

```
             FRIDAY  26/10/01   15:43:00
menu\automatisme

 1:time table
 2:enable hours
 3:historic of alarms
 4:historic of warnings
```

Choose "historic alarms".

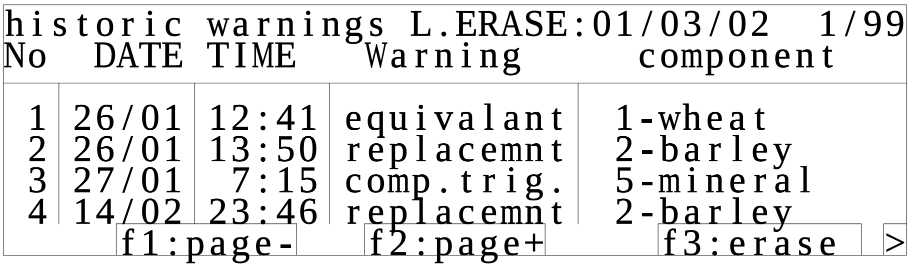
```
historic alarm  L.ERASE:01/03/02    1/99
No   DATE  TIME     ALARM

 1  13/02  16:19  10-OPENED      INPUT : 4
 2  01/03  21:32  31-MAXI WAIT   INPUT : 2
 3  07/03  00:45  32-NOT EMPTY
 4  00/00  00:00   0-...........
        f1:page-    f2:page+     f3:erase   >
```

```
historic alarm  L.ERASE:01/03/02    1/99
No FUNCTION           WEIGHT    recipe

 1   2-weight...       1   490.3   1
 2   2-weight...       1   272.4   2
 3   1-mill.....       1   216.8   5
 4   0-.........       0     0.0   0
<       f1:page-    f2:page+     f3:erase   >
```

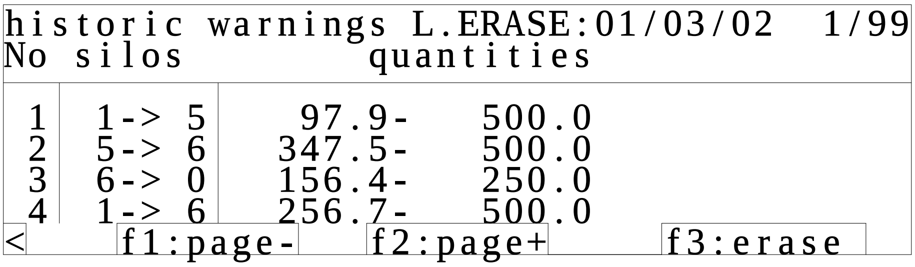
```
historic alarm  L.ERASE:01/03/02    1/99
No SILO    TRANS   QUANTITIES

 1     0       1     -483-    0
 2     0       3     -265-    0
 3     2       0     -500-    6
 4     0       0        0-    0
<       f1:page-    f2:page+     f3:erase
```

Much information is stored about each alarm case.
It is possible to change between the three pictures by "cursor control right" and "cursor control left".
Date, time, alarm type and related data can be read in the first picture.
The next picture contains information on the function in operation as the alarm occurred.

Furthermore the actual load on the balance and recipe number can be read. Information on possible component silo or transfer can be read in the last picture. Here are also data for scale set point and really obtained, as the alarm occurred. These pictures are also available for warning list.
Choose historic warnings in the menu “automatism”.



```
historic warnings L.ERASE:01/03/02  1/99
No  DATE  TIME   Warning     component

 1 26/01 12:41 equivalant   1-wheat
 2 26/01 13:50 replacemnt   2-barley
 3 27/01  7:15 comp.trig.   5-mineral
 4 14/02 23:46 replacemnt   2-barley
        f1:page-   f2:page+     f3:erase  >
```



```
historic warnings L.ERASE:01/03/02  1/99
No silos         quantities

 1  1-> 5    97.9-   500.0
 2  5-> 6   347.5-   500.0
 3  6-> 0   156.4-   250.0
 4  1-> 6   256.7-   500.0
<       f1:page-   f2:page+     f3:erase
```

You can change between the two pictures with “cursor control right” and “cursor control left”. Date, time, warning type and related component can be read in the first picture. The next picture contains information on the function that has caused the warning, e.g. in No. 1 there has been changed from silo1 to equivalent silo 5, and 97.8 kg of the calculated total quantity of 500 kg were weighed, as the change took place.

Alarm and warning lists are emptied by pressing “f3”. Then follow the display.

Alarm and warning lists are left like other picture by “ESC”, but in this case it is possible at departure from the picture to zero set with alarm and warning indications in the main menu by pressing “f3”.

14.2.2 Alarm survey

Nr.	Alarm	Error	Remedy
01	No signal	Communication error on the data connection to one or more INPUT OUTPUT modules.	Check power supply to the current module. Check cables. Check address configuration.
02	O.dataerror (out-dataerror)	Data error occurs when the computer sends information to the current module.	Check power supply to the current module. Check cables. Check address configuration.
03	I.dataerror (in-data-Error)	Data error occurs when the computer receives information from the current module.	Check power supply to the current module. Check cables. Check address configuration.
04	Error 4	Over load of weighing amplifier	Check that the load on the weighing system is not too big. Possibly dismount the cables from the load cells and check if the problem disappears. Load cell may be defective. Weighing amplifier may be defective.
05	Error 5	Weight variations	Check that the load on the weighing system is stable. Possibly dismount the cables from the load cells to check if the problem disappears. Load cell may be defective. Weighing amplifier may be defective.
06	Sensor	Over load of load cells	Check that the load on the weighing system is not too big. Possibly dismount the cables from the load cells to check if the problem disappears. Load cell may be defective. Weighing amplifier may be defective.
07	Error 7	Error on weighing amplifier	Weigh.amplifier may be defect.
08	Available		
09	Not defined	The current INPUT or OUTPUT number is not defined in the configuration	Check INPUT or OUTPUT location tables
10	Open	INPUT-signal wrong status, should be closed.	Check configuration. Check that signal unit (switch, sensor) is in the correct position. Check INPUT module.
11	Manual	OUTPUT-board is in manual position.	Change to auto on MAN/AUTO converter on computer panel front.

Nr.	Alarm	Error	Remedy
12	Closed	INPUT signal wrong status, should be open.	Check configuration. Check that signal unit (switch, sensor) is in correct position. Check INPUT module.
13	Power supply 24v	Voltage from power supply is too low (<13v).	Check that the power supply is not overloaded. Check power supply.
14	Distance	The automatic distance adjustment of disc mill cannot reach the wanted adjustment.	Check mill for mechanical errors. Check cable connection to mill controller. Check power supply to mill controller (230vac and 24 vdc min. 3 amp.) Check configuration/adjustment of mill controller.
15	Available		
16	Available		
17	Available		
18	Available		
19	Available		
20	Max time	A time limit in a function exceeded. At restart the time measuring will start from the beginning.	Check that the process is correct. Check of possibly change the configuration for the function in question.
21	Recipe ?	A valid recipe is not chosen in the time table.	Check that the recipe is correctly programmed. Change to another recipe.
22	Weight	No valid value for weight is programmed in the time table or in one of the parameters for the operating function.	Check weight indication in the time table. Check and possibly change the weight indication in the configuration for the function in question.
23	No. cycles	No valid value for No. of cycles is programmed in the time table	Check and possibly change value for cycles in the time table.
24	No. scale?	The scale No. is not programmed correctly in function	Check and possibly change the scale Number in the function in question.
25	Silo ?	Silo number is not programmed correctly in recipe and component data	Check component data.
26	Max. Weight	The wanted weighing weight exceeds the programmed max. Limit for the weighing system.	Reduce the portion size in the time table. Increase, if possible the programmed weight limit in the intake function.

Nr.	Alarm	Error	Remedy
27	Precision	Actually weighed quantity of a component varies more from set point than the indicated permitted tolerance.	Check excess run value in silo parameters (at first start up it might be necessary to indicate an evaluated excess run). Check the precision tolerance in silo parameters. Check the mechanical transport to the weighing system. Bring the weight of the weighed within the tolerance field in order to continue the process.
28	Max time	A time limit in a function is exceeded. At restart the time measuring start from the beginning.	Check that the process goes correctly. Check and possibly change the configuration for the function in question.
29	Error flow	The flow speed from a component silo is slower that the programme min. Limit.	Check that the silo is empty. Check if the excess is blocked. Check the mechanical transport un to the weighing system. Check and possibly change the value for min. flow in silo parameters.
30	Transfer ?	No valid value for transfer is programmed in the time table.	Insert valid value for transfer in time table (1-50)
31	Max wait. (max. Waiting time)	The programmed max. waiting time for empty indication from ready feed silo is exceeded at transfer. At restart the time measuring start from the beginning.	Ready feed silo is empty. Check sensor. Increase value for max. waiting time transfer function if possible.
32	Not empty	Too much load on the scale at start up of a new weighing.	Empty mixer or weighing bin. Clean the scale. Increase possibly the value "max. weight before start" in the intake function. Zero set the scale.
33	Sensor	There is programmed stop on sensor for high level in ready feed silo, but not start on sensor at low level.	Check function parameters for transfer (parameter 11). Check that a valid INPUT location is indicated.
34	Pulse ?	A pulse unit (e.g. flow meter) is connected to an INOUT that is not prepared for that.	Connect pulse unit to physical INOUT 1-2 on module for total pulse counting or 3-4 for half pulse counting.

Nr.	Alarm	Error	Remedy
35	Error flow	Flow speed at transfer is lower than the programmed min. Limit.	Check if mixer or weighing bin is empty. Check if outlet is blocked. Check mechanical transport from weighing system. Check and possibly change value for min. Flow in transfer function parameters.
36	No. scale	Scale number is not correctly programmed in transfer function	Check and possibly change scale No. in the ongoing function.
37	Sensor	There is chosen transfer with sensor indication for empty scale, but INPUT No. for sensor is not defined in transfer function	Indicate INPUT number in parameter 7 in the transfer function.
38	Flow ?	Value for flow is not usable for theoretic calculation of time for intake.	Check silo parameter 7 and insert possibly relevant value for theoretic flow.
39	Therm. d.o1 (thermal drop out 1)	Entry 1 for thermal drop out is activated.	Check over current relay for all motors. Check frequency controller for error indication, if any. Check system INPUT parameters. Check INPUT locations.
40	Therm. D.o2 (thermal drop out 2)	Entry 2 for thermal drop out is activated.	Check over current relay for all motors. Check frequency controller for error indication, if any. Check system INPUT parameters. Check INPUT locations.
41	Current d.o. Current drop out	There has been current drop out during a process. The system goes on automatically.	
42	Current d.o. Current drop out	There has been current drop out during a process and the system has stopped.	Restart the process with "f3" in process status.
43	Time ?	No valid parameter value in the intake function is programme for intake on time.	Check and possibly change the value for intake on time in silo parameters (parameter 10)
44	Hopper ?	At intake of manual components from hopper there is not programmed valid value for hopper number in time table.	Check and change the value for hopper in time table. Check hopper parameters.

Nr.	Alarm	Error	Remedy
45	Flow hopp. (flow hopper)	Flow speed from a hopper is lower than the programmed min. Limit.	Check if the hopper is empty. Check if outlet is blocked. Check mechanical transport to weighing system. Check and possible change value for min. flow in hopper parameters.
46	Max pause	The max. Waiting time before start signal for a stop function is reached.	Reset alarm and activate start signal (e.g. ”f3” in process status). Check and possibly change parameter value for max. waiting time in stop function (parameter ”FORS.”)
47	Flow mill	At milling from weighing bin the flow speed is lower than the programmed min. Limit.	Check if weighing bin is empty. Check if outlet is blocked. Check mechanical transport from weighing system to mill. Check and possibly change value for min. Flow in milling function parameters (parameter 6).
48	Scale ?	Scale number is not correctly programmed in milling the function.	Check and possibly change scale Number in the function in question.
49	Sensor ?	There is chosen milling with sensor indication for empty scale, but INPUT No. for sensor is not defined in the milling function.	Indicate INPUT number in parameter 7 in the milling function.
50	Mill ?	Mill number is not programmed in the milling function.	Indicate mill No. in parameter 2 in the millling function.
51	Max.time	The programmed max. Waiting time for signal from empty indicator is exceeded at milling. At restart the time measuring starts from the beginning.	Check empty indicator function. Check INPUT location. Check and possibly change the parameter value for max. waiting time for empty indicator in the milling function (parameter 10).

14.3 Warning survey

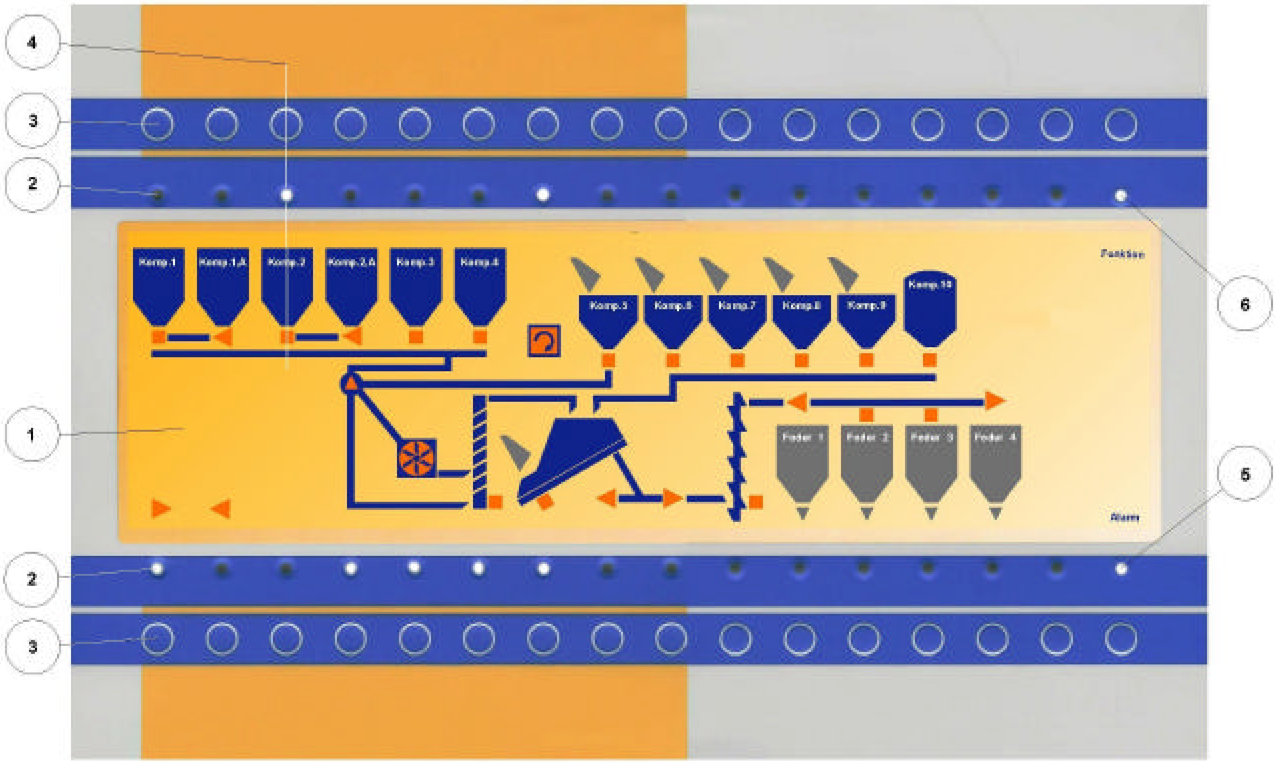
Warning	Error / occurrence	Note!
Equivalent	There is changed to another silo with the same component	Original component silo is empty and shall be refilled.
Replacement	Component silo is empty and the system could not find the same component in other silos. There is changed to the replacement component indicated in the recipe.	Refill component silo.
Comp.trig. (component trigger)	The indicated minimum stock is reached for a component silo.	Component silo should be refilled as soon as possible.

15 OPERATION

15.1 Manual operation

The front of the computer panel can, depending of plant size and complexity, be equipped with on or more so called system panels.

Fig. 4, System panel


4
3
2
1
2
3
6
5
Komp.1
Komp.1,A
Komp.2
Komp.2,A
Komp.3
Komp.4
Komp.5
Komp.6
Komp.7
Komp.8
Komp.9
Komp.10
Foder 1
Foder 2
Foder 3
Foder 4
Funktion
Alarm

The system panel comprises a flow diagram, fig. 4, pos. 1, designed individually for each plant which gives the user a good view of the current operation in the system.
Each system panel is equipped with 2 rows of 16 control lamps each, fig. 4, pos. 2, and belonging keys, fig. 4, pos. 3 for manual operation.

The flow diagram is designed so that each lamp and key is placed directly over or under the machine/function to which it refers, fig. 4, pos. 4 (variations may occur, but not without a distinct reference).
When a machine is activated in automatism or manual, the belonging lamp will be shining
The keys for manual operation will only be active, if the MAN/AUTO switch on the front of the computer panel is in position "MAN".
Manual operation is also possible, although the computer might be defective.
Press the key for starting a machine/function and press again for disconnecting.

NOTE! At manual operation, all security systems are out of operation.

Manual operation should only be carried out with extreme care, as it is important that machines and functions are started and stopped in the correct order.
If not, there will be great risk that material will block the system which at its worst may cause machine damage.

REMEMBER! After manual operation, the MAN/AUTO recipe switch must be reset to position “AUTO”, and alarms, if any, must be reset by pressing “f3:start” in the process control, before the system can resume automatic process.

Two of the lamps on the system panel will normally be reserved for showing of function status and alarm function, in this example fig. 4, pos. 5 and 6.
The alarm lamp switches on at stop because of error in the process.
The function lamp has three readings:

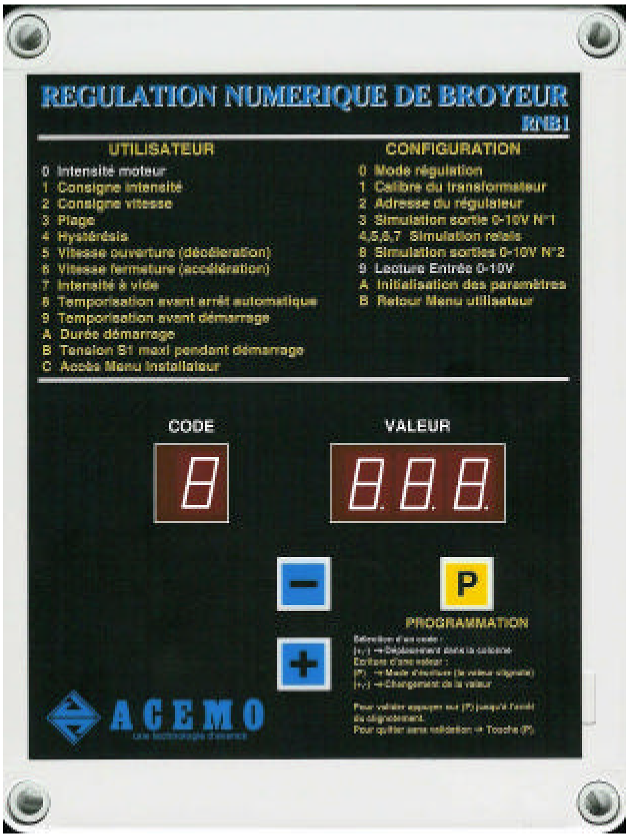
- It is switched off when the system is not operating (e.g. time tables cancelled, or if MAN/AUTO switch is in position ”MAN”, and at alarm).
- The lamp flashes if the system is ready for production, but actually no activity.
- Shines constantly when a process is ongoing.

15.2 Manual operation of disc mill with aut. adjusting

Manual adjusting of disc distance and speed for proportioning augers is possible via the front of the mill controller, if the MAN/AUTO switch on the front of the computer panel is in position “MAN”, and the mill is started manually (via the system panel).
The mill controller is normally placed inside the electric panel, but can also be placed outside.

NOTE! It is only permitted for authorized electricians to service components inside the electric panel while the current is on.

Fig. 5, Mill Controller


REGULATION NUMERIQUE DE BROYEUR
RNB1
UTILISATEUR
0 Intensité moteur
1 Consigne intensité
2 Consigne vitesse
3 Plage
4 Hystérésis
5 Vitesse ouverture (décélération)
6 Vitesse fermeture (accélération)
7 Intensité à vide
8 Temporisation avant arrêt automatique
9 Temporisation avant démarrage
A Durée démarrage
B Tension S1 maxi pendant démarrage
C Accès Menu Installateur
CONFIGURATION
0 Mode régulation
1 Calibre du transformateur
2 Adresse du régulateur
3 Simulation sortie 0-10V N°1
4,5,6,7 Simulation relais
8 Simulation sorties 0-10V N°2
9 Lecture Entrée 0-10V
A Initialisation des paramètres
B Retour Menu utilisateur
CODE
VALEUR
P
PROGRAMMATION
(+,-) → Changement de la valeur
Pour quitter sans validation → Touche (P)
ACEMO

The mill controller contains three user functions.
The code for the actual reading can be read in the display "CODE" and the actual value can be red in the display "VALEUR".

- CODE 0: Reading of mill ampere load (only readout). The value cannot be changed manually. If the controller keys have not be activated for some time, it is automatically switched over to this reading.
- CODE 1: Speed for frequency controlled auger (0-100)
- CODE 2: Disc distance in the mill (mm).
- CODE C: Access code to configuration menu (not user).

Change between the function with the keys "+" and "-".
To change a value in a chosen function, press short on "P" and the value in the display "VALEUR" start to flash. The value can now be changed with the keys "+" and "-".
Once the wanted value is set, press again the "P" key and keep it down until the display stops flashing, thereby indicating that the new value is registered.

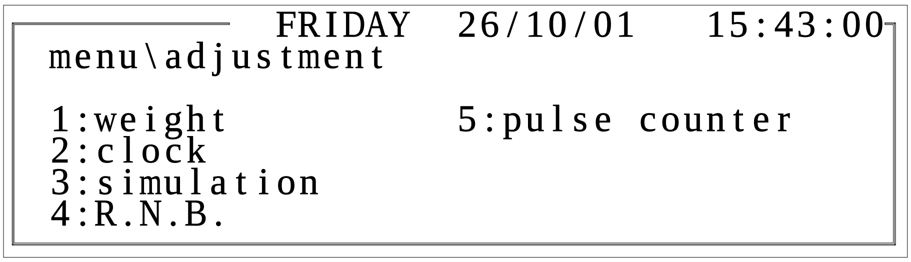
NOTE! Manual control of frequency controlled augers is only possible if auger and frequency controller are activated manually on the computer panel front (system panel).

It is not necessary to re-encode the original values after finished manual operation. as the system changes the values automatically when automatic operation is resumed.

16 SETTINGS

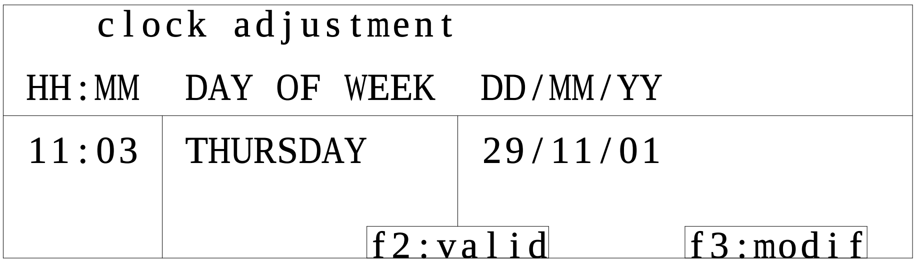
16.1 Setting of computer clock

Choose the function "Adjustments" in the main menu and choose the function "clock" in the sub menu.



```
                FRIDAY  26/10/01   15:43:00
menu\adjustment

1:weight              5:pulse counter
2:clock
3:simulation
4:R.N.B.
```

Now clock and calendar can be adjusted.



```
    clock adjustment

HH:MM   DAY OF WEEK   DD/MM/YY
11:03   THURSDAY      29/11/01

                f2:valid        f3:modif
```

Encode the correct values.
Day of week is changed by pressing "f3", when the curser is in the section.
Finish by pressing twice "f2".

16.2 Calibration of scales

In the main menu choose the function ”adjustments” and in its sub menu choose the function “1:weight”.

```
    weight adjustment
No  WEIGHT      GROSS VALUE

 1      0.0       9864      (ERROR)
 2
 3
      f1:call
```

In this picture you see the actual weight readout for all connected weighing systems and the “raw” internal system value can also be read (GROSS VALUE is used at service).
At technical errors on a weighing system, an error report can be read in the section (ERROR). See also the section “alarms and warnings” for more details on possible errors (alarm No. 1-7).

For calibration or adjusting the settings, press the ”f” key for the corresponding weighing system.

```
    weighing system adjustment  1

GROSS VALUE    9864          (ERROR)
WEIGHT           0.0
COEF A       0.3645
SIZE         0.1
GRADE          1
FILTER       16  f2:Coef A    f3:modif
```

In this picture the actual load on the scale can be read and the scale can be zero set by encoding 0.0 in the section weight.

“GROSS VALUE”, “COEF A”, “SIZE”, “STEP” and “FILTER” are internal values that the computer uses when it has to convert the weighing signal to a kilo value, and these values should not be modified, once determined during configuration/start up of plants.

At a new start up or at a noted weighing error, it is necessary to carry out the calibration procedure and “f2” is pressed.

```
     calculation of coef A

Gross weight:   9864
Empty the tank...............
Wait stability, low weight  :      0.0
Fill the tank................
Wait stability, high weight :    200.0
                               f3:calcul
```

The value in the section "Gross value" is the raw internal signal from the weighing system.
Check that this value increases when the load of the weighing system is increased.
At calibration, follow the instruction in the display.
Mixer or weighing bin must be absolutely empty and not activated when the value 0 is encoded in the section "wait stability, low weight".
Then the weighing system is loaded with a known weight (should be min. 10% of awaited total weight).
The load in kilo is encoded in the section "wait stability, high weight", while there are no other load of the weighing system, finish by "ENTER".
The text "f3:calcul" has now appeared at the bottom of the picture, and the key "f3" is pressed for finishing and storing the calibration.

Check in the previous picture that the weight reading turns to zero when the weighing system is not loaded.
If not, zero set as described.
Check now that the weight increases to the correct value when a known weight is laid on the weighing system.
The weighing must give the same result, no matter where on the scale the load is placed.
If the weight is not correct, check that there are no involuntary load from connected equipment, e.g. flexible connections to augers or the like.
The weighing system must have a perfectly free possibility to move. There cannot be fixed mechanical connections to other equipment.
Perhaps try to repeat the calibration procedure, until a satisfactory result is achieved.

16.3 Silo parameters

Some process parameters are attached to each single component silo.
It is rarely necessary to change the parameters when the plant has once been taken into operation.
It may occur that parameters for flow speed and automatic excess flow calculation must be adjusted, if component type of a silo is changed.

For all components taken in automatically or filled manually directly into weighing bin, a component silo is used (only one component silo for all manual components).

	Silo parameters Silo/hopper: 1	X/12
1	Auto/manual	Auto/manual
2	Measurement	Weight/flow/pulse/time
3	Minimum flow (kg/sec. or pulse/sec.)	0-999/0-999
4	Tempo after load (sec.)	0-999
5	Trail and flow calculation	Auto/manual
6	Measured trail (kg)	0-9999,9
7	Measured flow (kg/sec. or kg/pulse)	0-99,999
8	Accuracy +/- (kg)	0-9999,9
9	Pulse counter number.	0-3
10	Loading duration (sec.)	0-9999
11	Slow down output No.	0/110-129
12	Slow down trigger (kg)	0-9999

16.3.1 Parameter explanation for silo

1- Auto/manual start of component

Auto	The system takes automatically from the silo in question during weighing-in
manual	The system awaits start command (F3 in control window or external signal), before taking from silo during weighing-in

2- Method of measurement (definition how the system shall registrate the component that is taking in).

NOTE! The following parameter lines are not visible if they do not relate to the choice made in this line.

Weight	The system registers the component via the weighing system.
Flow	The component is taken in on time automatically calculated on basis of data in parameter line 7 (teoretic flow).
Pulse	The component is registered via counting of pulses e.g. from flow measurer when fluid is added. Weight per pulse is defined in parameter line 7.
Time	The actual component outlet is activated the programmed time in parameter line 10. When the time has passed, the system anticipates that the wanted quantity was taken in, and continues to next step of the process.

3- Minimum flow (kg/sec.)

0/0	No flow control. Is for example used at the fictive silo for the manual components.
1-999/1-999	Minimum flow speed at intake 5/60 as an example means, that the weight must rise with min. 5 kg during 60 sec. If the actual flow is smaller, the system stops and gives alarm as the silo is then probably empty. The flow number must be adjusted to the capacity of the plant. Note that with long transport lengths extra time must be calculated so that the component can reach the weighing system.

4- Tempo after load (sec.)

0-999	The time programmed is the time it takes to empty the transport system after stop of the component outlet. The time is depending on transport length and speed. The function enables the computer automatically to register and compensate for the excess flow.

5- Trail and flow calculation

Auto	Excess flow and flow are automatically registered and calculated (parameter 6-7).
manual	Data for excess flow and flow are fixed programmed values (parameter 6-7). This adjustment is chosen for the fictive silo used for the manually added components.

6- Measured trail (kg)

0-9999,9	The value for measured trail (excess flow) is automatically registered or is a fixed programmed value depending on the adjustment of parameter 5.

7- Measured flow (kg/sec.)

0-99,999	The automatically registered or fixed programmed value for flow speed for the component in the silo in question (depending on the choice in parameter line 5). The flow number is used by the system to calculate a theoretic time for intake if "weight" was chosen in parameter line 2, and the quantity to be taken in is smaller than the actual value for excess flow – or if intake was chosen according to theoretic "flow".

8- Accuracy +/- (kg)

0	No control.
1-9999,9	Specification of max. deviation (+/-) between the calculated and actual intake. If outside the limit, the system stops and alarm is given.

9- Pulse counter number

0-3	If intake per pulse was stated in parameter line 2, the number of the counter used (1-3) must be programmed in this line.

10- Loading duration (sec.)

0-9999	If "timed" intake was stated in parameter line 2, the duration for activating the component outlet must be programmed in this line.

11- Slow down output No.

0	The fine proportioning is not used.
110-129	In systems with very high requirements to accuracy of the weighing-in the proportioning equipment can be equipped with a fine proportioning mechanism that is activated during the last part of the weighing-in, or the speed of the proportioning auger, if any, is reduced. In this line the number of the general output function (110-129) activating the fine proportioning is programmed.

12- Slow down trigger (kg)

0-9999	When the fine proportioning function (parameter line 11) is used, it must be programmed in this line how many kg to be proportioned at last with reduced capacity.

16.4 Hopper parameters

In the "technician" menu you have access to hopper parameters being identical with silo parameters in function. However, these parameters only refer to hoppers used for manual components previously weighed and placed in a hopper in order automatically to be taken into the mixer later.
This function is among other things useful when adding manual components during operation at night.

17 FUNCTION TEST

17.1 Function Test of OUTPUT and INPUT Functions

At start up, operation disturbances or the like, it might be necessary to test manually the OUTPUT and INOUT functions of the computer.
Choose "adjustments" in the main menu.

```
            FRIDAY  26/10/01   15:43:00
 menu\adjustment

 1:weight             5:pulse counter
 2:clock
 3:simulation
 4:R.N.B.
```

Choose "simulation"

```
            FRIDAY  26/10/01   15:43:00
   menu\adjustment\simulation

 1:simulation outputs
 2:simulation functions
 3:simulation inputs
```

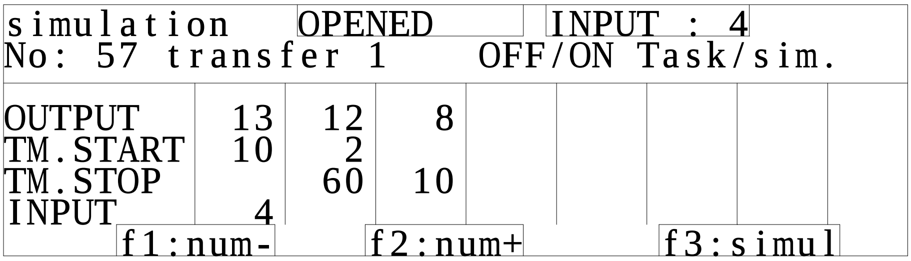
Outputs can be tested separately or as a part of a function, e.g. transfer.
Status on incoming signals can be read.

For test of outputs separately choose "simulation outputs".

```
     simulations\outputs                1/80
No   OUTPUT           MODE   STATE

  1  component1       AUTO     1
  2  component2       AUTO     0
  3  component3       AUTO     0
  4  component4       AUTO     0
      f1:page-       f2:page+
```

Test of outputs is only possible if the plant is in "AUTO" mode (MAN/AUTO switch on the front of the computer panel must be in AUTO position).
Choose the output you want to test, and encode "1" in the column "STATE" in order to activate.
Deactivation is done by encoding again "0".

Output functions, activating one or more outputs in a sequence, can also be activated in “simulation functions”.



```
simulation    OPENED        INPUT : 4
No: 57 transfer 1     OFF/ON Task/sim.

OUTPUT      13   12    8
TM.START    10    2
TM.STOP          60   10
INPUT        4
      f1:num-      f2:num+        f3:simul
```

The output functions are individually adapted to the various plants and the above picture is only an example of an output function for a transfer.

Output functions are programmed by a technician in connection with configuration of the plant.

The test function is primarily made to be used by the technician who then has the possibility to test all function before starting up the plant.

It is not possible to change the output functions inn this picture.

The number (1-129) on the function to be tested, is encoded in the second line, or it is scrolled by “f1” and “f2”.

When the simulation is activated by encoding “f3”, the system starts from the left and activates, in this example, output 13 first.

After that the system waits for 10 seconds before output 12 is activated, and then again 2 seconds before output 8 is activated.

The figures become visible one by one during the start up process.

The function is deactivated again by encoding “f3” once again, and then the stop procedure starts in the opposite order.

Output 8 is deactivated, then wait for 10 seconds before output 12 is deactivated.

Now wait for another 60 seconds before output 13 is deactivated and the function is interrupted.

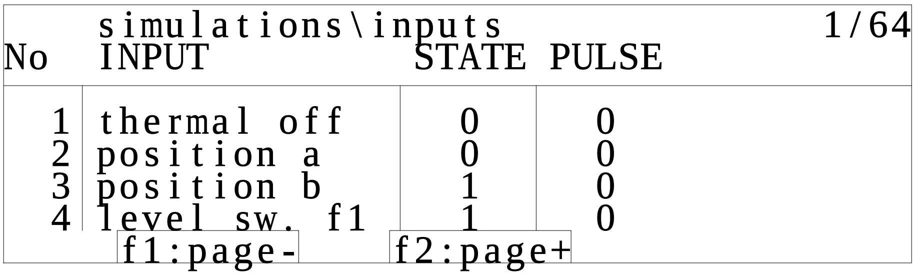
At programming of the output functions, conditions can be made in order that certain inputs must be activated at executing the functions.

In the above example input 4 must be activated when the start time for output 13 has expired.

If the state for the input is not correct, a warning is shown at the top of the picture.

17.2 Function Test of Input

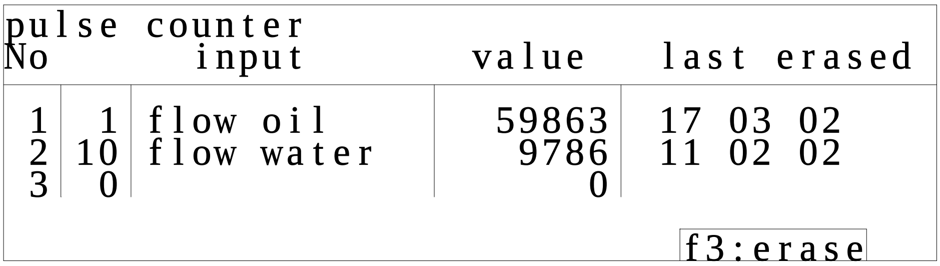
Choose ”simulation inputs” in the menu ”Adjust.test\simulation”.
Inputs can be tested in the below picture.



```
         simulations\inputs                    1/64
No   INPUT            STATE  PULSE
  1  thermal off        0      0
  2  position a         0      0
  3  position b         1      0
  4  level sw. f1       1      0
      f1:page-      f2:page+
```

The actual state on each input can be read in the column “STATE”.
Activated input is indicated by “1”.
If an input is used in connection with e.g. flow meter at proportioning of liquids,,, the number of counted impulses be read in the column “PULSE”.

A similar function for control of inputs used for pulse counting, is available in the menu “adjust/test”, in the function “pulse counter”.

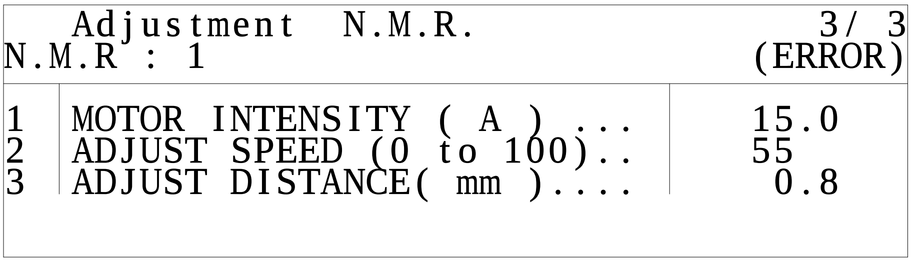


```
pulse counter
No        input          value    last erased
 1   1  flow oil         59863    17 03 02
 2  10  flow water        9786    11 02 02
 3   0                       0
                                     f3:erase
```

Three pulse-inputs can be surveyed at the same time in this picture.
In second column you choose input numbers.
In the column “VALUE” can be read how many impulses there are counted since the last zero setting by “f3”.
In the column “last erased” can be read on which date the figures last zero set.

17.3 Function Test Mill Controller

There can be no automatic processes ongoing when the mill controller is function tested.
The MAN/AUTO switch on the front of the computer panel is set in MAN position, and the mill is started via the manual start key on the system panel.
Choose “N.M.R.” in the menu “adjust/test”.



```
   Adjustment  N.M.R.                3/ 3
N.M.R : 1                         (ERROR)

1  MOTOR INTENSITY ( A ) ...      15.0
2  ADJUST SPEED (0 to 100)..      55
3  ADJUST DISTANCE( mm )....       0.8
```

Possible error reports regarding mill controller can be read in the top of the picture in the section (error).
Actual motor intensity on mill main motor can be read in the first parameter line.
The signal to the frequency controller of the proportioning augers can be read in line 2 (proportioning auger and frequency controller must be activated via the keys for manual operation on the system panel).
Disc distance in the disc mill can be modified in the last line.
At the new following recipe production the signal values for the proportioning speed and disc distance will automatically be set back to the what the recipe describes.

During automatic operation the current values can be read, but not modified.

18 EEC conformity Declaration

EEC CONFORMITY DECLARATION

SKIOLD Sæby A/S

Kjeldgaardsvej 3, 9300 Sæby, Denmark, Tel. No. +45 9989 8887

Hereby that the product

Description	Type
Computer controller	FlexMix

Is constructed and manufactured in conformity with
the following directives

Directive	Standard
89/392/EØF with revisions	DS/EN 292-1 DS/EN 292-2 DS/EN 294

Sæby, 24.03.2003
Place and date for issue

Henrik Hougaard
Managing Director