

# INSTALLATION & OPERATING MANUAL



**MC 302** Electronic weight indicator

Software P.W. 13.06  
Revise 2.0



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## SECTION 2: PROGRAMMING THE INSTRUMENT

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## SECTION 2: PROGRAMMING THE INSTRUMENT

### MAIN OPERATING FEATURES

The main operating features are:

- **Batch-in of up to 12 ingredients** or **Batch-out of 1 ingredient**.
- The batching sequences can be programmed by the operator.
- The storage of up to 50 different recipes eliminates the need to constantly change set-point values when producing multiple products.
- It features in-flight correction, tolerance checking and individual accumulators.
- Both the ingredients and the recipes can be totalised individually.
- The serial ports Rs232 / Rs422 or Rs485 allow the connection to external devices (PC, remote displays, printers, etc.)

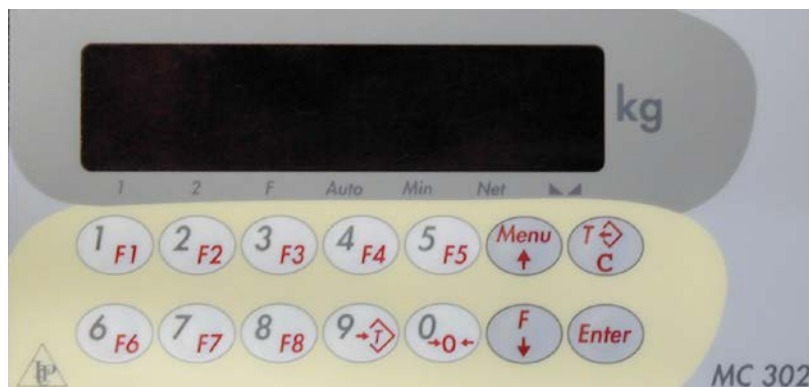
The system configuration provides for the following **optional** installations:

- 0 to 10 Vdc or 4 to 20 mA **analog output**.
- Memorization of weights in the **Alibi memory**.
- **BCD output** through an external card.
- **Profibus-DP output** through an external module for DIN guide.



For comprehensive installation instructions refer to section 1

### INSTRUMENT FRONT PANEL



#### DISPLAY

- The display normally shows the **weight** on the 7 digits display. On the basis of various programming procedures, the display is used to set the parameters to be entered in the memory, or messages indicating the type of operation currently underway, which help the operator when using and programming the instrument.

#### LED INDICATORS

- There are 7 LED indicators located underneath the display:

|             |  |
|-------------|--|
| <b>1</b>    | in Multirange mode, stands for <b>range 1</b> (with led 2 on stands for range 3).                |
| <b>2</b>    | in Multirange mode, stands for <b>range 2</b> (with led 1 on stands for range 3).                |
| <b>F</b>    | indicates the activation of the timed key <b>F</b> .   |
| <b>AUTO</b> | indicates that a batching sequence is in progress.   |
| <b>MIN</b>  | indicates that the <b>gross weight is within the minimum weight range</b> .                      |
| <b>NET</b>  | indicates that a tare has been entered and the <b>net weight</b> is therefore <b>displayed</b> . |
|             | indicates the <b>stable weight</b> condition.  |

## USING THE KEYBOARD

- The instrument is programmed and controlled through the 14 keys keyboard. 13 of these keys have a dual function. The operation underway at the time automatically provides the basis for the selection of one of the two functions.
- The programming menu management takes place by using the ↑ and ↓ keys to scroll up and down the items, the **ENTER** key to access the relative submenu or programmable parameter and the **C** key to leave the menu or return to the previous level.
- The **numerical parameters** can be set by using the numerical keys, and the value is reproduced on the display as on a calculator; a flashing display indicates that programming is underway. The **C** key is used to reset the value being programmed, while the **ENTER** key is used to confirm the value shown on the display and enter it in the instrument's memory.
- The **selection** from a list of parameters can be done by using the ↑ and ↓ keys. The **ENTER** key is used to confirm the value shown on the display and enter it in the instrument's memory, while the **C** key cancels the operation and causes the instrument to leave the selection phase. The display flashes in order to indicate that the selection is underway.

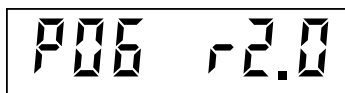
## START-UP MESSAGES

### DISPLAY TEST



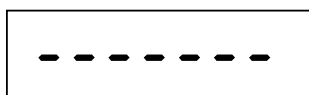
When the instrument is switched on, all the LEDs light up in order to test the display.

### SOFTWARE CODE AND VERSION DISPLAY



Following the display test, a software identification code and relative version is displayed. Remember to indicate this code when requesting assistance.

### INVALID WEIGHT INDICATION UPON SWITCHING THE INSTRUMENT ON



If the conditions for performing the automatic zero at power on (see page 2.13 for settings) do not exist, the display will show this invalid weight indication.

## WEIGHT DISPLAY

The display normally indicates the weight present on the weighing system. In this condition is possible to program the instrument.

The LEDs located below the display provide information about the weight status.

**In some ERROR conditions the following messages appear on the display instead of the weight value:**

### OVERLOAD INDICATION

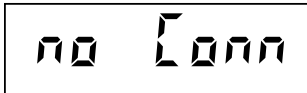


When the gross weight exceeds the weighing system's maximum capacity by over 9 divisions, the display will show this indication.

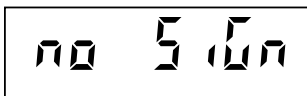
**UNDERLOAD INDICATION**

When the gross weight is negative by over 9 divisions, the display will show this underweight indication.

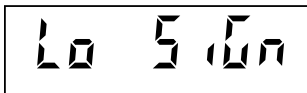
In case of a problem in the load cell connection one of the following messages will be displayed:

**MISSING LOAD CELL CONNECTION**

The load cells are not connected.

**LOAD CELL SIGNAL INPUT IS MISSING OR TOO HIGH**

The load cell signal input value is over the maximum level ( $> +3.9\text{mV/V}$ ).  
The + or – Signal load cell wires are not connected.

**LOAD CELL SIGNAL INPUT TOO LOW**

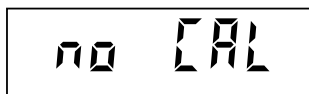
The load cell signal input value is below the minimum level ( $< -3.9\text{mV/V}$ ).

**A/D CONVERTER ERROR**

AD7730 A/D Converter internal error.

As soon as the problem is solved the instrument resumes normal operations.

In case the instrument's memory has been cleared (through a special sequence protected by a password), or in case of a brand new instrument in which the basic weighing parameters, such as Load cell capacity and Sensitivity, have not been programmed yet, the following message appears on the display:

**MULTIRANGE INDICATIONS**

LEDs 1 and 2 indicate the selected weighing range. If both LEDs are light up, range 3 is selected.

**During the increment of the weight** the switch from a lower range to a higher range takes place automatically when the load relative to a certain range is exceeded; the weight is therefore indicated with the display division value immediately above it.

**During the decrement of the weight** there is no switch from a higher range to a lower range. Both the gross weight and the display division value remain associated to the highest range reached during the increment of the weight.

Only when the gross weight returns to zero and stabilizes, the passage to range 1 takes place automatically.

## WEIGHING SET-UP MENU



Only the personnel responsible for instrument operations and the system it is installed in, may set the parameters in this menu. In case of metrological use, access to this menu is limited to personnel authorized by the current regulations.

The menu access modes depend on the function selected: FREE or “LEGAL FOR TRADE”.

### MENU ACCESS (“LEGAL FOR TRADE” FUNCTION)

Switch the instrument on keeping the calibration jumper in CALIBRATION position in order to directly access the weight set-up menu.



Refer to the installation manual for instructions on the use of the calibration jumper.

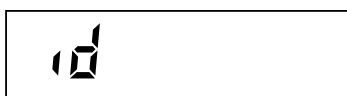
**Or:**



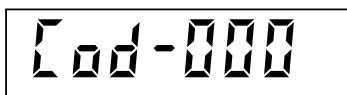
Press the **ENTER** key and keep it pressed **for 3 seconds** in order to have access to the password access procedure.



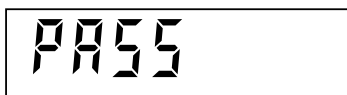
The password table is required for this procedure.



Type in the authorized operator's identification code, corresponding to the number in the password table. Confirm the setting by pressing **ENTER**. If 0 is confirmed the procedure ends.



A random 3 figure number is shown on the display. Identify the corresponding 4 figure password in the table, then press **ENTER** in order to be able to key it in.



Key in the password found in the table and confirm by pressing **ENTER**. If the password is correct you will be granted access to the weighing set-up menu, otherwise the procedure will end here.



In case of “legal for trade” function, all accesses to this menu is recorded in the consultable last 5 access operations history.



**MENU ACCESS (FREE FUNCTION)**

Press the **ENTER** key and keep it pressed for **3 seconds** in order to access the instrument set-up menu.

You may need to program the menu access password, if applicable.

**ITEMS IN THE WEIGHING SET-UP MENU**

Access to the weighing data programming submenu (load cell total capacity, load cell rated output, weighing system capacity, division value, multirange function activation).

“Dead weight” calibration procedure.

Access to the “legal for trade” / free use and weighing parameter programming submenu (filter, stability, automatic zeroing, zero tracking, minimum weight, gravity acceleration).

Access to the weighing test submenu (display of subdivisions, internal counts of the A/D converter, load cell signal input in mV/V, division / A/D converter points ratio).

**MENU MANAGEMENT**

Press the **↑** and **↓** keys in order to scroll up and down the items, the **ENTER** key in order to access the submenu or the relative procedure and the **C** key to leave the menu and end the procedure; in this case the instrument will automatically perform a reset procedure and will prepare itself for operational use.

## WEIGHING SYSTEM DATA PROGRAMMING



Press the **ENTER** key when the display shows the message “ConSt”

### “CONST” MENU ITEMS

L-CELLS

Programming the total capacity of the load cells (in kg)  
(from 1 to 500000) (\*\*\*\*)

SEnS it

Programming the rated output of the load cells (in mV/V) (\*\*\*\*)

CAPAC -

Programming the maximum capacity of the weighing system (in kg)  
(from 1 to 500000) (\*\*\*\*)

dEAd L

Programming the dead load value of the weighing system (in kg).  
This represents the weighing systems fixed tare (\*\*\*\*)

d-unit

Selection of the display division value (from 0.0001 to 100) (\*\*\*\*)

M-rAnGE

Activation of 2 or 3 weighing multirange fields.

### MENU MANAGEMENT



Press the **↑** and **↓** to scroll up and down the items, press the **ENTER** key in order to access the displayed menu item, press the **C** key in order to leave the submenu and come back to the **weighing set-up menu** (“ConSt”).



The coherence of the programmed data is checked when leaving the “CONST” menu. It is not possible to leave the submenu if the memorized data are not acceptable. The data coherence conditions are described in the relative paragraph.

### LOAD CELL’S TOTAL CAPACITY (“L-CELLS” SUBMENU)

This parameter represents the total capacity of the load cell connected to the instrument (this information can be easily found on the load cell’s specific label or in the calibration certificate). In case of several load cells connected in parallel, the value to be set consists of the **sum** of all the individual capacities.  
The programmed capacity value can range from 1 kg to 500,000 kg.

**RATED OUTPUT OF THE LOAD CELLS (“SENSIT” SUBMENU)**

This parameter is expressed in mV/V and represents the nominal sensitivity value of the load cell connected to the instrument (this information can be easily found on the load cell's specific label or in the calibration certificate). In case of several load cells connected in parallel, the value to be set consists of the **average** of all the individual nominal sensitivities.

**MAXIMUM CAPACITY OF THE WEIGHING SYSTEM (“CAPAC-” SUBMENU)**

This parameter is expressed in kg and represents the maximum value allowed on the weighing system. This value may be lower than the sum of the nominal load cell capacities.  
The programmed capacity value can range from 1 to 500,000 kg.



The setting of this parameter is mandatory.



Following the modification of the maximum capacity value, it is necessary to re-calibrate the weight.

**DEAD LOAD VALUE OF THE WEIGHING SYSTEM (“DEAD L” SUBMENU)**

This parameter is expressed in kg and represents the weight of the mechanical structure that is permanently present on the load cells. The sum of “DEAD L” + “CAPACITY” must never exceed the value of “CELL-C”

**DISPLAY DIVISION VALUE OF THE WEIGHING SYSTEM (“D-UNIT” SUBMENU)**

This parameter represents the minimum increment size of the weight value shown on the display. The value can be selected between 0.0001 kg and 100 kg.  
If the multirange function is active, the division value selected refers to the highest range.  
The ratio between the maximum capacity of the weighing system and the display division value represents the system resolution (number of divisions).



**In case of “legal for trade” use, select the division value so as to respect the limits provided for.  
In case of free use, limit the resolution to the weighing system precision.**



The weight calibration is automatically corrected once the division value has been modified, but only if the maximum capacity and the multirange function have not been modified.

(\*\*\*\*)

**THEORETICAL CALIBRATION**

When setting the parameters marked by (\*\*\*\*) the instrument performs a **theoretical calibration** with a **precision of 1<sup>0</sup>/<sub>100</sub>**. This procedure is very useful in various cases, such as when calibrating large tanks in which a simple level measurement is required and on which the direct load of sample weights may be difficult.

When the precision provided by the **theoretical calibration is acceptable** for the type of system, **calibration with sample weights is not necessary**.

Obviously, if the precision provided by this type of calibration is not acceptable, it is necessary to perform the “dead weight” calibration procedure, as described in the chapter entitled “WEIGHT CALIBRATION” on page 2.9

**MULTIRANGE FUNCTION SELECTION (“M-RANGE” SUBMENU)**

This datum is used to select the normal single range function (“oFF” selection), or the multirange 2 or 3 fields function (“2r” or “3r” selection).

In case of multirange function enabled, the display division value refers to the highest range. The display division values of the other ranges will be deduced automatically by the instrument using the values immediately below the display division value that has been set manually. The lower range limits are set automatically on the basis of the number of divisions in the top range, with possible rounding off by default to 1000 divisions.

The display shows the selection previously enabled (flashing):

A rectangular box representing a digital display showing the text 'oFF' in a monospaced font.

Normal single range operation.

or:

A rectangular box representing a digital display showing the text '2r' in a monospaced font.

Two weighing ranges operation.

or:

A rectangular box representing a digital display showing the text '3r' in a monospaced font.

Three weighing ranges operation.



Press **ENTER** to confirm the selection without changing it, or press **↑** and **↓** to display the desired selection and press **ENTER** to confirm it. Press the **C** key to leave the sequence without saving the changes.

**DATA COHERENCE**

- The number of divisions related to the maximum capacity (“CAPAC” parameter), must be between 500 and 600,000. (Number of divisions = Maximum capacity / Display division value)
- If only the display division value is changed, the weight calibration will be recalculated, resulting in a number of divisions between 100 and 600,000, referred to the 2 mV/V signal.
- With the multirange function enabled, each weighing range must have a number of divisions of no more than 6000.
- In the 2-range function, the display division value cannot be less than 0,0002 kg.
- In the 3-range function, the display division value cannot be less than 0.0005 kg.

If one of these conditions is not met, the message **invalid** will be displayed for a few seconds when leaving the submenu and the weighing data programming submenu will come up again.

**END OF THE PROCEDURE**

Press the **C** key to leave the procedure and come back to the **weighing set-up menu (“ConSt”)**.

## WEIGHT CALIBRATION



Press the **ENTER** key when the display shows the message “**CALibr**”

The weight calibration procedure is carried out in two steps:

- **Zero calibration** (zeroing the dead load on the weighing system).
- **Full scale calibration**



In case of “legal for trade” use, only the “Dead weight” calibration procedure is allowed.

During the calibration procedure, the display shows the message “CAL” alternating with the weight:



### ZERO CALIBRATION



With the weighing system unloaded, press the **→0←** key to perform the **ZERO** calibration.

The weight displayed must be zeroed. This operation can be repeated several times.

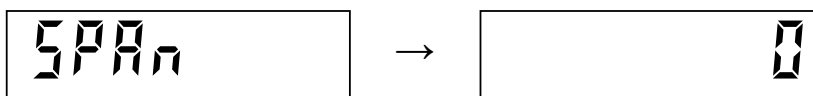
### FULL SCALE CALIBRATION

In order to perform the full scale calibration procedure use a known weight (sample weight), as near as possible to the maximum capacity of the weighing system.



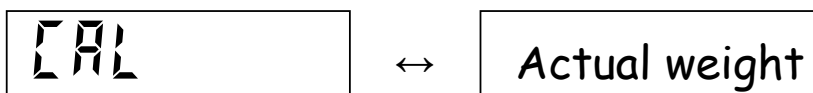
Load the sample weight on the weighing system, the display will show the measured value to be calibrated.

When the sample weight has stabilized, press the **9 →T** key. The message “Span” appears for 2 seconds, then the display prompts “0” and the actual weight value can be entered:



Enter the actual weight value by using the numeric keys. Confirm the setting by pressing the **ENTER** key.

The actual weight value just entered is now showed on the display:



If the value just entered set is greater than the resolution offered by the A/D converter, it will not be accepted and the display will show an error message for a few seconds.

It is always possible to repeat the calibration procedures without erasing the previous ones.



Performing the full scale calibration procedure will erase the gravity acceleration values.

**NOTE:** The following procedure is not mandatory:



The operator also has the chance to **cancel the calibration procedures** previously performed.

Press the **C** key.

The display will show the message “**dELEte**” for 2 seconds.

While this message is displayed

- Press the **→0←** key in order to cancel the previous zero calibrations.
- Press the **9→T** key in order to cancel the previous full scale calibrations.

NOTE: Once this procedure has been performed, the zero will be equivalent to a signal of around 0 mV/V while the full scale will be equivalent to around 10000 divisions with a signal of 2 mV/V.

### **END OF THE PROCEDURE**



Press **ENTER** to leave the procedure, save the weight calibration and come back to the **weighing set-up** menu (“**CALibr**”).

## WEIGHING PARAMETER PROGRAMMING



Press the **ENTER** key when the display shows the message **"PArAMeT"**

### "PARAMET" SUBMENU ITEMS

USE

"legal for trade" use or free use selection. None of the limits set by the "legal for trade" regulations apply during free use.

FILTER

Selection of the digital weight filter value from 0.2 to 50 Hz. This parameter can also be programmed in the instrument set-up menu.

Notion

Selection of weight stability parameter, which can be excluded or adjusted from 3 divisions in 1 second to 0.5 divisions in 0.5 seconds. This parameter can also be programmed in the instrument setup menu.

Auto 0

Programming the automatic zero execution set-point upon switching on. Can be set at an absolute value.

0 track

Selection of zero tracking value. Can be excluded or adjusted from 0.5 to 3 divisions per second

0 band

Programming the minimum weighing set-point.

G-CAL

Programming gravity acceleration in the weight calibration area.

G-USE

Programming gravity acceleration in the instrument use area.

### SUBMENU MANAGEMENT



Press **↑** and **↓** to scroll up and down the items, **ENTER** to access the programming or the relevant procedure, or **C** to leave the submenu and return to the **weighing set-up menu ("PArAMeT")**.

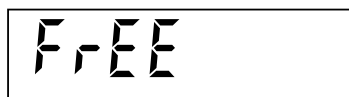
### FREE USE / "LEGAL FOR TRADE" USE SELECTION ("USE" SUBMENU)

This selection is used in order to exclude a series of limitations set by the "legal for trade" regulations if these limits are not required.

Some differences between the "Free" use and the "Legal for Trade" use

- If, during the power on sequence the weight exceeds the autozero range, the automatic zero calibration does not take place and the weight detected by the instrument is displayed as it is.
- The access to the weighing set-up menu is not governed by the calibration jumper and the password table system reserved for authorized personnel.

The display shows the stored selection (flashing):



Free use operation.

or:



“Legal for Trade” use operation.



Press **ENTER** to confirm the selection without changing it, or press **↑** and **↓** to display the desired selection and **ENTER** to confirm. Press the **C** key to leave the sequence without saving the changes



**If the “FREE” mode is changed to the “TRADE” mode, it is necessary to have access to the weighing set-up menu access system.**

An access test is therefore required to confirm and save this change. (See “Legal for trade” function, page 2.4)

### **DIGITAL FILTER (“FILTER” SUBMENU)**

Use this parameter to adjust the action of the digital filter applied on the measured weight. The filter operates on all weight data (display, serial output, analog output, etc.). The available digital filter values are given in the table here below, they can be selected by using the **↑** and **↓** keys and are expressed in Hertz. Selecting the maximum possible value (50 Hz) causes fast updates of the weight values. Selecting the minimum possible value (0.2 Hz) causes slow updates of the weight values.

| Digital Filter value in Hz | 50 | 25 | 10 | 5 | 2.5 | 1.5 | 1 | 0.7 | 0.4 | 0.2 |
|----------------------------|----|----|----|---|-----|-----|---|-----|-----|-----|
|----------------------------|----|----|----|---|-----|-----|---|-----|-----|-----|

### **WEIGHT STABILITY (“MOTION” SUBMENU)**

The weight is considered stable when it doesn’t change above a fixed range of divisions for a fixed period of time. This parameter selects various combinations as indicated in the table here below.

E.g.: the selection 3-1 allows to keep the stability condition even if the weight moves around a certain weight value within 3 divisions in 1 second. On the contrary, the selection 0.5-0.5 reduce to the minimum values the range of divisions and the time in which the stability condition is maintained.

The selection 0-0 disables the function. In this case the weight is considered always stable (led **▶◀** always on)

| Value     | Parameter Range of action    |
|-----------|------------------------------|
| 0 - 0     | Stability control excluded   |
| 3 - 1     | 3 divisions in 1 second      |
| 2 - 1     | 2 divisions in 1 second      |
| 1 - 1     | 1 divisions in 1 second      |
| 0.5 - 1   | 0.5 divisions in 1 second    |
| 3 - 0.5   | 3 divisions in 0.5 seconds   |
| 2 - 0.5   | 2 divisions in 0.5 seconds   |
| 1 - 0.5   | 1 divisions in 0.5 seconds   |
| 0.5 - 0.5 | 0.5 divisions in 0.5 seconds |



**AUTOMATIC ZERO AT POWER ON (“AUTO 0” SUBMENU)**

Programming the automatic zero range in weight value. The automatic zero function involves automatic zero calibration when the instrument is switched on, but only if the weight measured during the switching on phase is within the specified range. In order to disable the function, set the value at 0. In case of “legal for trade” use, no weight can be considered valid until this function has been performed.



In case of “legal for trade” use, this parameter may not exceed 10% of the weighing system capacity.

**ZERO TRACKING (“O TRACK” SUBMENU)**

The zero tracking function involves automatic zero calibration when the weight undergoes a slight variation over time, determined by this parameter as shown in the table below. Set the value at 0 in order to disable the function. The total sum of the weight values that can be zeroed by this function is 2% (positive or negative) of the maximum capacity (“CAPAC” parameter).

| Zero tracking value | Variation        |
|---------------------|------------------|
| 0                   | Control excluded |
| 0.5                 | 0.5 div / sec.   |
| 1                   | 1 div / sec.     |
| 2                   | 2 div / sec.     |
| 3                   | 3 div / sec.     |

**Default value: 0**



In case of “legal for trade” use, this parameter may not exceed 0.5 (0.5 div / sec).

**MINIMUM WEIGHT VALUE (“0 BAND” SUBMENU)**

This parameter is expressed in number of divisions and represents the weight value that must be exceeded in order to consider the weighing system loaded with a significant weight. The value must therefore exceed zero movements due to accumulated dirt, oscillations or other zeros that should not be taken into consideration.



In case of “legal for trade” use, this parameter must be set at 20 divisions.

**GRAVITY ACCELERATION VALUES (“G-CAL” AND “G-USE” SUBMENU)**

The 2 parameters that can be programmed with the gravity acceleration value make it possible to compensate the weight difference between the place in which the instrument is calibrated and the place in which the instrument will be used, due to different gravity acceleration. After programming both the gravity acceleration values, the weight calibration is automatically corrected. The gravity acceleration values must be between 9,77000 and 9,84000.



These parameters are zeroed when the full scale calibration is changed.

**END OF THE PROCEDURE**

Press **ENTER** to leave the procedure and come back to the **weighing set-up menu (“PArAMeT”)**.

## CHECKING THE WEIGHING SYSTEM



Press the **ENTER** key when the display shows the message “**tESt**”

### “TEST” SUBMENU ITEMS

Display the subdivision (weight with 10x resolution).

Display the A/D converter internal counts.

Display the mV/V signal coming from the load cell(s).

Display the internal counts / display division value ratio.

### SUBMENU MANAGEMENT



Press the **↑** and **↓** keys to scroll up and down the items, press the **ENTER** key to display the values, press the **C** key to leave the submenu and return to the **weighing set-up menu** (“**tESt**”).

## ZERO AND TARE FUNCTIONS

### SEMIAUTOMATIC ZERO

The Semiautomatic zero function is a **fast zero calibration procedure** that allows the weighing system to be zeroed without being forced to access the calibration menu.

The total sum of the weight values that can be zeroed by this function is 2% (positive or negative) of the maximum capacity ("CAPAC" parameter), with respect to the last zero calibration procedure performed during the calibration phase.

This operation is possible only when the weight is stable.



To perform the Semiautomatic zero function press the **→0←** key.



Only in case of FREE use (non "LEGAL FOR TRADE") of the instrument, the zero obtained with the semiautomatic zero function is kept in memory even when the instrument is switched off.

### AUTOMATIC TARE OPERATION



Press the **9→T** key in order to perform the automatic tare operation.

The weight value previously displayed by the instrument will be placed under tare and the **NET** LED on the front panel display will indicate that a tare value has been entered.



The entered tare value will be lost if the instrument is switched off.



The automatic tare operation is only possible if the gross weight is positive and stable

### ERASING THE TARE



Press the **T←C** key in order to erase the tare.

The gross weight is shown on the display and the **NET** LED is switched off.



In case the multirange has been enabled, the switch from Range 2 or Range 3 to range 1 is only possible once the tare has been erased.

## INSTRUMENT SET-UP MENU

### ACCESSING THE MENU



Press the **MENU** key and keep it pressed for **2 seconds** in order to access the instrument set-up menu. You may need to programme the menu access password, if applicable.

### SET-UP MENU ITEMS

PARANET

Access to the weighing parameter programming submenu (filter, motion and load cell mV/V input signal).

TIME-DA

Clock / calendar adjustment.

SERIAL

Programming the communication parameters for COM 1 (Rs232) and COM2 (Rs422 / Rs485), instrument address and form feed lines after printing.

ANALOG

Optional analog output configuration (full scale, mA or V type output, weight transmitted, calibration).

ACCESS

Weighing set-up menu access history (last 5 times the menu was accessed) (identification, progressive nr. and date).

LANGUAGE

Display and printer language selection (Italian, English).

REMOTE

Access to the download and upload procedures of the weighing set-up memory and the instrument set-up memory on the Rs232 serial line.

TRADE-M

Optional alibi memory selection.

TEST

Hardware and software test procedures.

### MENU MANAGEMENT



Press the **↓** and **↑** keys in order to scroll up and down the items, the **ENTER** key in order to access the submenu, the relative data selection or programming procedure. Press the **C** key to leave the menu and end the procedure.

## PROGRAMMING THE DIGITAL FILTER, WEIGHT STABILITY, AND CHECKING THE LOAD CELL SIGNAL



Press the **ENTER** key when the display shows the message “**PARAMET**”

### “PARAMET” MENU ITEMS

**F I L T E R**

Selection of the digital weight filter value from 0.2 to 50 Hz.  
This parameter can also be programmed in the weighing set-up menu.

**St a b i l i t y**

Selection of weight stability parameter, which can be excluded or adjusted from 3 divisions in 1 second to 0.5 divisions in 0.5 seconds.  
This parameter can also be programmed in the weighing set-up menu.

**S I G N A L**

Load cell mV/V input signal display.

### SUBMENU MANAGEMENT



Press the **↑** and **↓** keys to scroll up and down the items, press the **ENTER** key to access the parameter, press the **C** key to leave the submenu and return to the **instrument set-up menu** (“**PARAMET**”).

### DIGITAL FILTER (“FILTER” SUBMENU)

Use this parameter to adjust the action of the digital filter applied on the measured weight. The filter operates on all weight data (display, serial output, analog output, etc.). The available digital filter values are given in the table here below, they can be selected by using the **↑** and **↓** keys and are expressed in Hertz. Selecting the maximum possible value (50 Hz) causes fast updates of the weight values. Selecting the minimum possible value (0.2 Hz) causes slow updates of the weight values.

| Digital Filter value in Hz | 50 | 25 | 10 | 5 | 2.5 | 1.5 | 1 | 0.7 | 0.4 | 0.2 |
|----------------------------|----|----|----|---|-----|-----|---|-----|-----|-----|
|----------------------------|----|----|----|---|-----|-----|---|-----|-----|-----|

### **WEIGHT STABILITY (“MOTION” SUBMENU)**

The weight is considered stable when it doesn't change above a fixed range of divisions for a fixed period of time. This parameter selects various combinations as indicated in the table here below.

E.g.: the selection 3-1 allows to keep the stability condition even if the weight moves around a certain weight value within 3 divisions in 1 second. On the contrary, the selection 0.5-0.5 reduce to the minimum values the range of divisions and the time in which the stability condition is maintained.

The selection 0-0 disables the function. In this case the weight is considered always stable (led ►◄ always on)

| Value     | Parameter Range of action    |
|-----------|------------------------------|
| 0 - 0     | Stability control excluded   |
| 3 - 1     | 3 divisions in 1 second      |
| 2 - 1     | 2 divisions in 1 second      |
| 1 - 1     | 1 divisions in 1 second      |
| 0.5 - 1   | 0.5 divisions in 1 second    |
| 3 - 0.5   | 3 divisions in 0.5 seconds   |
| 2 - 0.5   | 2 divisions in 0.5 seconds   |
| 1 - 0.5   | 1 divisions in 0.5 seconds   |
| 0.5 - 0.5 | 0.5 divisions in 0.5 seconds |

### **LOAD CELL INPUT SIGNAL DISPLAY (“SIGNAL” SUBMENU)**

The load cell input signal expressed in mV/V is shown on the display.



Press the **C** key to exit.



Press again the **C** key to leave the submenu and return to the **instrument set-up menu (“PArAMeT”)**.

### **ADJUSTING THE CLOCK / CALENDAR**



Press the **ENTER** key when the display shows the message “**tiME-dA**”

#### **“TIME-DA” MENU ITEMS**



Date and time setting.

**SUBMENU MANAGEMENT**

Press the **↑** and **↓** keys to scroll up and down the items, press the **ENTER** key to access the parameter, press the **C** key to leave the submenu and return to the **instrument set-up menu ("tiME-dA")**.

**CLOCK / CALENDAR ADJUSTMENT**

The HOURS, MINUTES, DAY, MONTH and YEAR values are programmed in sequence.  
A message is displayed for 2 seconds before accessing the set-up, to identify the parameter being set.



**During the 2 seconds display of the message** indicating the parameter being set, press the **↑** and **↓** keys to scroll up and down the parameters, press the **ENTER** key to access the parameter set-up or **C** to leave the sequence.



**While setting up the flashing parameter**, press the **ENTER** key to confirm the value without change it.

To change the value, press the **C** key, enter the new value using the numeric keys, then press the **ENTER** key to confirm.

Hour setting.

Minutes setting.

Day setting

Month setting (from 1 to 12).

Year setting (from 00 to 99).

The procedure is completed when the last value in the sequence is confirmed. The message "AdJUst" will be displayed again.



Press the **C** key to leave the submenu and return to the **instrument set-up menu ("tiME-dA")**.

## SERIAL COMMUNICATION PARAMETERS SET-UP



Press the **ENTER** key when the display shows the message “**SErIAL**”

This submenu makes it possible to configure the serial ports COM1 and COM2.

The instrument is equipped with two independent serial ports. Wirings are available on the same connector.

- |                             |                                   |
|-----------------------------|-----------------------------------|
| • COM1 with Rs232 interface | • COM2 with Rs422/Rs485 interface |
|-----------------------------|-----------------------------------|



For instructions on how to connect the serial ports, see section 1 of the Installation manual.

### “SERIAL” MENU ITEMS

Baud rate selection for COM1.

Communication protocol selection for COM1.

Baud rate selection for COM2.

Communication protocol selection for COM2.

Instrument address.

Number of paper advance lines at the end of printout.

Number of the slave node (address 001 to 126) in the Profibus-DP network.

3 lines of alphanumeric characters can be received from a PC over the COM1 port and be used as heading in the printout reports.  
Function available only if the COM1 protocol has been selected as “Print”.

### SUBMENU MANAGEMENT



Press the **↑** and **↓** keys to scroll up and down the items, press the **ENTER** key to access the parameter, press the **C** key to leave the submenu and return to the **instrument set-up menu** (“**SErIAL**”).

### BAUD RATE SELECTION (BAUD C1) (BAUD C2)

The display shows the current selection (blinking): the baud rates that can be selected are:

**1200, 2400, 4800, 9600, 19200, 38400 and 115200 bit / sec.**



Select the baud rate value by using the **↑** and **↓** keys, then press the **ENTER** key to confirm.



**PROTOCOL SELECTION FOR COM1 (Rs232) (PROTOC1)**

The display shows the current selection (blinking):

Continuous data transmission (transmission frequency 5 Hz)

Automatic data transmission during the batching procedure

MASTER / SLAVE ASCII protocol with data transmission upon request from the serial line

MODBUS RTU protocol

Connection to panel printer for printing out the batching procedures, the totals and the inventories.

Protocol for the connection to the external BCD board (optional).



Select the desired protocol by using the  $\uparrow$  and  $\downarrow$  keys, then press the **ENTER** key to confirm.  
Press the **C** key to come back to “ProtoC1”.

**PROTOCOL SELECTION FOR COM2 (Rs422) (PROTOC2)**

The display shows the current selection (blinking):

Continuous data transmission (transmission frequency 5 Hz)

Automatic data transmission during the batching procedure

MASTER / SLAVE ASCII protocol with data transmission upon request from the serial line

MODBUS RTU protocol.

Profibus-DP protocol (for more detailed information on this protocol consult this manual from page 2.61 to page 2.64)



Select the desired protocol by using the  $\uparrow$  and  $\downarrow$  keys, then press the **ENTER** key to confirm.  
Press the **C** key to come back to “ProtoC2”.

### **INSTRUMENT ADDRESS NUMBER (ADDRESS)**

This parameter represents the communication address in the “PC request” and “Modbus” protocols. Moreover, if it is set at any number other than 0, it is printed out as Identification Code on the printouts. The value can be programmed from 0 to 99.



Press the **ENTER** key to confirm the value without changing it. To change the value, press the **C** key, enter the new value using the numeric keys, then confirm by pressing the **ENTER** key.

### **PROGRAMMING THE FORM FEED LINES AFTER PRINTOUT (F-FEED)**

If a printer is used (COM1 protocol selected as “**PrintEr**”), this parameter adjusts the paper advance distance after printing, in order to optimize the size of the receipt on the basis of the paper rip or economy. The value can be programmed from 0 to 9.



Press the **ENTER** key to confirm the value without changing it. To change the value, press the **C** key, enter the new value using the numeric keys, then confirm by pressing the **ENTER** key.

### **PROFIBUS NODE ADDRESS PROGRAMMING (PROF AD)**

This parameter represents the Profibus node address. The value can be programmed from 0 to 126. Program this parameter only in case the COM2 protocol has been selected as “Profibus”. Profibus-DP communication requires the use of the S125 external module.



Press the **ENTER** key to confirm the value without changing it. To change the value, press the **C** key, enter the new value using the numeric keys, then confirm by pressing the **ENTER** key.

### **PROGRAMMING THE HEADING FOR THE PRINTOUT REPORTS**



This function allows to receive from a PC over the COM1 port up to 3 lines of alphanumeric characters. The characters received will be printed as heading in the printout reports.

The above procedure needs a special PC application to be carried out. Contact the service for further details.



Press the **C** key to leave the submenu and return to the **instrument set-up menu (“SErIAL”)**.

## ANALOG OUTPUT PARAMETERS SET-UP



Press the **ENTER** key when the display shows the message “**AnALoG**”



Check that the instrument is equipped with the optional analog output board.

The analog output type (**Voltage** or **Current**) is determined in the factory.

The **Current** output can range from **0 to 20 mA** or from **4 to 20 mA**.

The **Voltage** output may range from **0 to 10 V** or from **0 to 5 V**.

The analog output is obtained through the conversion of the digital weight value of the gross or net weight (DAC) with a resolution of 16 bit. (65535 divisions).

The signal update frequency is the same as the display update frequency and can be modified in the instrument set-up procedure. The filter applied to the analog output are that applied to the displayed weight.

The min. and max. range of values that the analog output can take are the following:

- In case **Current** output, from around  $-0.4 \text{ mA}$  to  $21.5 \text{ mA}$ .
- In case **Voltage** output, from around  $-0.2 \text{ V}$  to  $10.5 \text{ V}$ .

When the weight is invalid (weight outside the measurement field, weight not yet measured upon switching on), the output signal takes the minimum value.



For the analog output connection see the instrument Installation manual (Section 1).

### “ANALOG” SUBMENU ITEMS

F-SCALE

Programming the weight value corresponding to the analog output full scale.

An Mode

Type of weight transmitted as analog output (net / gross).

rANGE

Analog output range selection (0-10V, 0-5V, 0-20mA, 4-20mA).

offset

Analog output offset adjustment.

### SUBMENU MANAGEMENT



Press the  $\uparrow$  and  $\downarrow$  keys to scroll up and down the items, the **ENTER** key to access the programming or the relevant procedure.

Press the **C** key to leave the submenu and return to the **instrument set-up menu** (“**AnALoG**”)

### **FULL SCALE (F-SCALE)**

This parameter programmes the weight value corresponding to the analog output full scale (10V, 5V or 20 mA). This makes it possible to use the entire analog output range even if the weight used is not close to the full scale of the weighing system. The default value is the weighing system capacity ("CAPAC" parameter), but it can be set at a lower value (up to 10% of the weighing system capacity).

### **TRANSMITTED WEIGHT SELECTION (AN-MODE)**

The display shows the stored selection (flashing):

net

The analog output takes the value corresponding to the **net weight**

Or:

Gross

The analog output takes the value corresponding to the **gross weight**



Press the **ENTER** key to confirm the selection without changing it, Press the  $\uparrow$  or  $\downarrow$  keys to display the desired selection and press **ENTER** to confirm. Press the **C** key to leave the submenu.

### **ANALOG OUTPUT RANGE SELECTION (RANGE)**

The display shows the stored selection (flashing):

0-10 V

0 – 10 V output;

or:

0-5 V

0 – 5 V output;

or:

4-20 mA

4 – 20 mA output;

or:

0-20 mA

0 – 20 mA output.



Press the **ENTER** key to confirm the selection without changing it, Press the  $\uparrow$  or  $\downarrow$  keys to display the desired selection and press **ENTER** to confirm. Press the **C** key to leave the submenu.



Once the analog output range has been modified, the calibration of the analog output through the offset adjustment procedure is needed.

**ANALOG OUTPUT CALIBRATION (OFFSET ADJUSTMENT)**

Connect a digital multimeter to the terminals no.14 and 15 of the MC terminal block (see page 1.13 of the manual Sec.1), then adjust both the zero offset and the full scale offset by using the following procedure:

Indicates that the zero offset can be adjusted. The analog output assumes a value corresponding to the zero of the weighing system.

Indicates that the full scale offset can be adjusted. The analog output assumes a value corresponding to the full scale of the weighing system.



Press the **→0←** keys in order to enable the zero adjustment procedure.

Press the **→T** keys in order to enable the full scale adjustment procedure.

The **↑** and **↓** keys allow the **coarse adjustment** of the analog output offset.

The **F1** and **F6** keys allow the **fine adjustment** of the analog output offset.

Press the **ENTER** key in order to save the adjustment and end the procedure.

### VIEWING ACCESS TO THE WEIGHING SET-UP MENU



Press the **ENTER** key when the display shows the message “**ACCESS**”

**“ACCESS” MENU ITEMS**

Access the data display relative to the last access to the weighing set-up menu.

Access the data display relative to the penultimate access to the weighing set-up menu.

Access the data display relative to the third from last access to the weighing set-up menu.

Access the data display relative to the fourth from last access to the weighing set-up menu.

Access the data display relative to the fifth from last access to the weighing set-up menu.

**SUBMENU MANAGEMENT**

Press the **↑** and **↓** keys to scroll up and down the items, the **ENTER** key to access the relevant procedure.

Press the **C** key to leave the submenu and return to the **instrument set-up menu (“ACCESS”)**

## VIEWING DATA RELATIVE TO ACCESS TO THE WEIGHING SET-UP MENU

The following data will be displayed automatically in a timed sequence. Once the last timing expires the procedure automatically ends.

Identification Code used for access (password table). If the access has been performed by using the calibration jumper, the Identification Code is 0.

Progressive access number. This value is never reset.

Date (day, month and year) of access.

## SELECTING THE DISPLAY AND PRINTER MESSAGES LANGUAGE



Press the **ENTER** key when the display shows the message “**LAnGuAGE**”

The display shows the stored selection (flashing):

The messages on the display and the printed reports are in Italian

or:

The messages on the display and the printed reports are in English.



Press the **ENTER** key to confirm the selection without changing it, Press the **↑** or **↓** keys to display the desired selection and press **ENTER** to confirm. Press the **C** key to leave the submenu.

## HARDWARE AND SOFTWARE TEST PROCEDURES



Press the **ENTER** key when the display shows the message “**tEst**”

### “TEST” MENU ITEMS

Access the current date and time display.

Access the analog output test procedure.

Access the remote input test procedure.

Access the relay output test procedure.

### SUBMENU MANAGEMENT



Press the **↑** and **↓** keys to scroll up and down the items, the **ENTER** key to access the relevant procedure.

Press the **C** key to leave the submenu and return to the **instrument set-up menu** (“**tEst**”)

### CLOCK/CALENDAR TEST (TIME-DA)

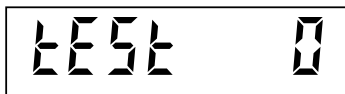
The hour is displayed.

Use one of the two keys **↑** and **↓** to display the date.



Press the **C** key to leave the submenu and return to the **instrument set-up menu** (“**time-dA**”)

### ANALOG OUTPUT TEST (ANALOG)



This procedure allows to generate, through the keyboard, an analog output value that corresponds to the selected percentage. To measure the output value it is necessary to use a digital multimeter connected to the terminals no.14 and 15 of the MC terminal block (see page 1.13 of the manual Sec.1)

The 2 right digits indicates the percentage of the analog output value.



Press the keys **from 1 to 9** to generate the output values from 10% to 90%

Touch the **0** key to generate a value equivalent to 100%.

Touch the **F** key to generate a value equivalent to 0.

Press the **C** key to leave the submenu and return to the **instrument set-up menu ("AnALoG")**

### REMOTE INPUTS TEST (TEST IN)



The display shows the status of the 6 remote inputs. Each digit is associated to an input. The farthest digit to the left is associated to input 1.

By activating one of the remote inputs (see page. 1.7 of the manual Sec.1) the corresponding digit on the display takes the value of 1.

Digit = 0: input is de-activated; Digit = 1: input is activated.

Press the **C** key to leave the submenu and return to the **instrument set-up menu ("tEst-In")**

### TEST OUTPUT RELAYS (TESTOUT)



The display shows the status of the 6 relay outputs. Each digit is associated to an output. The farthest digit to the left is associated to output 1. Press the **numeric** keys from 1 to 6 to activate and de-activate the outputs from 1 to 6.

Set to "ohm" a digital multimeter and connect it to the terminal block MB (See page 1.8 of the manual Sec.1) to verify the opening and closing of the contacts.

Press the **C** key to leave the submenu and return to the **instrument set-up menu ("tEstout")**

Press the **C** key a second time to go back to the **"TEST"** menu.

Press the **C** key the last time to get out from the menu of the instrument set-up procedure.



## DESCRIPTION OF THE POSSIBLE BATCHING SEQUENCES AND MODES

The instrument can handle up to **50 recipes** besides the basic recipe dedicated to the manual batching (recipe nr. 0)

There are **2 types of batching sequences** and therefore two programming procedures of the recipes.

The different types of sequence are selectable via the **F1** key and are briefly explained here below:

- **FIXED SEQUENCE:**

Each recipe is made up by 1 batching set point related to each ingredient; the batch of the ingredients takes place in a fixed sequence from the first to the last one.

By programming one of the set points= 0 the relative ingredient is not batched. It is not possible to pause the batching sequence or perform intermediate discharges during the batch-in phase, therefore, the discharge phase of the weighing system takes place only at the end of the batch-in cycle.

If the "DIS SET" mode is enabled (see page 2.31) the amount of product to be discharged can be programmed after the set point value of the last ingredient.

- **VARIABLE SEQUENCE WITH INTERMEDIATE DISCHARGES:**

Each recipe is made up by a sequence of batching activities (**up to 20** per recipe). Each activity can be:

- 1) **Batch-in** of anyone of the ingredients;
- 2) **Discharge** operation, complete or partial, depending on the "Discharge mode selection", page 2.31;
- 3) **Pause** the batching sequence
- 4) **End of the recipe.**

The **batching order** of the ingredients is therefore **programmable** and the batching of a specific ingredient can be repeated more times in the same recipe.

Also, there are **2 different ways** in which the **set-point value of the ingredients** can be programmed:

- **WEIGHT SET-POINT:** The set point is **programmed as an absolute weight value**. The weight value for each ingredient is the one specified in the recipe. During the operative phase it is possible to increase or decrease any/all of the weight values, in relation to a programmable factor, temporary, without modifying the recipe stored in the memory.
- **PERCENTAGE SETPOINT:** The set point **is programmed as a percentage** relative to the total value of the recipe (= to 100%)

## SET UP MENU OF THE OPERATIVE FUNCTIONS

### HOW TO SELECT THE OPERATING MODE OF THE RECIPES AND THE BATCHING

This procedure establishes the **operating modes of the recipes and the way in which the batching is handled and checked**. Furthermore, this procedure also allows to activate the **keyboard lock** and the **password** to have access to **certain functions**.

Press the **MENU** key, the following messages will appear

Recipes and batching operating mode selection.

**Keyboard lock** and **password** to have access to certain functions.  
(refer to page 2.33)



Press the keys **↑** or **↓** to switch between the two messages.

Press the **ENTER** key to have access to the desired function.

Press the **C** key to leave the menu.

## THE SUBMENU “BAT-SEL”



Number of the remote inputs used to perform the recipe selection



Programming the maximum number of the ingredients

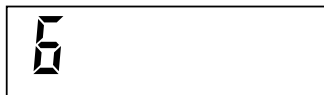


Press the keys ↑ or ↓ to switch between the two messages.

Press the **ENTER** key to have access to the desired function.

Press the **C** key to leave the menu.

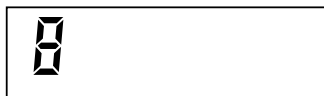
## (N INPUT) NUMBER OF INPUTS SELECTION



**6 remote inputs** are selected. This configuration allows to select **up to 15 recipes** through the remote inputs (see page 2.54).

The connection for the optional **analog output is available** on the MC 302 terminal block (nr. 14 and 15) ;

or:



**8 remote inputs** are selected. This configuration allows to select **up to 50 recipes** through the remote inputs (see page 2.54).

The connection for the optional **analog output is NOT available** on the MC 302 terminal block;



Press the keys ↑ or ↓ to switch between the two messages.

Press the **ENTER** key to confirm the desired number.

## (N COMP) BATCH-IN/BATCH-OUT SELECTION AND PROGRAMMING THE NUMBER OF INGREDIENTS IN THE BATCH-IN SEQUENCE

### Enabling the batch-out sequence:

- The **BATCH-OUT** sequence will be automatically enabled by setting the number of ingredients = 0.  
The outputs take the functions explained on page 2.54.

### Enabling the batch-in sequence:

- The **BATCH-IN** sequence will be automatically enabled by setting the number of ingredients ≠ 0.
- By programming a **value from 1 to 3** the batch-in of **1, 2 or 3 ingredients at dual speed will be enabled**.  
The outputs take the functions explained on page 2.54.
- By programming the **value 4** the batch-in of **4 ingredients at single speed will be enabled**.  
The outputs take the functions explained on page 2.54.
- By programming a **value from 5 to 11** the batch-in of **5, 6, 7, 8, 9, 10 or 11 ingredients at dual speed will be enabled**. The outputs take the functions explained on page 2.54.  
**The optional 8 relays external module is needed.**

- By programming **the value 12** the batch-in of **12 ingredients at single speed will be enabled**. The outputs take the functions explained on page 2.54.  
**The optional 8 relays external module is needed.**



**During the programming of the blinking parameter**, to confirm the value without changing it, press the **ENTER** key. To modify the value first press **C** to zero, set the new value with the numeric keys, and confirm the programming with the **ENTER** key.

### SELECTION OF THE INGREDIENTS SET-POINT VALUE AS A WEIGHT OR AS A PERCENTAGE



This selection **is active** only in case the batching of **at least 2 ingredients** is configured.

The display visualizes one of the two following options:

The **set points** are programmed as absolute **weight** values (see parameter “VAR FAC” on page. 2.42).

or:

The **set points** are programmed as **percentage** values. (see parameter “REC” on page 2.43).

### SELECTION OF A RECIPE IN A FIXED SEQUENCE OR VARIABLE SEQUENCE WITH INTERMEDIATE DISCHARGES



This selection is **active only in case** the **sequence of the batch-in** is configured.

The display visualizes one of the two following options:

See “**FIXED SEQUENCE**” on page 2.29

or:

See “**VARIABLE SEQUENCE WITH INTERMEDIATE DISCHARGES**” on page 2.29

### DISCHARGE MODE SELECTION



In the **FIXED SEQUENCE** the discharge phase takes place only once the batch-in phase has been completed.

This function allows the **partial discharge** of the product. Its value can be programmed in the recipe once the last set point value has been entered.

or:

This function causes the **complete discharge** of the product, until the scale is completely emptied. No values need to be programmed.

### SELECTION OF THE TOLERANCE VALUE AS A WEIGHT OR AS A PERCENTAGE

tol

The **tolerance** parameter can be set as an absolute **weight value**

or:

% tol

The **tolerance** parameter can be set as a **percentage** of the corresponding set point value.

### PERFORMING THE AUTOTARE FUNCTION WHEN STARTING THE BATCH-IN PHASE

tarE on

When starting the batch-in phase an **autotare will be performed**.  
The displayed weight will be the "Net weight"

or:

tarEoff

When starting the batch-in phase the **autotare will not be performed**.  
The displayed weight will be the "Gross weight"

### SELECTING THE AUTOMATIC DISCHARGE OF COMPLETED BATCH



This selection is **active only when the message "r-VAr" (VARIABLE SEQUENCE WITH INTERMEDIATE DISCHARGES) is selected**.

d15 on

Once the last activity of the recipe has been terminated, **the complete discharge of the product will always take place** causing the sequence to end.

or:

d15 off

The discharge phase **does not perform automatically** upon completion of the batch, unless it has been previously programmed as the last step of the recipe.

### ENABLING/DISABLING THE AUTOMATIC PRINTOUT



The following selection is **active only when** the protocol of the serial port **COM1 is set to "PrIntEr"**.  
(See page 2.21)

Prn on

A printout report is produced automatically at the end of each batching cycle.

or:

Prn off

The printout can be activated manually, but only for printing the **totals** and the **inventory** (see pages 2.49 to 2.53).

By pressing the **ENTER** key after selecting this last parameter the procedure ends and the **"BAT SEL" (batch selection)** message comes back on the display

**DIFFERENT WAYS IN WHICH THE “FINE” AND “COARSE” OUTPUTS CAN OPERATE IN THE BATCH-OUT SEQUENCE**

This selection is **active only in case** the **sequence of the batch-out** is configured.

The “Fine batch-out” and the “Coarse batch-out” outputs activate together after the START command. When the coarse value is reached, the “Coarse batch-out” output de-activates and only the “Fine batch-out” output stays active until the set-point is reached. (**Con** = **Contemporary**)

or:

Only the “Coarse batch-out” output activates after the START command. When the coarse value is reached, the “Coarse batch-out” output de-activates while the “Fine batch-out” activates and stays active until the set-point is reached. (**Alt** = **Alternate**)

**HOW TO HANDLE SECURITY**

**Keyboard lock** and **password** to have access to certain functions.  
(see page 2.29)

**ACTIVATE THE KEYBOARD LOCK AND PROGRAMMING THE PASSWORD**

When the message here above is displayed, press the **ENTER** key to initiate access to the function. It is important to remember here that the following procedure allows the user to accomplish two different things (independently of each other): **first** the locking of the keyboard, **second** the ability to program a password in order to prevent any undesired or unauthorized access to the following parameters:

|  |           |
|--|-----------|
| <b>Weighing</b> set-up menu            | Page 2.4  |
| <b>Instrument</b> set-up menu          | Page 2.16 |
| <b>Operating functions</b> set-up menu | Page 2.29 |
| <b>F1</b> key (Programming the recipe) | Page 2.35 |
| <b>F2</b> key (Batching parameters)    | Page 2.38 |

**The locking of the keyboard.** If any key is pressed once the keyboard has been locked, this message will appear on the display for 2 seconds.

**NOTE:**

- **Once the keyboard is locked the user only has access to the “Operating functions set-up menu” (page 2.29).** This menu can be protected by a password (see below).
- **There is only one password for all 3 of the set-up menus.** The password can be disabled by setting the value to 0.
- **In case the “Metric” use is enabled** the access to the weighing set-up menu is carried out by the procedure described on page 2.4

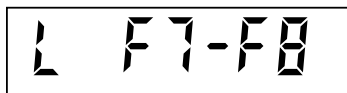
## LOCK/UNLOCK SELECTION

The three possible choices include:



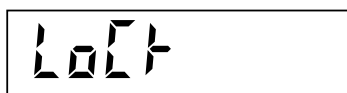
The keyboard is **unlocked**

or:



Only the **F7** and **F8** keys are **locked** to prevent any access to the **START** and **STOP** batching functions.

or:



The keyboard is **completely LOCKED**. It is only possible to access the operating functions set-up menu.

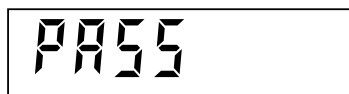


Press the keys **↑** or **↓** to display the desired message.

Press **ENTER** to select and confirm.

Press **C** to leave the menu.

## 2) PROGRAMMING ACCESS PASSWORD TO THE SETTINGS



6 digits numeric password for the access to the settings described on the previous page.

At this point the instrument will prompt the user to enter a password of his choosing (from 1 to 6 digits).

**Programming a password will prevent unwanted access to the following parameters:**

|  |           |
|--|-----------|
| <b>Weighing</b> set-up menu            | Page 2.4  |
| <b>Instrument</b> set-up menu          | Page 2.16 |
| <b>Operating functions</b> set-up menu | Page 2.29 |
| <b>F1</b> key (Programming the recipe) | Page 2.35 |
| <b>F2</b> key (Batching parameters)    | Page 2.38 |



To modify the value, press the **C** key, enter the new value and press **ENTER**.

After this operation the message “**SECURE**” will be shown on the display signifying the instrument’s acceptance of the password. Press the **C** key to end the procedure.

## SELECTING AND PROGRAMMING THE BATCHING RECIPE



It is necessary to select the number of the recipe **before** programming it, by using the following procedure.

Press the **F** key to select the number you wish to assign to the recipe to be programmed.

The number of the active recipe is displayed. To confirm the value without modifying it, press **ENTER**.

To change the value press the **C** key, enter a number from 1 to 50 and press **ENTER**.

The recipes in memory can also be selected through external inputs (see the part of the manual about the input and output functions)

## PROGRAMMING THE INGREDIENTS SET-POINT VALUE AND THE BATCHING SEQUENCES OF THE RECIPES

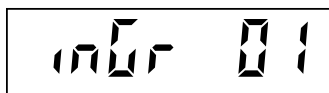


Based on the selection “**R-FI / R-VAR**” (see page. 2.31), there are two possible ways to program the recipe:

“**Recipe with a fixed batching sequence**” or “**Recipe with variable sequence and intermediate discharges**”

### RECIPE WITH FIXED BATCHING SEQUENCE

Press **F1** to program the selected recipe



With this procedure, the set-points of all the ingredients are programmed in a fixed sequence from the first to the last one. To **avoid batching** one or more ingredients, program their set point value = 0. The message shown on the left identifies the selected ingredient (1,2,3... up to the number of ingredients chosen by the user).

This flashes for 2 seconds then the current value of the set-point will be displayed automatically.



**This message will flash only if the “dIS SET” function (discharge set-point) has been previously enabled** (see selection “dIS SET” on page 2.31). The setting of the “discharge” set-point takes place once the set-point value of the last ingredient has been programmed.



By pressing the **↑** or **↓** keys **when the messages “inGr...” or “d 15Ch” flash on the display**, it is possible to move to previous/following parameters, then access to the parameter to be set by pressing the **ENTER** key. Similarly, by pressing **C** during this time delay, the user can immediately leave the sequence.

**RECIPES WITH VARIABLE SEQUENCES AND INTERMEDIATE DISCHARGES**

Through this procedure it is possible to program up to 20 activities in each recipe, which are:

- **Batch-in activity.** The user selects the number of the ingredient and its set-point value.
- **Discharge activity.** Just in case the “dIS SET” function (**partial discharge**) has been previously enabled, the user must enter the amount of product to be discharged. Otherwise, if the “dIS ALL” function (**complete discharge**) has been previously enabled, the setting of the discharge set-point **is not** needed because the discharge stops automatically when the weight returns within the 0 level (see parameter “MIN” - page. 2.41).

**REMINDER:**

If the “dIS ON” function is **enabled** (see page 2.32), the **discharge phase will always take place** after the batching of the last ingredient, even if it has not been programmed as the last activity of the recipe.

If the “dIS OFF” function is **enabled** (see page. 2.32), the **discharge phase takes place only if** the discharge activity has been programmed as the last step of the recipe.

- **Pause activity.** When the batching sequence reaches this step, the instrument pauses the batching and waits for a command (**F7** key or **Start** input) to continue with the next activity. During the pause activity the display shows the letter “A” on the left. None of the outputs is enabled.
- **End of the recipe activity.** When the user either chooses, or accepts the “Er” message prompted by the instrument, the batching of the recipe (being programmed) will end.

**PROGRAMMING OF THE ACTIVITIES: BATCHING INGREDIENT / DISCHARGE / END OF THE RECIPE**

Press **F1** to program the recipe

The programming of the activities in the recipe (max. 20) is indicated by the following messages on the display:

The **Activity n. 1** has been programmed to perform the batching of the **Ingredient 01**

The **Activity n. 2** has been programmed to perform the batching of the **Ingredient 02**

The **Activity n. 3** has been programmed to **pause** the batching sequence

The **Activity n. 4** has been programmed to perform the discharge of the weighing system

The **Activity n. 5** has been programmed to terminate the batching sequence (End of the Recipe)



Press **↑** and **↓** to select the desired activity. Press **ENTER** to confirm the selection.

By pressing the **C** key the user can leave the sequence at any time without saving any of the modifications previously entered.



### **PROGRAMMING OF THE INGREDIENTS' SET-POINT**

Following the confirmation of the **batch-in activity** or the **discharge activity** the corresponding set-point can be programmed; the instrument displays (blinking on-off-on) the value previously set in the memory.



To confirm the proposed value without modifying it, press the **ENTER** key. To modify the set-point, press the **C** key to clear the old value, set the new value with the numeric digits and then press the **ENTER** key.

Once the selection "**Er**" (end of recipe) is confirmed or once the the last possible activity (nr. 20) has been programmed, the recipe is memorized and the programming procedure ends.

### **RECIPE FOR MANUAL BATCHING**

Recipe **0** is reserved for the manual batching of a sequence that is programmed only temporarily. Select the recipe **0** before programming. The programming procedure is the same as the one described for the other recipes. By selecting a different recipe or by powering off the instrument the data stored in recipe **0** will be lost.

### **CHECKING THE CAPACITY**

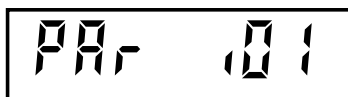
At the end of the procedure the instrument automatically checks the validity of the programmed set-point values. The sum of the set-points is checked against the net weight value of the system. If this sum exceeds the net weight value **the error message "InvALId"** is shown on the display for two seconds then the instrument prompts the user to re-enter another value; it is therefore necessary to check the previously set values and reprogram them with acceptable values.

## PROGRAMMING THE OTHER BATCHING PARAMETERS OF EACH SINGLE INGREDIENT

### ACCESSING THE MENU

Press the **F2** key.

If previously programmed, the password for the access to the menu needs to be entered (see page. 2.34).



Programming sequence of the batching **parameters** for the **ingredient 1** (coarse value, in-flight value, tolerance value, time delay values, timeout value, minimum stock).



Programming sequence of the batching **parameters** for the **ingredient 2** (coarse value, in-flight value, tolerance value, time delay values, timeout value, minimum stock).



Programming sequence of the generic **batching parameters**, common to all the ingredients, (zero level, empty scale value, timers, min. and max. levels).



The number of the headings in the programming procedure changes in relation to the number of the ingredients that has been previously programmed ( see page. 2.30)

### HANDLING OF THE SUB-MENU

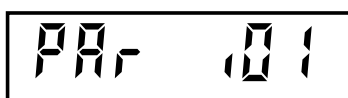


Press the keys **↑** or **↓** to display the desired message, press **ENTER** to access the programming of the related procedure, press **C** to quit the sub-menu and to go back to the instrument set-up menu

### PROGRAMMING SEQUENCE



The programming sequence is the same for all the ingredients



The batching parameters of the ingredients are programmed in sequence. Before having access to the setting a message that identifies the parameter to be set will appear for 2 seconds.



During the two second display of the message it is possible to move immediately to the parameter the user desires to set by pressing the **↑** and **↓** keys; then access to the parameter by pressing the **ENTER** key. Similarly, by pressing **C** during this time delay, the user can immediately leave the sequence.



**During the programming of any blinking parameter**, the user can confirm the value, without modifying it, by pressing **ENTER**. However, in order to modify the value, the user must first press **C** to clear, enter the new value with the number keys followed by **ENTER** to set in instrument's memory.

This parameter represents the amount of the product that will be batched at a slow speed.

In case the coarse value is higher than the set-point value stored in the recipe, the corresponding ingredient will be batched completely at a low speed.

By programming the coarse value equal to zero the corresponding ingredient will be batched completely at a high speed.



In the configuration with 4 to or 12 ingredients, the preset can't be programmed, this is because the batch can only take place at a single speed.

This parameter represents the quantity of the “in-flight” product at the end of the batch. The end of the batch must be anticipated to compensate the falling of this product

*The point of de-activation of the batch output is equal to: set-point value – in-flight value*

The in-flight value of the ingredient must be lower than the set-point value, otherwise the batching of the ingredient cannot be executed and an error message at the start of the batching phase will appear.



In case the automatic calculation of the in-flight value is enabled, the value presented at the time of the setting is the one automatically calculated by the instrument.

If this value is modified manually by the user, the instrument takes the new value and does not take into account the values calculated automatically on the basis of the previous batching sequences.

This parameter represents the number of batches on which the average is based for the automatic calculation of the in-flight value. The maximum value that can be set is 5.

- By setting the value to 0 the automatic calculation of the in-flight value is disabled.
- By setting the value 1 each batching sequence will use the in-flight value detected in the previous batching sequence.
- By setting a value from 2 to 5 the in-flight value will be the average of the in-flight values detected in the last 2, 3, 4 or 5 previous batching sequences.

The tolerance value is checked at the end of the batching of each ingredient. If the quantity just batched is outside the range “set-point + tolerance” or “set-point – tolerance”, the alarm output will be activated and also an alarm message will be displayed.

The alarm condition needs to be cleared manually by the operator by activating the remote input nr. 1 or by pressing the **F7** key.

If the tolerance value is = 0 no controls will be made at the end of the batching on the quantity exceeding the set-point value.



Depending on the condition of the parameter described on page 2.32 “**Tol**” or “**P Tol**”, the tolerance value can be programmed both as an absolute weight value and as a percentage of the corresponding set-point value.

This parameter represents the time delay between the de-activation of the batch output and the control of the weight value just batched.

Once the set-point value of an ingredient has been reached the batch output de-activates and the time delay starts immediately, the value of the net weight just batched will be checked as soon as the time delay ends (the weight must be stable, otherwise the instrument will wait for the stability condition). All the successive steps will be performed after this time (tolerance error, batch of the next ingredient, discharge phase).

This parameter is programmable from 0.0 to 999.9 seconds. Delay = 0 de-activates the function.

This parameter represents the time delay for the activation of an alarm output when a product is missing (lack of product).  
If, during the batching phase of an ingredient, the weight stabilizes, the “timeout” time starts. If the weight stays stable for a time period higher than the “timeout”

time, it means that the product is missing, in this case the Alarm output will be activated.

This parameter is programmable from 0.0 to 999.9 seconds. Timeout = 0 de-activates the function.

This parameter represents the minimum stock level of the ingredient.  
When, after a certain number of batching sequences, the inventory value of an ingredient (see page 2.52 for settings) goes under the “MIN ST” level, an alarm message will be displayed in order to alert the operator and remind him to refill

the product and update its inventory value to be able to continue the batching process.

By programming the value 0 this function is disabled and the minimum stock level is not checked.

By pressing the **ENTER** key after selecting this last parameter the procedure ends and the “**PAR I xx**” (**Parameters of the Ingredient nr. xx**) message comes back on the display. Press the ↓ key to move to the other ingredients and perform the setting as done for the first one.

When, pressing the ↓ key the message “**Bat Par**” appears on the display, it is possible to access the parameters described in the following chapter:

## PROGRAMMING THE BATCHING PARAMETERS COMMON TO ALL THE INGREDIENTS

### PROGRAMMING SEQUENCE

Press the **ENTER** key when this message is displayed.  
The message “**Ctrl 0**”, corresponding to the first parameter, will appear.



During the two second display of the message it is possible to move immediately to the parameter the user desires to set by pressing the ↑ and ↓ keys; then access to the parameter by pressing the **ENTER** key. Similarly, by pressing **C** during this time delay, the user can immediately leave the sequence.



**During the programming of any blinking parameter**, the user can confirm the value, without modifying it, by pressing **ENTER**. However, in order to modify the value, the user must first press **C** to clear, enter the new value with the number keys followed by **ENTER** to set in instrument's memory.



This selection is **active only in case** the **sequence of the batch-in** is configured.

This parameter represents the maximum weight value allowed on the weighing system to perform the start of the batching sequence.

If, when performing the start of batching, the weight value exceeds the “**Ctrl 0**” level, the batch sequence will not start and an error message (see on page 2.44) will be displayed.

By programming the value 0 this function is disabled and the “**Ctrl 0**” level is not checked.



This selection is **active only in case** the **sequence of the batch-in** is configured.



This parameter represents the weight level under which the weighing system is considered completely discharged. This level is **checked only during the discharge phase**: when the weight goes under this level, the discharge phase is considered completed and the discharge output will be de-activated.



This selection is **active only in case** the **sequence of the batch-in** is configured.



This parameter represents the **time extension FOR the discharge phase**. During the discharge phase, as soon as the weight goes under the “Min” level, the time extension starts and the discharge phase is prolonged for the programmed time to ensure the complete discharge of the weighing system.

The time is programmable from 0.0 to 999.9 seconds.



This selection is **active only in case** the **sequence of the batch-in** is configured.



This parameter represents the **time extension AFTER the discharge phase**. Once the discharge phase has been completed, the instrument waits this time to end of before passing to the next activity (only in case of partial discharges), or allowing the start of the next batching sequence.

The time is programmable from 0.0 to 999.9 seconds.

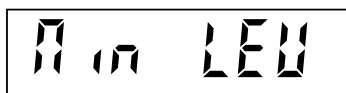


Batching cycle = Batching sequence. This parameter represents the time delay between the end of a batching cycle and the beginning of a new one (in case of automatic repetition of the batching cycles).

The time is programmable from 0.0 to 999.9 seconds.



This selection is **active only in case** the **sequence of the batch-out** is configured.

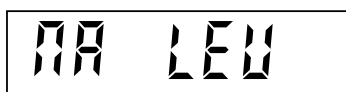


This parameter represents the **minimum amount of product** that allows to perform at least one “batch-out” sequence. When, during the batch-out of the product from the container, the gross weight reaches the **Minimum Level** value, the relay output nr. 2 (see page 2.54) will be activated in order to allow the

container to be refilled. By setting this parameter to zero the function is disabled.



This selection is **active only in case** the **sequence of the batch-out** is configured.



This parameter represents the **maximum amount of product** allowed in the container (maximum capacity). When, during the refill of the container, the gross weight reaches the **Maximum Level** value, the relay output nr. 3 (see page 2.54) will be activated in order to stop the refill procedure.

By setting this parameter to zero the function is disabled.

## PROGRAMMING THE NUMBER OF BATCHING CYCLES

With this operation it is possible to program a number of batching cycles of the same recipe, which are repeated without giving the start command at each cycle



Press **F3** to program the number of batching cycles.



By programming a value from **01 to 98** the instrument performs an automatic sequence of batching cycles, until the programmed number is reached.

By programming the **value 99** the instrument performs a **never ending sequence** of batching cycles. The batching cycles counter increases up to 99, then it remains to 99 (display & printouts) even if the sequence continues. Press the F1 key at any time during the batching in order to stop the automatic sequence; the message "LAST" appears on the display for 2 secs. while the batching cycle in progress will be completed.



**During the programming of the blinking parameter**, the user can confirm the value, without modifying it, by pressing **ENTER**. However, in order to modify the value, the user must first press **C** to clear, enter the new value with the number keys followed by **ENTER** to set in instrument's memory.



At the end of the number of cycles executed, this value is automatically set to 1 by the instrument, therefore the user has to program this parameter for each series of batching cycles.

## MODIFYING THE WEIGHT QUANTITY OF THE BATCHING RECIPE

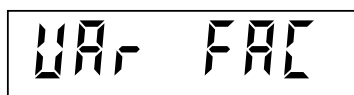


This selection is **active only in case** the **sequence of the batch-in** is configured.



Press **F4**. The message that appears on the display depends on the selection "SET" or "PERCSET" previously operated in the menu "bAt SEL" (see page 2.31).

- If the selection previously operated is "SET", by pressing **F4** the following message is displayed:



**Variation Factor** is a parameter that represents a **multiplication factor** that allows to modify temporarily the weight quantity to be batched. This allows to **reduce up to one tenth, or to increase up to ten times** the weight of each set-point in the selected recipe **without modifying them permanently**.

It is possible to program a value from 0.1 to 10.0. Each set-point programmed in the recipe will be multiplied by the programmed factor.

The factor 1.0 leaves the set-points as they are set in the recipe. If, for example, the factor 0.5 is programmed, the set-points will be cut by half, while with a factor equal to 2.0 the set-points will be doubled.



**During the programming of the blinking parameter**, the user can confirm the value, without modifying it, by pressing **ENTER**. However, in order to modify the value, the user must first press **C** to clear, enter the new value with the number keys followed by **ENTER** to set in instrument's memory.



The **Variation Factor modifies only temporarily the set-points in the selected recipe**, so that the original values previously stored in the memory will not be modified. When the recipe will be selected another time, the variation factor is immediately restored to 1.0.

## CHECKING THE CAPACITY

At the end of the procedure the instrument automatically checks the validity of the programmed **Variation Factor** value. The sum of the set-points is checked against the net weight value of the system. If this sum exceeds the net

weight value **the error message “InvALId”** is shown on the display for two seconds then the instrument prompts the user to re-enter a different **Variation Factor** value.

- If the selection previously operated in the menu “**bAt SEL**” is “**PERCSET**”, by pressing **F4** the following message is displayed:



In this case, this parameter represents the **total amount of weight** that is needed for one recipe.

Following this setting and based upon the percentages that have been previously entered for each set-point, the absolute weight values to be batched will be calculated.



**During the programming of the blinking parameter**, the user can confirm the value, without modifying it, by pressing **ENTER**. However, in order to modify the value, the user must first press **C** to clear, enter the new value with the number keys followed by **ENTER** to set in instrument's memory.

### **MORE PRECISE INFORMATION**

When the set-points programming procedure has been selected as **weight mode (SET)**, the set-points are set as **absolute weight values**.

The parameter “**Var FAC**” modifies (temporarily) all the set point values stored in the recipe.

By multiplying the set-points values by the “**Var FAC**” value, the user can obtain quantities from 1/10 to 10 times the nominal quantities.

The “**Var FAC**” parameter is the same for all the set-points in the recipe.

When the set-points programming procedure has been selected as **percentage mode (PERCSET)**, the set-points are set as **percentage values** with respect to the quantity set in the “**rEC**” parameter.

Therefore, the “**rEC**” value represents the total amount of weight that the user wants to obtain with the batch of the selected recipe. Each ingredient will be batched in its percentage with respect to the “**rEC**” value.

The instrument checks that the sum of the percentages of all the ingredients does not exceed 100%.

### **EXAMPLES:**

- **Batching of 4 ingredients with Weight mode (SET) selected:**

|                              |   |       |                              |
|------------------------------|---|-------|------------------------------|
| Parameter “ <b>Var FAC</b> ” | = | 1.5   |                              |
| Set-point ingredient 1       | = | 25 kg | (25 x 1,5 = <b>37.5 kg</b> ) |
| Set-point ingredient 2       | = | 10 kg | (10 x 1,5 = <b>15 kg</b> )   |
| Set-point ingredient 3       | = | 13 kg | (13 x 1,5 = <b>19,5 kg</b> ) |
| Set-point ingredient 4       | = | 28 kg | (28 x 1,5 = <b>42 kg</b> )   |

The set-points stored in the selected recipe have been multiplied by the “**Var FAC**” parameter and the new quantities have been obtained (in parenthesis in **bold**)

- **Batching of 4 ingredients with Percentage mode (PERCSET) selected:**

|                          |   |        |                             |
|--------------------------|---|--------|-----------------------------|
| Parameter “ <b>rEC</b> ” | = | 200 kg |                             |
| Set-point ingredient 1   | = | 25 %   | (200 x 25% = <b>50 kg</b> ) |
| Set-point ingredient 2   | = | 39 %   | (200 x 39% = <b>78 kg</b> ) |
| Set-point ingredient 3   | = | 28 %   | (200 x 28% = <b>56 kg</b> ) |
| Set-point ingredient 4   | = | 8 %    | (200 x 8% = <b>16 kg</b> )  |

The “**rEC**” value has been multiplied by the percentage of each ingredient and the new quantities have been obtained (in parenthesis in **bold**)

## MESSAGES ON THE DISPLAY DURING THE BATCHING SEQUENCE

d <net>

During the batching cycle the display shows the net weight and the letter “d” on the left.

During the batching cycle the **F** key allows to display other information such as:

01 -02

Number of the ingredient and number of the recipe during the batching phase. This message indicates that the ingredient 1 of the recipe 2 is being batched.

1 02-10

Number of the current batching cycle and number of the programmed cycles (only if programmed cycles > 1). This message indicates that the cycle nr. 2 on 10 programmed cycles is being batched.

d 15 -01

Discharge phase. This message indicates that a discharge phase is in course in the recipe nr. 1.

### Error messages displayed automatically

no Prod

Following the start command, if the selected recipe is not programmed. (The message is timed for 3 seconds).

PAR Err

Following the start command, if the batching parameters are not compatible among themselves. (The message is timed for 3 seconds).

CAP Err

Following the start command, if the sum of the set points is higher than the weighing system capacity. (The message is timed only for 3 seconds).  
**ACTIVE ONLY IN THE BATCH-IN SEQUENCE**

H Err

Following the start command, if the weight is not sufficient to perform the batch-out. (The message is timed for 3 seconds)  
**ACTIVE ONLY IN THE BATCH-OUT SEQUENCE**

N in H

Following the start command, if the weighing system is not empty (under the “Ctrl 0” value). **ACTIVE ONLY IN THE BATCH-IN SEQUENCE**

Sta Err

Following the start command, if the inventory value (stock) of one of the ingredients is under the relative level (parameter “MIN ST”, page 2.40).

tolEr

This message, alternated with the batched net weight, indicates that the ingredient has been batched outside the tolerance.

PAUSE

This message indicates that the batch-in or the batch-out sequences have been paused.

no Prod

If, during the batching of an ingredient, the feeding of the product stops (lack of product), the “Timeout” time delay (see page 2.40) starts. If the programmed quantity is not batched within the “Timeout” time delay, the message “NO PROD” appears on the display.

RESTART

If, during a batch-in or a batch-out sequence, a “black out” occurs, the “Restart” message will appear at power up. The user has the chance to stop the batch definitively (Stop command) or to resume the batch (Start command)

LAST

This message indicates that the batching cycle in progress will be the last one performed.



## THE “BATCH-IN” SEQUENCE

### DESCRIPTION OF THE BATCH-IN SEQUENCE

The **START** of the batch-in sequence **can be performed in 2 different ways**:

1. **By closing the remote input nr. 1**

Or

2. **By pressing the F7 key**

Before allowing the batch-in sequence to start, the conditions described here below must be satisfied. Any error message will be displayed for 3 seconds (see previous page).

- The selected recipe has to be previously programmed (at least one of the ingredients has to be set to a value  $\neq 0$ )
- The batching parameters must be compatible between them (all the “in-flight” values must be lower than the relative set-point)
- The sum of the set-points of all the ingredients cannot exceed the maximum capacity of the weighing system (“CAPAC” parameter, page 2.6)
- The inventory value (“StOCK” parameter, page 2.52) must be higher than the minimum stock value (“Min St” parameter, page 2.40) programmed for each ingredient. Otherwise an error message will be displayed and the “Alarm” output will be activated. Press the ENTER key to clear the error condition.
- The weight value on the weighing system must be lower than the “Ctrl 0” level, (“Ctrl 0” parameter, page 2.40). If the “Start” command is performed with the weight value exceeding the “Ctrl 0” range, an error message will be displayed. In case the weight value returns inside the “Ctrl 0” range the batch-in sequence will automatically start, otherwise the STOP command (input nr. 2) will be needed.

If the above conditions are satisfied, after the START command the **OUTPUT** corresponding to the **first ingredient** programmed in the recipe will be activated; an autotare will be performed only if the “TarE On” function has been previously selected (“TarE On” parameter, page 2.32).

In case of a **dual speed** batch-in sequence (not available in case of 4 or 12 ingredients), both the **COARSE** and the **FINE OUTPUT** are activated; when the weight reaches a value equal to **set-point value** minus **coarse value** minus **in-flight value**, the COARSE OUTPUT de-activates (and is no longer reactivated, even if the weight becomes again lower than the point of de-activation).

When the weight reaches the **set-point value** (actually **set-point value** minus **in-flight value**), also the FINE OUTPUT de-activates. If the weight, still in motion, goes under the **negative tolerance** level (**set-point value** minus **tolerance value**) the FINE OUTPUT re-activates until the **set-point value** will be reached again. The re-activation of the FINE OUTPUT will be performed even if the **tolerance value** is = 0.

If, during the batch-in phase of an ingredient, the weight stop to increase and stays stable for more than the programmed time (“tiMEOUT” parameter, page 2.40) the ALARM OUTPUT is activated and an error message is displayed (this happens only if the Timeout time is  $\neq 0$ ). The COARSE and/or the FINE OUTPUTS are maintained active. As soon as the weight starts to increase again, the ALARM condition is automatically cleared. Also the **F7 key** or the **remote input nr. 2** can be used to clear the ALARM condition but, in this case, the batching of the ingredient will be considered concluded definitively and the instrument will proceed with the batching sequence of the remaining ingredients.

When the **set-point value** is reached the “delay” time, if  $\neq 0$ , starts (see page 2.39), when the time expires and the weight is stable the **tolerance value** will be checked (no check if tolerance value = 0).

If the weight just batched is outside the negative tolerance level (**set-point value** minus **tolerance value**) or the positive tolerance level (**set-point value** plus **tolerance value**) the ALARM OUTPUT is activated and an error message is displayed. Use the **F7 key** or the **remote input nr. 2** to clear the ALARM condition

Now the next ingredient will be batched (or, in case of **variable sequence** enabled, the next activity will be performed) up to the last one.

In case of **fixed sequence** enabled (“r-Fi” parameter, page 2.31) the **discharge phase** is always performed after the batching of the last ingredient programmed in the recipe.

In case of a **Variable sequence** enabled (“r-VAr” parameter, page 2.31) the **discharge phase** can take place at any time, depending on how the intermediate discharge activities have been previously programmed in the recipe.

The **discharge phase** is always associated to the activation of the DISCHARGE OUTPUT.

During the **discharge phase**, the weight value displayed by the instrument and the way in which the DISCHARGE OUTPUT operates, depend on how the **discharge mode** has been previously selected (“diS Set” or “diS All” parameter, page 2.31)

- If the **discharge mode** has been selected as a **partial discharge** (“diS Set”), during the **discharge phase** the display shows the decrement of the **net weight partially discharged**.  
As soon as the discharge set-point has been reached, the DISCHARGE OUTPUT de-activates and the **time extension AFTER the discharge phase** starts (“diS E” parameter, page 2.41).
- If the **discharge mode** has been selected as a **complete discharge** (“diS All”), during the **discharge phase** the display shows the decrement of **the gross weight** (the sum of each ingredient just batched).  
As soon as the minimum level (“Min” parameter, page 2.41) has been reached, the **time extension FOR the discharge phase** starts (“dl tiME” parameter, page 2.41), when the time expires the DISCHARGE OUTPUT de-activates and the **time extension AFTER the discharge phase** starts (“diS E” parameter, page 2.41).

When the **batching cycle** ends the “Cycle time delay” starts (“CYC End” parameter, page 2.41).

In case the **number of automatic batching cycles is > 1** a new **batching cycle** will be **automatically performed** only once the “Cycle time delay” is expired.

In case the **number of automatic batching cycles is ≤ 1** a new **START command** (F7 key or remote input nr.1) will be accepted only once the “Cycle time delay” is expired.

### **POSSIBLE COMMANDS DURING THE BATCH-IN SEQUENCE**

The batch-in sequence can be suspended at any time by pressing the **F8** key or by activating the **remote input nr. 2** (STOP command).

When the batch-in sequence is suspended, it is possible to **resume the sequence** by pressing the **F7** key or by activating the **remote input nr. 1** (START command).

Otherwise it is possible to **stop the sequence definitively** by pressing another time the **F8** key or by activating another time the **remote input nr. 2** (STOP command).

During the batching cycle it is possible to change the visualization on the display as described in the paragraph **“MESSAGES ON THE DISPLAY DURING THE BATCHING SEQUENCE”** (page 2.44)

During the batching cycle is not possible to start any data programming procedure.

### **BLACK-OUT**

In the event of a loss of power, the batching sequence can be re-started when power is restored.

**All the partial batching data are kept in the memory.**

OPERATIONAL MESSAGE:

If a power loss occurs, the instrument displays the message **“rEStArt”**.

To end the interrupted sequence, press the **C** key.

To resume the batch-in sequence, press the **ENTER** key.

**PRINTED REPORT OF THE BATCH-IN CYCLE**

Printed report of the **recipe nr. 5**, programmed with **3 ingredients**, **2<sup>nd</sup> cycle** of 10

**BATCH-IN**

|                      |            |
|----------------------|------------|
| 04/11/03             | 10:30      |
| ID Code: 01          |            |
| BATCHING RECIPE N.05 |            |
| CYCLE N.02/10        |            |
| INGRED. 01           | 211.5 kg * |
| INGRED. 02           | 25.5 kg    |
| INGRED. 03           | 103.0 kg   |
| -----                | -----      |
| TOTAL                | 340.0 kg   |

**NOTE:**

- In case the **fixed sequence** of batching ("r-Fi" parameter, page 2.31) has been previously enabled, the report will be automatically printed when the last ingredient will be batched
- In case the **variable sequence** of batching ("r-VAR" parameter, page 2.31) has been previously enabled, the report will be automatically printed when the last activity previously programmed in the recipe will be performed
- When an ingredient is batched outside the tolerance, the symbol \* close to the weight value will be printed
- The line "ID Code: xx" will not be printed if the ID Code is = 0
- The line "CYCLE N. xx/xx" will not be printed if the number of automatic batching cycles is  $\leq 1$

**THE "BATCH-OUT" SEQUENCE****NOTE:**

- The batch-out sequence is automatically enabled when the number of ingredients is = 0
- The batch-out sequence allows the batching of 1 ingredient only

**DESCRIPTION OF THE BATCH-OUT SEQUENCE**

The **START** of the batch-out sequence can be performed in 2 different ways:

**3. By closing the remote input nr. 1**

Or

**4. By pressing the F7 key**

Before allowing the batch-in sequence to start, the conditions described here below must be satisfied. Any error message will be displayed for 3 seconds (see previous page).

- The selected recipe has to be previously programmed (the ingredient has to be set to a value  $\neq 0$ )
- The batching parameters must be compatible between them (the "in-flight" value must be lower than the set-point value)
- The weight present on the weighing system must be higher than the set-point value

- The inventory value (“StOCK” parameter, page 2.52) must be higher than the minimum stock value (“Min St” parameter, page 2.41) programmed for the ingredient. Otherwise an error message will be displayed and the “Alarm” output will be activated. Press the ENTER key to clear the error condition.

If the above conditions are satisfied, after the START command the autotare will be performed and the batch-out **OUTPUT** will be activated.

In case of a **dual speed** batch-out sequence both the **COARSE** and the **FINE OUTPUT** are activated; when the weight reaches a value equal to **set-point value** minus **coarse value** minus **in-flight value**, the COARSE OUTPUT de-activates (and is no longer re-activated, even if the weight becomes again lower than the point of de-activation).

When the weight reaches the **set-point value** (actually **set-point value** minus **in-flight value**), also the FINE OUTPUT de-activates. If the weight, still in motion, goes under the **negative tolerance level** (**set-point value** minus **tolerance value**) the FINE OUTPUT re-activates until the **set-point value** will be reached again.

The re-activation of the FINE OUTPUT is performed even if the **tolerance value** = 0.

If, during the batch-out phase, the weight stays stable for more than the programmed time (“tiMEOUT” parameter, page 2.41) the ALARM OUTPUT is activated and an error message is displayed (this happens only if the Timeout time is ≠ 0). The COARSE and/or the FINE OUTPUTS are maintained active. As soon as the weight start to move, the ALARM condition is automatically cleared. Also the **F7 key** or the **remote input nr. 2** can be used to clear the ALARM condition but, in this case, the batching sequence will be definitively stopped.

When the **set-point value** is reached the “delay” time, if ≠ 0, starts (see page 2.39), when the time expires and the weight is stable the **tolerance value** will be checked (no check if tolerance value = 0).

If the weight just batched is outside the negative tolerance level (**set-point value** minus **tolerance value**) or the positive tolerance level (**set-point value** plus **tolerance value**) the ALARM OUTPUT is activated and an error message is displayed. Use the **F7 key** or the **remote input nr. 2** to clear the ALARM condition.

When the **batching cycle** ends the “Cycle time delay” starts (“CYC End” parameter, page 2.41).

In case the **number of automatic batching cycles** is > 1 a new **batching cycle** will be **automatically performed** only once the “Cycle time delay” is expired.

In case the **number of automatic batching cycles** is ≤ 1 a new **START command** (F7 key or remote input nr.1) will be accepted only once the “Cycle time delay” is expired.

## **POSSIBLE COMMANDS DURING THE BATCH-OUT SEQUENCE**

The batch-out sequence can be suspended at any time by pressing the **F8** key or by activating the **remote input nr. 2** (STOP command).

When the batch-out sequence is suspended, it is possible to **resume the sequence** by pressing the **F7** key or by activating the **remote input nr. 1** (START command).

Otherwise it is possible to **stop the sequence definitively** by pressing another time the **F8** key or by activating another time the **remote input nr. 2** (STOP command).

During the batching cycle it is possible to change the visualization on the display as described in the paragraph **“MESSAGES ON THE DISPLAY DURING THE BATCHING SEQUENCE”** (page 2.44)

During the batching cycle is not possible to start any data programming procedure.

## **BLACK-OUT**

In the event of a loss of power, the batching sequence can be re-started when power is restored.

**All the partial batching data are kept in the memory.**

OPERATIONAL MESSAGE:

If a power loss occurs, the instrument displays the message **“rEstArt”**.

To end the interrupted sequence, press the **C** key.

To resume the batch-in sequence, press the **ENTER** key.

**PRINTED REPORT OF THE BATCH-OUT CYCLE**

Printed report of the **recipe nr. 1**, **3<sup>rd</sup>** cycle of 15

**BATCH-OUT**

```

04/11/03      10:30

      ID Code: 01
  BATCHING RECIPE N.01
      CYCLE N.03/15

STARTING WEIG      151.5 kg
PRODUCT            28.5 kg *
RESIDUAL WEIG      123.0 kg
  
```

**NOTE:**

- The report will be automatically printed at the end of the batch-out sequence.
- When the ingredient is batched outside the tolerance, the symbol \* close to the weight value will be printed
- The line "ID Code: xx" will not be printed if the ID Code is = 0
- The line "CYCLE N. xx/xx" will not be printed if the number of automatic batching cycles is  $\leq 1$

**DISPLAY AND PRINT THE TOTALS OF THE INGREDIENTS**

Press the **F5** key

```

t  ingr
  
```

Press the **ENTER** key when this message is displayed.

```

tot  01
  
```

The message corresponding to the total of the first ingredient will appear for 2 seconds, then the corresponding weight value will be displayed automatically.



During the two second display of the message it is possible to move immediately to the nr. of the ingredient the user desires to display by pressing the  $\uparrow$  and  $\downarrow$  keys; then access to the total weight value of the selected ingredient by pressing the **ENTER** key. Similarly, by pressing the **F5** key during this time delay, the user can immediately leave the sequence.

## PRINTED REPORT OF THE TOTALS



When the total weight value of any ingredient is displayed, the user can **print the totals of all the ingredients** by pressing the **ENTER** key.

Of course the printout will be performed only if the **Print function** has been previously enabled.

Printed report of the totals in case of 3 ingredients

### TOTALS

|                 |          |
|-----------------|----------|
| 04/11/03        | 10:30    |
| ID Code: 01     |          |
| PRINT CONSUMPT. |          |
| INGRED. 01      | 211.5 kg |
| INGRED. 02      | 25.5 kg  |
| INGRED. 03      | 103.0 kg |
| -----           | -----    |
| TOTAL           | 340.0 kg |



NOTE:

- Only the totals with a value  $\neq 0$  will be printed.
- The line "ID Code: xx" will not be printed if the ID Code is = 0
- Once the printout of the totals has been performed, the instrument quit the sequence automatically

## ZEROING THE TOTALS



When the total weight value of any ingredient is displayed, the user can **set to zero the totals of all the ingredients** by pressing the **C** key. The message here below will be **displayed for 2 seconds**:

CANCEL

During the 2 seconds display of the message **press** the **ENTER** key to set all the totals to zero.

If the **Print function** has been previously enabled the printout report will be automatically produced:

### TOTALS ZEROED

|                        |          |
|------------------------|----------|
| 04/11/03               | 10:30    |
| ID Code: 01            |          |
| PRINT CONSUMPT.        |          |
| INGRED. 01             | 211.5 kg |
| INGRED. 02             | 25.5 kg  |
| INGRED. 03             | 103.0 kg |
| -----                  | -----    |
| TOTAL                  | 340.0 kg |
| TOT INGREDIENTS ERASED |          |

## DISPLAY AND PRINT THE TOTALS OF THE RECIPES



Press the **F5** key

t nr

Press the ↑ or ↓ keys to **move to the totals of the recipes**:

tot rEE

Press the **ENTER** key when this message is displayed.

tot r01

The message corresponding to the total of the first recipe will appear for 2 seconds, then the corresponding weight value will be displayed automatically.



During the two second display of the message it is possible to move immediately to the nr. of the recipe the user desires to display by pressing the ↑ and ↓ keys; then access to the total weight value of the selected recipe by pressing the **ENTER** key. Similarly, by pressing the **F5** key during this time delay, the user can immediately leave the sequence.

### PRINTED REPORT OF THE TOTALS



When the total weight value of any recipe is displayed, the user can **print the totals of all the recipes** by pressing the **ENTER** key. Of course the printout will be performed only if the **Print function** has been previously enabled.

Printed report of the totals in case of 3 recipes

#### TOTALS

|                  |    |           |
|------------------|----|-----------|
| 04/11/03         |    | 10:30     |
| ID Code: 01      |    |           |
| PRINT PRODUCTION |    |           |
| RECIPE           | 01 | 1200 kg   |
| RECIPE           | 02 | 755.5 kg  |
| RECIPE           | 03 | 1030 kg   |
| -----            |    |           |
| TOTAL            |    | 2985.5 kg |



NOTE:

- Only the totals with a value ≠ 0 will be printed.
- The line "ID Code: xx" will not be printed if the ID Code is = 0
- Once the printout of the totals has been performed, the instrument quit the sequence automatically

**ZEROING THE TOTALS**

When the total weight value of any recipe is displayed, the user can **set to zero the totals of all the recipes** by pressing the **C** key. The message here below will be **displayed for 2 seconds**:



During the 2 seconds display of the message **press** the **ENTER** key to set all the totals to zero.

If the **Print function** has been previously enabled the printout report will be automatically produced:

**TOTALS ZEROED**

```

04/11/03      10:30

      ID Code: 01
    PRINT PRODUCTION

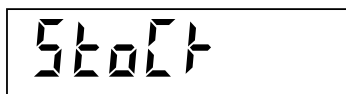
RECIPE  01      1200 kg
RECIPE  02      755.5 kg
RECIPE  03      1030 kg
-----
TOTAL                2985.5 kg

TOTAL RECIPES ERASED

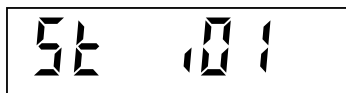
```

**HANDLING THE INVENTORY OF THE INGREDIENTS**

Press the **F6** key



Press the **ENTER** key when this message is displayed.



The message corresponding to the inventory value of the first ingredient will appear for 2 seconds, then the corresponding weight value will be displayed automatically.



During the two seconds display of the message it is possible to move immediately to the nr. of the inventory value of the ingredient the user desires to update by pressing the **↑** and **↓** keys; then access to the inventory value of the selected ingredient by pressing the **ENTER** key. Similarly, by pressing the **F6** key during this time delay, the user can immediately leave the sequence.



### **UPDATING THE INVENTORY VALUES**

Normally the inventory value of an ingredient is **automatically** updated at each batching sequence. The **manual** update procedure consists in adding a certain amount of product to the existing inventory value.



When the inventory value **of the selected ingredient** is displayed, press the **0** key to **enable the manual update procedure**.



Now, by using the **numeric** keys, it is possible to enter the amount of product to be added to the existing inventory value.



By pressing the **ENTER** key the amount of product just entered will be added to the existing inventory value and the updated **inventory value** will be **blinking on the display**.

**When the inventory value of any ingredient is blinking on the display it is possible to:**

1. **MOVE** to the inventory value of **any other ingredient**
  2. **PRINT** the inventory values of **all the ingredients**
  3. **CLEAR** the inventory value of **any ingredient**
  4. **LEAVE** the sequence
1. **MOVE** to the inventory value of any other ingredient by pressing the ↑ or ↓ keys.
  2. **PRINT** the inventory values by pressing the **ENTER** key:  
If the **Print function** has been previously enabled the printout report will be automatically produced, only the inventory values ≠ 0 will be printed:

#### **INVENTORY VALUES**

|             |      |       |
|-------------|------|-------|
| 04/11/03    |      | 10:30 |
| ID Code: 01 |      |       |
| PRINT STOCK |      |       |
| INGRED. 01  | 3500 | kg    |
| INGRED. 02  | 4150 | kg    |
| INGRED. 03  | 2000 | kg    |
| -----       |      |       |
| TOTAL       | 9650 | kg    |

3. **CLEAR** the inventory value of one of the ingredients by pressing the **C** key. The display will show the message "CANCEL", press the **ENTER** key to erase the value
4. **LEAVE** the sequence by pressing the **F6** key.

## INPUT AND OUTPUT FUNCTIONS

See pages 1.7 and 1.8 of the manual Sec.1 for wiring.

| <b>INPUTS</b> | <b>FUNCTION</b>                            |
|---------------|--|
| Input 1       | Start – Re-start – Clear alarm (pulse)     |
| Input 2       | Stop – Pause (pulse)                       |
| Input 3       | Recipe selection bit 1 (pulse)             |
| Input 4       | Recipe selection bit 2 (pulse)             |
| Input 5       | Recipe selection bit 4 (pulse)             |
| Input 6       | Recipe selection bit 8 (pulse)             |
| Input 7       | Recipe selection bit 16 (pulse) (OPTIONAL) |
| Input 8       | Recipe selection bit 32 (pulse) (OPTIONAL) |

| <b>OUTPUTS</b>  |                         |                |                          |                 |                  |   |
|---|-------------------------|----------------|--------------------------|-----------------|------------------|---|
| <b><u>BATCH-IN SEQUENCES FROM 1 TO 12 INGREDIENTS</u></b>           |                         |                |                          |                 |                  | <b><u>BATCH-OUT OF 1 INGREDIENT</u></b> |
| Output Nr.  | From 1 to 3 ingredients | 4 ingredients  | From 5 to 11 ingredients | 12 ingredients  |                  |   |
| <b>“MB” Terminal block on the MC302 instrument</b>                  | 1                       | Fine ingred. 1 | Batch ingred. 1          | Fine ingred. 1  | Batch ingred. 1  | Fine batch-out                          |
|   | 2                       | Fine ingred. 2 | Batch ingred. 2          | Fine ingred. 2  | Batch ingred. 2  | Minimum level                           |
|   | 3                       | Fine ingred. 3 | Batch ingred. 3          | Fine ingred. 3  | Batch ingred. 3  | Maximum level                           |
|   | 4                       | Coarse         | Batch ingred. 4          | Fine ingred. 4  | Batch ingred. 4  | Coarse batch-out                        |
|   | 5                       | Alarm          | Alarm                    | Alarm           | Alarm            | Alarm                                   |
|   | 6                       | Discharge      | Discharge                | Discharge       | Discharge        | Cycle in progress                       |
| <b>“MB” Terminal block on the 8 relays external module (option)</b> | 1                       | Not needed     | Not needed               | Fine ingred. 5  | Batch ingred. 5  | Not needed                              |
|   | 2                       | Not needed     | Not needed               | Fine ingred. 6  | Batch ingred. 6  | Not needed                              |
|   | 3                       | Not needed     | Not needed               | Fine ingred. 7  | Batch ingred. 7  | Not needed                              |
|   | 4                       | Not needed     | Not needed               | Fine ingred. 8  | Batch ingred. 8  | Not needed                              |
|   | 5                       | Not needed     | Not needed               | Fine ingred. 9  | Batch ingred. 9  | Not needed                              |
|   | 6                       | Not needed     | Not needed               | Fine ingred. 10 | Batch ingred. 10 | Not needed                              |
|   | 7                       | Not needed     | Not needed               | Fine ingred. 11 | Batch ingred. 11 | Not needed                              |
|   | 8                       | Not needed     | Not needed               | Coarse          | Batch ingred. 12 | Not needed                              |

During any programming procedure the input and output functions are disabled.

## SERIAL COMMUNICATION PROTOCOLS

### CONTINUOUS TRANSMISSION

**Communication parameters:**      **Start bit = 1, Data bit = 8, Stop bit = 1, Parity = none**

The “Continuous” mode is used to interface with remote serial displays, computers, or other types of devices that require constant data updating. The frequency is 5 Hz (5 transmissions per second)

In the continuous mode, the indicator sends serial data using the format shown below:

|     |         |         |     |        |     |
|-----|---------|---------|-----|--------|-----|
| STX | <stato> | <netto> | ETX | <csum> | EOT |
|-----|---------|---------|-----|--------|-----|

**<stato>**      ASCII character used to indicate the status of the instrument.  
The coding is given in the table here below (**bit = 1** means condition **true**):

| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3            | Bit 2             | Bit 1            | Bit 0             |
|-------|-------|-------|-------|------------------|-------------------|------------------|-------------------|
| 0     | 0     | 1     | 1     | Tare<br>Inserted | Minimum<br>weight | Stable<br>weight | Center of<br>zero |

**<netto>**      This field consists of 7 ASCII characters with right justified numeric values. Character values can range from “0” to “9” (30h to 39h), space (20h), or decimal point (2Eh). If the weight is negative, the first character of the <netto> field will be “-” (2Dh).  
  
In case of “**Out of range**” condition the field takes the value: “^ ^ ^ ^ ^ ^ ^ ^”.  
In case of “**Negative weight**” condition the field takes the value: “ \_ \_ \_ \_ \_ \_ \_ ”.  
In case of “**Overload**” condition the field takes the value: “ **O-L** ”.

**<csum>**      Data string checksum composed of 2 ASCII characters calculated by performing the XOR (OR exclusive) operation on the values between STX and ETX. (STX and ETX are not included in the checksum calculation). The result of the XOR is expressed by two hexadecimal characters; the first character pertains to the four most significant bits (7 to 4), the second one pertains to the four least significant bits (3 to 0).  
The <csum> is the ASCII coding of the two hexadecimal characters.  
**Example:** XOR = 5Dh; <csum> = 5Dh (35h and 44h).

### AUTOMATIC DATA TRANSMISSION DURING THE BATCHING SEQUENCE

**Communication parameters:**      **Start bit = 1, Data bit = 8, Stop bit = 1, Parity = none**

In this mode, the indicator sends out serial data to a PC each time the batching of any of the ingredients has been performed. The instrument does not wait for any answer from the PC. The data format is shown here below:

|     |         |          |         |            |     |        |     |
|-----|---------|----------|---------|------------|-----|--------|-----|
| STX | <stato> | <n.comp> | <netto> | (<codice>) | ETX | <csum> | EOT |
|-----|---------|----------|---------|------------|-----|--------|-----|

**<stato>**      ASCII character used to indicate the status of the instrument.  
The coding is given in the table here below (**bit = 1** means condition **true**):

| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3            | Bit 2             | Bit 1            | Bit 0             |
|-------|-------|-------|-------|------------------|-------------------|------------------|-------------------|
| 0     | 0     | 1     | 1     | Tare<br>Inserted | Minimum<br>weight | Stable<br>weight | Center of<br>zero |

|                         |   |
|-------------------------|---|
| <b>&lt;n.comp&gt;</b>   | This field consists of 2 ASCII characters with right justified numeric values, corresponding to the number of the batched ingredient. Character values can range from "0" to "9" (30h to 39h), or space (20h).  |
| <b>&lt;netto&gt;</b>    | <p>This field consists of 7 ASCII characters with right justified numeric values. Character values can range from "0" to "9" (30h to 39h), space (20h), or decimal point (2Eh). If the weight is negative, the first character of the &lt;netto&gt; field will be "-" (2Dh).</p> <p>In case of "<b>Out of range</b>" condition the field takes the value: "^^^^^^^^".</p> <p>In case of "<b>Negative weight</b>" condition the field takes the value: "- _ _ _ _ _".</p> <p>In case of "<b>Overload</b>" condition the field takes the value: " O-L".</p>                       |
| <b>(&lt;codice&gt;)</b> | The code is associated to the net weight. Only in case the Alibi Memory function has been previously enabled, this field will be transmitted.   |
| <b>&lt;csum&gt;</b>     | <p>Data string checksum composed of 2 ASCII characters calculated by performing the XOR (OR exclusive) operation on the values between STX and ETX. (STX and ETX are not included in the checksum calculation). The result of the XOR is expressed by two hexadecimal characters; the first character pertains to the four most significant bits (7 to 4), the second one pertains to the four least significant bits (3 to 0). The &lt;csum&gt; is the ASCII coding of the two hexadecimal characters.</p> <p><b>Example:</b> XOR = 5Dh; &lt;csum&gt; = 5Dh (35h and 44h).</p> |

### SERIAL PROTOCOL UPON PC REQUEST (SLAVE MODE)

**Communication parameters:**                      **Start bit = 1, Data bit = 8, Stop bit = 1, Parity = none**

#### **Command Listing**

The bi-directional communication protocol permits the following operations to be performed by the Master.

1. Net weight and instrument status (request)
2. Recipe programming (command)
3. Selected recipe (request)
4. Semi-automatic zero (command)
5. Start batching cycle (command)
6. Pause / Stop batch cycle (command)
7. Re-start / Clear alarm condition (command)
8. Net weight values of previous batch (request)
9. Clear net weight values of previous batch (command)
10. Total of each ingredient (request)
11. Zero all of the ingredient totals (command)

The unit connected to the MC 302 (typically a DCS or PLC) operates as the MASTER, it is the only unit that can initiate the communication procedure. The communication procedure always starts with a request from the MASTER, followed by a response from the SLAVE (MC 302).

#### **Format of commands**

The quotation marks ( " ) indicate constant characters that are included (retain the upper and lower case letters). The < > indicate variable numeric fields included.

#### 1. NET WEIGHT AND INSTRUMENT STATUS (REQUEST)

MASTER:            <Ind> "N" EOT

INSTRUMENT: <Ind> "N" <stato> <n.comp> <netto> ETX <csum> EOT      or: <Ind> NAK EOT

#### 2. RECIPE PROGRAMMING (COMMAND)

MASTER:            <Ind> "S" <n.ricetta> <n.comp> <quantità>... ETX <csum> EOT

INSTRUMENT: <Ind>"S"<n.ricetta.><n.comp><quantità>....ETX ACK EOT                      or: <Ind> NAK EOT

3. SELECTED RECIPE (REQUEST)

MASTER: <Ind> "R" <n.ricetta> ETX <csum> EOT  
 INSTRUMENT: <Ind> "R" <n.ricetta> <n.comp> <quantità>... ETX <csum> EOT or: <Ind> NAK EOT

4. SEMI-AUTOMATIC ZERO (COMMAND)

MASTER: <Ind> "zero" EOT  
 INSTRUMENT: <Ind> "zero" ACK EOT or: <Ind> NAK EOT

5. START BATCHING CYCLE (COMMAND)

MASTER: <Ind> "start" <n.ricetta> <n.cicli> <peso ricetta> <variaz> ETX <csum> EOT  
 INSTRUMENT: <Ind> "start" ACK EOT or: <Ind> NAK EOT

6. PAUSE / STOP BATCH CYCLE (COMMAND)

MASTER: <Ind> "stop" EOT  
 INSTRUMENT: <Ind> "stop" ACK EOT or: <Ind> NAK EOT

7. RE-START / CLEAR ALARM CONDITION (COMMAND)

MASTER: <Ind> "enter" EOT  
 INSTRUMENT: <Ind> "enter" ACK EOT or: <Ind> NAK EOT

8. NET WEIGHT VALUES OF PREVIOUS BATCH (REQUEST)

MASTER: <Ind> "D" EOT  
 INSTRUMENT: <Ind> "D" <n.form> <n.comp> <netto>... ETX <csum> EOT or: <Ind> NAK EOT

9. CLEAR NET WEIGHT VALUES OF PREVIOUS BATCH (COMMAND)

MASTER: <Ind> "reset" EOT  
 INSTRUMENT: <Ind> "reset" ACK EOT or: <Ind> NAK EOT

10. TOTAL OF EACH INGREDIENT (REQUEST)

MASTER: <Ind> "T" EOT  
 INSTRUMENT: <Ind> "T" <totale> .... ETX <csum> EOT or: <Ind> NAK EOT

11. ZERO ALL OF THE INGREDIENT TOTALS (COMMAND)

MASTER: <Ind> "canc" EOT  
 INSTRUMENT: <Ind> "canc" ACK EOT or: <Ind> NAK EOT

12. INTERRUPTION OF THE BATCHING CYCLES AUTOMATIC SEQUENCE

MASTER: <Ind> "last" EOT  
 INSTRUMENT: <Ind> "last" ACK EOT or: <Ind> NAK EOT

**Characters used in the strings:**

**ETX** End of text; data string end character (ASCII value 03h)  
**EOT** End of transmission; string end character (ASCII value 04h)  
**ACK** Acknowledgement; character received correctly (ASCII value 06h)  
**NAK** No acknowledgement; character not received correctly (ASCII value 15h)  
**<Ind>** Serial address of the MC 302. ASCII character that is obtained by adding 80h to the serial address.  
**Example:** If MC 302's serial address = 3, the <Ind> field would be 83h (03h + 80h)

**<csum>** Data string checksum composed of 2 ASCII characters calculated by performing the XOR (OR exclusive) operation on the values between <Ind> and ETX. (<Ind> and ETX are not included in the checksum calculation). The result of the XOR is expressed by two hexadecimal characters; the first character pertains to the four most significant bits (7 to 4), the second one pertains to the four least significant bits (3 to 0). The <csum> is the ASCII coding of the two hexadecimal characters.  
**Example:** XOR = 5Dh; <csum> = 5Dh (35h and 44h).

**<netto>** This field consists of 7 ASCII characters with right justified numeric values. Character values can range from "0" to "9" (30h to 39h), space (20h), or decimal point (2Eh). If the weight is negative, the first character of the <netto> field will be "-" (2Dh).

In case of "**Out of range**" condition the field takes the value: "^^^^^^^^".

In case of "**Negative weight**" condition the field takes the value: " \_ \_ \_ \_ \_ \_ \_ \_".

In case of "**Overload**" condition the field takes the value: " O-L".

**<stato>** ASCII character used to indicate the status of the instrument.  
The coding is given in the table here below:

|     |  |
|-----|--|
| "S" | Stable weight. Waiting for commands  |
| "M" | Weight in motion. Waiting for commands   |
| "P" | Instrument is in program mode (via keyboard)   |
| "D" | Batching cycle in progress   |
| "V" | The instrument received a start command, but all the ingredients for the recipe selected are set to zero (status character remains for 3 seconds). |
| "C" | The instrument received a start command, but the batching parameters are incompatible (status character remains for 3 seconds).                    |
| "Z" | The instrument received a start command, but the scale is not empty.   |
| "G" | Insufficient amount of weight in the scale to perform the batching sequence.   |
| "A" | Batching cycle paused.   |
| "B" | Batching cycle paused after a power loss   |
| "N" | Product is missing (ingredient timeout alarm)  |

**<n.comp>** ingredient nr. from "1" to "9", "A" = 10, "S" = batch-out (1 ASCII character)

**<quantità>** Field consisting of 7 ASCII characters with right justified numeric values. Character values can range from "0" to "9" (30h to 39h), space (20h), or decimal point (2Eh). The decimal point position has to match with the one displayed by the instrument. In case of recipe with the set-points expressed as percentage, the "quantity" value represents the percentage value with two decimal digits (xxx.xx %).

**<n.ricetta>** number of the recipe from "01" to "50" (2 ASCII characters)

**<n.cicli>** number of batching cycles to be performed automatically from "01" to "99" (2 ASCII characters)

**<peso ricetta>** Field consisting of 7 ASCII characters with right justified numeric values. Character values can range from "0" to "9" (30h to 39h), space (20h), or decimal point (2Eh). The decimal point position has to match with the one displayed by the instrument.

**<variaz>** Field consisting of 4 ASCII characters with right justified numeric values. Character values can range from "0" to "9" (30h to 39h), space (20h), or decimal point (2Eh). The decimal point position has to retain the format "xx.x".

**<totale>** Field consisting of 8 ASCII characters with right justified numeric values. Character values can range from "0" to "9" (30h to 39h), space (20h), or decimal point (2Eh).



#### NOTE:

- The fields (or group of fields) that are underlined can be repeated more than one time in the string, depending both on the number of activities (max. 20) and on the number of ingredients (max. 12) previously programmed in the recipe
- In case the fixed sequence of batching is enabled, the intermediate discharges cannot be programmed and the same ingredient cannot be repeated in the recipe.

## THE MODBUS RTU PROTOCOL



The addresses given in the following tables refer to the standards provided in the Modicon Modbus Protocol Reference Guide PI-MBUS-300 Rev J.

Supported functions: **READ HOLDING REGISTER**  
**PRESET SINGLE REGISTER**

### LIST OF THE HOLDING REGISTERS (4xxxx)

| Address | Description                      | R/W |
|---------|----------------------------------|-----|
| 0009    | Instrument Error                 | R   |
| 0010    | Status Register                  | R   |
| 0011    | Gross weight MSB (*)             | R   |
| 0012    | Gross weight LSB (*)             | R   |
| 0013    | Decimal point                    | R   |
| 0014    | Net weight MSB (*)               | R   |
| 0015    | Net weight LSB (*)               | R   |
| 0016    | Decimal point                    | R   |
| 0017    | Net weight string (char 1 and 2) | R   |
| 0018    | Net weight string (char 3 and 4) | R   |
| 0019    | Net weight string (char 5 and 6) | R   |
| 0020    | Net weight string (char 7 and 8) | R   |
| 0029    | Command Register                 | W   |

(\*) Signed

### ERRORS CODIFICATION IN THE ADDRESS 0009 “Instrument Error”

| Address 0009 | Condition              | Meaning  |
|--------------|------------------------|--|
| 00 00        | <b>No errors</b>       | The instrument is working fine   |
| 00 03        | <b>Out of range</b>    | The signal coming from the load cells is higher than the maximum allowed value of 3,9 mV/V |
| 00 05        | <b>Overload</b>        | The weight value is higher than the maximum capacity of the weighing system                |
| 00 07        | <b>Negative weight</b> | The weight value is negative for more than 9 divisions under the 0 value                   |

### LIST OF THE BITS IN THE ADDRESS 0010 “Status Register”

The bits = 1 have the following meaning:

| Bit 9   | Bit 8   | Bit 7        | Bit 6     | Bit 5           | Bit 4        | Bit 3         | Bit 2          | Bit 1         | Bit 0          |
|---------|---------|--------------|-----------|-----------------|--------------|---------------|----------------|---------------|----------------|
| Range 2 | Range 1 | Out of range | Over load | Negative weight | Valid weight | Tare inserted | Minimum weight | Stable weight | Center of zero |

### LIST OF THE FUNCTIONS IN THE ADDRESS 0029 “Command Register”

By writing in the “Command register” address the functions here below, the following commands will be performed:

|         | Function   |                    |          |
|---------|------------|--------------------|----------|
|         | 9          | 8                  | 7        |
| Command | Erase tare | Semiautomatic zero | Autotare |

### **INFORMATIONS ON THE MODBUS ADDRESSES FROM 0017 TO 0020 (“Net weight string”)**

This group of addresses contains the **net weight value codified in ASCII characters**.

It is used for the communication with an ESA touch-screen panel (optional) to perform particular applications.

The touch-screen panel allows the following functions to be performed:

- Visualization of the weight value and the LED's status
- Programming of a tare value, autotare, erase tare
- Semiautomatic zero

In the table here below it is possible to see how the net weight value of 125974 kg is represented.

First line: **ASCII characters**

Second line: **Decimal characters**

| Address<br>0017 |             | Address<br>0018 |             | Address<br>0019 |             | Address<br>0020 |             |
|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|
| Character 1     | Character 2 | Character 1     | Character 2 | Character 1     | Character 2 | Character 1     | Character 2 |
| 30              | 30          | 31              | 32          | 35              | 39          | 37              | 34          |
| 0               | 0           | 1               | 2           | 5               | 9           | 7               | 4           |



## THE PROFIBUS-DP PROTOCOL (OPTIONAL)

### ADDRESSES

#### PROFIBUS Input Data Area

| <i><b>VARIABLE</b></i>    | <i><b>BYTES MAPPING</b></i> |
|---------------------------|-----------------------------|
| Instrument error register | 0 – 1                       |
| Status register           | 2 – 3                       |
| Gross weight (MSB) (*)    | 4 – 5                       |
| Gross weight (LSB) (*)    | 6 – 7                       |
| DP position (GW)          | 8 – 9                       |
| Net weight (MSB) (*)      | 10 – 11                     |
| Net weight (LSB) (*)      | 12 – 13                     |
| DP position (NW)          | 14 – 15                     |

(\*) Signed

#### PROFIBUS Output Data Area

| <i><b>VARIABLE</b></i> | <i><b>BYTES MAPPING</b></i> |
|------------------------|-----------------------------|
| Command register       | 0 – 1                       |

#### Instrument error register

| <i><b>Value</b></i> | <i><b>Meaning</b></i> |
|---------------------|-----------------------|
| 00                  | No errors             |
| 03                  | Out of range          |
| 05                  | Overload              |
| 07                  | Negative weight       |

#### Status register

| <b>Bit 9</b> | <b>Bit 8</b> | <b>Bit 7</b> | <b>Bit 6</b> | <b>Bit 5</b>    | <b>Bit 4</b> | <b>Bit 3</b>  | <b>Bit 2</b>   | <b>Bit 1</b>  | <b>Bit 0</b>   |
|--------------|--------------|--------------|--------------|-----------------|--------------|---------------|----------------|---------------|----------------|
| Range 2      | Range 1      | Out of range | Over load    | Negative weight | Valid weight | Tare inserted | Minimum weight | Stable weight | Center of zero |

#### Command register

| <i><b>Valore</b></i> | <i><b>Significato</b></i> |
|----------------------|---------------------------|
| 07                   | Autotare                  |
| 08                   | Semiautomatic zero        |
| 09                   | Erase tare                |

#### Error messages on the instrument's display

The errors are displayed only when any data programming procedure is not in progress:

**NO COMM** = The connection between the S125 Profibus module and the Profibus network is missing. The error is cleared automatically when the connection will be established.

**E-PROF** = The connection between the MC302 and the S125 Profibus module is missing. The communication will be interrupted after few attempts to establish it.

**E-CRC** = Communication error between the MC302 and the S125 Profibus module

**THE GSD FILE** *(supplied with the instrument)*

```

=====
; Profibus Device Database of HMS Industrial Networks.
;
; Model :    Anybus-IC DP-V0
; Description : Anybus-IC DP-V0 slave
; Language :  English
; Date :     16 March 2007
; Author :   HMS Industrial Networks
;
; Revision log:
;
; 2006-10-02: Updated revision information. Cleared old
;             revision history.
; 2007-03-16: Updated revision information.
; 2007-03-16: Updated SW revision information.
; 2007-09-18: Updated SW revision information.
;
=====

```

#Profibus\_DP

GSD\_Revision = 3

; Device identification

```

Vendor_Name = "HMS Industrial Networks"
Model_Name  = "Anybus-IC DP-V0"
Revision    = "Version 2.06"
Ident_Number = 0x1810
Protocol_Ident = 0      ; DP protocol
Station_Type  = 0      ; Slave device
FMS_supp      = 0      ; FMS not supported
Hardware_Release = "Version 2.3"
Software_Release = "Version 2.06"

```

; Used bitmap

```

Bitmap_Device = "ABIC_DE"
Bitmap_Diag   = "ABIC_DI"
Bitmap_SF     = "ABIC_SF"

```

; Supported baudrates

```

9.6_supp      = 1
19.2_supp     = 1
45.45_supp    = 1
93.75_supp    = 1
187.5_supp    = 1
500_supp      = 1
1.5M_supp     = 1
3M_supp       = 1
6M_supp       = 1
12M_supp      = 1

```

; Maximum responder time for supported baudrates

```

MaxTsdr_9.6   = 15
MaxTsdr_19.2  = 15
MaxTsdr_45.45 = 15
MaxTsdr_93.75 = 15
MaxTsdr_187.5 = 15
MaxTsdr_500   = 15
MaxTsdr_1.5M  = 25
MaxTsdr_3M    = 50

```

MaxTsdr\_6M = 100  
MaxTsdr\_12M = 200

; Supported hardware features  
Redundancy = 0 ; not supported  
Repeater\_Ctrl\_Sig = 2 ; TTL  
24V\_Pins = 0 ; not connected  
Implementation\_Type = "NP30"

; Supported DP features  
Freeze\_Mode\_supp = 1 ; supported  
Sync\_Mode\_supp = 1 ; supported  
Auto\_Baud\_supp = 1 ; supported  
Set\_Slave\_Add\_supp = 1 ; supported

; Maximum polling frequency  
Min\_Slave\_Intervall = 1 ; 100 us

; Maximum supported sizes  
Modular\_Station = 1 ; modular  
Max\_Module = 24  
Max\_Input\_Len = 144  
Max\_Output\_Len = 144  
Max\_Data\_Len = 288  
Modul\_Offset = 1

Fail\_Safe = 1 ; Data telegram without data in state CLEAR accepted

Slave\_Family = 0  
Max\_Diag\_Data\_Len = 6

; Definition of modules  
Module = "IN/OUT: 32 Byte (16 word)" 0x7F  
6  
EndModule  
;  
Module = "OUTPUT: 16 Byte ( 8 word)" 0x67  
17  
EndModule  
;

#### NOTE:

**0x7F** corresponds to: "IN/OUT: 32 Byte (16 word)" 0x7F  
**0x67** corresponds to: "OUTPUT: 16 Byte (8 word)" 0x67

**This means that the PLC Master must be configured to exchange 32 Input bytes and 48 output bytes.**

### **S125 PROFIBUS MODULE SPECIFICATIONS (AnyBus-IC PDP)**

AnyBus-IC PDP is a module developed for the communication inside a Profibus-DP network and operates as a Profibus-DP **slave** module.

#### **Main features:**

- **32 bytes input / 32 bytes output** (see note on page 2.63)  
The significant bytes in the MC302 communication protocol are the following:  
**16** for the Profibus Input Area (**16 bytes** from 0 to 15, see “Profibus Input Data Area” on page 2.61)  
**2** for the Profibus Output Area (**2 bytes** from 0 to 1, see “Profibus Output Data Area” on page 2.61)
- **Supports all Profibus baurates from 9,6 kbit/s to 12 Mbit/s**  
The AnyBus-IC PDP supports automatic baurate detection, which means that the actual baudrate is only to be configured in the Profibus master.
- **Galvanically isolated bus electronics**  
The bus power is separated from other electronics via a DC/DC converter. The send and receive signals are isolated via opto couplers.

#### **ID Profibus number**

The ID Profibus number of the AnyBus-IC module (included in the GSD file) is **1810h**

#### **Profibus connector (9 pin Sub-D)**

The recommended connector for Profibus is a 9 pin Sub-D female connector.  
When using a 9 pin Sub-D, the A-Line, B-Line, +5V BUS, GND BUS and Shield are mandatory signals and should be connected.

See pinout on page 1.17 of the Manual Section 1

## **THE BCD OUTPUT PROTOCOL**

The baud rate of the serial communication to the BCD board is 9600, therefore it is necessary to program the COM1 baud rate to the same value.

The frequency used to refresh the outputs is 10 Hz (not changeable).




The value represented by the BCD board is the gross weight.

39.999 is the maximum value that can be represented by the BCD board.

All the outputs but the polarity output will be activated at the same time in case of:

- Weight value higher than the maximum capacity of the weighing system
- Weight value not valid
- Negative weight

## LIST OF THE PROGRAMMING PROCEDURES

| KEY   | FUNCTION   |
|---|--|
| <b>F</b>  | Recipe selection   |
| <b>F1</b>   | Recipe programming procedure<br>Interruption of the batching cycles automatic sequence |
| <b>F2</b>   | Programming other batching parameters  |
| <b>F3</b>   | Programming the number of the batching cycles  |
| <b>F4</b>   | Modification of the recipe's quantity  |
| <b>F5</b>   | Handling of the totals of the ingredients and the recipes                              |
| <b>F6</b>   | Handling of the inventories of the ingredients   |
| <b>F7</b>   | Start batch / Re-start batch / Clear alarm   |
| <b>F8</b>   | Stop batch / Pause   |
|  | Autotare   |
|  | Semiautomatic zero   |
|  | Cancel the tare  |
| <b>MENU</b>   | Access to the set-up menu of the operative functions                                   |
| <b>MENU</b> (pressed for 2 sec.)  | Access to the instrument set-up menu   |
| <b>ENTER</b> (pressed for 3 sec.)   | Access to the weighing parameters set-up menu  |

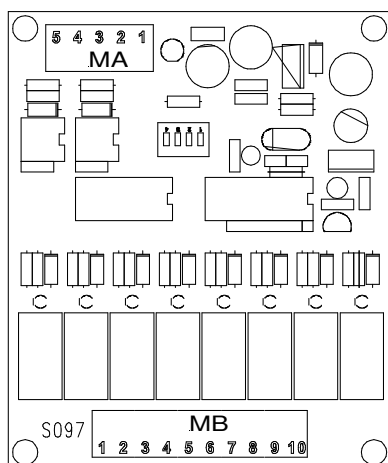
## TROUBLESHOOTING GUIDE

| PROBLEM  | POSSIBLE CAUSE  | POSSIBLE SOLUTION  |
|--|---|--|
| The batch does not START   | <ul style="list-style-type: none"> <li>The batched recipe has not been selected or has not been programmed correctly.</li> </ul>                        | <ul style="list-style-type: none"> <li>Select and set-up the recipes following the related instructions.</li> </ul>  |
| The instrument batches incorrectly   | <ul style="list-style-type: none"> <li>The parameters that are necessary for the batch have not been set correctly.</li> </ul>                          | <ul style="list-style-type: none"> <li>Make sure that they have been set according to the desired options.</li> </ul>  |
| The serial communication does not work correctly                           | <ul style="list-style-type: none"> <li>The connection has not been executed properly</li> <li>The serial interface selection is wrong</li> </ul>        | <ul style="list-style-type: none"> <li>Check the installation as described in section 1</li> <li>Select the settings correctly</li> </ul>  |
| The semiautomatic zero function does not work                              | <ul style="list-style-type: none"> <li>The gross weight is over the limit range of the semiautomatic zero.</li> <li>The weight is not stable</li> </ul> | <ul style="list-style-type: none"> <li>To perform the zero it is necessary to re-calibrate the weight</li> <li>Wait for the weight stabilization or adjust the digital filter value</li> </ul> |
| The messages on the display and on the printer are not readable.           | <ul style="list-style-type: none"> <li>The selected language is not English</li> </ul>  | <ul style="list-style-type: none"> <li>Select the English language</li> </ul>  |
| The keyboard does not work or the programming menu access is not available | <ul style="list-style-type: none"> <li>The keyboard lock has been activated</li> <li>The access menu password has been activated</li> </ul>             | <ul style="list-style-type: none"> <li>Check the keyboard access and the menu password.</li> </ul>   |

## APPENDIX

### 8 RELAYS EXTERNAL MODULE

#### CONNECTIONS



| Pole Nr. | 5 pole MA terminal block | 10 pole MB terminal block |
|----------|--------------------------|---------------------------|
| 1        | (+) 24 Vdc or 24 Vac (*) | Common 1                  |
| 2        | (-) 24 Vdc or 24 Vac (*) | OUTPUT 1                  |
| 3        | COM + (**)               | OUTPUT 2                  |
| 4        | TXD (**)                 | OUTPUT 3                  |
| 5        | SCLK (**)                | OUTPUT 4                  |
| 6        |                          | Common 2                  |
| 7        |                          | OUTPUT 5                  |
| 8        |                          | OUTPUT 6                  |
| 9        |                          | OUTPUT 7                  |
| 10       |                          | OUTPUT 8                  |

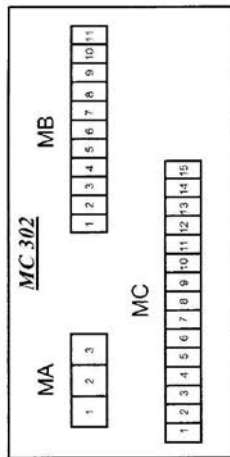
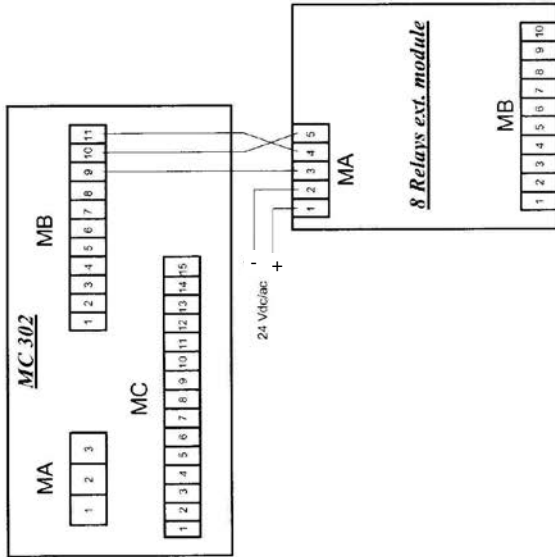
(\*) The 24V may be supplied as DC Voltage, but also AC voltage is allowed.

(\*\*) For the connection of the 8 Relays Module board to the MC302 instrument Refer to page 1.15 of the Installation manual (Sec. 1)

#### TECHNICAL FEATURES

|                              |   |
|------------------------------|---|
| Power supply                 | 24 Vdc or 24 Vac $\pm 10\%$                                 |
| Power consumption            | 8 W   |
| Isolation                    | Class III   |
| Operative temperature        | -10°C ÷ +40°C (relative humidity 85% non-condensing)        |
| Storage temperature          | -20°C ÷ +50°C   |
| Overall dimensions           | 93 mm x 126 mm x 60 mm (l x h x d) (DIN43700)               |
| Mounting                     | DIN rail  |
| Enclosure                    | Polyammide 6.6 UL 94V-0 auto extinguishing                  |
| Grado di protezione frontale | IP00  |
| Wiring connections           | Terminal blocks (pitch 5.08 mm.)                            |
| Logic Outputs                | Nr 8 relays (dry contact N.O.) max 115Vac/30Vdc, 0.5 A each |
| Serial port                  | Synchronous serial interface in current loop (RX only).     |
| Cable maximum length         | 100 mt  |
| Serial protocol              | Dedicated   |
| CE Conformity                | EN50081-1, EN50082-2, EN61010-1                             |

**BATCH-IN and BATCH-OUT WIRING DIAGRAMS**



| BATCH-IN SEQUENCE             |                   | BATCH-IN SEQUENCE                 |                     |
|-------------------------------|-------------------|-----------------------------------|---------------------|
| 4 INGREDIENTS AT DUAL SPEED   |                   | 5 TO 11 INGREDIENTS AT DUAL SPEED |                     |
| MC302 MB Terminal block       |                   | MC302 MB Terminal block           |                     |
| 1                             | Fine ingredient 1 | 1                                 | Batch ingredient 1  |
| 2                             | Fine ingredient 2 | 2                                 | Batch ingredient 2  |
| 3                             | Common output     | 3                                 | Common output       |
| 4                             | Fine ingredient 3 | 4                                 | Batch ingredient 3  |
| 5                             | Fine ingredient 4 | 5                                 | Batch ingredient 4  |
| 6                             | Alarm             | 6                                 | Alarm               |
| 7                             | Discharge         | 7                                 | Discharge           |
| 8                             | Common output     | 8                                 | Common output       |
| EXT. MODULE MB Terminal block |                   | EXT. MODULE MB Terminal block     |                     |
| 1                             | Common output     | 1                                 | Common output       |
| 2                             | —                 | 2                                 | Batch ingredient 5  |
| 3                             | —                 | 3                                 | Batch ingredient 6  |
| 4                             | —                 | 4                                 | Batch ingredient 7  |
| 5                             | —                 | 5                                 | Batch ingredient 8  |
| 6                             | Common output     | 6                                 | Common output       |
| 7                             | —                 | 7                                 | Batch ingredient 9  |
| 8                             | —                 | 8                                 | Batch ingredient 10 |
| 9                             | —                 | 9                                 | Batch ingredient 11 |
| 10                            | Common Coarse     | 10                                | Batch ingredient 12 |

| BATCH-OUT SEQUENCE            |                   | BATCH-IN SEQUENCE             |                    |
|-------------------------------|-------------------|-------------------------------|--------------------|
| 1 INGREDIENT AT DUAL SPEED    |                   | 4 INGREDIENTS AT SINGLE SPEED |                    |
| MC302 MB Terminal block       |                   | MC302 MB Terminal block       |                    |
| 1                             | Fine batch-out    | 1                             | Batch ingredient 1 |
| 2                             | Minimum level     | 2                             | Batch ingredient 2 |
| 3                             | Common output     | 3                             | Common output      |
| 4                             | Maximum level     | 4                             | Batch ingredient 3 |
| 5                             | Coarse batch-out  | 5                             | Batch ingredient 4 |
| 6                             | Alarm             | 6                             | Alarm              |
| 7                             | Cycle in progress | 7                             | Discharge          |
| 8                             | Common output     | 8                             | Common output      |
| EXT. MODULE MB Terminal block |                   | EXT. MODULE MB Terminal block |                    |
| 1                             | —                 | 1                             | Common output      |
| 2                             | —                 | 2                             | —                  |
| 3                             | —                 | 3                             | —                  |
| 4                             | —                 | 4                             | —                  |
| 5                             | —                 | 5                             | —                  |
| 6                             | —                 | 6                             | Common output      |
| 7                             | —                 | 7                             | —                  |
| 8                             | —                 | 8                             | —                  |
| 9                             | —                 | 9                             | —                  |
| 10                            | —                 | 10                            | Common Coarse      |





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Certifications:



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