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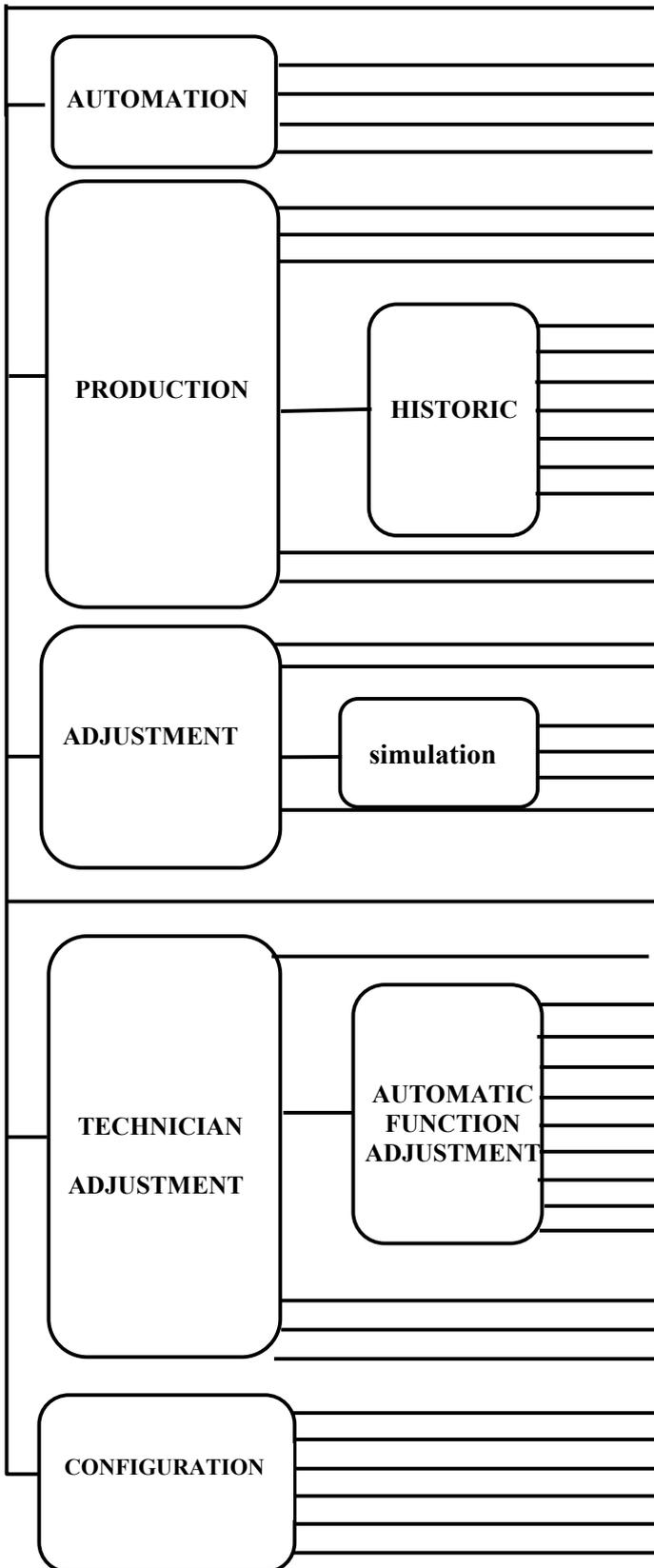
FLEXMIX SOFTWARE



FOR Version 3.25

27 JANUARY 2007

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PRESENTATION

SOFTWARE CHARACTERISTICS

The programming can either be carried from the computer, or from a PC (extra).

-50 ingredients, and for each one:

-10 nutritional elements.

-4 silos for storage.

-50 silos for raw material.

-40 silos for transfer.

-50 formulas using up to 20 ingredients.

-calculation of the nutritional elements for each formula.

-20 sequence tables where the automatic functions operate one after another (sequential), or in order to conditions (multiple).

-2 tasks and 6 levels per task to execute the automatic functions.

-possibility of many adjustments for each automatic function.

-40 time table providing many ways to start up the sequence tables.

-stock control for the silos and the ingredients.

-accumulators giving quantities in kg and in prices for the silos, the ingredients, and the formulas.

-registration of up to 3000 productions, including information on each component for an efficient trace.

-calculation of the fabrications per silo, per component, per recipe, or per transfer.

-registrations of the last 100 alarms.

-registrations of the last 100 warnings.

-96 digital outputs with programmable location on the output boards.

-128 digital inputs with programmable location on the input boards.

-3 mixers.

-3 weighing devices.

SCREEN & KEYBOARD USE

A screen displays many lines (up to 8), and a line contains fields that can be modified or not by the operator. A field can be a integer number, a decimal number, or a string of characters.

When a field has been keyed, it must be validated by pressing the Entr, Up, Down, Right, or left key.

If the keyboard has not been used a programmed time, the system comes back to the previous step of programming until it reaches the main menu display.

- **F1, F2, F3:** The functionalities of those keys are written on the last line of the display when they are used. They are usually used on that way:

F1: to switch to the following page.

F2: to switch to the previous page.

F3: specific facility (to modify data, to validate, to erase, to display the values available,...)

- **ESC:** escape, to come back to the previous step when programming. Keying on that touch, many times leads the user to the main menu.

- **UP:** to validate the modification of the field, and to point to the previous line without changing of column.

- **DOWN:** to validate the modification of the field, and to point to the next line without changing of column.

- **LEFT:** to validate the modification of the field, and to point to the previous field without changing of line.

- **RIGHT:** to validate the modification of the field, and to point to the next field without changing of line.

- **0,1,2,3,4,5,6,7,8,9, . , - :** numeric keys.

- **A,B,C,..,Z:** small size letters , large size letters with **Ctrl** key.

- **<:** to move the cursor of one character left when keying a string of characters.

- **>:** to move the cursor of one character right when keying a string of characters.

- **Blank:** blank character, when keying a string of characters.

- **Enter:** to validate the modification of a field without changing of field.

- **Shift:** always used simultaneously with an other key to give it an other meaning.

Ctrl + Up: to switch to the previous page without changing the column.

Ctrl + Down: to switch to the next page without changing the column.

Ctrl + Left: not used.

Ctrl + Right: not used.

- **Print:** to get the print function according to the actual screen.

- **Control:** to switch to the real time control display.

- **Copy:** to recall the last number keyed, or the last string of charactors entered.

STARTING UP

At power up, the system first executes boot software during 10 seconds, then switches to the main menu.

During boot, the technician can enter «1234» to access the boot program that contains functionalities about the computer board:

- read the program memory.
- erase the flash program memory.
- download the flash program memory from a PC.
- checksum of the program memory.
- read the ram memory.
- write into the ram memory.
- read the flash program memory.
- test the real time clock.
- test the serial link 1 &2.

Boot software has been designed to be used by technicians only.

IMPORTANT: Boot access is very dangerous; the system program can be erased.

MAIN MENU

From this screen the user can access any program of the software. The contents of the menu are adjusted according to the level of password selected. Four levels are available:

- 'read only', no password is validated, all data can be read, and nothing can be modified except the password.
- 'user', read and modify can be achieved on the user data.
- 'technician', read and modify can be achieved on the user data and technician data.
- 'configuration', read and modify can be achieved on all the data.

If no key is used for a long time, the Flexmix can come back automatically on the main menu (see «configuration »).

Information is also displayed:

- Software version number.
- Date and time from the internal clock of the system.
- State of the task1 & 2 about the automatic process.
 - 'TASKx' not displayed, no automatic process is running on that task.
 - 'TASKx' blinks, « time table » is validated, an automatic process can start at any moment.
 - 'TASKx' displayed, an automatic process is running on that task.
- Number of warnings occurred since the last erased of that counter, it is displayed only if it is different from zero. This counter is erased from the « historic of warning ».
- Number of alarms occurred since the last erased of that counter, it is displayed only if it is different from zero. This counter is erased from the « historic of alarms ».

COMPUTER CONFIGURATION

- 1) Language:** (English,Russian, Danish, German,Polish)
- 2) Weighing device number:** (0 to 3), number of weighing devices connected to the computer.
- 3) Outputs device number:** (0 to 6), number of outputs board connected to the computer.
- 4) Inputs device number:** (0 to 16), number of inputs board connected to the computer.
- 5) RNB device number:** (0 to 3), number of RNB devices connected to the computer.
- 6) Clear codes if no key (mn):** (0 to 99 minutes). If set to 0, this functionality is not used. Otherwise, all the passwords will be devalidated when the keyboard has not been used for that time.
- 7) Back menu if no key (mn):** (0 to 99 minutes). If set to 0, this functionality is not used. Otherwise, the system generates an ESC if the keyboard has not been used during that time. On that way, its comes back automatically to the main menu.
- 8) Printer speed serial 2:** Speed of the serial link 2, when it is connected to the printer. This serial link is also used to download the program from a pc, and to communicate with the pc.
- 9) Printer word size serial 2:** Must be set to 8 for the serial printer.
- 10) Printer line delay (ms):** When printing, this time delay is inserted between each line.
- 11) Warning duration (sec) :** At the begining of an automatic process, or after a power failure if a process is running (whatever the state of the procees), the system activates the warning1(2) outputs according to the task ,during that time delay.The aim is to inform the user a process is going to start. If set to zero, this functionality is ignored.
- 12) Timetable off at power on (yes/no):** If set to «yes», after a power failure, the general validation for Timetables is disabled. If set to «no», this functionality is ignored.
- 13) Stop process at power on (yes/no):** When a power failure occurs during a process, at power on the system can work according two ways:
 - 1) If set to «yes», the warning output if activated, the process is stopped and alarm n°42 is set and registrated.
 - 2) If set to «no», the warning output if activated, the process goes on, and alarm n°41 is registrated.
- 14) Pc speed serial 2:** Speed of the link 2, when it is connected to a pc. 115200 bauds is suitable when Flexmix is directly connected to a pc. If a modem is used, this speed must be set about 9600 bauds.
- 15) Keyboard cyrillic(0/1):** '0' for latin keyboard , '1' for cyrillic keyboard.

Q (Б)	W (Ц)	E (У)	R (К)	T (Е)	Y (Н)	U (Г)	I (Ш)	O (Ж)	P (З)	
A (Ф)	S (Х)	D (В)	F (А)	G (П)	H (Р)	J (О)	K (Л)	L (Д)		
Z (Я)	X (Ч)	C (С)	V (М)	B (И)	N (Т)	M (Ь)				

Й Ы Э Ъ Ю Щ can not be keyed

16) Horse trainer (yes/no) : if set to "yes" Flexmix is Horse trainer operating , otherwise it is normal operating.

Horse trainer operating : As soon as real time control is selected , Flexmix displays only the horse trainer realtime control screen . User can choose the program to execute , start it , follow the process , and cancel it . From this display , to get Flexmix normal display , just enter “thoraso” .

Program to execute are sequencetables from 1 to 10 . Those sequencetables can contain only 3 kinds of automatic functions : "outputs on/off" , "tempo" , and "pause" .

OUTPUTS ALLOCATION

The technician set the functionality of every relay of the output boards according the user's plant and the electromecanic wiring.

Each relay output is identified by the system with its number

Line: (1 to 96), output number.

Designation: 12 characters for the name of the output.

Card: (0 to 6), number of the output board connected to the serial link. It is selected by jumpers on the output board. If set to zero, all the line will be ignored.

Output: (0 to16), number of the output channelon the outputs board. If set to zero, all the line will be ignored.

	Designation	Card	Output
1	row material 1	1	1
2	row material 2	1	2
3	Commun screw	1	3
4	mill 1	1	4
5	Mixer 1	1	5
6		1	6
7		1	7
8		1	8
9		2	1
96		6	16

INPUTS ALLOCATION

The technician set the functionality of every digital input of the input boards according to the user's plant and the electromecanic wiring.

Each digital input is identified by the system with its number.

Line: (1 to 128), input number.

Designation: 12 characters for the name of the input.

Card: (0 to 16), number of the input board connected to the serial link. It is selected by jumpers on the input board. If set to zero, all the line will be ignored.

Input: (0 to 8), number of the input channel on the inputs board. If set to zero, all the line will be ignored.

	Designation	Card	Input
1	go on input	1	1
2	stop input	1	2
3	mill stop input	1	3
4	low end silo 1	1	4
5	low end silo 2	1	5
6	low end silo 3	1	6
7	.....	1	7
8	.....	1	8
128		16	8

OUTPUTS FUNCTIONS

When operating, the computer don't activate a simple relay output, but it activates successively many outputs which are linked with delays and input checks, we call that a function of outputs.

The system contains two kinds of outputs functions:

System Outputs Functions. The name of each function is defined and corresponds to an important and standard element in the automatic process (row silos, mills, mixers, end silos, etc...). Because it is more concise, we often write System outputs.

General Outputs Functions. The name of each function is defined by the technician and corresponds to a specific group of I/O. Because it is more concise, we often write General outputs.

Warning! During automatic process, only two functions of outputs using a commun output can be activated at a time.

Each function is identified by a number but the designation is very convenient to understand the operating way of the plant.

S1,S2,S3,S4,S5,S6,S7,S8 are the 8 output number.

T1M,T2M,T3M,T4M,T5M, T6M,T7M,T8M, are the 8 delays used during activation.

T1A,T2A,T3A,T4A,T5A ,T6A,T7A,T8A, are the 8 delays used during desactivation.

I1,I2,I3,I4,I5,I6,I7,I8 are the 8 input number.

The process of function activation is:

- if output S1 not already activated
 - Activation output S1, time delay T1M,
 - if I1 is not zero:
 - If S1 is not zero, check contact on input I1 is closed.
 - If S1 is zero, check contact on input I1 is opened.
 - Validation of the continuous check for this input.

- if output S2 not already activated
 - Activation output S2, time delay T2M,
 - if I2 is not zero:
 - If S2 is not zero, check contact on input I2 is closed.
 - If S2 is zero, check contact on input I2 is opened.
 - Validation of the continuous check for this input

-
-
- if output S8 not already activated
 - Activation output S8, time delay T8M,
 - if I8 is not zero:
 - If S8 is not zero, check contact on input I8 is closed.
 - If S8 is zero, check contact on input I8 is opened.
 - Validation of the continuous check for this input.
- End of activation.

- During the activation of the outputs, if a level input is not right, an alarm is set.
- All the inputs that are programmed in the function of outputs are continuously checked during the automatic process, and an alarm is set when a wrong input state is detected. In that case outputs from S8 to the wrong input are deactivated at once, and other outputs to S1 are deactivated regarding the stop delays.

The process of a standard deactivation is:

- if output S8 not already deactivated
 - Desactivation output S8, devalidation of the continuous check for input I8.
 - Time delay T8A.
- if output S7 not already deactivated
 - Desactivation output S7, devalidation of the continuous check for input I7.
 - Time delay T7A.
-
-
- if output S1 not already deactivated
 - Desactivation output S1, devalidation of the continuous check for input I1.
 - Time delay T1A.

SYSTEM OUTPUT FUNCTIONS

The number of line (1 to 109) is read only, and it is used by the system to identify the system outputs concerned.

Warning! During automatic process, only two functions of outputs using a common output can be activated at a time.

Designation: 12 characters for the name of the output function, can't be modified.

O.: (0 to 96), number of the output.

Tm: (0 to 999 sec), Time delay before read the input and activate the next output.

Ta: (0 to 999 sec), Time delay before deactivate the previous output.

In: (0 to 128), number of the input to check.

		output 1				.....	output8						
	Designation	O	Tm-	Ta-	In	O	-Tm-	Ta-	In	O	- Tm-	Ta-	In
1	Auto1	00-	000	-000	-000	00-	000	-000	-000	00-	000	-000	-000
2	Alarm1												
3	Warning1												
4	Auto2												
5	Alarm2												
6	Warning2												
7	sil01												
8	sil02												
..												
55	sil049												
56	sil050												
57	Transfer1												
58	Transfer2												
..												
95	Transfer39												
96	Transfer40												
97	Mixer1												
98	Mixer2												
99	Mixer3												
100	Mill1												
101	Mill2												
102	Mill3												
103	hopper1												
104	hopper2												
105	hopper3												
106	hopper4												
107	hopper5												
108	hopper6												
109	hopper7												

Auto1(2) : according to the task selected(1 or 2), these outputs work as the following:

Auto1(2) outputs	Time table validation	Automatic process
Permanent activation	Yes or no	running
Alternate activation	yes	off
Desactivation	no	off

Warning 1, 2: Before starting up an automatic process, and after a power failure at power back, the system activates the warning1(2) outputs according to the task, during the time delay entered in the « computer configuration ».

The aim is to inform the user a process is going to start.

Alarm1, 2: According to the task selected, as soon as an alarm is detected, this output is activated. It is deactivated after a restart from the user or when the process is terminated.

Silo1,..., 50:

Transfer1,..., 40:

Mixer1,..., 3:

Mill1,..., 3:

Hopper1,..., 7: not used in that program.

GENERAL OUTPUT FUNCTIONS

The number of line (110 to 129) is read only, and it is used by the system to identify the general outputs concerned.

Warning! During automatic process, only two functions of outputs using a commun output can be activated at a time.

Designation: 12 characters for the name of the output function.

O.: (0 to 96), number of the ouput.

Tm: (0 to 999 sec), Time delay before read the input and activate the next output.

Ta: (0 to 999 sec), Time delay before deactivate the previous output.

In: (0 to 128), number of the input to check.

	Designation	Output 1				.....	output8						
		O	Tm-	Ta-	In	O	Tm-	Ta	-In	O	-Tm-	Ta	-In
110	00-	000	-000	-000	00-	000	-000	-000	00-	000	-000	-000
111												
112												
113												
114												
115												
116												
117												
118												
119												
120												
121												
122												
123												
124												
125												
126												
127												
128												
129												

SYSTEM INPUTS ADJUSTMENT

Task : 1

Designation	Input number	Contact state	Contact time
Remote start	01	Closed	1
Remote stop	02	Closed	1
Waiting	03	Opened	2
Security1	04	Opened	1
Security2	05	Opened	2

The computer can control 2 different tasks at a time, and each task has its own separate inputs.

Remote start: During an automatic process, and when the system is stopped, a pulse activation of this input restarts the process. This functionality can be also achieved from the keyboard of the computer.

Remote stop: During an automatic process, a pulse activation of this input stops the process. A start command will restart the process. This functionality can be also achieved from the keyboard of the computer.

Waiting: During an automatic process, the system is stopped while this input is activated, and operates normally while this input is deactivated. This input is taken in count according the value of the "hour" parameter in the sequence table.

Security 1: During an automatic process, pulse activation on this input generates a security that stops the process. Generally, the disjunction contacts of the electromecanic box are wired on this input.

Security 2: During an automatic process, pulse activation on this input generates a security that stops the process. Generally, the disjunction contacts of the electromecanic box are wired on this input.

Input number: (0 to 128), number of the digital input where is connected the contact. If zero, the system doesn't care of the functionality.

Contact state: (closed, opened), state of the contact to activate the functionality of the input.

Contact time: (0 to 99 sec), the contact must be activated (closed or opened, according to the previous choice) during that time to assume the functionality of the input is achieved.

SILOS & HOPPERS ADJUSTMENTS

One screen per silo with the following data to program.

Silo: (1 to 40), to choose the silo number.

1) Auto/Manual: (1 for auto mode, 0 for manual mode).

-In Auto mode, during the loading process, the silo output is automatically activated.

-In Manual mode, during the loading process, the silo output is activated only if the user presses on the restart key from the keyboard (F3) or from a remote box.

2) Measurement: way to measure the quantity of ingredient loading into the tank. 4 ways are used:

-weighing, the quantities are measured by weighing and by flow (small quantities).

-flow, the quantities are always measured by a duration calculated from the flow (kg/sec).

-pulse, the quantities are always measured by pulses calculated from a flow (kg/pulse).

-time delay, the silo output is activated during the programmed time, and the quantities loaded are assumed to be as programmed in the recipe.

	weighing	flow	pulse	time delay
3) alarm mini flow	yes	yes	yes	yes
4) tempo after load'	yes	yes	yes	yes
5) trail & flow calculation	yes	no	no	no
6) trail value	yes	no	no	no
7) flow value	kg/sec	kg/sec	kg/pulse	no
8) precision	yes	yes	yes	yes
9) input number	no	no	yes	no
10) time delay	no	no	no	yes

3) Alarm mini flow: (xxx.x kg/ xxx sec). This parameter contains 2 values defining a flow that correspond to the weight change (kg) during a time delay (sec). Under this value a replacement ingredient is used, or the system creates an alarm n°29. In case of hopper, an alarm n°29 is always generated.

If one of those values is set to zero, this functionality is not used.

4) Tempo after load: (0 to 999 sec), time delay at end of loading to get good weight stability so as to calculate the actual quantity loaded.

5) Trail & flow calculation: Auto, the trail and the flow are automatically updated at each loading. Manu, the trail and the flow are only manually adjusted.

The trail is the weight increase between the output stop and the end of "tempo after load".

It is used to calculate the stop weight at the beginning of a loading ingredient process.

Weight stop = actual weight + quantity to load - trail.

If the trail is great in respect to the quantity, the system calculates an activation time according to the flow value (see Flow value parameter).

6) Trail value: (0 to 999,999 kg), if « auto » is set for parameter 5, this value is automatically calculated at the end of each loading cycle. At each calculation, the trail modification represents 50% of the measured trail, with a limitation to +-5 kg.

7) Flow value:

-weighing measurement, (0 to 99,999 kg/sec), value that corresponds to the average flow that can be measured during a loading. It is automatically updated if «auto» is set for parameter 5. The system uses this data to measure the small quantities in the following case: quantity to load < trail + (precision/2).

In that way, the quantity to load into the tank is measured by activating the silo output during a time calculated like this:

Activation time in seconds = weight to load / flow.

If set to zero, the loading by flow is impossible, and the small quantities are loaded by weighing: stop weight = actual weight + quantity/2.

The quantity in kg assumed to be loaded is calculated in order to the achieved time activation.

-flow measurement, (0 to 99,999 kg/sec). The quantity to load into the tank is measured by activating the silo output during a time calculated like this:

Activation time in seconds = weight to load / flow.

If flow is set to zero, the loading is impossible, and an alarm n°38 is generated (flow set to 0).

The quantity in kg assumed to be loaded is calculated in order to the achieved time activation.

-pulses measurement, (0 to 99,999 kg/sec). The quantity to load into the tank is measured by activating the silo output until the calculated number of pulses has no been received.

Number of pulses to receive = weight to load / flow.

If flow is set to zero, the loading is impossible, and an alarm n°38 is generated (flow set to 0).

The quantity in kg assumed to be loaded is calculated in order to the received pulses.

8) Precision: (0 to 999,999 kg). At the end of each loading process, if the difference between the actual quantity and the set quantity is less than the precision value, the loading is assumed good. Otherwise a "Precision alarm n°27" is generated; the process is stopped, and waits for a restart from the user.

If set to zero, this functionality is not used.

9) Pulse counter number: (0 to 3). Number of the pulse counter used during loading this silo. The features of counter must be programmed in the adjustment of the pulse counter.

If set to zero, the loading is impossible, and an alarm n°34 is generated (input set to 0).

10) Time delay: (0 to 9999 sec). The quantity to load into the tank is measured by activating the silo output during that time.

If set to zero, the loading is impossible, and an alarm n°43 is generated (time set to 0).

The quantity in kg assumed to be loaded is always the value programmed in the recipe.

Calculated in order to the achieved time activation.

11) Slow down output: (0,129), number of the function of out puts to activate for reducing the speed of the loading before reaching the set point. When the set weight is reached, the slow down outputs are deactivated. The aim is to increase the accuracy.

This functionality is deasabled if slow down ouput is set to zero, or if measurement mode is not "weighing".

12) Slow down trigger: this value in kg is used to calculate the weight level which activates the slow down output. Weight trigger = weight set - slow down trigger.

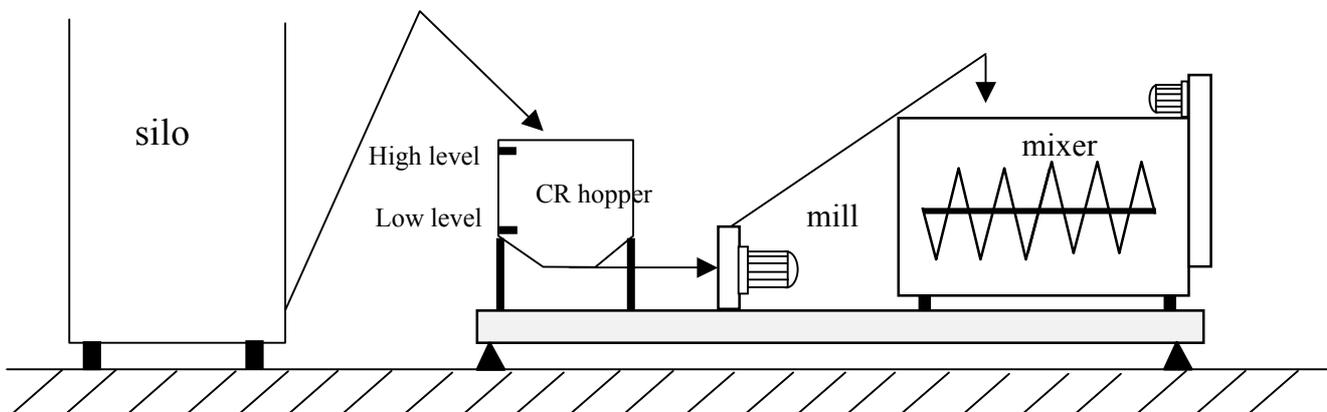
13) Input low Level : (0,128), if set to "0" this functionality is not used . Number of the input that is connected to the empty sensor of the silo , during a loading without weight , and with a measurement set to flow , time , or pulse . When an empty silo is detected , Flexmix switches to equivalent , then to replacement as standard working in that situation .

14) contact state : (opened or closed) when the silo is empty .

16) contact time : (0 to 999 seconds) , contact must be closed or opened (according to previous choice) during this time to assume silo is empty.

LOADING FUNCTION ADJUSTMENT

MOST COMPLEX LOADING DEVICE



Adjustment number: (1 to 10), and 12 characters to identify the functionality.

1) Loading source:

silo: the ingredients from silos are loaded into a tank.

hopper: The ingredients from silos have been manually loaded into a hopper. The automatic process loads from the hopper during production.

2) Weighing system number: (1 to 3)

3) Maxi weight before start: (kg). Before the start of the loading function, the system checks the weight value. If it is greater than this parameter, an alarm n° 32 « not empty » is generated. If set to zero, parameter no used.

4) Maxi Weight: (kg). Capacity of the main tank. If the quantity to load added to the start weight is over that value, an alarm n°26 « maxi weight » is generated. This parameter must be always programmed.

5) Maxi weight decrease: (kg, not used). During the execution of that function, the weight decreased must not be greater than the value programmed here, otherwise an alarm is generated.

6) Hopper: (0 to 7). Only used if loading source is set to « hopper ».

= 1 to 7, this value is the hopper number to activate during production. The system does not take in count the hopper number in the time table.

= 0, the hopper number to activate during production, is selected by the time table as described in the following table:

hopper in the time table	hopper selected during process
0	no hopper , and alarm n°44
1 to 7	1 to 7
11 to 17	11 to 17 - 11 + cycle number

The user has loaded in the right hopper ingredients from silos.

The concerned ingredients and silos are programmed in the recipe with the same « group » as the Loading function in the sequence table.

During this loading process, the system calculates the quantity to load from the hopper by selecting in the recipe the concerned ingredients depending of the group number.

If the quantity is zero, the system goes to the next function, otherwise it execute the hopper loading function. If the hopper number calculated is not ok, an alarm n°44 is generated.

7) Outputs loading number: (0,110 to 129), if different from zero, this function of outputs is activated a time delay before the weighing function.

8) Time delay before function: (0 to 99 sec). If parameter n° 7 set to 0, time delay is not used. At the beginning of the function, the system starts to activate the loading outputs, executes this time delay, and then continues the function. At the end of the function, the system executes this time delay, starts to deactivate the loading outputs, and then switches to the next function.

9) Mill number: (0 to 3), if zero, no mill is activated. Otherwise, the concerned mill is activated at the beginning of the loading function, and is deactivated at the end.

10) Time delay to start the mill: (0 to 99 sec). Not used if mill number is set to nul.

If not zero, at the beginning of each loading , mill is started,start time delay executed , and then silo is activated.(same working as previous versions)

If zero is set here, time delay to start the mill can be set in the last step of the mill function of outputs. At the beginning of each loading , mill is started,and as soon as the mill function of outputs is achieved , silo is activated. This way , if a long stop time delay is set on the function of the mill, the mill is not stopped between two loadings and no time is wasted to start a mill that is not stopped.

11) Mixer number: (0 to 3). Number of the mixer which is used .If zero, the mixer is not used and the system doesn't care of the following four data about the mixer.

12) Mixer stop trigger: (kg). Flexmix uses this parameter to calculate the mixer stop weight as: mixer stop weight = silo stop weight – mixer stop trigger . At the end of each ingredient loading, when the actual weight reaches the mixer stop weight , mixer stops . It restarts at the beginning of the next ingredient or if weight is 10 kg lower than the mixer stop weight . This way mixer do not blink when actual weight is moving near the mixer stop weight , and loading precision is increased . If set to zero, this functionality is ignored .

13) Mixer start trigger: (kg). When weight is higher this value , mixer runs continuously. When weight is lower this value minus 10 kg , mixer is alternated mode. This way mixer do not blink when actual weight is moving near the mixer start trigger .

14) Mixer on time: (0 to 9999 sec)

15) Mixer off time: (0 to 9999 sec). Those 2 parameters define the alternated mode.If one is set to zero, the mixer does not run, else the mixer alternates running and stopping periods according to the programmed values:

Mixer on time	mixer off time	what happen?
0	any value	No running
Value > 0	value > 0	Alternated running
Value >0	0	No running

16) Mill regulator address: (0 to 3), this number defines the mill regulation box address.If set to zero, no transmission to the mill regulator occurs.

17) Time delay to adjust the mill: (0 to 99 sec), the adjustments programmed in the formula are transmitted to the mill regulator at the beginning of each ingredient loading. The silo outputs are activated at the end of that time delay. If an hopper is used, the mill adjustment executed is the adjustment of the first component of the recipe that belongs to the hopper.

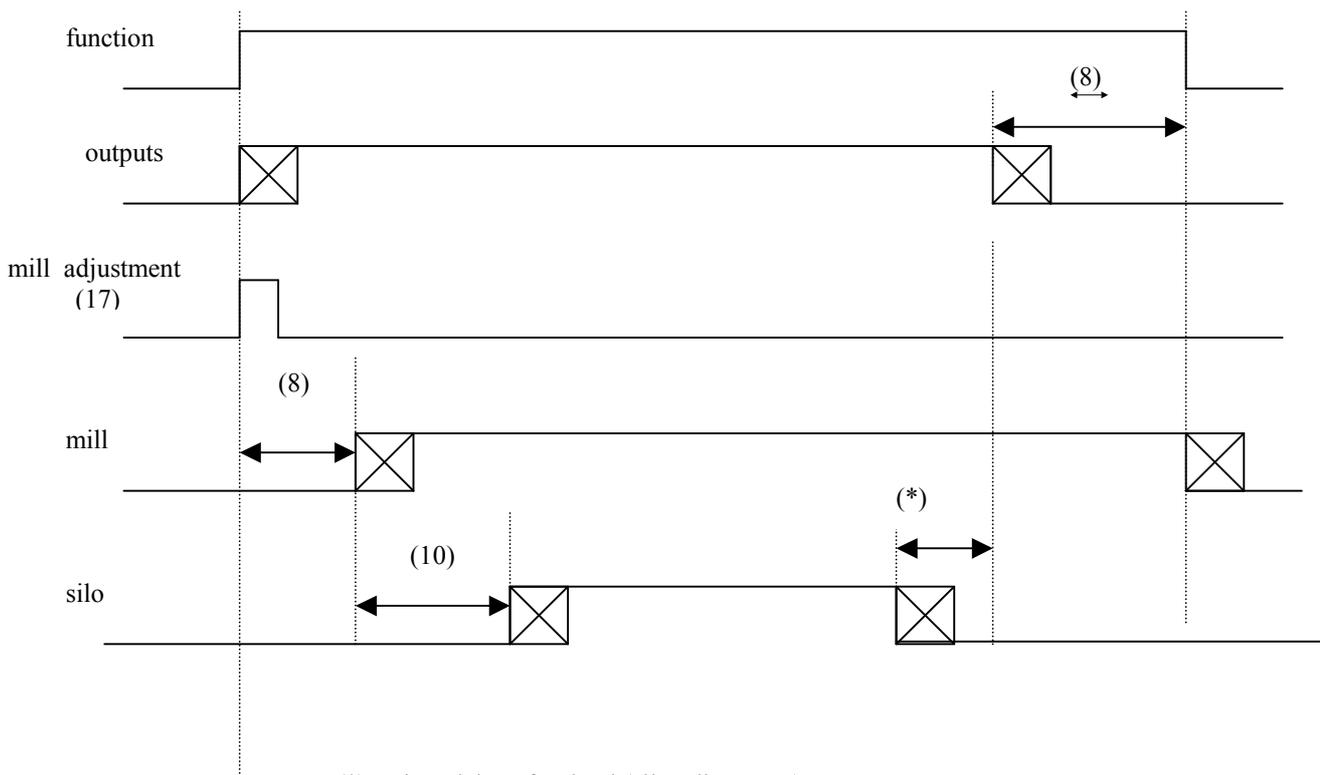
18) Multiloading (yes/no): if set to yes, the multiloading mode is selected. The capacity of the tank (parameter4) is lower than the quantity to load. The Flexmix automatically divides the quantity and executes many loading process and emptying process to acheive the entire quantity programmed. The emptying process is programmed with the next parameter.

19) Emptying adj.number: (0 to 10), number of the adjustment of the emptying function used by the multiloading mode. Not used if multimode is set to no.

20) Input low level: (0 to 128). Set to zero if this function is not used.
 Number of the input that connected to the empty sensor of the silo. During a loading without weight ,and mesasured set to flow, time or pulse, when an empty silo is detected, Flexmix switches to equivalent, then to the replacement, as working in that situation.

21) Contact state: (Open, Close), state of the contact of the level sensor when the the silo is empty.

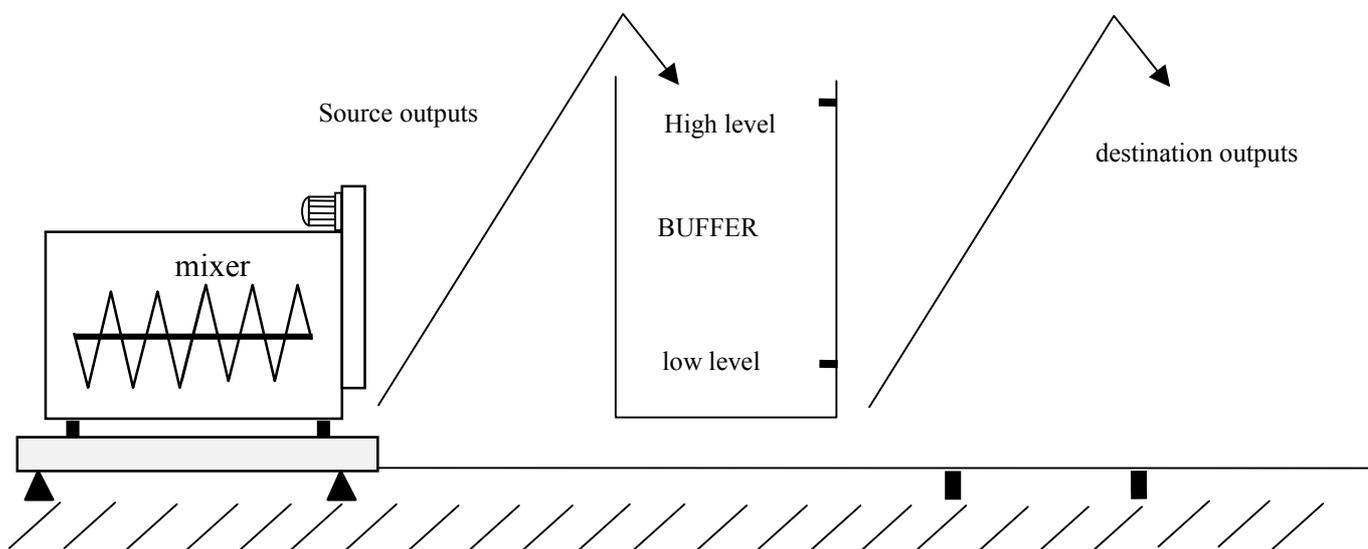
22) Contact time: (0 to 999sec), the contact must be closed or opened (according to the previous choice) during that time to assume the silo is empty.



- (*) = time delay after load (silo adjustment)
- (8) = time delay before function (mill)
- (10) = time to start the mill
- (17) = mill adjustment

EMPTYING FUNCTION ADJUSTMENT

TYPICAL DEVICE



Adjustment number: (1 to 10), and 12 characters to identify the functionality.

1) Emptying mode

weighing mode: Emptying is controlled by the weight.

sensor mode: Emptying is controlled by a sensor.

The following parameters are used if emptying mode is set to **weight**.

2) Weighing system number: (1 to 3)

3) Maxi weight to empty: (kg). If the weight transferred during this function reaches this value before the mini weight, the function is stopped, and the system switches to the next function of the “sequence table”. If set to zero, this functionality is not used and the tank is entirely empty.

4) Mini weight: (kg). When the weight reaches this value, the time delay after mini tank is executed to completely empty the tank and the mechanical device that carries the ingredients.

5) Mini flow (kg:/sec): Those 2 values define a flow that corresponds to the weight changing (kg) during a time delay (sec). If the throughput measured is under, the system generates an alarm n°35. If one of the two parameters is set to zero, this test is not used.

6) Time delay after mini tank: This time delay is executed after the mini weight is reached, or after the low level sensor for emptying is true. (0 to 999 sec).

The following parameters are used if emptying mode is set to **sensor**.

7) Input number for emptying: (0 to 128). Set to zero if this function is not used.

Number of the digital input where is connected the low level sensor which is used to know if the tank is empty or not.

8) Contact state: (Open, Close), state of the contact of the level sensor when the tank is empty.
Contact time: (0 to 99 sec).

9) Contact time: (0 to 999sec), the contact must be closed or opened (according to the previous choice) during that time to assume the tank is empty.

10) Maxi time for emptying: (0 to 32000 sec). The emptying function must not exceed that time; otherwise an alarm n° 20 is generated. If set to zero, the duration maximum is unlimited.

Low level sensor on buffer:

11) Input for low level buffer: (0 to 128): If zero, the system doesn't care about this functionality, and starts immediately to empty the tank.

If not zero, the system waits for this input before emptying the tank. General emptying outputs and destination outputs are activated.

12) Contact state: (open, close), state of the contact of the low level sensor.

13) Contact time: (0 to 99 sec), the contact must be closed or opened (according to the previous choice) during that time to assume the low level is good.

14) Maxi waiting time: (0 to 9999 sec) . The time the system waits for the low level must not exceed that value, otherwise an alarm 31 is generated. During this waiting time, the source outputs are deactivated, and the destination outputs and the general emptying outputs are activated . If set to zero, that duration is unlimited.

High level sensor level on buffer:

15) Input for high level buffer: (0 to 128): If zero, the system doesn't care about this functionality.

If not zero, the system checks this input to stop emptying the tank and to wait again for the low level. During this waiting time, the source outputs are deactivated, and the destination outputs are activated

16) Contact state: (open, close), state of the contact of the high level sensor.

17) Contact time: (0 to 99 sec), the contact must be closed or opened (according to the previous choice) during that time to assume the high level is good.

18) Weight per cycle: (kg) . Used only if emptying mode is set to weight.

If zero, the system doesn't care about this functionality. If not zero, the system stops emptying when the quantity transferred reaches that value, then it waits for the low level sensor to restart emptying. If the low level functionality is not validated, the system waits for a start from the keyboard or from the remote start button.

Mixer operating:

19) Mixer number: (0 to 3) set to zero if no mixer is used.

20) Mixer start trigger: (kg). Used only if emptying mode is set to weight.

The mixer is activated permanently when the weight is lower than that value.

Set to zero, if the mixer doesn't care about that parameter.

If the mixer number is validated and the weight trigger not reached, the mixer operates according to the values of "mixer on" and "mixer off".

21) Mixer on time: (0 to 9999 sec)

22) Mixer off time: (0 to 9999 sec) when selected, the mixer can alternate running and stop period according to the programmed values:

IN sensor mode, the mixer runs in alternate when the end sensor is not activated, and it runs permanently when the end sensor is activated.

Mixer is stopped during the waiting for low level buffer.

Mixer on time	Mixer off time	what happen?
0	Any value	No running
Value > 0	Value > 0	alternated running
Value >0	0	No running

23) Outputs emptying number :(0,110 to 129), if different from zero, this outputs function is activated a time delay before the destination outputs.

24) Time delay before destination: (0 to 99 sec) .After the beginning of the activation of the emptying outputs, this time delay is executed, and then the destination outputs are set on.

25) Time delay after destination: (0 to 99 sec) .After the beginning of the desactivation of the destination outputs, this time delay is executed, and then the emptying outputs are set off.

26) Outputs destination number:

=0, if not used.

=110 to 129, general outputs function.

=200, number of transfer programmed in the “time table”.

Activation at the beginning of the function, after the end of this activation, the source outputs is then activated.

Desactivation, when the empty has to stop.

27) Time delay before source (0 to 99 sec). After the beginning of the activation of the destination outputs, this time delay is executed, and then the source outputs are set on.

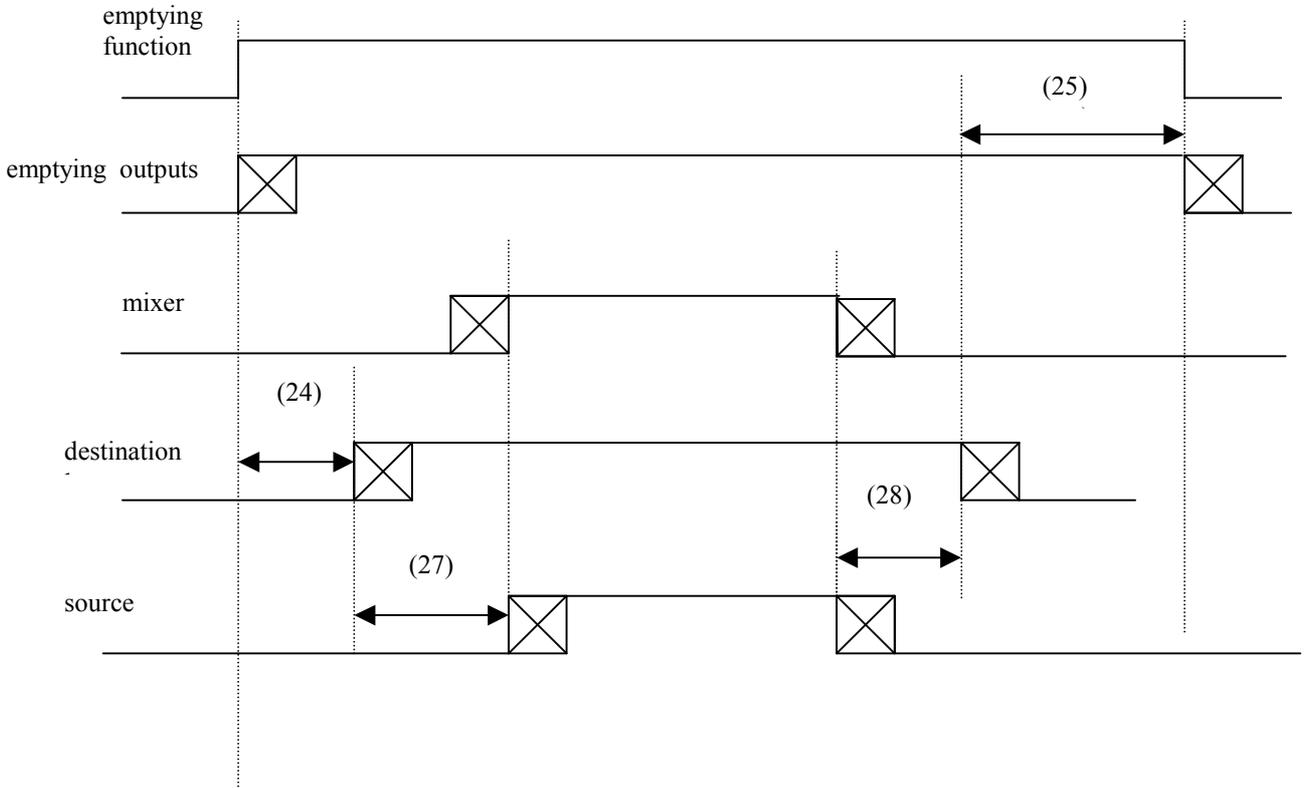
28) Time delay after source (0 to 99 sec). After the beginning of the desactivation of the source outputs, this time delay is executed, and then the sources outputs are set off.

29) Outputs source number: (0,100 to 119) it is desactivated during the waiting for low level.

30) Low level buffer before end (0/1): used only if the input for low level buffer is not zero.

= 0, when the main tank is empty, the low level buffer is ignored, Flexmix terminates the function.

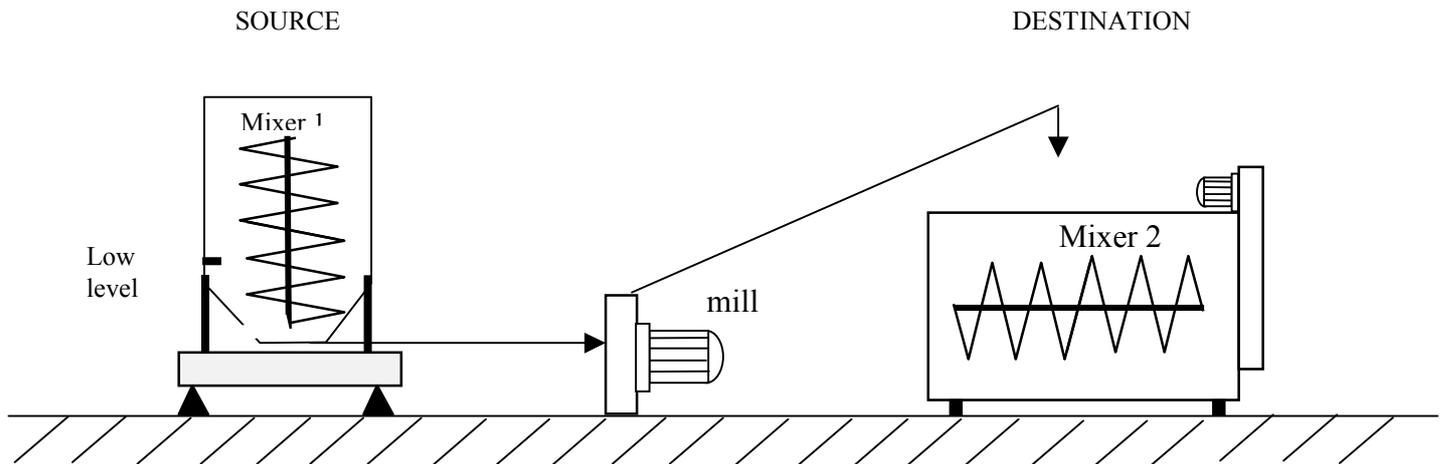
= 1, when the main tank is empty, the system waits for the low level on buffer before ending the function by activating the destinations and general outputs.



(24) = delay before destination
(27) = delay before source
(28) = delay after source has been stopped
(25) = delay after destination has been stopped

MILLING FUNCTION ADJUSTMENT

MOST COMPLEX MILLING DEVICE



Adjustment number: (1 to 10), and 12 characters to identify the functionality.

1) Milling mode:

-milling weight: the end of the milling function is provided by a mini weight.

-milling sensor: = the end of the milling function is provided by a low level sensor.

2) Mill number: (0 to 3), number of the mill, set to zero if that function is not used.

3) Weighing system number: (1 to 3)

The 3 following parameters are used only if the milling mode is set to **weight**.

4) Mini weight: (kg). When the weight reaches this value, a time delay is executed to completely empty the tank and the mechanical device that carries the flour.

5) Time delay after mini weight: (0 to 999 sec).

6) Mini flow (kg/sec): Those 2 values define a flow that corresponds to the weight changing (kg) during a time delay (sec). If the throughput measured is under, the system generates an alarm n°xx. If one of the parameter is zero, this test is not used.

The 4 following parameters are used only if the milling mode is set to **sensor**.

7) Digital input number: (1 to 128), number of the digital input where is connected the low level sensor which is used to know if the tank is empty or not.

8) Contact state: (Open, Close), state of the contact of the level sensor when the tank is empty.
Contact time: (0 to 99 sec),

9) Contact time for end: (0 to 999sec), the contact must be closed or opened (according to the previous choice) during that time to assume the tank is empty.

10) Maxi time for milling: (0 to 999 min). The milling function must not exceed that time; otherwise an alarm n°51 is generated.

Source mixer operating:

11) Output number for source mixer: (0 to 129) set to zero if no mixer is used.

12) Slow down trigger: (kg) .Used if milling mode set to weight.

The mixer is activated permanently when the weight is lower than that value.

Set to zero, if the mixer doesn't care about that parameter.

If the output number is not zero, and the weight trigger not reached, the mixer operates according to the values of “mixer on” and “mixer off”.

13) Contact time for mixer on: (0 to 99 sec). Used if milling mode set to sensor.

The contact of low level sensor must closed or opened (according to the contact state) during that time to start the mixer continuously.

If set to zero, or if the low level not reached the mixer runs only according to the two following parameters.

14) Mixer on time: (0 to 9999 sec)

15) Mixer off time: (0 to 9999 sec) when selected, the mixer can alternate running and stop period according to the programmed values:

Mixer on time	mixer off time	What happen?
0	any value	No running
Value > 0	value > 0	Alternated running
Value >0	0	No running

Destination mixer operating:

16) Mixer number: (0 to 3) set to zero if no mixer is used.

17) Mixer on time: (0 to 9999 sec)

18) Mixer off time: (0 to 9999 sec) when selected, the mixer can alternate running and stop period according to the programmed values:

Mixer on time	mixer off time	What happen?
0	any value	No running
Value > 0	value > 0	Alternated running
Value >0	0	No running

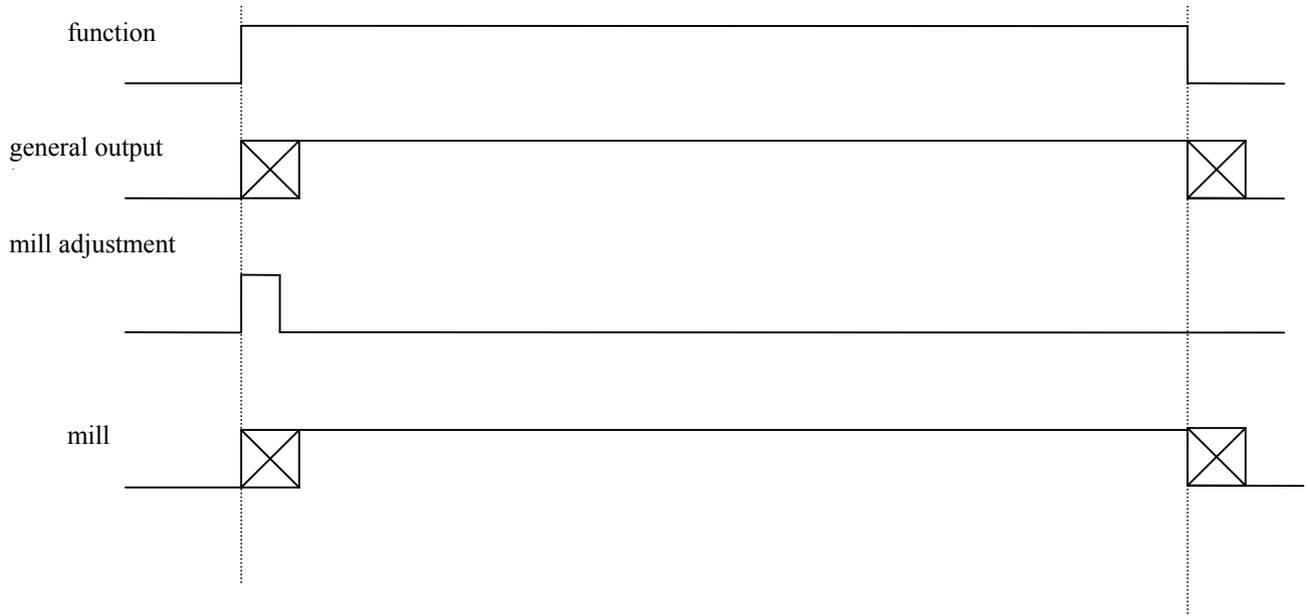
19) General outputs number :(0,110 to 129), if different from zero, this outputs function is activated at the beginning of the milling function and deactivated at the end.

20) Mill regulator address: (0 to 3), this number defines the mill regulation box address.If set to zero, no transmission to the mill regulator occurs.

21) Sensor chang. end milling: (0 to 255 sec), to validate end milling sensor when milling mode is set to sensor.

If set to zero: the contact of the sensor must be activated (closed or opened according to the contact state parameter 9) during the time programmed in parameter 9 to validate end milling.

If different from zero(1 to 255 sec): The contact of the sensor must be have been deactivated at least during the hereby value before it is activated, to validate end milling.



TEMPO FUNCTION ADJUSTMENT

The computer does not modify the state of the outputs, and at the end of the time delay, it switches to the next function.

Adjustment number: (1 to 20), and 12 characters to identify the functionality.

Weighing system number: (0 to 3), the weight of the device selected is displayed in the real time control function.

Time delay: (0 to 9999 sec).

OUTPUTS ON&OFF FUNCTION ADJUSTMENT

In this chapter, are described the adjustments for the two functions “output on” and “output off”.

Those functions can activate or deactivate up to 8 outputs that belongs to a function of outputs which is defined in the “system outputs functions” or in the “general outputs function”.

If the duration time is not zero, the “output on” function activates the outputs during that time and then deactivates all of them before switching to the next function of the sequence table.

If the duration time is zero, the outputs can be deactivated only through an “output off” function.

An alternate activation can be selected for the adjustments 1 to 2.

If the waiting state is activated, all the outputs are stopped for the concerned task. They restart as soon as waiting is deactivated.

When a function of outputs that has been activated by an “outputs on” is restarted after a power cut , or after a start key , all the concerned outputs are first activated regarding the start delays . The process goes on only when this activation is achieved .

A function of outputs that has been activated by an “outputs on “ with a duration set to “0” , can be restarted only by a “start all levels “ command from keyboard .

Adjustment number: (1 to 20), and 12 characters to identify the functionality.

1) Weighing system number: (0 to 3), the weight of the device selected is displayed in the real time control function.

2) Time delay before activation: (0 to 9999 sec), at the start of the function, this time delay is executed before the beginning of the activations of the outputs.

3) Outputs number: number of the function of outputs to activate (0 to 129 or 200).

If zero, no outputs are activated.

If 200, the function of outputs will be the function of outputs of the transfer number of the timetable .

4) Mixing time: (yes, no).

-If set to « yes », the duration of the activation of the output is the « mixing time « programmed in the Timetable. In that case, parameter n°5 is not used.

-If set to « no », the duration of the activation of the output is the « duration » programmed with the following parameter.

5) Duration: (0 to 9999 sec), used only by an “outputs on” function when Mixing time is set to « no ». This time delay begins at the same time that the start of the outputs activation.

If zero, the system switches to the next function , as soon it begins the outputs activation. An « outputs off » function must be set up to deactivate the outputs.

If not zero, the system executes this time delay, begins the outputs deactivation, and starts the time delay after deactivation.

The two following parameters are only used for the adjustments 1 and 2. If one of those two parameters is set to zero, the alternated running mode is disabled and the selected outputs runs permanently.

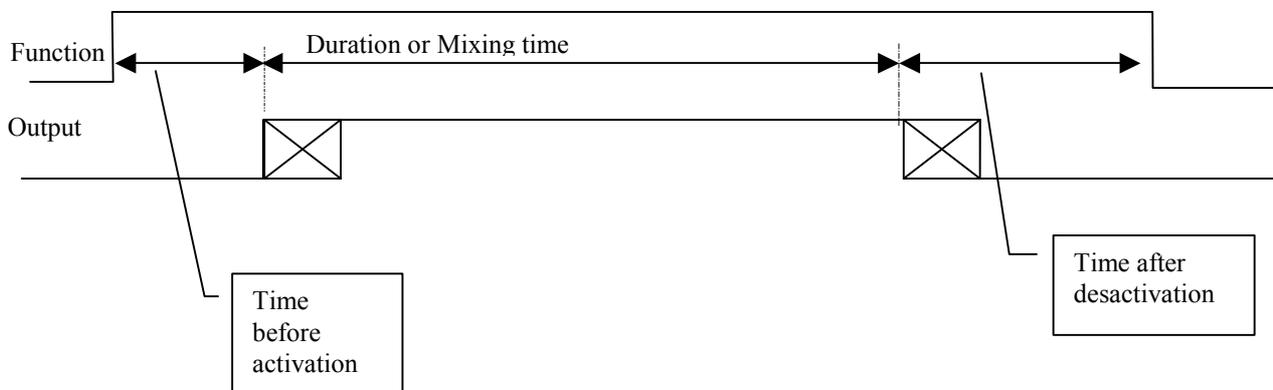
6) Outputs on time: 0 to 999 sec.

7) Outputs off time: 0 to 999 sec.

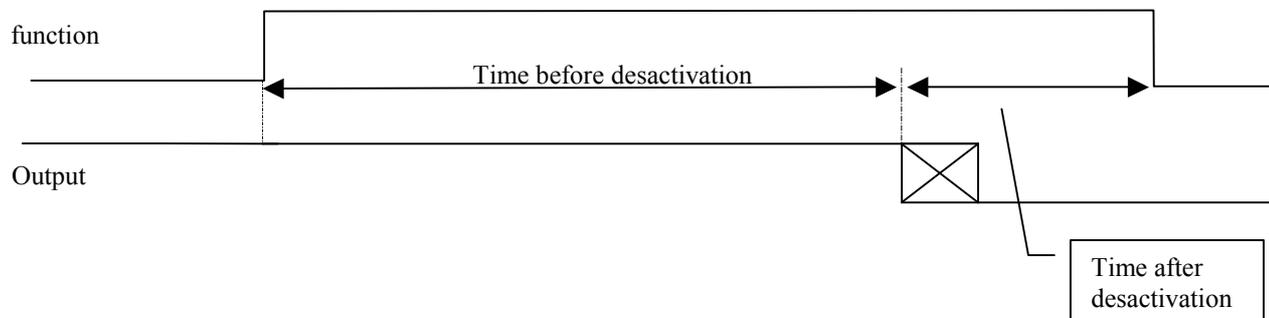
8) Time delay before deactivation: (0 to 9999 sec), used only at the beginning of an “outputs off” function. At the end of that time delay the outputs deactivation begins.

9) Time delay after deactivation: (0 to 9999 sec), this time begins with the outputs deactivation, at the end of that time, the system switches to the next function.

OUTPUTS ON TIMING



OUTPUTS OFF TIMING



VALID SENSOR FUNCTION ADJUSTMENT

The system checks the input selected during a programmed maximum time. As soon as the input has been activated during the time programmed (contact time), the system switches to the next function of the "sequence table". If the input has not been activated before the maximum time duration, the computer stops the execution of the "sequence table" for the current cycle, and switches to the next start up programmed in the "time table".

Adjustment number: (1 to 10)

1) Weighing system number: (0 to 3), the weight of the device selected is displayed in the real time control function.

2) Sensor on transfer silo: (0, 1).

= 1, the sensor is used as a low level sensor on a transfer silo.

-actual input number = input number + transfer number.

=0, the sensor is a general sensor:

-actual input = input number.

3) Input number: (0 to 128), number of the digital input that is used to calculate the actual input number where is connected the sensor concerned. The calculation is described with the previous parameter.

If the actual input from calculation is zero, the function "valid sensor" can not work properly, and in this case the system assumes the sensor is not activated, terminates the actual function, and switches to the next line of the time table.

4) Contact state: (Opened, Closed), state of the contact of the sensor to assume the actual input is activated or true.

5) Contact time: (0 to 99 sec), the actual input must be activated (closed or opened according to the previous choice) during that time to assume this function is true. Then, the system switches to the next function of the "sequence table".

6) Maximum waiting time: (0 to 9999 sec), when the waiting time to get the activation of the actual input exceeds this value, the computer stops the execution of the "sequence table" on hand, and switches to the next start up programmed in the "time table". If set to zero the waiting time is unlimited, Flexmix waits until the activation of the sensor.

7) For first cycle only (1): (0, 1)

=0, the "valid sensor function" is executed when it is programmed on the sequence table.

=1, the "valid sensor function" is executed when it is programmed on the sequence table, and during the first cycle. On that way, the function is executed one time, during the first cycle.

8) Busy sensor : (0, 1)

= 0 : functionality deactivated.

= 1 : when executing a valid sensor , if the contact state is activated, Flexmix switches to next function and internally set a busy flag for that sensor. While internal busy is set, all future valid sensor return sensor not activated. At the end of production, all the internal flags that have been set by this task are reset.

WAIT FOR SENSOR FUNCTION ADJUSTMENT

The system checks the input selected during a maximum time. As soon as the input has been activated during the time programmed (contact time), the system switches to the next function of the “sequence table”. If the input has not been activated before the maximum time duration, the computer stops the execution and generates an alarm. A restart command by the user will start again the function.

Adjustment number: (1 to 10)

1) Weighing system number: (0 to 3), the weight of the device selected is displayed in the real time control function.

2) Sensor on transfer silo: (0, 1).

= 1, the sensor is used as a low level sensor on a transfer silo.

-actual input number = input number + transfer number.

=0, the sensor is a general sensor:

-actual input = input number.

The transfer number is programmed in the time table.

3) Input number: (0 to 128), number of the digital input that is used to calculate the actual input number where is connected the sensor concerned. The calculation is described with the previous parameter.

If the actual input from calculation is different from 1 to 128, the function “valid sensor” can not work properly, and in this case the system generates an alarm n°49.

4) Contact state: (Opened, Closed), state of the contact of the sensor to assume the actual input is activated or true.

5) Contact time: (0 to 99 sec), the actual input must be activated (closed or opened according to the previous choice) during that time to assume this function is true. Then, the system switches to the next function of the “sequence table”.

6) Maximum waiting time: (0 to 9999 sec), when the waiting time to get the activation of the actual input exceeds this value, the computer generates an alarm n°20, and waits for a command from the user. ”. If set to zero the waiting time is unlimited, Flexmix waits until the activation of the sensor .

HOPPERS ADJUSTMENT

Same as silos adjustment. The only difference is there is no replacement for the hopper, an alarm n°29 is generated. (See silos adjustment)

PAUSE FUNCTION ADJUSTMENT

The computer does not modify the state of the outputs, and waits for a remote start, or a computer start to switch to the next function. While waiting, a maximum time delay is running, if no start command has been received at the end of the time delay, an alarm n°46 is generated.

Adjustment number: (1 to 20), and 12 characters to identify the functionality.

Weighing system number: (0 to 3), the weight of the device selected is displayed in the real time control function.

Time delay: (0 to 999minuts), maximum waiting time for the start command. When it is acheived an alarm n° 46 is generated, and a start command restarts the function. ”. If set to zero the duration of the “pause” is unlimited, Flexmix waits until a start command is entered.

START SEQ.TABLE FUNCTION ADJUSTMENT

This function starts a second sequence table on the other task that must be free at that moment. This start seq.table function is terminated as soon as the second sequence is running. If Flexmix can not start the second sequence table before the end of a time delay , an alarm n° 53 is generated.

Adjustment number: (1 to 20), and 12 characters to identify the functionality.

Time delay: (0 to 999minuts), maximum waiting time before starting the second sequence table. When it is acheived an alarm n° 53 is generated, and a start command from keyboard restarts the time delay. . If set to zero the duration is unlimited.

Seq.table: (0 to 20), number of the second sequence table to start. If zero an alarm n°52 will be generated during automatic process.

SEQUENCE TABLES

The system works with 20 tables, each table is composed of 25 lines for the programming of different automatic functions. Two kinds of tables can be built:

- 1) sequentiel: the function are executad one after an other, in the same order they are entered.
- 2) multiple: up to six functions can be executed at the same time according the conditions programmed.

The basic functions available are:

- 0, Nop
- 1, Loading
- 2, Emptying
- 3, Milling
- 4, Tempo
- 5, Outputs on
- 6, Valid Sensor
- 7, Wait Sensor
- 8, Outputs off
- 9, Pause
- 10, Sequence table

Sequence table: 16 Multiple

	Functions	Adjusments	Group	Hour	C	Conditions				Ala.
1	0-Nop	..	.		N					0
2	4-Tempo	01 1 0 s e c o n d s	.		F	- 2	0	0	0	0
3	5-Outputs on	01 g a t e s i l o	.		F	-3	2			0
4	8-Outputs off	01 g a t e s i l o	.		L					0
5	6-Valid.sensor	01 s i l o / t r a n s f .	.		F					0
6	7-Wait.sensor	01 m i n i m i x e r 1	.		F					0
7	1-Loading.	01 c e r e a l s .	. 1		N					0
8	2-Emptying	01 m i x e r 1	.		N					0
9	3-Milling	01 b y s e n s o r	.		N					0
..
25	0-Nop	.. .....	.		N					0

Sequence table: (1 to 20), number of the table, and 12 characters for the identification of the table.
Sequentiel/Multiple: running way for the sequence table. If multiple is selected, a second screen is available to program the conditions for the start of the functions.

Function: (0 to 9) code of the function for the automatic process.

Adjustment: (1 to 20), number of the adjustment table where are programmed the operating conditions for the function.

Group: (0 to 9) only used with the loading and milling functions.

--> Loading : the system loads in the tank the ingredient of the recipe whose group number is equal to this value.

If set to zero, the system loads in the tank all the ingredient of the recipe.

--> Milling :

- groupe = 0: the mill ajustement executed is the ajustement of the first component of the recipe.

- groupe != 0: the mill ajustement executed is the ajustement of the component of the recipe whose group number is equal to this value.

If group number doesn't exist in recipe then flexmix go to the next function of the sequence table .

_Hour: (0 to 3). This data defines a way to put the concerned function of the automatic process in a waiting state according to conditions. The conditions can be the waiting input level or periods of times. When the conditions are not right the function process is stopped, Flexmix is in a waiting state, and "att.relay" or att.timet." is displayed. It restarts automatically when the conditions become right again.

=0, no waiting state occurs; the system is always running (normal state).

= 1, the waiting input is taken in count. The "att.relay" waiting state is set if the waiting input is activated (see system input adjustment).

= 2, the enable hours table is taken in count. The "att.timet" waiting state is set if the two following conditions are ok:

- Enable hours table is validated.
- The real time clock in not inside a period for the present day.

(See enable hours table)

=3, the waiting input and the enable hours table are taken in count.

Code (C) : (N,F,L)

"N"(Normal) The function is executed for all cycles

"F"(First) The function is executed only at first cycle

"L"(Last) The function is executed only at last cycle

Conditions, used and available only in multiple mode. Five conditions can be entered to determinate the start of the function. A function on a line can start only if all the conditions keyed are true. A condition consists of the line number:

line number = 0, no condition, the condition is always true.

line number < 0, the function on that line number must be terminated for the previous cycle to assume the condition is true.

line number > 0, the function on that line number must be terminated for the current cycle to assume the condition is true.

Ala. (Alarm level) : (only in mode multisequence) , this parameter is used as alarm link. During a process, if an alarm occurs when executing this function, this function is stopped, and the other functions working on that moment will be stopped also if their "alarm level" is same or higher as the function that got a problem. Functions with a smaller "Alarm level" will continue running.

If set to "0", the function is entirely independant regarding alarms . It does not disturb other functions, and it can not be disturbed by other functions.

REAL TIME CONTROL

From any menu , 'control' key enters on that program , from main menu, 'F1' can also be used . Real time control displays the different steps that are running during an automatic process. Two tasks can works together, and for each task six automatic functions can be executed together. Keys 'F2' and 'F3' are used to stop, to start, or to cancel the selected process.

Two screens are available, an overview screen and a detail screen.

Real time screen 1(overview):

Timetable: xx	Sequen.tab: xx-.....
Recipe.....: xx	Cycles.....: xxx/xxx
Transfer...: xx	Function.....: xx-.....
Task.12....: xx	Adjustment: xx-.....
Level123456: x	State: xx- normal
Weight 1->xxxx.x	2->xxxxx.x 3->xxxxx.x.....
f1: detail	f2: choice f3: stop

-general informations are displayed , the parameter selected by moving the cursor is invert video . By pressing F1 , a screen with the details of this parameter is generated. When going back from the details , real time screen 1 is still displayed .

Pressing 'control' key switches always to the details of the running process.

'Esc' goes back to the menus.

-time table running , 'F1' key switches to timetables windows for programming.

-recipe running , 'F1' key switches to recipes windows for programming.

-transfer running , no detail.

-task : only running tasks are displayed :

-normal video , the task is working .

-blinking video , task is not working properly .

- One or more levels of the task are stopped because of an alarm or a stop key ,

- outputs activated by "output on" have got an alarm .

A running task can be entered and 'F1' key swiches to the details of the process according the level selected below . If no task operates , 'F1' key is ignored .

-level 1,2,3,4,5,6: only running levels of the selected task are displayed :

-normal video , the level is working .

-blinking video , the level is not working properly . It is stopped because of an alarm or of stop key

A running level can be entered and 'F1' key switches to the details of the process . If no task operates , 'F1' key has no action .

-sequence table running, when this items is selected, 'F1' key switches to sequence windows for programming .

-cycles xxx/xxx : running cycle number/ total number of cycles programmed. Second value can be reduced as possible from the time table.

-process function running , 'F1' key switches to the details of the process .

-process adjustment running , 'F1'key switches to adjustments windows of the current function for programming (if technician password ok).

- state : state of the process :
- normal : process is running
- att.relay : process is stopped because input "waiting" is activated ,and it will restart automatically when input "waiting" will be desactivated (see enable hours)
- att.timet : process is stopped because time clock is not inside the time periods and it will restart automatically when the time clock will be inside the time periods (see enable hours)
- stop key , process is stopped because user has pressed on a key of the FLEXMIX.
- stop dose , emptying is stopped (see parameter 18 of emptying adjustments)
- remote stop , process is stopped because remote stop input has been activated(see system inputs adjustments)
- alarm xx : process is stopped because of alarm xx. . F1' switches to a detail window for the alarm . 'F1' key is ignored if no alarm.

Weighing devices connected are always displayed .

```

Alarm ... N° : xx- .....
Function.. ..: xx-.....  Recipe ...: xx
Quant.prog : xxxxx.x    Silo.....: xx
Q.acheived : xxxxx.x    Transfer : xx
Weight..... : x- xxxxx.x
Out/input . : ..... - .....
    
```

Real time screen 2(overview):

-main values of the process for the function selected are displayed . From that screen 'ESC' or 'Control' return back to screen 1.

**From screen 1 and screen 2 , user can modify the process:
when process is running:**

-F3 -> generate a small window with 4 choices:

```

Stop all levels ..... (E)
Stop current level ..... ( C)
Start all levels .....(A)
Exit .....(F3)
    
```

- 1) Stop all levels : press keys 'shift' and 'E' at the same time . Flexmix stops all the running levels , and all outputs that have been activated by "outputs on" with a duration set to "0".
 - 2) – Stop current level : press keys 'shift' and 'C' at the same time . Flexmix stops only the current level.
 - 3) -Start all levels : press keys 'shift' and 'A' at thr same time . Flexmix restarts all the runnin levels and outputs than have been activated by an "outputs on " function with a duration set to "0" .
- current level is the level number that has been entered by user on line level.

-F2 -> generates a small window with 3 choices :

Cancel after cycles running	(C)
Skip to next step	(S)
Exit.....	(F2)

- 1) – if keys ‘shift’ and ‘C’ are pressed at the same time, Flexmix terminates all the cycles that are running and then cancels the automatic process. (Concerns all the process).
- 2) – if keys ‘shift’ and ‘S’ are pressed at the same time, Flexmix switches immediatly to the next function, or to the next step within a function(*). (Concerns only the function of the selected level).
- 3) – Exit from that window.

when process is stopped:

-F3 -> generate a small window with 3 choices:

Start all levels	(A)
Start current level	(C)
Exit	(F3)

- 1) – Start all levels : press keys ‘shift’ and ‘A’ at the same time . Flexmix starts all the running levels , and all outputs that have been activated by “outputs on” with a duration set to “0”.
- 2) – Stop current level : press keys ‘shift’ and ‘C’ at the same time . Flexmix starts only the current level.

-F2 -> -> generates a small window with 3 choices :

Cancel process now	(C)
Skip to next step	(S)
Exit.....	(F2)

- 1) – if keys ‘shift’ and ‘C’ are pressed at the same time, Flexmix cancels immediatly the process if all running levels are stopped .
- 2) – if keys ‘shift’ and ‘S’ are pressed at the same time, Flexmix restarts and skips immediatly to the next function, or the the next step within a function(*). (Concerns only the function of the selected level).
- 3) – Exit from that window.

(*) for loading function , skip immediate stop current component, update stock, and switch to next component.

RAZ AUTO

WARNING!

Reserved for technician only. When something wrong occurs with the automatic process, this function erases the part of the internal memory of the computer about the actual process running. The running process will be cancelled, and the general validation for the timetable will be set to « no ». **The only data corrupted is the general validation of the timetable.**

TIME TABLE

The system handles 40 start up times. Depending of the programation, each line can start many times per day, once time per day, or some days on the week.

A line starts up if the following conditions are true:

- time is not set to: 00:00.
- no automatic process is running for the selected task.
- “general validation” is set to yes.
- “start mode” set to mediate or to time.
- if “start mode“ is set to time , the time and the date of the clock corresponds, or is not more than 12 hours ahead of the programmed time and date.

When a line has just started up, the system calculates the time and the date of the next start up, and disables the mediate start, and sets the time start mode.

- a) All the days of the week are devalidated(set to 0),3 cases:
- 1) Scan = 0: time is set to 00:00, date is unchanged, no new starts will occurs on that line
 - 2) Scan != 0, and new time < 24 o'clock: new time = time programmed + scan time, date unchanged, and next start up only for this day.
 - 3) Scan != 0, and new time > 24 o'clock: time is set to 00:00, date is unchanged, and no next start up.
- b) At least one day of the week is validated (set to 1),3 cases:
- 1) Scan = 0: Time unchanged, date changed with the closest date that corresponds to the days validated.
 - 2) Scan != 0, new time <24 o'clock: new time = time programmed + scan time, date unchanged, and next start up only for this day.
 - 3) Scan != 0, new time > 24 o'clock: new time = time programmed + scan time, date changed with the closest date that corresponds to one the days validated.
- Time table contains two screens, screen 1 for the general validation, and screen2 for the selected Timetable

For screen 1:

Last modification: read only, date of the last modification achieved by the user on the time table.

Validation (YES/NO): General validation for the time table.

=NO, the system will not scan the time tables, and no new start up can occur. If an automatic process is running when the parameter is set to « NO », the computer will continue up to the end.

=YES, the system tests the time tables, searching for the next start up time.

For screen 2:

Timetable: (1 to 40), number of the time table, 12 characters to identify it.

Date and time from the clock of the system: read only.

Start (no,time,now,link), start mode for the selected timetable.

- no: no start
- time: start can occur depending of the programming in the following.
- now (or mediate): start will occur as soon as the user returns back to the main menu.
- Link xx: time table consists of information relative to production only .xx is the number of the time table containing the time start up conditions. Time table xx is first executed, and after the entire time table linked are executed from 1 to 40. On that way, if multi sequence working table are used, Flexmix can start a time table before previous one is terminated.
- All timetables linked , must use similar sequence tables:
 - multisequence mode.
 - same number of functions,
 - functions and adjustments can be different.

Parameters 6,7,8,11,12 are used only in "time" and "now" mode to calculate the start time.

1) Recipe: (0 to 50), number of the recipe. This number is only used by the “loading” functions programmed in the sequence table. The name of the recipe is also displayed.

If «auto » is displayed on that line, the recipe number can not be changed because it is automatically calculated by the computer according to the transfer number (see Current feeding and feeding plan).

If « auto » is not displayed, the recipe can be changed.

2) Transfer: (0 to 40), number of the silo where is stored the end recipe.

3) Quantity per cycle: (0 to 9999kg), it is the quantity the system can load for each cycle. Total weight = weight * cycle. This value is used to calculate the quantity of each ingredient to load in order to the selected formula.

If «auto » is displayed on that line, the quantity per cycle can not be changed because it is automatically calculated by the computer according to the transfer number (see Current feeding and Feeding plan).

If « auto » is not displayed, the quantity per cycle can be changed.

4) Number of cycles: (1 to 200), number of sequential cycles the system will achieve to execute the selected line of the time table. Total weight = weight * cycle.

If zero, the system assumes the process is achieved and switches to the next line.

When the time table is running, the number of cycles can not be increased, but can be decreased until the new value is over the number of cycles executed at the moment.

5) Mixing time: (0 to 9999 seconds), duration of the mixing time that will be applied during execution of an «output on» function if the parameter mixing time is set to «yes» in its adjustment.

6) Enable days M.T.W.T.F.S.S: monday,tuesday,wednesday,thursday,friday,saturday,sunday. Each day is associated with a number:

= 0, no next set up will occur on that day of the week.

= 1, next set up will occur on that day.

7) Next start time, hh:mm: Hours and minutes of the next start up. It is programmed by the user, or changed automatically when a scan delay is set. If set to 00:00, no start up will occur in the time mode.

8) Next start time, dd/mm/yy: date of the next start up. It is programmed by the user, and changed automatically when at least one day of the week is enabled.

9) Sequence table: (1 to 20), number of the working table, its name is also displayed.

-Up to Flexmix version 3.15 , this parameter must not be changed when the timetable is running .

-From Flexmix version 3.16 , this parameter is taken in count only at beginning of the timetable execution . If it is changed by user when timetable is running , the new value will be taken in count only at next starting of this timetable .

10) Manual components hopper: (0 to 7), number of the hopper where the minerals have been dropped by the user before the automatic process running. This number is only used by the “loading”

function when the loading source is set to « hopper » (see loading adjustments). The number of cycles must be in the range 1 to 7.

hopper in the time table	hopper selected during process
0	no hopper outputs
1 to 7	(1 to 7)
11 to 17	(1 to 7) according to the cycle number
	1 for cycle1,2for cycle2,.....

11) Scantime: (0 to 99 minuts), used to calculate the next start time:

new start time = actual time + scan time. If set to zero, the scantime function is disabled.

12) Task: (0, 1), number of the task that will execute the process. If zero, the system assumes the process is acheived and switches to the next line.

ENABLE HOURS

According to the value of the parameter "hour" programmed in the "sequence table", the current functions of the automatic process running, go on, or stop and then wait for the right conditions to restart automatically. The "hour" parameter sets the conditions to take in count as the following:

- = 0, the automatic functions operate at any hour of the day, according the "time table".
- = 1, the automatic functions operate only if the contact connected on the waiting input is deactivated.
- = 2, the automatic functions operate only if the real time clock is inside one the periods defined in the "enable hours".
- = 3, the automatic functions operate if the waiting input is deactivated, and if the real time clock time is inside one of the periods defined in the "enable hour". (Conditions 1 &2 have to be true).

Validation: yes

	start1	end1	start2	End2	start3	end3	start4	end4
monday	00:00	07:00	22:30	23:59	00:00	00:00	00:00	00.00
tuesday								
wednesday								
thuesday								
friday								
saturday								
sunday								

Validation :(yes/no) :

=no, the table is not validated; the Flexmix assumes it can work at any time of the day without looking at the content of the table. .

=yes, the table is validated; the periods defined in the table will be taken in count.

start1 - end1,...., start4- end4: those parameters defined four periods of time per day of the week. For proper operating, the start time must be less or equal to the end time for each period. If end time is set to zero, the concerned period is disabled.

Example: 00:00 to 23:59, Flexmix can work all day long.

HISTORIC OF ALARMS

The system stored in that table the 99 last alarms occurred during the automatic cycles. The operator can only erase it, and the date of that operation is automatically recorded. When coming into that function, the system displays the most recent registration. Each time an alarm is recorded, a general counter displayed on the main menu is incremented. When cancelling this table, the general counter can be erased.

By pressing F3 key, the content of this table can be erased.

Last erased : 20/02/00

	Date	Time	Alarm	Function	Weight.	Recipe	Silo	Trans	Quantities
1	29/02	14:30	1 no receive output 18.	1-chargement	1/ 124,8	1	1	1	50/1200
2									
3									
4									
5									
99									

The following parameters are recorded for each alarm:

Date:

Time:

Alarm: code and designation of the alarm.

Function: number and designation of the adjustment.

Weight: number of the weighing device and value the weight.

Recipe: number of the recipe.

Silo: number of the silo or of the hopper.

Trans.: number of the transfer.

Quantities: quantity set, quantity achieved. (The unit depends of the function).

DESCRIPTION OF THE ALARMS

When an alarm occurs, the automatic process is immediately stopped, the alarm output is activated, and an alarm message is displayed on the control screen. The general counter displayed on main menu is also incremented.

The user has to find the reason of the alarm, to solve, and then to restart by pressing F3 from the control screen.

01 no receive: (no reception). Failure on the serial link between the computer and the concerned I/O board. The computer does not receive informations from the I/O board

- check the supply of the I/O board.
- check the cables
- check the configuration of the I/O board

02 err transm: (error transmission). Failure on the serial link between the computer and the concerned I/O board. The computer can not transmit informations to the I/O board.

- check the supply of the I/O board.
- check the cables
- check the configuration of the I/O board
- the transmission chip on the computer board can be damage

03 err recept: (error reception). Failure on the serial link between the computer and the concerned I/O board. The computer receives wrong informations from the I/O board

- check the supply of the I/O board.
- check the cables
- check the configuration of the I/O board

04 error 4: overrange problem on the A/Dconverter of the concerned weighing device. If the weighing device contains a display, this message also appears on it.

- check the load on the loadcells.
- disconnect the loadcells and check if the problem is always on.
- A/D converter can be damage.
- the weighing board can be damage.

05 error 5: oscillation problem on the A/Dconverter of the concerned weighing device. If the weighing device contains a display, this message also appears on it.

- check the load on the loadcells.
- disconnect the loadcells and check if the problem is always on.
- A/D converter can be damage.
- the weighing board can be damage.

06 sensor: overload on the loadcells connected on the concerned weighing device. If the weighing device contains a display, this message also appears on it.

- check the load on the loadcells.
- disconnect the loadcells and check if the problem is always on.
- A/D converter can be damage.
- the weighing board can be damage.

07 error 7: failure of the A/Dconverter of the concerned weighing device. If the weighing device contains a display, this message also appears on it.

- A/D converter can be damage.
- the weighing board can be damage.

08 error 8: not used

09 no define: (undefined input or output). The input or the output concerned is not correctly defined.

- check the «inputs allocation » or the « outputs allocation ».

10 opened: The contact connected on the concerned input is not on the good state. Its good state is closed.

- Check the configuration of this input.
- Check the sensor connected on that input.
- Check the input board.

11 manual: The output boards are in manual mode.

12 closed: The contact connected on the concerned input is not on the good state. Its good state is opened.

- Check the configuration of this input.
- Check the sensor connected on that input.
- Check the input board.

13 24V supply: The voltage of the power supply connected to the concerned input is under 13 volts.

- Check if the power supply is overloaded.
- Check the power supply.

14 distance: The numeric mill regulator (RNB) can not control the distance between the disks of the mill.

- check the mill.
- Check the wiring between the mill and the RNB.
- Check the power supply of the RNB.
- Check the 24V supply for the micromotor of the mill

15 error15: not used.

16 error16: not used.

17 error17: not used.

18 error18: no communication with the input board where is connected the pulse counter.

19 error19: not used.

20 maxi time: during the automatic process, the maximum time delay programmed to acheive the concerned function is terminated.A restart command will restart the delay.

- check the programmation of the concerned delay.

21 recipe ?: the number of the recipe is not correctly programmed in the « time table ».

22 weight ?: the weight value is not correctly programmed in the « time table », or in the concerned adjustment.

23 cylce ? : the cycle number is not correctly programmed in the « time table ».

24 nb weight ? : the number of the weighing device is not correctly programmed in the concerned adjustment.

25 silo ? : the number of the silo is not correctly programmed in the «recipe», or in the « component data ».

26 max weight: the quantity to load is over the maxi weight value programmed in the « loading adjustment ».

27 precision: At the end the component loading, the actual weight loaded is greater or smaller than the theoretical value, according the programmed precision.

- check the trail value.(silo adjustment)
- Check the precision value (silo adjustment)
- Check the weighing device.
- Check the mechanical loading device for the silo.

28 maxi time: during the automatic process, the maximum time delay programmed to acheive the concerned function is terminated.A restart command will restart the delay.

- check the programmation of the concerned delay.

29 err .flow: During a loading, the measured flow is lower than the programmed value for the concerned silo.

- check the mechanical loading device for the silo.
- check the programmed value. (Adjustment silo, kg/sec).

30 transfer ? : the number of the transfer is not correctly programmed in the «time table».

31 maxi wait : : during an emptying function , the maxi time delay programmed to wait for the destination silo to be empty is terminated ,but the sensor is not in the right state.

- check the parameter n° 14 in the «emptying adjustment ».
- check the sensor working.
- check the input board.

32 not empty: Before loading, the weight in the tank is over the «maxi weight before start » programmed in the loading adjustment.

33 sensor ? : during an emptying function , the silo destination is full . The computer has to wait for the destination silo to be empty to continue emptying.The problem is, there is no mini sensor programmed. (Adjustment emptying, low level sensor on destination silo).

- check the parameter n° 7 in the « emptying adjustment ».
- check the « input allocation ».

34 pulse ? : the input where is connected the pulse counter is not correctly programmed.

35 error flow : during an emptying function, the measured flow is too low , according to the theoretical flow programmed with the parameter n°5 in the « emptying adjustment ».

- check the mechanical device.
- check the parameter n°5.

36 nb weight ? : the number of the weighing device is not correctly programmed in the concerned « emptying adjustment » .

37 sensor ? : during an emptying function using a sensor to check if the tank is empty, the number in the input is not defined.

- check the parameter n°7.

38 flow ? : During a loading by flow, the flow value is not correctly programmed. (see silo adjustment)

39 disjonct 1: (disjonction 1°). The contact connected on that input is not on the right state.

Generally the thermal protection of the motors of the electromecanic box n°1 is serially connected on that input.

- check the thermal protection of the motors.
- check the « system inputs adjustment ».
- check the «input allocation ».

40 disjonct 2: (disjonction 2°). The contact connected on that input is not on the right state.

Generally the thermal protection of the motors of the electromecanic box n°2 is serially connected on that input.

- check the thermal protection of the motors.
- check the «system inputs adjustment ».
- check the «input allocation ».

41 Power back: A power failure has occurred during a process, at power back this alarm is registered and the process goes on. (See computer configuration)

42 Power back: A power failure has occurred during a process, at power back this alarm is registered and the process is stopped. (See computer configuration)

43 time ? : During a loading by time, the duration value is not correctly programmed. (See « silo adjustment »)

44 hopper? : During a loading in hopper mode, the hopper value is not correctly programmed. (See « loading adjustment » and « time table »)

45 flow hopper: During a loading in hopper mode, an alarm flow has occurred. (See « hopper adjustment »)

- 46 maxi pause:** During a pause function, the maximum waiting time has been reached. (See « pause adjustment »)
- 47 mill flow:** During a milling function by weight, the measured flow is under the theoretical flow programmed. (See « milling adjustment »)
- 48 weight? :** During a milling function by weight, the weighing device number is not correctly programmed. (See « milling adjustment »)
- 49 sensor ? :** During a milling function by sensor, the input number where is connected the sensor to detect the end of milling is not correctly programmed. (See « milling adjustment »)
- 50 mill? :** During a milling function, the mill number is not correctly programmed. (See « milling adjustment »)
- 51 maxi time:** During a milling function by sensor, the duration of milling has reached the maximum value programmed. (See « milling adjustment »)
- 52 seq.table? :** During a start seq.table function , the number of the sequence table in the adjustment is not correctly programmed. (See « start seq.table adjustment »)
- 53 maxi time:** During a start seq.table function , the time delay has reached its maximum value programmed before running the second sequence table. (See « start seq.table adjustment »)

HISTORIC OF WARNINGS

The system stored in that table the 99 last warnings occurred during the automatic cycles. A warning is a small problem that do not disturb the process, but that is registered to inform the user. When the operator erases this table, the date of that operation is automatically recorded. When coming into that function; the system displays the most recent registration. Each time a warning is recorded, a general counter displayed on the main menu is incremented. When cancelling this table, the general counter can be erased.

By pressing F3 key, the content of this table can be erased.

last erased : 20/02/00

	Date	Time	Warning	Component	Silos	Quantities(kg)
1	29/02	14:30	equivalent.	1-.....	1 -> 2	125 -> 340
2						
3						
4						
5						
99						

The following parameters are recorded for each warning:

Date:

Time:

Warning: designation of the warning.

Component: number and designation of the component.

Silos: numbers of the silos before and after the warning.

Quantities: quantity achieved, and quantity set.

DESCRIPTION OF THE WARNINGS

Equivalent: During a loading process, a switch to an equivalent silo has been achieved.

component:

silos: start silo , and equivalent silo.

quantities: quantity loaded with the start silo , and quantity remainder for the equivalent silo.

Replacement: During a loading process, a switch to a replacement silo has been achieved.

component: start component

silos: start silo , and replacement silo.

quantities: quantity loaded with the start silo , and quantity remainder for the replacement silo.

Component trigger: During a loading process, the remainder stock for the concerned component has reached the low level trigger programmed on the « stocks ».

component:

silos:

quantities: quantity remainder for the component , quantity trigger programmed on the « stocks ».

COMPONENTS DATA

	components	silos				parameter1	parameter2	Parameter3	parameter4	parameter5
		1	2	3	4					
1	Wheat	00	00	00	00					
2	Corn									
3	Barley									
4	.....								
39	.....								
50	.....								

component : 10 characters to give a name to each component.

silos 1,2,3,4 :(0 to 50) ,the selected component can be stored up to four silos. When loading the component into a tank, the system activated the silo output programmed in the recipe. If the silo is empty because the throughput is too lower, the computer switches automatically on the next silo programmed here.

If this new silo is not zero, it is also automatically entered in all the recipes of the system, and the empty silo is moved to the last position of the silos list.Up to four switches can be achieved when loading a silo .If the throughput is always smaller, the replacement process is activated, and the recipe is not modified. The replacement silo is enabling only for the current loading.

If this new silo is zero, no switch occurs, and the replacement process is activated.

parameter1,2,3,4,5 ..10: Those 10 parameters are generally important nutritive elements. 12 characters can be keyed to give them a name.

For each component, the values keyed are positive decimal numbers on 5 characters.

RECIPES

Recipe : 01 total : 100,00 %

	Components	Silo	Percentage	Replacement comp. rate	Group	Speed	Distance
1	Wheat	00	00,000	00 00,000	0	45	1.7
2	Corn						
3	Barley						
4	.....					
15	.....					

Recipe: (1 to 50), number of the recipe, and 12 characters to give it an identification.

Total: (0 to 100,00), read only. It is the sum of the percentages of the ingredients of the formula. For proper working, must be set to 100,00 %.

Component: the number of the ingredient is keyed, and its designation appears automatically. The designation is entered in the "components data". The ingredients are loaded in the same order they are programmed.

Silo: (0 to 50), read only, number of the silo to activate for loading the component. This silo is always calculated by the computer, and it is the first silo for the concerned ingredient in the «component data». During processing this number is changed if the silo is empty (throughput measured lower than the minimum throughput). The new silo is the next silo of the silos list for this component (see "component data"). The empty silo is also automatically moved at the last position of the silos list.

Percentage: (0 to 100,000%), percentage of the ingredient in the recipe.

R.comp (replacement component): (0 to 50), number of the component that will be activated when all the silos containing the selected components are empty. The silo activated will be the first silo among the list of 4 silos programmed in the "components data"

R.rate (replacement rate): (0 to 100%), minimum percentage of the initial silo that must be loaded before accepting a switch to the replacement silo.

If 0%, all the initial ingredient can be replaced, if 100 % the replacement is disabled.

Group: (0 to 9), group number of the component. The computer loads only the ingredients of the formula whose group number is the same as the group number programmed in the sequence table. This enables to load ingredients at different moments in the automatic process (cereals, minerals, liquid minerals ...).

Speed: (0 to 999), regarding to the NMR configuration this value has 2 meanings.

-NMR mode 4: It represents the speed of the silo auger during the loading process. The range is 0 for nul speed to 100 for the maxi speed. It is automatically transmitted to the mill regulator (RNB). (See loading adjustment).

-NMR mode 2 & 3: It represents the current setting for the mill motor regulation.

Distance: (0 to 15.0), regarding to the NMR configuration this value has 2 meanings.

-NMR mode 2& 4: It represents the distance of the two disks of the mill.

-NMR mode 3: It represents the voltage on output S2 in the range from 0 to 10 volts. It can be used to set the speed of the mill motor without regulation.

The analysis of the recipe can be displayed by pressing key F3 .

STOCK SILOS

This table is used to display and modify the stock on hand for each of the 50 silos. The user enters the quantities (weight, and price) he wants to add or to subtract to the silo on hand, and then validates it by pressing f3 key. The stock silo and the stock component are immediately updated.

The stock silo and the stock component also can be directly erased.

The date of the last operation is recorded and displayed.

Stock silo : 1 –ble.....

Modif. : 21/11/00

Warning level on component : 1200 kg

	quantity(ton)	price/ton	price	capacity(ton)
ENTRY	xxx.xxx	xxxxxx.xx	xxxxxxxx	
SILO	xxxx.xxx	xxxxxx.xx	xxxxxxxx	xxxx
COMPONENT	xxxx.xxx	xxxxxx.xx	xxxxxxxx	

Silo: number of the silo.

Components: read only, name of the component stored in the silo. This name can be changed only in the table “components data”.

Modif. : Date of the last modification achieved by the user on that silo or component.

Warning level on component: value in kg, if the stock for the component is under that value, a warning is displayed on the main menu.

Entry quantity: (-999.999 to 999.999), value in ton, representing the total weight to add (if +) or to substrate (if -) to the stock silo and stock component. When F3 key is pressed, the stock silo and the stock component are updated.

Entry price/ton: (0 to 999999.99), price per ton .The total price is then calculated automatically.

total price = price/ton * quantity. When F3 key is pressed, the stock silo and the stock component are updated.

Entry price: (-9999999 to 9999999), rice of the quantity to move on the stocks, can be entered, or calculated. When F3 key is pressed, the stock silo and the stock component can be updated.

Silo quantity: (-9999.999 to 9999.999 ton), read only value in kg, representing the actual weight on the silo. When F3 key is pressed, the stock silo can be erased and the stock component updated.

Silo price/ton: (0 to 9999.99) read only value, representing the actual price per ton on the silo.

Silo price: (-9999999 to 9999999), read only value, representing the actual price on the silo.

Silo capacity: (0 to 9999 ton) , capacity maximum of the silo. It is used only the PC software to draw graphically the level of the quantity on the silo.

Component quantity: (-9999.999 to 9999.999 ton), read only value in kg, representing the actual weight for the component. When F3 key is pressed, the stock component and concerned silos can be erased.

Component price/ton: (0 to 999999.99) read only value, representing the actual price per ton for the component.

Component price: (-9999999 to 9999999), read only value, representing the actual price for the component.

The analysis of the recipe can be displayed by pressing key F3.

HISTORIC OF PRODUCTION / LISTING

The system registrates informations for each automatic process using ingredients from silos.

A large part of memory is reserved for that functionality, to enable the user to have all the important details about the productions that have been made in the past.

Two ways of display are available. When coming on this program, the system provides a sequential listing of the productions made and points directly to the most recent registration.

On the right corner of the screen, a number displays the registration pointed, and an other one displays the number of registrations in the memory . For each production, quantity of memory needed depends the number of silos used . This way from 1150 to 3000 productions can be registrated.

By pressing the f3 key, the details of the pointed line are displayed.

When memory is full , the older registration is overwritten by the current one.

Historical of production, Listing.

17/02/00 150/3000

Num	Date	Time	Long	Recip	Theoretical weight	Real weight	Price	Trans.	Remp.	Alarm
1	16/02	22:54	02:34	12	2500	2543	1459,45	12	5	00
2										
3										
4										
3000										

Num: (1 to 3000) number of the registration.

Date: date of the automatic process start up.

Time: time of the automatic process start up.

Long: duration of the automatic process (hours and minutes).

Recipe: recipe made during the automatic process.

Weight theoretical: weight in kg programmed in the time table for the automatic process.

Weight real: actual weight taken off from the silos during the automatic process(*).

Price: actual price of the ingredient taken off from the silo.

Trans.: number of the transfer silo programmed in the time table for the automatic process.

Remp. : number of the first silo used as a replacement silo during the automatic process.

Alarm: number of alarms occurred during the automatic process.

(*) = automatic format for weighing values :

-value < 100 ->xx.xxx

-value < 1000 ->xxx.xx

-value < 10000 ->xxxx.x

-autre -> xxxxxx

HISTORIC OF PRODUCTION / RECORDS

For the record selected , the computer displays the details of the fabrication Up to 20 silos or components can be registrated. If more than 20 lines are needed, the overrun quantities are added to the twentieth line. Depending of length of each records, the number of records can reach 3000. When a record is empty, its display values are zero.

record : 125 date : 12/06/00 time : 22:50 recipe : 12

Silos	Component	Pourcentage theoretical	Weight Theoretical	Weight real	Replacement	Price
1	wheat	25,00	500	514	0	1234
2	corn					
3	barley.....					
20	.....				

Record: (1 to3000) number of the registration.

Date: date of the automatic process start up.

Time: time of the automatic process start up.

Recipe: number and designation associated to the recipe number.

Component: nameof the component associated to the silo number.

Percentage: (0 to 100,00%), percentage of the ingredient in the formula.

Weight theoretical: weight of the ingredient that must be loaded(*).

Weight real: weight of the ingredient that has been actually loaded(*).

Replacement: number of the component loaded as remplacement.if zero, no remplacement occurred.

Price: price of the ingredient that has been actually loaded.

(*) = automatic format for weighing values :

- value < 100 ->xx.xxx
- value < 1000 ->xxx.xx
- value < 10000 -< xxxx.x
- autre -> xxxxxx

ACCUMULATORS PER SILO

This table shows the quantities for each of the 50 silos that have been taken off by the automatic process during the period selected, for the transfer selected, and for the recipe selected. Data used for that calculation comes from the fabrications registered (up to 3000).

Screen1:

The user has to key the values for the selection.

-if recipe number is set to zero, all recipes are selected.

-if transfer number is set to zero, all transfers are selected.

When he presses the down key to enter in the second part of the screen, the calculation is achieved, and three values are displayed:

-the total quantity in ton

-the price per ton

-the total price

first date : 00/00/00 recipe : xx

last date: 00/00/00 transfer : xx

quantity (T)	00000,000
Price/T	0
Total price . .	0

Screen2 :

By pressing F3 key, the quantities for each silo are displayed.

Silo	Quantity(T)	Price/T	Price
1	00000,000	0000,00	000000
2			
3			
4			
50			

ACCUMULATORS PER COMPONENT

This table shows the quantities for each of the 50 components that have been taken off by the automatic process during the period selected, for the transfer selected, and for the recipe selected. Data used for that calculation comes from the fabrications registered (up to 3000).

Screen1:

The user has to key the values for the selection.

-if recipe number is set to zero, all recipes are selected.

-if transfer number is set to zero, all transfers are selected.

When he presses the down key to enter in the second part of the screen, the calculation is acheived, and three values are displayed:

-the total quantity in ton

-the total per ton

-the total price

first date : 00/00/00 recipe : xx

last date: 00/00/00 transfer : xx

quantity (T)..	00000,000
Price/T	0
Total price. .	0

Screen2 :

By pressing F3 key, the quantities for each component are displayed.

Num	Components	Quantity(T)	Price/T	Price
1	Wheat	00000,000	0000,00	000000
2	Corn			
3	Barley			
4	. . . . .		
50	. . . . .		

ACCUMULATORS PER RECIPE

This table shows the quantities for each of the 50 recipes that have been produced by the automatic process during the period selected and for the transfer selected. Data used for that calculation comes from the fabrications registrated (up to 3000). Two screens are used for this functionality.

Screen1:

The user selects the period and the transfer number.

-if transfer number is set to zero, all transfers are selected.

When pressing the down key to enter in the second part of the screen, the calculation is acheived, and three values are displayed:

-the total quantity in ton

-the price per ton

-the total price

first date : 00/00/00

last date: 00/00/00 transfer : 2

quantity (T)	00000,000
Price/T....	0
Total price..	0

Screen2 :

By pressing F3 key, the quantities for each recipe are displayed.

Num	Recipes	Quantity(T)	Price/T	Price
1	Wheat	00000,000	0000,00	000000
2	Corn			
3	Barley			
4	.....		
50	.....		

ACCUMULATORS PER TRANSFER

This table shows the quantities for each of the 40 transfers that have been produced by the automatic process during the period selected and for the recipe selected. Data used for that calculation comes from the fabrications registered (up to 3000). Two screens are used for this functionality.

Screen1:

The user selects the period and the recipe number.

When pressing the down key to enter in the second part of the screen, the calculation is achieved, and three values are displayed:

- the total quantity in ton
- the price per ton
- the total price

first date : 00/00/00

last date: 00/00/00 recipe : 2

quantity (T)	00000,000
Price/T	0
Total price. .	0

Screen2 :

By pressing F3 key, the quantities for each transfer are displayed.

Transfer	Quantity(T)	Price/T	Price
1	00000,000	0000,00	000000
2			
3			
4			
40			

HISTORIC ERASING

WARNING !

This function erases the 999 registrations of fabrication. To proceed, the user has to follow the instructions from the display. When this operation is achieved, the date of the last erasing is updated.

FEEDING PLANS

A feeding plan defines the recipe and the quantity that will be selected according to the days. It contains 20 lines, each line represents a period of days where the recipe and the quantity programmed will be valid until the last day programmed. When exit from that table, Flexmix updates the current feeding and the timetables according to the feeding plans values.

5 feeding plans can be entered.

Feeding plan n° : 01

	Recipe	Last day	Q/cycle
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
...			
20			

CURRENT FEEDING

The current feeding table represents the state of the automatic changes of recipe and batch size for each transfer .

Every day , current feeding and timetables are automatically updated .An updating calculates the following parameters:

- adds one day to the age when day from clock has changed .
- if validation is “yes” :
 - calculation of the recipe number..
 - calculation of the quantity per cycle.
 - modification of the timetables according to the current feeding.

Transfer: (1 to 40), number of the silo transfer.

Validation: yes or no.

= yes, the recipe automatic change is validated:

- recipe number is calculated every day.
- when the transfer of that line is programmed in the “time table”, this recipe is automatically made.

= no, only age is updated every day.

Age: (0 to 999), representing the age of the animals feeded by the food of the transfer silo. It is automatically incremented every day, and it has to be set up by the user when the animals come into the stable.

Feed: (0 to 5), number of the feeding plan to use for this transfer.

If zero, the system doesn't care about the recipe automatic change functionality.

Recipe: (1 to 50), read only value representing the number of the recipe that will be made by the process when the transfer written on that line will be programmed in the “time table”. This automatic recipe change occurs only is validation is set to yes. In that case; “auto” is also display near the recipe in the “time table”.

The recipe is calculated in order to the plan and the age if:

- validation = yes
- plan = 1 to 5
- transfert = 1 to 40

Qty/cycle: (0 to 9999), read only value representing the quantity/cycle that will be made by the process when the transfer written on that line will be programmed in the “time table”. This automatic quantity change occurs only is validation is set to yes. In that case; “auto” is also display near the quantity/cycle in the “time table”.

The quantity/cycle is calculated in order to the plan and the age if:

- validation = yes
- plan = 1 to 5
- transfert = 1 to 40

Transfer	Validation	Age	Feed	Recipe	Qty/cycle
1	YES	99	1	1-recipe1.....	1000
2					
3					
...					
...					
39					
40					

ACCESS CODE

Four levels of password are available: 'read only', 'user', 'technician' and 'configuration'. The password is composed of 4 characters. The password validates the writing to the data according to the password level.

Read only: no password is validated, all data can be read.

Configuration: it is factory set, it can not be modified. When it is validated by keying its right value, the 2 others code are validated automatically, and the value of the user code is also displayed. The user can read and write all the programmable data of the system.

This code is disabled by keying a wrong data, at power up, and by no using the keyboard during the time programmed in the "configuration/computer".

Technician: it is factory set, it can not be modified. When it is validated by keying its right value, the user code is also validated and displayed automatically. The user can read and write only the technician data and the user data.

This code is disabled by keying a wrong data, at power up, and by no using the keyboard during the time programmed in the "configuration/computer".

User: it can be modified only if it has been validated. It is validated by keying its right value, and the user can read and write only the user data.

This code is disabled by keying a wrong data, at power up, and by no using the keyboard during the time programmed in the "configuration/computer".

Changing the user code: when user code is validated, "F3" key switches to a new screen. The user has to enter the actual code and to enter the new code.

code	State	Value
configuration	Yes	
technician	Yes	
User		****
Enter code		****

WEIGHTS ADJUSTMENT

3 weighing devices can be connected to the computer via the RS485. The weighing devices transmit to the computer data that can be displayed through 2 screens.

-screen1, for the 3 weighing devices, the user can modify the weight value according to the real content of the tank. The gross value is also displayed for information.

-screen2, for each weighing device, the technician can achieve the calibration. From this screen, a function to calculate automatically "coefa" is available by pressing F2 key.

Important: the number of weighing device connected has to be entered in the «computer configuration».

Screen1 :

	Weight (kg)	Gross value
1		
2		
3		

F1 cal 1 F2 cal 2 F3 cal 3

Gross value: It is a read only value sending by the weighing device, and that is provided from the Analogic to Digital converter (ADC) plugged on the weighing board.

Weight: weight value in Kg representing the content of the tank. It can be modify by the user.

If something wrong is detected, an alarm message is displayed.

Calibration can be achieved by pressing the function key corresponding to the desired device.

Screen2 : (for technician only)

Calibration has to be achieved only by technician.

For the following it is important to know the formula:

$$\text{Weight (kg)} = \text{gross value} * \text{coefficient A} - \text{coefficient B.}$$

Gross value: It is a read only value sending by the weighing device, and that is provided from the Analogic to Digital converter (ADC) plugged on the weighing board.

Weight: weight value in Kg calculated by the weighing device according to the configuration data.

When it is modify, coefficient B is internally adjusted.

$$\text{CoefB} = \text{grossA} * \text{coefA} - \text{weight.}$$

Coefficient A: Decimal number that depends of the following parameters:

-load cell sensitivity (1mv/v, 1,5mv/v, 2mv/v).

-load cell capacity (100kg,500kg,1000kg,1500kg,3000kg...).

-number of load cells (1, 3, 4).

-converter gain.

To get a high accuracy, it has to be adjusting experimentally for each plant. Standard value from a table can also be used, but the accuracy will be lower, according to the theoretical accuracy of every element of the weighing device. About 0.5% can be get in that case.

When coefficient A is obtained by a manual or automatic calculation, a load that represents at least 25% of the sum of the sensors capacity has to be used.

$$\text{Coefficient A} = \text{load (kg)} / (\text{gross value with load} - \text{gross value without load})$$

When coef A is directly modified, the weight value is automatically adjusted.

Automatic calculation of "coefficient A" is selected by pressing F2 key, and then the technician has to follow the instructions displayed.

Size: it represents the display format of the weight, and it can be changed only with key F3.

The weight always contains 5 digits, and the size sets the comma position. It must be adjusted according to the load cells capacity.

total load cells capacity	size	weight value format
0 to 10 kg	0.001	xx.xxx Kg
11 to 200 kg	0.01	xxx.xx Kg
201 to 9999 kg	0.1	xxxx.x Kg
> 10000 kg	1	xxxxx Kg

Standard value : 0.1

Grade: (1 to 10), it represents the minimum gap between two different values of weight.

Standard value : 1

Filter: (4,8,16,32), the values are modified with F3. To get a better stability, an average with the converter's data is achieved. The filter value is the number of consecutive measurements needed to calculate the average.

Standard value: 8

CLOCK ADJUSTMENT

This function is used to adjust the system's internal clock. To achieve an adjustment, the user has to enter the following:

- the time
- the day of week with F3 key
- the date
- press F2 key to validate into the clock chip.
- press ESC to quit.

Important: the seconds are not programmed by the user; they are automatically set to 00 when F2 key is pressed.

hh : mm	day of week	dd/mm/yy
12 : 45	Tuesday	29/02/00

F2 update F3 modif

F3: to change the day of the week

F2: to write the values displayed on the physical clock.

SIMULATION

3 screens are available to simulate respectively, the activation of the outputs, the activation of the functions of outputs, and the state of the inputs. The desired screen is selected by pressing on the indicated key. When quitting the simulation all the outputs that have been activated during the simulation are automatically deactivated. The automatic process can operate during the simulation, and the user has to take care to not disturb it.

SIMULATION \OUPUTS

With this program, the user can read and control each output. To activate or deactivate an output, he just has to write a 1 or a 0 in the «state» column. The screen is permanently updated according to the output board states.

When quitting the simulation all the outputs that have been activated during the simulation are automatically deactivated. The automatic process can operate during the simulation, and the user has to take care to not disturb it.

Nr	output	mode	state
1	Auto	0
2	Auto	0
...	Manu	0
96	????	--

Nr: (1 to 96) number of the output.

Output: read only, identification of the output.

Mode: read only, it represents the mode of the output.

- Auto: the ouput board where is located that output is in auto mode.
- Manu: the output board where is located that output is in manual mode.
- ? ? ? ? : This output is not located on an output board (see output allocation).

State: state of the output at the moment.

- 0 → the output is deactivated,
- 1 → the ouput is activated.
- -- → no state, because no allocation has been defined for the output.

SIMULATION \FUNCTIONS OF OUTPUTS

With this program, the user can read and control each function of outputs. Key F3 is used to change the state of the function of outputs. The screen is permanently updated according to the output board states.

When quitting the simulation all the outputs that have been activated during the simulation are automatically deactivated. The automatic process can operate during the simulation, and the user has to take care to not disturb it.

Nr: 25 – silo of corn..... on task1

	1	2	3	4	5	6	7	8
OUTPUTS.								
TIME START								
TIME STOP								
INPUTS								

F3 simul

Nr: 1 to 129, number of the function of outputs to control. The designation is displayed automatically according to the number selected.

On: (on, off), state of function of outputs. It is controlled by the running process and by the user.

Task1: number of the task that has made the last control of the function of outputs. The different tasks are:

- Task1, when a process is running on task1.
- Task2, when a process is running on task2.
- Simulation, when the user has just made the control.
-

Outputs: number of the outputs that are activated.

- Number is 0, when the output is deactivated.
- Number is erased when output « 0 » is programmed in this area.

Time start: value of the time delay that have been achieved during the last start.

Time stop: value of the time delay that have been achieved during the last stop.

Inputs: number of the input that is checked.

- Number is 0, when the input is not checked.
- Number is erased, when input « 0 » is programmed in this area.

Important:

- The input right level is high (contact closed) when an output is programmed in the column.
- The input right level is low (contact opened) when no output is programmed in the column.

The last column on the left is reserved for the alarm messages. (See alarm description)

SIMULATION \INPUTS

With this program, the user can read the state of the 128 inputs.

Nr	inputs	Contact state	Pulses
1	0	0
2	0	0
...	0	0
128	--	--

Nr: (1 to 128) number of the input.

Inputs: read only, identification of the input.

Contact state: state of the contact connected on the input.

- 0 ->the contact is opened.
- 1 -> the contact is closed.
- ? -> no allocation has been defined for the input.

Pulses: (0 to 9999), input pulses counter. On input boards, only inputs 1,2,3,4 have counters with two different operating ways:

- for input 1&2, the counter is incremented every close to open change.
- for input 3&4, the counter is incremented every close to open, and open to close change.

WARNING! Pulse counter is available only on input boards from version 8E/02.

ADJUSTMENT NMR

The data of that screen are permanently read from the selected NMR. If a NMR is used don't forget to program it in the « computer configuration ». FLEXMIX automatically detects if NMR or NMR2 is connected .

No Version NMR2 only

N.M.R .1.00. : 1

1	Motor intensity (Amp)	0	
2	Adjust speed (0 to 100)	0	
3	Adjust distance (mm)	0	
4	Distance actual (mm)	0	(NMR2 only)
5	Auto/manu	0	(NMR2 only)
6	Simulation Diskmill	OFF	(NMR2 only)
7	Input 1 PT100	- - - -	(NMR2 only)
8	Input 2 PT100	21	(NMR2 only)
9	Input 3 PT100	0	(NMR2 only)

NMR: (1 to 3), number of the NMR device.

Motor intensity (Amp) : read only value. This function can be achieved only if a transformer current is fixed on a power lead of the mill and connected to the current measurement input of the NMR. This intensity is also displayed on the NMR.

Adjust speed (0 to 100): this value is transmitted to the analogic output of the NMR device. Generally a frequency converter is connected on that output to control the speed of the silo auger. -0 → 0 volt and no speed, 100 → 10 volts and maxi speed.

Adjust distance (mm): distance in mm between the two disks of the mill.

NMR distance adjustment process: as soon as the contact connected on the input « 0-IN sensor » of the NMR is closed, the NMR start its automatic process as following:

- Moving disks up to maxi distance.
- Waiting 6 seconds.
- Activation of the relay 2.
- Adjustment at the programmed distance.

If an error occurs, the alarm relay 1 is deactivated; the message « error 2 » is displayed on the NMR, and transmitted to the computer through the serial link. The alarm is erased when an other start command occurs on the input « 0-IN sensor » of the NMR

NMR2 distance adjustment process: see documentation "nrm2.doc."

The following parameters exist only on the NMR2

Distance actual (0 to 15 mm) : . Read only value ,that represents Diskmill distance that is measured .

Auto/manu. Read only value ,that represents the state of the contact connected on terminals “auto” of NMR2.

-> manual , contact is opened, all automatic regulation process are off , NMR2 can be controlled by simulation only.

-> auto , contact is closed, all automatic regulation process are validated (normal state).

Simulation Diskmill :

OFF → the simulation is deactivated .

ON → the simulation is activated :

- Moving disks up to maxi distance.
- Waiting 6 seconds.
- Activation of the relay 2.
- Adjustment at the distance programmed on line 3.

Simulation is automatically deactivated (OFF) if an automatic process is running . If a distance alarm is detected , enter simulation to OFF then ON to restart .

Input 1 pt100 : Read only , temperature (-40° to 240°) on the PT100 sensor connected on input E1 when it is configured as PT100 (see codeA2 documentation "nmr2.doc").

Input 2 pt100 : Read only ,temperature (-40° to 240°) on the PT100 sensor connected on input E2, when it is configured as PT100 (see codeA3 documentation "nmr2.doc").

Input 3 pt100 : Read only ,temperature (-40° to 240°) on the PT100 sensor connected on input E3, when it is configured as PT100 (see codeA4 documentation "nmr2.doc").

NMR2 contains two operating mode :

Operationg mode = old , NMR2 process is same as NMR .

Operationg mode = new , NMR2 process is closely managed from flexmix, and not compatible with NMR .

F2 Configuration : only if the flexmix is connected to NMR2 ,see documentation "nmr2.doc."

PULSES COUNTERS

3 pulses counters are available. A pulse counter is in charge of counting and registering the pulses detected on the selected input. When a silo or a hopper uses a pulse counter to measure the loaded ingredients, the pulse counter number must be programmed in the silo or the hopper adjustment.

	Input	Value	Last erased
1	5-liquid 1...		
2	28-oil		
3			

Input: (0 to 3), number of the input where is connected the pulse counter. It can be change only in technician or configuration mode. The maximum frequency rate is 10 pulses per second. Only input 1,2,3,4 of each input board can count pulses.

For inputs 1&2, the counter is incremented every close to open change.

For inputs 3&4, the counter is incremented every close to open, and open to close change.

If set to 0, the selected counter is devalidated.

Value: read only value (0 to 999999). It is automatically incremented every time a pulse is detected. It can be set to 0 by pressing F3 key when the cursor is on the line of the selected counter.

Last erased: read only. Date of the last erasing operation. It is automatically updated each time an erasing is achieved by pressing key F3.

PRINTER TEST

Printing display symbol for characters 32 to 255 (ASCII characters) . this way it is possible to know the current characters table of the printer.

	Désignation	Interface	Card	Output
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				

	Désignation	Interface	Card	Output
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				
60				
61				
62				
63				
64				

OUTPUTS ALLOCATION

	Désignation	Interface	Card	Output
65				
66				
67				
68				
69				
70				
71				
72				
73				
74				
75				
76				
77				
78				
79				
80				

	Désignation	Interface	Card	Output
81				
82				
83				
84				
85				
86				
87				
88				
89				
90				
91				
92				
93				
94				
95				
96				

INPUTS ALLOCATION

	Désignation	Interface	Card	Input
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

	Désignation	Interface	Card	Input
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				

	Désignation	Interfac	Card	Input
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				
60				
61				
62				
63				
64				
...				
...				
...				
124				
125				
126				
127				
128				

SYSTEM OUPUTS FUNCTIONS

		Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8
	Désignation	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In
1	Auto1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
2	Alarm1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
3	Warning1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
4	Auto2	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
5	Alarm2	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
6	Warning2	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
7	Silo1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
8	Silo2	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
9	Silo3	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
10	Silo4	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
11	Silo5	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
12	Silo6	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
13	Silo7	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
14	Silo8	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
15	Silo9	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
16	Silo10	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
17	Silo11	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
18	Silo12	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
19	Silo13	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
20	Silo14	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
21	Silo15	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
22	Silo16	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
23	Silo17	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
24	Silo18	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
25	Silo19	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
26	Silo20	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
27	Silo21	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
28	Silo22	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
29	Silo23	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
30	Silo24	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
31	Silo25	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
32	Silo26	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
33	Silo27	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
34	Silo28	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
35	Silo29	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
36	Silo30	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
37	Silo31	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

38	Silo32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SYSTEM OUPUTS FUNCTIONS

		Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8
	Désignation	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In
39	Silo33	-	-	-	-	-	-	-	-
40	Silo34	-	-	-	-	-	-	-	-
41	Silo35	-	-	-	-	-	-	-	-
42	Silo36	-	-	-	-	-	-	-	-
43	Silo37	-	-	-	-	-	-	-	-
44	Silo38	-	-	-	-	-	-	-	-
45	Silo39	-	-	-	-	-	-	-	-
46	Silo40	-	-	-	-	-	-	-	-
47	Silo41	-	-	-	-	-	-	-	-
48	Silo42	-	-	-	-	-	-	-	-
49	Silo43	-	-	-	-	-	-	-	-
50	Silo44	-	-	-	-	-	-	-	-
51	Silo45	-	-	-	-	-	-	-	-
52	Silo46	-	-	-	-	-	-	-	-
53	Silo47	-	-	-	-	-	-	-	-
54	Silo48	-	-	-	-	-	-	-	-
55	Silo49	-	-	-	-	-	-	-	-
56	Silo50	-	-	-	-	-	-	-	-
57	Transfert1	-	-	-	-	-	-	-	-
58	Transfert2	-	-	-	-	-	-	-	-
59	Transfert3	-	-	-	-	-	-	-	-
60	Transfert4	-	-	-	-	-	-	-	-
61	Transfert5	-	-	-	-	-	-	-	-
62	Transfert6	-	-	-	-	-	-	-	-
63	Transfert7	-	-	-	-	-	-	-	-
64	Transfert8	-	-	-	-	-	-	-	-
65	Transfert9	-	-	-	-	-	-	-	-
66	Transfert10	-	-	-	-	-	-	-	-
67	Transfert11	-	-	-	-	-	-	-	-
68	Transfert12	-	-	-	-	-	-	-	-
69	Transfert13	-	-	-	-	-	-	-	-
70	Transfert14	-	-	-	-	-	-	-	-
71	Transfert15	-	-	-	-	-	-	-	-
72	Transfert16	-	-	-	-	-	-	-	-
73	Transfert17	-	-	-	-	-	-	-	-

74	Transfert18	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
75	Transfert19	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

SYSTEM OUPUTS FUNCTIONS

		Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8
	Désignation	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In	O-Tm-Ta -In
76	Transfert20	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
77	Transfert21	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
78	Transfert 22	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
79	Transfert23	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
80	Transfert24	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
81	Transfert25	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
82	Transfert26	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
83	Transfert27	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
84	Transfert28	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
85	Transfert29	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
86	Transfert30	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
87	Transfert31	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
88	Transfert32	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
89	Transfert33	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
90	Transfert34	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
91	Transfert35	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
92	Transfert36	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
93	Transfert37	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
94	Transfert38	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
95	Transfert.39	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
96	Transfert40	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
97	Mixer1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
98	Mixer2	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
99	Mixer3	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
100	Mill1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
101	Mill2	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
102	Mill3	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
103	Hopper1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
104	Hopper2	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
105	Hopper3	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
106	Hopper4	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
107	Hopper5	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
108	Hopper6	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
109	Hopper7	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

GENERAL OUPUTS FUNCTIONS

		Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8
	Désignation	O - Tm - Ta - In							
110		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
111		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
112		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
113		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
114		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
115		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
116		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
117		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
118		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
119		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
120		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
121		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
122		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
123		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
124		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
125		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
126		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
127		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
128		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
129		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

SYSTEM INPUTS ADJUSTMENT

task : 1

	Désignation	Input number	Contact state	Contact time
1	Remote start			
2	Remote stop			
3	Waiting			
4	Security 1			
5	Security 2			

task : 2

	Désignation	Input number	Contact state	Contact time
1	Remote start			
2	Remote stop			
3	Waiting			
4	Security 1			
5	Security 2			